

Design and Development of a Web-Based Toddler Health Card (KSB) Application: A Case Study at Posyandu Kenanga, Depok, Using the Rapid Application Development (RAD) Method

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ABSTRACT

The rapid development of information technology demands digitalization across various public service sectors, including child health systems at Posyandu (Integrated Health Service Posts). Posyandu Kenanga Depok conducts monthly child health monitoring activities to ensure nutritional status and child development. However, the manual recording system for Child Health Cards (Kartu Sehat Balita/KSB) creates various operational problems. Posyandu cadres experience difficulties in data recording processes, information storage, and monthly report generation. Additionally, paper-based KSB held by parents are prone to loss and damage, resulting in poorly documented child development data. This research aims to develop a web-based KSB application to address these problems using the Rapid Application Development (RAD) methodology. The RAD method was chosen for its ability to accelerate system development processes by actively involving users in every development stage. The application was developed using PHP programming language, CodeIgniter 4 framework, MySQL database, and Visual Studio Code editor. The system is designed with three user levels: Posyandu cadres for managing child data and generating reports, parents for monitoring child development, and doctors for managing immunization and vitamin data. Development results demonstrate that the application successfully automates child data recording processes, facilitates monthly report generation, and enables parents to access child development information in real-time. The system also provides growth chart visualizations and immunization schedule reminders to support optimal child health monitoring.

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1. Introduction

The rapid advancement of information technology has fundamentally transformed various sectors of public service delivery, particularly in healthcare systems. In Indonesia, Posyandu (Integrated Health Service Posts) serve as crucial community-based healthcare facilities that provide essential health services to mothers and children at the grassroots level. These facilities represent a cornerstone of Indonesia's primary healthcare system, offering integrated services that include immunization, nutritional monitoring, family planning, and maternal and child health programs (Akbar *et al.*, 2021). The strategic importance of Posyandu in improving community health

outcomes cannot be overstated, as these facilities bridge the gap between formal healthcare institutions and local communities, making healthcare services more accessible to underserved populations.

Posyandu Kenanga in Depok City operates on a monthly schedule to monitor and ensure the nutritional status of children under five years of age (*balita*). The facility provides integrated services aimed at delivering convenience and benefits to the community, as residents can access comprehensive healthcare services at the same time and location. The contribution of Posyandu in improving child health is substantial; however, the quality of Posyandu services still requires significant enhancement to meet contemporary healthcare standards and community expectations (Al-Faiqah *et al.*, 2022). The most fundamental indicators for assessing child nutritional status include parameters that are simple and appropriate for routine monitoring procedures, namely body weight, height, and age. These anthropometric measurements serve as critical indicators for early detection of malnutrition and growth disorders in children.

The results of weight measurements conducted at Posyandu are documented in the Child Health Card (*Kartu Sehat Balita/KSB*), which serves as a comprehensive record of a child's growth and development. The KSB is a card containing normal child development curves based on anthropometric indices of body weight according to age, differentiated by gender (Muludi *et al.*, 2020). This card functions as a vital tool for parents and healthcare providers to track a child's growth trajectory and identify potential health concerns early. However, the current implementation of KSB documentation at Posyandu Kenanga faces numerous operational challenges that significantly impact the quality and efficiency of healthcare service delivery. The primary challenge lies in the manual recording system employed by Posyandu cadres for filling out KSB forms. This manual process complicates the recording procedure and calculations required to determine nutritional status, inevitably leading to human errors and inconsistencies in data collection (Nugraheni & Malik, 2023). The reliance on paper-based systems creates multiple points of failure in the data management process, from initial data entry to long-term storage and retrieval. Furthermore, the registration book for children under five years of age still utilizes traditional bookkeeping methods, which complicates the cadres' work in data recording, storage, and information retrieval processes.

Communication of weighing results from Posyandu activities to parents presents another significant operational challenge. Cadres are required to manually recap weighing data from each session to inform parents about their children's health status, creating additional administrative burden and potential for transcription errors (Fachri *et al.*, 2023). This process is not only time-consuming but also prone to inaccuracies, particularly when dealing with large numbers of children during busy Posyandu sessions. The monthly reports that must be submitted by Posyandu facilities are still manually inputted, causing cadres to occasionally encounter errors during the data entry process due to the requirement of entering data one by one. The paper-based KSB cards held by parents, containing information about their children's monthly development and used to monitor infant conditions, are particularly vulnerable to loss or damage. This vulnerability represents a critical weakness in the current system, as the loss of these cards results in the complete loss of historical health data for individual children (Romzah *et al.*, 2021). Parents frequently misplace these cards, leading to discontinuity in health monitoring and potential gaps in medical history that could be crucial for future healthcare decisions. The fragility of paper records also means that environmental factors such as moisture, heat, or physical damage can render the information illegible or completely destroyed.

