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Implementation of a Web-Based Posyandu Information System Using the CodeIgniter Framework: A Case Study in Dusun Budiawaton, Central Lombok

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ABSTRACT

This study presents the design and implementation of a web-based information system to support the operational and administrative activities of Posyandu Mawar, a community-based maternal and child health service in Dusun Budiawaton, Central Lombok, Indonesia. The manual recording system currently used—particularly for monitoring child growth, immunization schedules, and nutritional data—has been identified as inefficient and prone to errors. To address these issues, a digital system was developed using the CodeIgniter framework, which offers a lightweight structure and MVC architecture for improved maintainability and scalability. Key features include registration of mothers and children, immunization tracking, growth monitoring with integrated KMS charts, and automated report generation. The system was developed using a prototyping methodology with continuous feedback from midwives and health volunteers to align the system with real-world needs. Testing demonstrated significant improvements in data accuracy, time efficiency, and accessibility of historical records. The interface was designed to be user-friendly, accommodating various levels of digital literacy among users. The successful implementation of this system highlights the potential of localized digital health solutions to enhance service delivery in rural areas. It also offers a replicable model that can be adopted by other Posyandu units in Indonesia, contributing to the broader agenda of community health digitalization.

KEYWORDS

Posyandu, Information System, Web-Based Application, CodeIgniter, Community Health, Child Monitoring.

INTRODUCTION

Community-based health services such as *Posyandu* (Integrated Health Post) play a crucial role in improving maternal and child health in Indonesia, especially in rural and under-resourced areas. These grassroots-level health centers are designed to provide accessible and low-cost services, including immunization, nutrition monitoring, antenatal care, and early detection of growth and development issues (Kementerian Kesehatan Republik Indonesia, 2019). Despite their critical role in public health, many Posyandu units still rely on manual, paper-based data recording systems, typically using physical logbooks. These methods are prone to human error, data loss, redundancy, and inefficiency in daily operations and reporting (Wicaksono & Damayanti, 2022).

The growing emphasis on evidence-based and data-driven healthcare in Indonesia underscores the urgent need to transition toward digital health systems. Health Information Systems (HIS) have proven to be essential tools for improving healthcare delivery, enabling real-time data processing, decision support, and efficient resource management (Sommerville, 2016). In the Posyandu context, a web-based information system offers a sustainable and scalable solution for managing individual and aggregated data on child growth, immunization schedules, and nutritional status (Budi & Raharjo, 2021). Digitizing these core functions can significantly enhance the accuracy, accessibility, and reliability of health records while reducing the administrative workload on health volunteers (*kader*) and midwives.

This study presents the design and implementation of a web-based Posyandu Information System for Posyandu Mawar, located in Dusun Budiawaton, Desa Mujur, Central Lombok. The system was developed using CodeIgniter, a lightweight PHP-based framework that supports the Model-View-Controller (MVC) architectural pattern. CodeIgniter was chosen for its rapid development capabilities, ease of use, and minimal server requirements—characteristics that make it ideal for small-scale, community-oriented applications (CodeIgniter Foundation, 2023; Nugroho & Prasetyo, 2020).

A prototyping development methodology was employed in this study to ensure iterative feedback and user involvement during each phase of system design. Health volunteers and midwives were actively engaged to align the functionality of the system with actual field practices and user expectations (Pressman & Maxim, 2020). By incorporating local insights and needs, the developed system offers practical tools such as digital child registration, automated growth charting, immunization tracking, and real-time report generation.

Through the implementation of this system, the study aims to demonstrate measurable improvements in service efficiency and data accuracy. Moreover, the outcome provides a replicable model that supports the digital transformation of maternal and child health services in rural Indonesia, aligning with broader national e-health strategies.

LITERATURE REVIEW

Posyandu and Community-Based Health Services in Indonesia

Posyandu (Integrated Health Post) is a community-based health initiative that serves as a frontline service for maternal and child health in Indonesia. These services include child growth monitoring, immunization, nutrition counseling, and maternal health checks. Despite their importance, many Posyandu units still operate using paper-based systems, which limit their ability to track data longitudinally and generate timely health reports (Kementerian Kesehatan Republik Indonesia, 2019).