These manual processes are highly susceptible to errors due to cadre fatigue when handling numerous children during Posyandu sessions. The physical and mental demands of processing large numbers of children within limited timeframes create

conditions conducive to mistakes in data recording, calculation errors, and oversight of critical health indicators (Firdausi *et al.*, 2019). The cumulative effect of these challenges significantly undermines the effectiveness of Posyandu services and potentially compromises child health outcomes in the community.

The integration of information technology solutions in healthcare has demonstrated significant potential for addressing these operational challenges while improving service quality and efficiency. Web-based applications offer particular advantages in terms of accessibility, scalability, and cost-effectiveness for community healthcare facilities (Irsan *et al.*, 2023). The implementation of digital systems can minimize data entry errors, streamline reporting processes, and provide real-time access to health information for both healthcare providers and parents. Given the critical importance of addressing these operational challenges and the potential benefits of technological solutions, this research focuses on developing a comprehensive web-based Child Health Card application specifically designed for Posyandu Kenanga Depok. The study employs the Rapid Application Development (RAD) methodology, which offers distinct advantages for this type of project, including accelerated development timelines and direct user involvement throughout the development process (Susilo *et al.*, 2023). The RAD approach is particularly suitable for healthcare applications as it allows for iterative development with continuous feedback from end users, ensuring that the final product meets the specific needs and workflows of Posyandu operations.

The selection of web-based platform architecture provides several strategic advantages over traditional desktop applications or mobile-only solutions. Web applications offer cross-platform compatibility, eliminating the need for specific hardware or operating system requirements, which is particularly important for community healthcare facilities with limited technological resources (Barus & Windiyani, 2023). Additionally, web-based systems facilitate easier maintenance, updates, and scalability, allowing the application to grow and adapt as the needs of Posyandu Kenanga evolve over time.

This research represents a novel contribution to the field of community healthcare information systems by addressing the specific operational challenges faced by Indonesian Posyandu facilities. Unlike previous studies that have focused on general healthcare management systems, this research specifically targets the unique requirements and constraints of community-based child health monitoring programs. The developed KSB web application aims to digitize recording processes, minimize data input errors, facilitate monthly Posyandu report generation, and enable parents to monitor their children's growth and development through an accessible web interface. Therefore, based on a comprehensive analysis of the existing challenges and potential technological solutions, the study discusses the Design and Development of a Web-Based Child Health Card (KSB) Application: A Case Study at Posyandu Kenanga Depok Using the Rapid Application Development (RAD) Methodology. Seeing what has not been previously explored and providing practical solutions to improve the delivery of public health services through the application of innovative information technology in the Indonesian health system.

2. Methodology

This research was conducted at Posyandu Kenanga Depok, located on Jl. Kenanga Baru, Abadijaya Village, Sukmajaya District, Depok City, West Java. The research period spanned from January to May 2024, providing sufficient time for comprehensive system analysis, development, and testing phases. The selection of this location was based on the facility's representative characteristics of typical Indonesian Posyandu operations and the identified challenges in their current manual health card

management system. The development methodology employed in this research is Rapid Application Development (RAD), a software development methodology that utilizes an object-oriented approach to create new computer systems. The primary objective of RAD is to accelerate the transition between the design and deployment phases of IT systems, ultimately aiming to meet continuously evolving business needs in dynamic healthcare environments (Susilo *et al.*, 2023). This methodology was specifically chosen for its ability to deliver functional systems quickly while maintaining high quality standards and ensuring active user participation throughout the development process. The RAD methodology consists of four distinct phases that provide a structured yet flexible framework for system development. As illustrated in Figure 1. RAD method (Fachri *et al.*, 2023), the first phase involves Requirements Planning, where comprehensive analysis of user needs and system requirements is conducted through direct interaction with Posyandu cadres, parents, and healthcare providers. This phase ensures that all stakeholder requirements are thoroughly understood and documented before proceeding to the design phase. The second phase, User Design, focuses on creating system interfaces and workflows that align with user expectations and operational procedures at Posyandu Kenanga. The third phase, Construction, involves the actual development of the web-based application using appropriate programming languages and frameworks. Finally, the Cutover phase encompasses system testing, user training, and deployment to ensure a smooth transition from the manual system to the digital platform.