Wicaksono and Damayanti (2022) highlight that manual data recording often leads to inefficiencies, especially in rural settings where access to trained personnel and reliable infrastructure is limited. Therefore, integrating digital technologies into these services can greatly enhance health data quality and improve service delivery outcomes. Digital transformation in Posyandu operations has proven to be effective in improving data accuracy and service efficiency, especially in managing child health records (Hasanah & Widodo, 2022).

According to Fitriani and Syahrial (2021), the application of information technology in rural health services contributes positively to operational efficiency, especially in managing community health data and enabling timely health interventions.

Health Information Systems and Their Role in Primary Care

Health Information Systems (HIS) have become a vital component of modern healthcare. They allow for the collection, processing, and analysis of patient data to support clinical decision-making, improve efficiency, and enhance health outcomes (Sommerville, 2016). In low-resource settings, particularly in rural areas, web-based HIS can serve as affordable and scalable solutions.

Previous research by Budi and Raharjo (2021) demonstrated that implementing a web-based information system in community health services can significantly reduce data entry errors and administrative workload. Furthermore, the integration of HIS in rural health units provides an opportunity for real-time monitoring and evaluation of health indicators.

CodeIgniter Framework in Web-Based Health Applications

CodeIgniter is a popular open-source PHP framework that uses the Model-View-Controller (MVC) pattern, which allows developers to build scalable and maintainable web applications (CodeIgniter Foundation, 2023). Its lightweight nature and ease of configuration make it suitable for small to medium-scale systems that need to be deployed rapidly.

Nugroho and Prasetyo (2020) emphasized the use of CodeIgniter in developing web-based health applications due to its clear structure and robust documentation. Their study found that CodeIgniter improved the speed of development while maintaining high system performance. This aligns with the goals of community-level health systems that require reliable, simple, and cost-effective technology.

The development approach taken in this study is consistent with the system architecture proposed by Hidayah and Zulfikar (2021), which emphasized modular design and usability for low-resource health environments such as Posyandu.

System Development Methodologies for Health Information Systems

The choice of development methodology plays a crucial role in the success of information system projects. The prototyping model, as suggested by Pressman and Maxim (2020), is particularly effective in environments where requirements evolve during development. This approach involves iterative design, testing, and refinement based on user feedback—making it ideal for community-based systems such as Posyandu, where users (midwives and volunteers) may not have strong technical backgrounds. According to Widyaningsih and Hidayat (2019), conducting a thorough user needs analysis is a critical step in developing effective digital applications for Posyandu, as it ensures the system aligns with the routines and capabilities of its end users.

In addition, user-centered development ensures that the final system reflects the real-world workflows and constraints of the intended environment (Sutopo & Arifin, 2018). Engaging end-users throughout the development process increases the likelihood of system adoption and long-term sustainability.

METHOD

Research Approach

This research adopts an applied qualitative approach with an emphasis on design-based system development, particularly tailored to the needs of community health environments (Sutopo &

Arifin, 2018; Creswell & Poth, 2018). The primary objective is not only to produce a functioning web-based information system but also to ensure that the system aligns with the actual workflows, challenges, and digital literacy levels of users in rural health services, especially *kader* (health volunteers) and midwives (Wicaksono & Damayanti, 2022).

The qualitative nature of the study allows for an in-depth exploration of contextual issues, including how users interact with existing systems, their perceptions of digital tools, and their needs for usability and reliability (Creswell & Poth, 2018; Sutopo & Arifin, 2018). This is crucial in systems development for public health, where success often depends not only on technical performance but also on user engagement and adoption (Sommerville, 2016; Pressman & Maxim, 2020).

The choice of this approach is grounded in the understanding that user participation and iterative feedback are key components in building solutions for non-technical stakeholders (Pressman & Maxim, 2020). A purely quantitative or top-down approach may overlook subtle but critical aspects of daily operations and user limitations. Hence, qualitative and participatory design methods are more suitable for capturing user behaviors, contextual constraints, and opportunities for improvement in rural health service delivery (Budi & Raharjo, 2021; Nugroho & Prasetyo, 2020).

Ultimately, this applied qualitative approach enables the development of a contextually grounded and socially responsive system, contributing to sustainable innovation in health information systems at the community level (Wicaksono & Damayanti, 2022; Kementerian Kesehatan Republik Indonesia, 2019).

Development Model

The system development in this study employed the prototyping model, a user-centered methodology that emphasizes iterative refinement through continuous feedback between developers and users (Pressman & Maxim, 2020). This model was chosen due to its flexibility in adapting to changing or evolving requirements, especially in environments where users may not be able to articulate technical specifications clearly at the outset (Sommerville, 2016).

The development process began with a preliminary needs assessment, conducted through informal interviews and direct observation of Posyandu Mawar's daily operations. This stage allowed the research team to understand the real challenges faced by health volunteers (*kader*) and midwives in recording, accessing, and reporting health data. From this assessment, the

researchers identified several critical system requirements, such as simplified child registration, integrated growth monitoring, immunization tracking, and printable monthly reports (Kementerian Kesehatan Republik Indonesia, 2019; Wicaksono & Damayanti, 2022).

A low-fidelity prototype was then designed to represent the system's initial interface and key functionalities. The prototype was presented to selected end-users who provided feedback regarding usability, clarity of navigation, and relevance of features. Based on this feedback, the system was refined and gradually expanded into a high-fidelity version using the CodeIgniter framework, which supports the Model-View-Controller (MVC) architecture and allows rapid web development with minimal server resource requirements (Nugroho & Prasetyo, 2020; CodeIgniter Foundation, 2023).

The prototyping model was especially effective in this setting because it allowed users with limited technical background to engage actively in the design process, not by defining specifications, but by reacting to working versions of the system. This approach reduced the gap between system design and real-world application, increasing the likelihood of system acceptance and long-term adoption (Budi & Raharjo, 2021).

In conclusion, the use of the prototyping model ensured that the system was not only technically functional but also socially and operationally relevant to its users in the field.

System Design and Implementation

The system was designed to address the operational needs of Posyandu Mawar, focusing on improving efficiency, accuracy, and accessibility of maternal and child health data. The design process followed the Model-View-Controller (MVC) architectural pattern, which separates data logic, interface presentation, and user interaction layers. This structure enhances system maintainability, scalability, and code modularity—an essential requirement for small-scale health applications in rural settings (CodeIgniter Foundation, 2023; Pressman & Maxim, 2020).

In line with the findings of Pratama and Lestari (2020), this study adopted a modular web-based approach that allows for easier updates and maintenance, especially in community-based health services with limited technical resources.

The system was developed using the CodeIgniter PHP framework, a lightweight and widely used platform suitable for rapid development. CodeIgniter supports easy configuration, integrated routing, form validation, and security mechanisms, making it appropriate for environments with limited infrastructure and developer resources (Nugroho & Prasetyo, 2020). MySQL was used as

the backend database to store structured records of children, mothers, immunization history, and growth monitoring data.

Core system functionalities include:

User authentication and role management, supporting two user levels: admin (midwives) and volunteers (*kader*).

Child and maternal registration, with structured input forms and dropdown menus to minimize entry errors.

Immunization scheduling and tracking, including alert flags for upcoming or missed vaccines.

Growth monitoring, with automatic integration into KMS (Kartu Menuju Sehat) charts using WHO growth standards.

Monthly report generation, allowing users to print or download formatted data summaries in PDF.

System Architecture

The system architecture was designed using a three-tier web application model, comprising the presentation layer (browser interface), the application logic layer (web server with CodeIgniter framework), and the data layer (MySQL database). This layered approach separates user interaction from business logic and data storage, allowing for better maintainability, modularity, and scalability (Pressman & Maxim, 2020; Sommerville, 2016).

At the user level, the system accommodates two roles: admin users (typically midwives) and volunteer users (kader). Both user types access the system through a browser-based interface designed with responsiveness and simplicity in mind. User inputs and requests are handled by the web server, where the CodeIgniter framework processes logic through its Model-View-Controller (MVC) architecture. The MVC pattern enhances clarity in code structure by isolating data models, business logic, and user interface components (CodeIgniter Foundation, 2023).

The MySQL database serves as the backend for storing structured health records, including child registration, immunization schedules, growth monitoring data, and historical weight records. All data transactions between users and the database are mediated by the application logic layer, ensuring secure and validated data handling.

A key feature of this architecture is its lightweight nature and compatibility with low-resource environments, making it ideal for rural health facilities like Posyandu (Nugroho & Prasetyo, 2020). The system also supports cloud deployment, enabling remote access and data synchronization when internet connectivity is available, while still functioning locally during offline periods.

The figure below illustrates the logical structure and data flow of the system (see Figure 1).