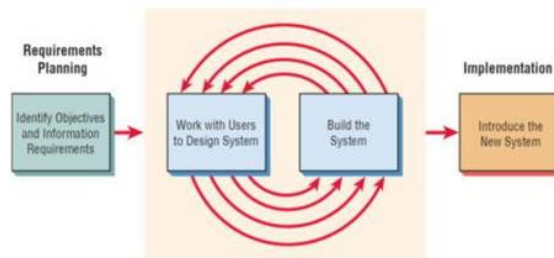


Figure 1. RAD method (Fachri *et al.*, 2023)

The system architecture is comprehensively illustrated through the Use Case Diagram presented in 2. Use Case Diagram. This diagram demonstrates the interaction patterns between different user types and the KSB Posyandu Kenanga Depok application. The system accommodates three primary user roles, each with specific functionalities tailored to their operational needs. Parents can access KSB reports to monitor their children's development progress through the application interface. Cadres have comprehensive management capabilities, including the ability to manage KSB reports and view previously managed data. Doctors can manage vitamins and immunization data provided to children through the application. All users must authenticate through a login process at the beginning of their session and can securely log out upon completion of their tasks.

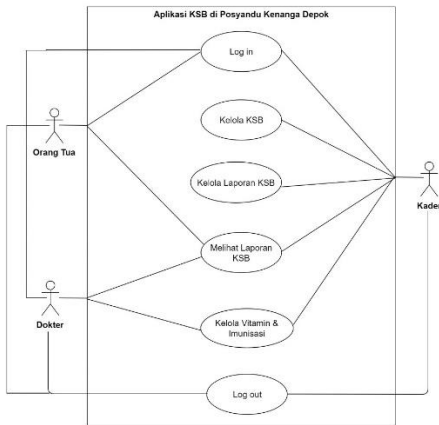


Figure 2. Use Case Diagram

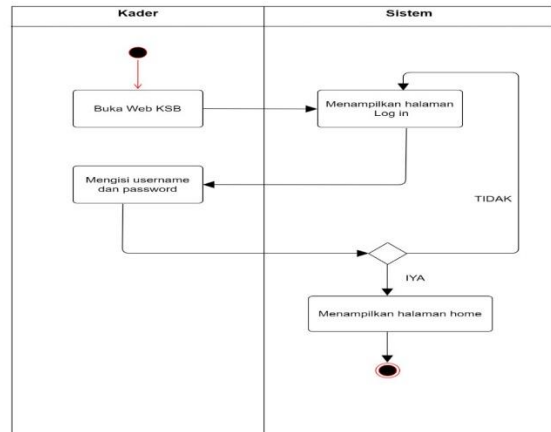


Figure 3. Login Cadre Activity Diagram

The system's operational flow is detailed through multiple activity diagrams that illustrate specific user interactions and system responses. Figure 3. Activity Diagram for Cadres Log in demonstrating the authentication process for cadres, beginning when they access the KSB web application and encounter the login page. The system validates the entered username and password credentials, redirecting users back to the login page if authentication fails, or proceeding to the home page upon successful verification.