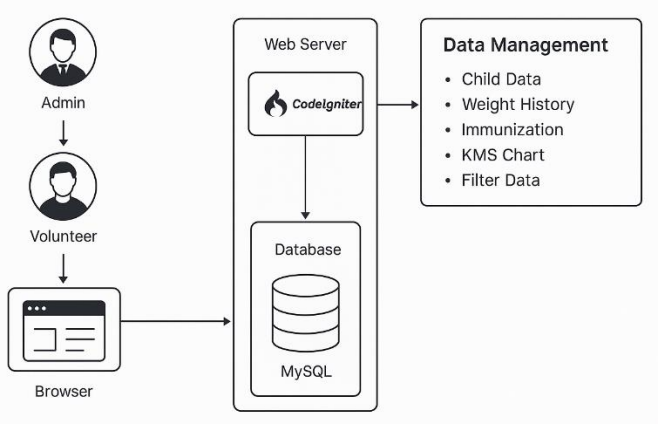

Figure 1. System Architecture

Context Diagram

The context diagram provides a high-level representation of the Posyandu Mawar Information System and illustrates how the system interacts with external actors. As a foundational component in system analysis, this diagram is crucial for understanding system boundaries, data flow, and stakeholder roles (Pressman & Maxim, 2020). It simplifies complex interactions into a single process, highlighting only external entities and the type of data exchanged with the system.

In the context of this study, the system is primarily used by two types of users: health volunteers (*kader*) and midwives. These users interact directly with the system through a web-based interface. The kader are responsible for registering new children, recording anthropometric data (e.g., weight, height), and updating immunization status. Meanwhile, midwives serve as administrators who manage user accounts, validate health data, and generate official monthly reports for submission to local health authorities.

Additionally, the system communicates indirectly with external stakeholders such as the Puskesmas (Community Health Center) or District Health Office, where exported reports may be submitted for integration into broader health monitoring programs (Kementerian Kesehatan

Republik Indonesia, 2019). However, in this prototype, the interaction with external systems remains manual via printable or downloadable report formats.

The context diagram clearly defines:

The system as a single unified process ("Posyandu Mawar Information System")

The external entities involved: *Kader*, *Midwives*, and optionally, *Health Authorities*

The main data flows, including inputs (child registration, measurement data, immunization logs) and outputs (reports, alerts, user access control)

This model is essential for guiding the development team in understanding who uses the system, what information they provide, and what outcomes they expect. It also supports communication with non-technical stakeholders by presenting the system in an intuitive and simplified structure (Sommerville, 2016).

A visual representation of this context is provided in Figure 2, which illustrates data flows between the system and its external environment.

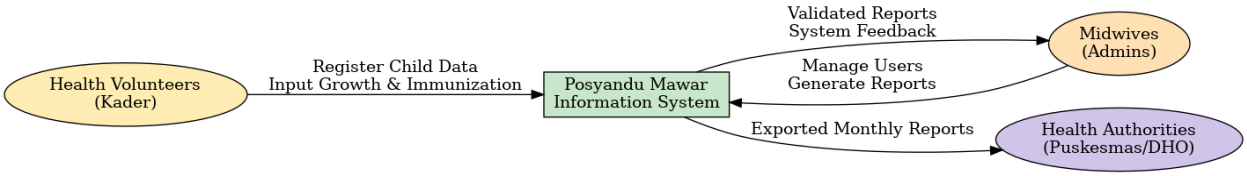

Figure 2. System's Context Diagram

System Overview Diagram

The System Overview Diagram provides a comprehensive view of the main functional modules and data flows within the Posyandu Mawar Information System. Unlike the context diagram that focuses on external interactions, this diagram highlights internal processes, system modules, and how they are interlinked to deliver the overall functionality of the application (Pressman & Maxim, 2020).

This visual representation is essential to ensure that both developers and stakeholders have a shared understanding of the system's architecture and operational flow. It supports system analysis, module testing, and further enhancements by offering a simplified but complete depiction of all key components.

The system is divided into five core modules:

1. **User Management Module**

   This module handles user registration, login, authentication, and role-based access control. It distinguishes between admin users (midwives) and kader (volunteers), ensuring that access rights are properly assigned and enforced.

2. **Child Registration Module**

   Provides forms and logic to input and manage demographic data of children, including parental information and address. It serves as the primary entry point for health monitoring data.