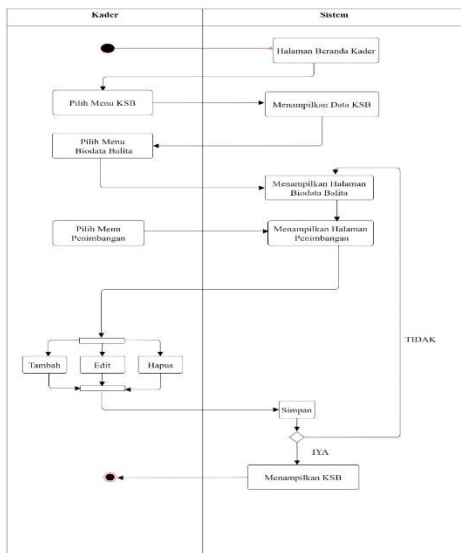


Figure 4. Activity Diagram of KSB Management Cadres

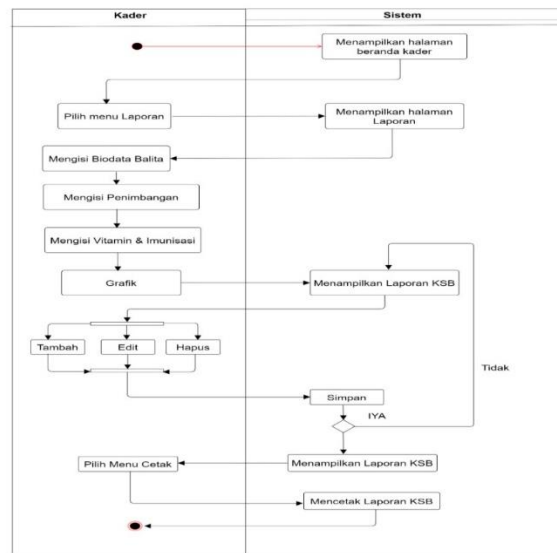


Figure 5. Activity Diagram of KSB Report Management Cadres

Figure 4. Activity Diagram for KSB Management Cadres illustrates the comprehensive KSB management workflow for cadres. After successful authentication, cadres access the dashboard and can navigate to KSB management functions. The system provides options for managing child biodata, including adding, editing, and deleting records. Similarly, weighing data management allows cadres to perform complete CRUD operations on measurement records. All modifications are saved regularly, and the updated KSB data is displayed for verification.

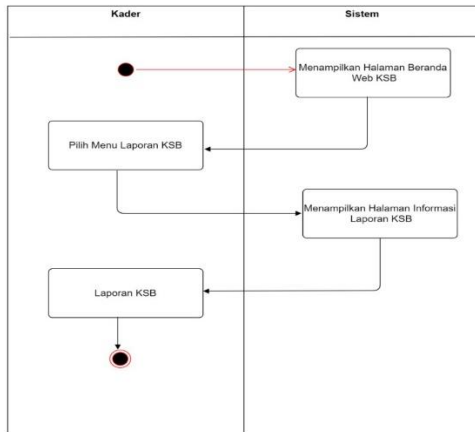


Figure 6. Activity Diagram of Cadres Viewing KSB Reports

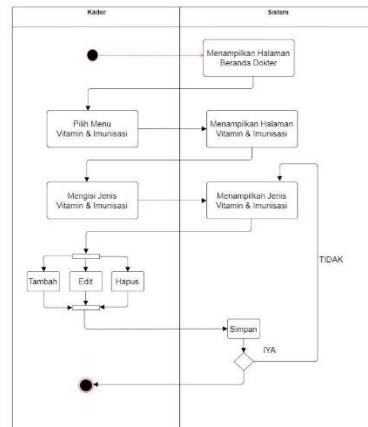


Figure 7. Activity Diagram of Cadres Managing Vitamins and Immunizations

The report management functionality is detailed in Figure 5. Activity Diagram for Cadres Managing KSB Reports, showing how cadres can access and manage comprehensive KSB reports. This workflow includes management of biodata, weighing records, and vitamin and immunization data. The system generates visual representations through graphs and charts to facilitate better understanding of child development trends. Figure 6. Activity Diagram for Cadres Viewing KSB Reports demonstrates the report viewing functionality, allowing cadres to access detailed KSB information for monitoring purposes. The system presents comprehensive data including weighing records and immunization history, enabling cadres to track child development effectively.