3. **Growth Monitoring Module**

   Enables users to record weight, height, and other anthropometric data. The system automatically calculates the child's age in months and links the data to standardized growth charts (KMS) for visual interpretation.

4. **Immunization Tracking Module**

   Allows input and tracking of vaccine types, administration dates, and responsible health workers. This module generates alerts for scheduled or missed immunizations.

5. **Reporting Module**

   Used primarily by admins, this module aggregates data by month, generates downloadable reports (in PDF or spreadsheet format), and allows printing for manual submission to external health offices.

These modules interact with a centralized database and are connected through a secure session-controlled web interface. Figure 4 illustrates the overall system structure and workflow.

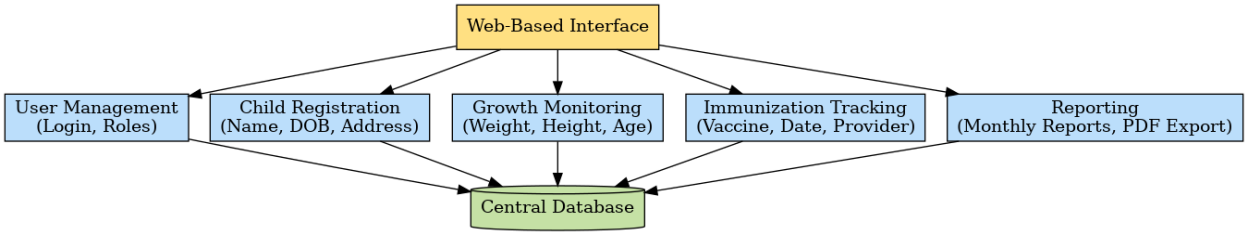

Figure 4. System Overview Diagram of Posyandu Mawar Information System

The modular design supports incremental system upgrades and simplifies maintenance, especially important in rural or low-resource environments where technical support may be limited (Budi & Raharjo, 2021). Moreover, the separation of concerns in the system design ensures that developers can update individual modules without disrupting other components, aligning with best practices in modern software architecture (Sommerville, 2016).

Database Design

The database design for the Posyandu Mawar Information System was guided by the need to ensure data consistency, integrity, and long-term scalability. A relational model was chosen for its robustness and suitability for transactional health data. The database schema was constructed using Entity-Relationship (ER) modeling, followed by a normalization process up to the Third Normal Form (3NF) to eliminate redundancy and ensure that each table maintains a single, well-defined purpose (Sommerville, 2016; Pressman & Maxim, 2020).

The core objective of the database is to support key health service functions: child registration, immunization tracking, growth monitoring, and automated reporting. As such, the schema includes tables for users, children, growth_records, immunizations, and monthly_reports. Each table was designed to represent distinct entities with clear relationships. For example, a one-to-many relationship exists between users and children, as well as between children and their respective growth or immunization records.

The users table stores authentication data and access roles, while the children table captures demographic and familial information. Health-specific data such as weight, height, and vaccination history are stored in the growth_records and immunizations tables, respectively. All tables are linked through foreign key constraints to maintain relational integrity and support cascading operations when records are deleted or updated (Nugroho & Prasetyo, 2020).

To accommodate future expansion, such as integration with broader district-level health systems, the database design adheres to modular principles and avoids hardcoded dependencies. Furthermore, all date-related fields are standardized in ISO format to facilitate time-based queries and reporting functions. Indexing is also applied to primary and foreign key columns to enhance performance in query execution.

The database consists of the following main tables:

Table 1. users

Field Name	Data Type	Description
user_id	INT (PK)	Unique identifier
username	VARCHAR	Login username
password_hash	TEXT	Encrypted password
role	ENUM	admin or kader
full_name	VARCHAR	Full name of the user

- **Normalization**: 3NF – no partial or transitive dependencies.
- **Purpose**: Manages user accounts and access levels.

Table 2. children

Field Name	Data Type	Description
child_id	INT (PK)	Unique ID for the child
full_name	VARCHAR	Name of the child
gender	ENUM	male / female
birth_date	DATE	Date of birth
parent_name	VARCHAR	Name of mother/father/guardian
address	TEXT	Full address
created_by	INT (FK)	References users.user_id

- **Normalization**: 3NF – child records are stored independently; foreign key links to creator.

Table 3. growth_records

Field Name	Data Type	Description
record_id	INT (PK)	Unique growth record ID
child_id	INT (FK)	References children.child_id
date_measured	DATE	Date of measurement
weight	DECIMAL	Weight in kilograms
height	DECIMAL	Height in centimeters
age_months	INT	Age in months (auto-calculated)
notes	TEXT	Optional notes or remarks

- **Normalization**: 3NF – fully functional dependencies on primary key.

Table 4. immunizations

Field Name	Data Type	Description
immunization_id	INT (PK)	Immunization record ID
child_id	INT (FK)	References children.child_id
immunization_type	VARCHAR	Type of vaccine (e.g., BCG, DPT)
date_given	DATE	Date of administration
administered_by	VARCHAR	Name of nurse or midwife

- **Normalization**: 3NF – each record represents a single vaccine event.

Table 5. monthly_reports

Field Name	Data Type	Description
report_id	INT (PK)	Unique report ID
month	VARCHAR	Reporting month (e.g., 'June 2025')
generated_by	INT (FK)	References users.user_id
created_at	DATETIME	Time of generation
total_children	INT	Number of children recorded that month
total_growth_records	INT	Number of growth checkups
total_immunized	INT	Number of immunization events

- **Normalization**: 3NF – monthly summaries, generated automatically.

Relational Design and Relationships

- One user can create many children records.
- Each child can have multiple growth_records and immunizations.
- monthly_reports are generated based on aggregation of data from the other three tables.

All foreign keys are enforced with ON DELETE CASCADE to maintain integrity and prevent orphan records.

Entity-Relationship (ER) Design

The Entity-Relationship (ER) design serves as the conceptual blueprint of the system's data structure, illustrating how entities within the Posyandu Mawar Information System are logically related. This model is critical in guiding the database normalization process and ensuring that each table in the relational schema corresponds accurately to a real-world object or transaction (Sommerville, 2016).

In the context of community health service management, the core entities identified include: User, Child, GrowthRecord, Immunization, and MonthlyReport. These entities are derived from

the system's functional requirements and validated through discussions with midwives and health volunteers (*kader*), ensuring that the data model aligns with field practices (Wicaksono & Damayanti, 2022).

Entity Descriptions

User: Represents system users, categorized as either admin (midwives) or health volunteers. Each user can be linked to data entries they create.

Child: Contains identity and demographic details of registered children, forming the central subject for health monitoring.

GrowthRecord: Stores routine anthropometric data such as weight and height, linked to each child.

Immunization: Records the immunization history of each child, including vaccine type and administration date.

MonthlyReport: Aggregates health service data on a monthly basis for monitoring and reporting.

Relationships

A User **can create** multiple Child records (1:M).

A Child **has many** GrowthRecord entries (1:M).

A Child **receives** multiple Immunizations (1:M).

A MonthlyReport **summarizes** data associated with system-wide activity, and is **generated by** a User (1:M).

These relationships are visually represented in an **Entity-Relationship Diagram (ERD)**, as shown in Figure 4.