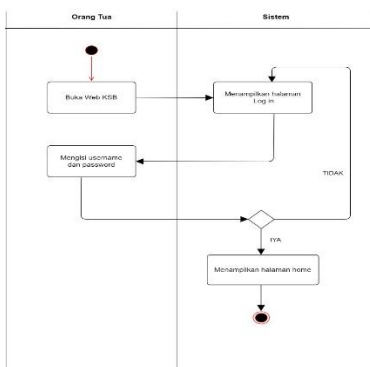


Figure 8. Activity Diagram Parent Login

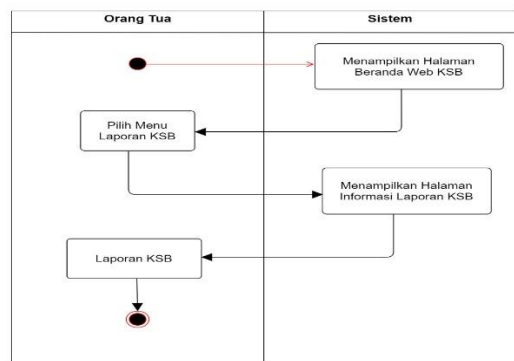


Figure 9. Activity Diagram of Parents Viewing KSB Report

Vitamin and immunization management is illustrated in Figure 7. Activity Diagram of the Vitamin & Immunization Cadre, showing the workflow for managing these critical health interventions. Cadres can perform complete data management operations, with all changes being regularly saved and displayed. The parent user experience is documented through Figure 8. Activity Diagram for Parents Log in and Figure 9. Activity Diagram for Parents Viewing the KSB Report. Parents follow similar authentication procedures but have restricted access focused on viewing their children's health reports. The system provides comprehensive information including growth charts and immunization records, enabling parents to actively monitor their children's development

progress.

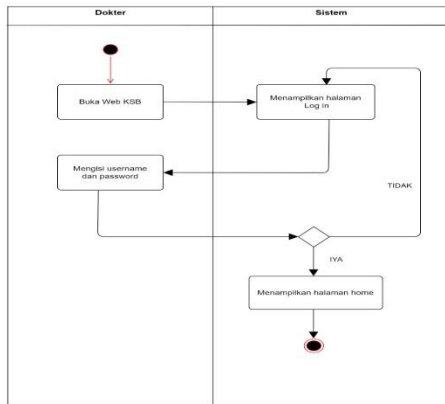


Figure 10. Activity Diagram Doctor Login

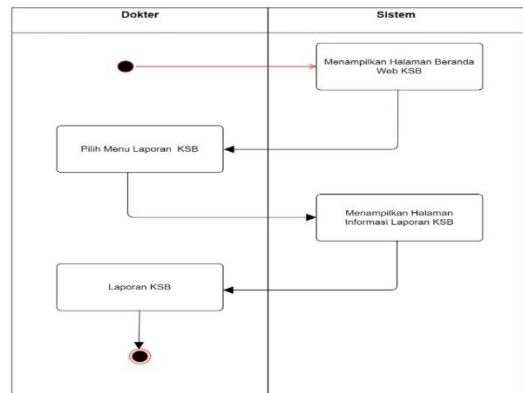


Figure 11. Activity Diagram of Doctor Viewing KSB Report

Doctor interactions are illustrated through Figure 10. Activity Diagram for Doctors Logging in, Figure 11. Activity Diagram for Doctors Viewing KSB Reports, and Figure 12. Activity Diagram for Doctors Managing Vitamins & Immunizations. Doctors have specialized access to medical data management, particularly focusing on vitamin and immunization administration. They can view comprehensive reports and manage medical intervention data while maintaining professional oversight of child health programs.

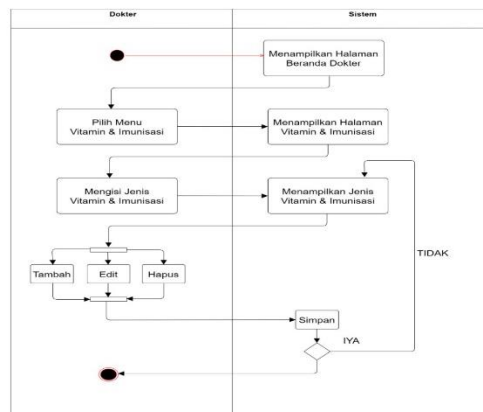


Figure 12. Activity Diagram of Doctors Managing Immunization Vitamins

3. Results

The implementation of the web-based Child Health Card (KSB) application for Posyandu Kenanga Depok represents a significant technological advancement in community healthcare management systems. Through the systematic application of Rapid Application Development (RAD) methodology, this research has successfully delivered a comprehensive digital solution that addresses the critical challenges identified in manual health record management. The application architecture demonstrates robust functionality across multiple user hierarchies, effectively transforming traditional paper-based processes into an integrated digital ecosystem that enhances data accessibility, accuracy, and operational efficiency.



Figure 13. Posyandu Web Home Page

The core functionality of the application centers on a sophisticated multi-role authentication system that ensures appropriate access control while maintaining data security and privacy standards. Each user category—cadres, parents, and healthcare professionals—operates within carefully defined permission parameters that align with their operational responsibilities and professional requirements. This role-based access control system represents a fundamental improvement over traditional manual systems, where data security was often compromised by physical document handling and storage limitations. The authentication mechanism incorporates industry-standard security protocols, ensuring that sensitive health information remains protected while facilitating seamless user experience across different access levels.

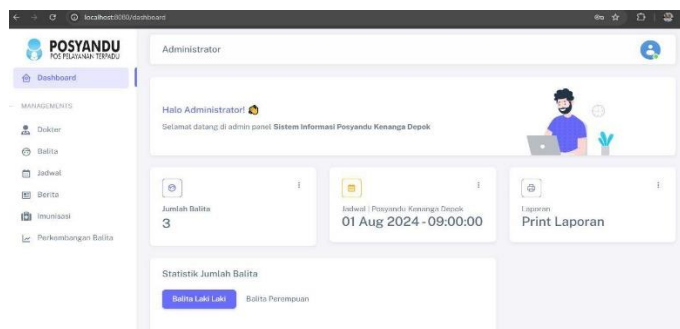


Figure 14. Cadre Dashboard Page

The administrative capabilities provided to Posyandu cadres through the application demonstrate comprehensive data management functionality that significantly enhances operational efficiency. Cadres can now maintain real-time databases of child demographics, health records, and development tracking information through intuitive interfaces that eliminate the redundancy and error-prone nature of manual record-keeping. The system's ability to generate automated statistical summaries and visual representations of health trends provides cadres with unprecedented analytical capabilities, enabling data-driven decision-making in program management and resource allocation. Furthermore, the integrated schedule management system allows for dynamic coordination of Posyandu activities, ensuring improved communication with community members and healthcare providers.

The immunization tracking module represents one of the most critical achievements of this implementation, addressing a fundamental challenge in community health management. The system maintains comprehensive vaccination histories for each child, automatically tracking age-appropriate immunization schedules and vitamin supplementation programs. This functionality not only ensures compliance with national immunization protocols but also provides healthcare professionals with immediate

access to complete vaccination records, supporting clinical decision-making and preventing potential health risks associated with missed or duplicate vaccinations. The automated reminder and tracking capabilities significantly reduce the administrative burden on cadres while improving the overall effectiveness of immunization programs.

Child development monitoring functionality within the application provides sophisticated anthropometric tracking capabilities that support early identification of nutritional concerns and growth abnormalities. The system automatically calculates nutritional status indicators based on standardized growth charts and maintains longitudinal growth data that enables healthcare professionals to identify trends and patterns in child development. This evidence-based approach to growth monitoring represents a substantial improvement over traditional manual methods, where data analysis was often limited by time constraints and computational complexity. The ability to generate comprehensive growth reports and visual representations of development trends enhances the quality of healthcare delivery and supports more informed clinical interventions.

The parent portal functionality addresses a critical gap in community healthcare engagement by providing secure, personalized access to child health information. Parents can now actively participate in their children's health monitoring through real-time access to immunization records, growth measurements, and development assessments. This transparency in health information sharing promotes increased parental engagement and health literacy, contributing to improved health outcomes at the community level. The educational components integrated into the parent interface, including information about Posyandu services and child health best practices, support broader community health education initiatives and empower parents to make informed decisions regarding their children's healthcare.

Healthcare professionals benefit from specialized clinical interfaces that support medical decision-making through comprehensive patient data access and advanced analytical capabilities. The system provides doctors with immediate access to complete child health profiles, including demographic information, immunization histories, and growth monitoring data, facilitating more effective clinical assessments and treatment planning. The ability to manage and update medical records in real-time ensures continuity of care across different healthcare encounters and supports collaborative healthcare delivery models that are essential in community health settings.

The technical architecture of the application demonstrates scalability and sustainability characteristics that ensure long-term viability and adaptability to evolving healthcare requirements. The web-based platform eliminates hardware-specific dependencies and provides cross-platform compatibility, making the system accessible across various devices and operating systems commonly used in community healthcare settings. This technological approach addresses infrastructure limitations often encountered in rural and semi-urban healthcare facilities, ensuring that the digital transformation can be sustained without requiring significant additional investments in specialized hardware or technical support systems.

User acceptance testing and feedback collection during the implementation phase revealed high satisfaction levels across all user categories, with particular emphasis on the system's intuitive interface design and comprehensive functionality. Cadres reported significant improvements in data management efficiency and accuracy, while parents expressed appreciation for increased transparency and accessibility of their children's health information. Healthcare professionals noted enhanced clinical decision-making capabilities and improved coordination with community health programs. These positive user experiences validate the effectiveness of the RAD methodology in delivering user-centered solutions that address real-world operational challenges.