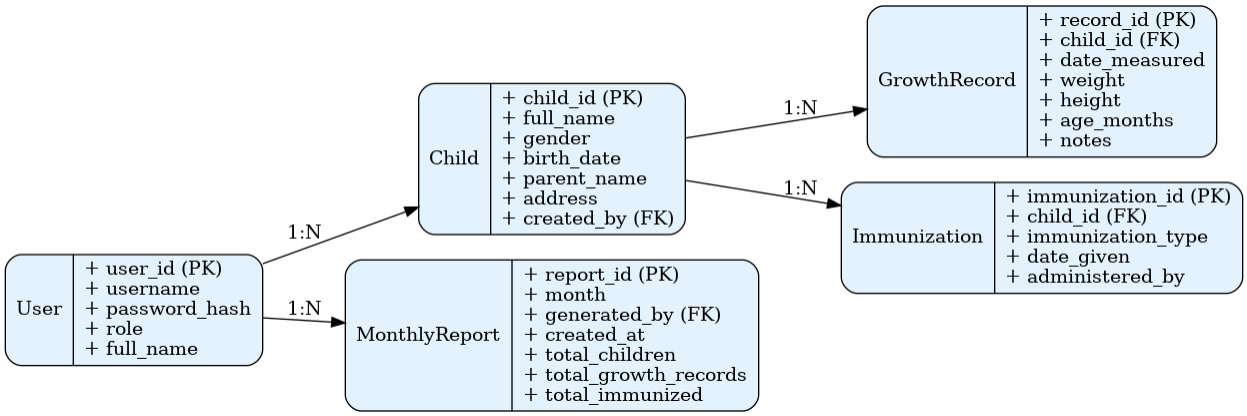

Figure 4. Entity-Relationship Diagram (ERD) of the system

The ER diagram also reflects cardinality constraints and attributes within each entity. All foreign keys are assigned referential integrity constraints to prevent orphan records and to ensure consistent data flow across modules. This model enables seamless expansion and future integration with broader e-health infrastructures, such as district-level maternal and child health monitoring platforms (Kementerian Kesehatan Republik Indonesia, 2019).

The conceptual ER model was later translated into a physical relational schema, which formed the basis for the implementation in MySQL. The consistency between conceptual and physical models plays a vital role in system robustness, data reliability, and ease of maintenance (Pressman & Maxim, 2020).

Testing and Evaluation

The testing and evaluation phase of the Posyandu Mawar Information System was conducted to ensure that the developed system met both functional and non-functional requirements as defined during the design phase. This process involved two primary forms of validation: **functional testing** and **user acceptance testing (UAT)**. Each approach was selected to assess the system from both a technical and user-centered perspective, following best practices in software engineering (Pressman & Maxim, 2020; Sommerville, 2016).

Functional Testing

Functional testing was implemented to verify whether each module performed as expected according to the system specification. The method used was **black-box testing**, which focuses on input-output behavior without requiring knowledge of the internal code structure (Myers et al., 2011). Test cases were created for all critical features, including:

- User login and authentication
- Data input for child registration
- Growth record entry and automatic age calculation
- Immunization logging and retrieval
- Report generation and export functionality

Each test case included clear expected outcomes and was marked as "Pass" or "Fail" based on the results. All core modules successfully passed the defined test scenarios, demonstrating the stability and correctness of the implemented functionalities.

User Acceptance Testing (UAT)

To evaluate usability and alignment with real-world workflows, User Acceptance Testing (UAT) was conducted with five kader and one bidan from Posyandu Mawar. The goal was to assess whether the system met user expectations and supported routine operations effectively. Participants were asked to perform a series of tasks, such as registering a new child, inputting growth data, and printing a monthly report.

After completing the tasks, users filled out a short survey based on a 5-point Likert scale evaluating ease of use, clarity of interface, relevance of features, and overall satisfaction. The results indicated high satisfaction across all indicators, with particular appreciation for the simplified report printing and clear data entry layout. Minor suggestions were made to adjust font sizes and field labels for older volunteers, which were incorporated into the final version.

Evaluation Summary

The combination of structured functional testing and field-based UAT ensured a comprehensive assessment of both system reliability and user experience. This dual strategy not only verified technical performance but also ensured contextual fit, especially in a rural health setting where digital literacy and infrastructure may be limited (Wicaksono & Damayanti, 2022; Budi & Raharjo,

2021). The positive results from both tests support the conclusion that the system is ready for pilot implementation and further scaling.

RESULT AND DISCUSSION

Login and Authentication Page

The system begins with a secure login interface that allows access based on user roles: admin (midwives) and kader (volunteers). The login form includes fields for username and password, a "Remember Me" checkbox for session management, and validation messages for incorrect credentials.

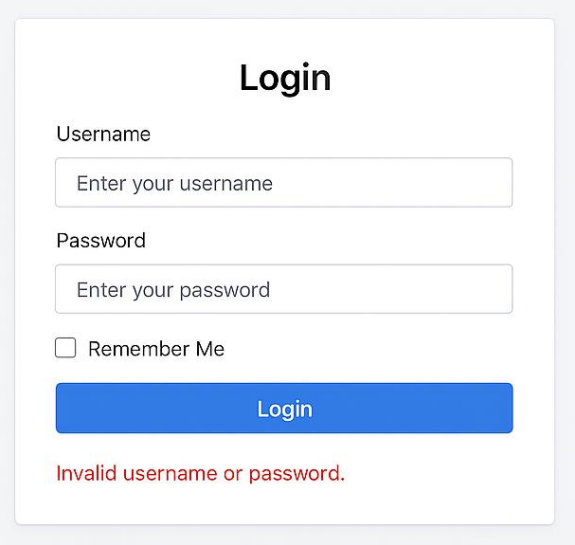

Figure 5. Login Page Interface

This feature ensures restricted access and supports user-level data separation, which is crucial for maintaining data privacy and administrative control.