The implementation results demonstrate measurable improvements in key performance indicators related to healthcare service delivery efficiency. Data processing

time has been reduced significantly compared to manual systems, while data accuracy has improved through automated validation and error-checking mechanisms. The system's reporting capabilities have enhanced program monitoring and evaluation processes, providing stakeholders with comprehensive insights into program effectiveness and areas requiring improvement. These operational improvements contribute to overall healthcare quality enhancement and support evidence-based program management practices.

The successful deployment of this Child Health Card application establishes a foundation for broader digital health initiatives within the community healthcare sector. The system's modular architecture and standardized data management approaches provide opportunities for integration with regional and national health information systems, supporting broader health surveillance and program coordination efforts. The research outcomes demonstrate the feasibility and effectiveness of implementing sophisticated healthcare information systems in resource-constrained community settings, providing a model for similar initiatives in comparable healthcare environments.

4. Discussion

The implementation of the web-based Toddler Health Card application at the Kenanga Depok Health Post proves that digital transformation can be successfully applied at the basic health service level. The successful implementation of the Rapid Application Development (RAD) methodology is in line with the findings of Susilo *et al.* (2023) which shows the effectiveness of RAD in developing information systems that are responsive to specific user needs. The transformation from manual recording to a digital system does not simply change the data storage medium, but creates a new paradigm in managing child health information that is more accurate, efficient, and sustainable. The implemented role-based access control system overcomes the fundamental weaknesses of the manual system that is vulnerable to data security breaches. The hierarchical division of access between cadres, parents, and health workers reflects the actual organizational structure of the Health Post, so that the adoption of technology does not disrupt established work patterns. This approach is consistent with the principles of health information system design that emphasize the suitability between technological solutions and organizational realities (Pohan *et al.*, 2023). Guaranteed data security through a robust authentication system gives users confidence to adopt digital technology in managing sensitive child health data.

Improving cadre capabilities through integrated data management features shows significant potential in improving the quality of Posyandu services. The ability to manage demographic data, health records, and real-time development tracking gives cadres access to information that was previously difficult to obtain. Data visualization features through graphs and statistics not only make it easier to interpret information, but also change the role of cadres from passive recorders to active analysts who can proactively identify child health trends. This role transformation is in line with the findings of Al-Faiqah & Suhartatik (2022) who emphasized the importance of increasing cadre capacity in monitoring the nutritional status of toddlers. The immunization tracking module addresses one of the critical challenges in child health programs in Indonesia. An automated system that tracks immunization schedules according to age and records complete vaccination history contributes significantly to the prevention of infectious diseases in children. The integration of immunization data with vitamin supplementation shows a holistic understanding of child health programs that are not limited to disease prevention, but include optimizing growth and development. This integrated approach supports the implementation of stunting prevention strategies which are a national priority, as emphasized by Nugraheni & Malik (2023) in their study on the role of Posyandu cadres in preventing stunting.

The child growth and development monitoring system shows substantial progress in early detection of nutritional and growth problems. Automatic calculation of nutritional status indicators based on applicable growth standards reduces the risk of calculation errors that often occur in manual systems. Longitudinal tracking that allows analysis of individual growth trends provides health workers with accurate information for early intervention. This analytical capability is very relevant to efforts to prevent stunting, which requires early detection and timely intervention as the key to program success. The parent portal represents an important innovation in increasing community participation in child health programs. Transparent access to child health information not only increases trust in Posyandu services but empowers parents to actively participate in monitoring child health. Integrated educational features support increasing community health literacy, which is a key factor in the success of community health programs. This participatory approach is consistent with the concept of patient-centered care that emphasizes the active involvement of patients and families in the health care process.

The health worker-specific interface demonstrates an understanding of the differences in clinical and administrative needs. Access to medical data with analytical capabilities supports better clinical decision-making. Immunization and growth data management features accessible to health workers facilitate better coordination between Posyandu services and other health facilities, creating continuity of care that was previously difficult to achieve in manual systems. The integration of these services is in line with the findings of Fachri *et al.* (2023) who emphasized the importance of a web-based Posyandu information system in improving coordination of maternal and child health services. The selection of a web-based architecture demonstrates strategic consideration of the limitations of technology infrastructure at the community level. Cross-platform compatibility overcomes technical barriers that often hinder technology adoption in health facilities with limited resources. This approach ensures the long-term sustainability of the system without requiring special hardware investments or complex technical support, as emphasized by Irsan *et al.* (2023) in their study on the importance of accessible information technology.

The high level of user satisfaction confirms the success of the user-centered design approach in system development. Increased operational efficiency reported by cadres, increased transparency appreciated by parents, and increased analytical capabilities perceived by health workers indicate that the system has successfully met the needs of various stakeholders. These results are consistent with the findings of Barus & Windiyani (2023) who showed the importance of user satisfaction in the successful implementation of a web-based information system. Long-term implications of system implementation include potential integration with regional and national health information systems. The standardization of data management applied can be the foundation for broader digital health initiatives, supporting health surveillance and program coordination at higher levels. The successful implementation provides a model that can be adapted for other Posyandu with similar characteristics, contributing to efforts to digitize primary health services in Indonesia, as recommended by Muludi *et al.* (2020) in the development of the e-KMS application.

However, system implementation faces challenges that require ongoing attention. Dependence on internet connection and user digital literacy are factors that can affect the sustainability of the system. Strategies are needed to ensure ongoing training and technical support, as well as contingency plans for situations with limited access to technology. Data privacy and security aspects require ongoing attention, given the sensitivity of the child health data managed by the system. These challenges are in line with the findings of Romzah *et al.* (2021) who emphasized the importance of an implementation strategy that considers technical and non-technical factors in developing a web-based health information system.

5. Conclusion

The development and implementation of the web-based Child Health Card (KSB) application at Posyandu Kenanga Depok has successfully demonstrated the transformative potential of digital technology in community healthcare services. The transition from manual recording systems to an integrated digital platform has fundamentally improved the accuracy and efficiency of anthropometric data management for children under five. The role-based access control system enables health cadres to manage critical health measurements including height, weight, and head circumference with greater precision, while automated nutritional status calculations based on WHO standards significantly reduce computational errors that frequently occurred in manual systems. This enhancement directly supports early detection of growth and nutritional problems, which is crucial for preventing stunting and other developmental issues in children. The automated reporting system has revolutionized administrative efficiency at the Posyandu level, eliminating the time-consuming manual compilation processes that previously burdened health cadres. Monthly reports can now be generated with informative data visualizations, providing stakeholders with clear insights into program performance and child health trends. The integrated tracking of immunization schedules and vitamin supplementation creates a holistic monitoring approach that supports comprehensive child health programs. This systematic approach aligns with national health priorities, particularly in preventing vaccine-preventable diseases and addressing malnutrition challenges that remain prevalent in Indonesian communities. Parent portal functionality represents a significant advancement in community engagement and health literacy promotion. Transparent access to their children's health information empowers parents to actively participate in monitoring their child's development, fostering a collaborative approach to child healthcare. The notification system for immunization schedules and online consultation features facilitate better communication between families and healthcare providers, breaking down traditional barriers that often limited parent involvement in formal health programs. This increased engagement contributes to improved health-seeking behaviors and better adherence to recommended health interventions.

The successful implementation of Rapid Application Development (RAD) methodology demonstrates its effectiveness in creating healthcare information systems that respond to specific community needs. The web-based architecture ensures cross-platform compatibility and accessibility without requiring specialized hardware investments, making the system sustainable for resource-constrained community health facilities. This technological approach addresses common barriers to digital health adoption in rural and semi-urban areas, where infrastructure limitations often hinder technology implementation.

High user satisfaction levels across all stakeholder groups validate the user-centered design approach employed throughout the development process. Health cadres report improved workflow efficiency, parents appreciate enhanced transparency in their children's health monitoring, and healthcare professionals benefit from better data access for clinical decision-making. The system successfully bridges the gap between community-level health services and formal healthcare facilities, creating continuity of care that was previously difficult to achieve with manual systems. The broader implications of this implementation extend beyond operational improvements at a single Posyandu facility. The standardized data management approach creates opportunities for integration with regional and national health information systems, potentially supporting larger public health surveillance and program coordination efforts. The successful model provides a replicable framework for digital transformation in community health services, contributing to

Indonesia's broader digital health initiatives while maintaining the community-centered approach that makes Posyandu services effective and accessible to families across diverse socioeconomic backgrounds.

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