Dashboard Interface

Upon successful login, users are directed to a dashboard displaying a summary of key data, including the number of registered children, growth records, immunizations, and reports. Admin users have extended access to user management and system logs.

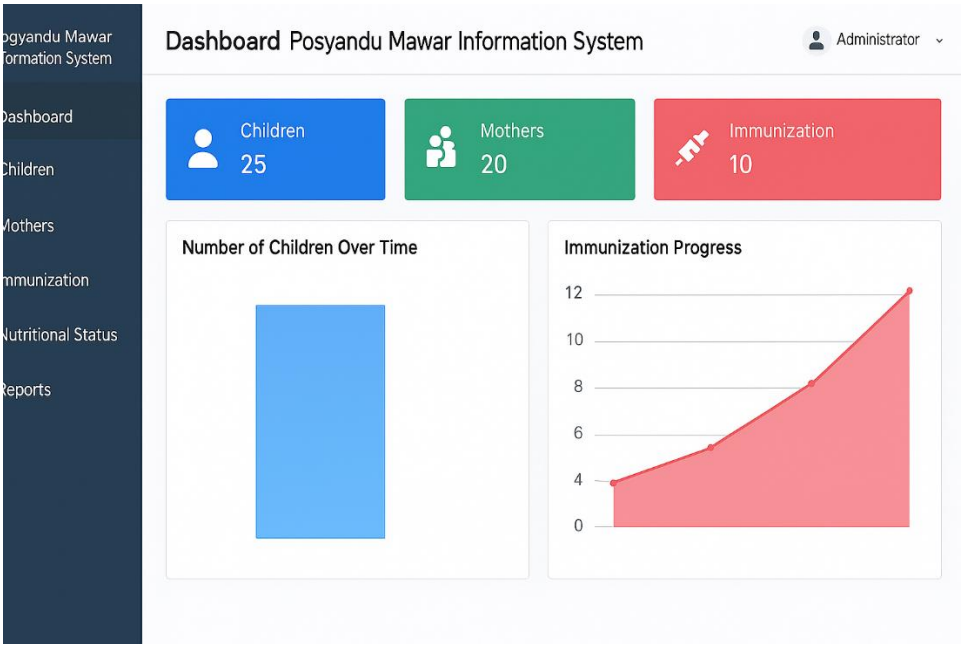

Figure 6. Admin Dashboard

The dashboard provides a real-time overview of system activity, supporting faster decision-making and task prioritization.

Child Registration Interface

This form allows users to register new children by entering personal information such as full name, gender, date of birth, parent name, and address. A dropdown or calendar input ensures valid data entry.

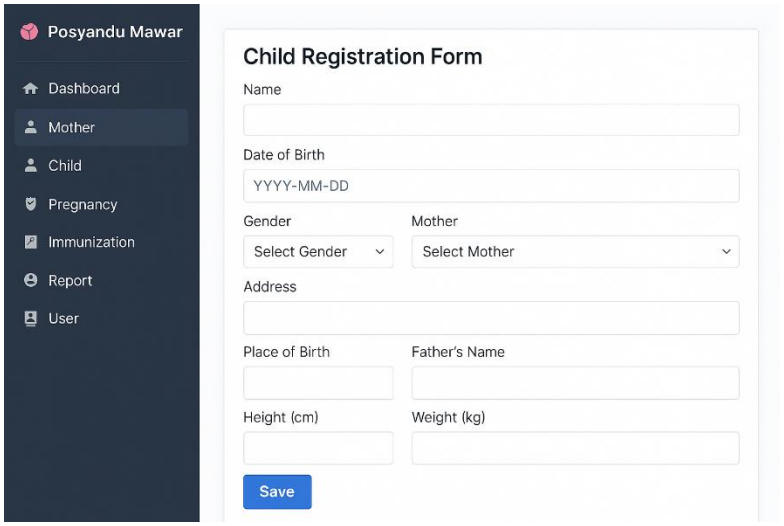

Figure 7. Child Registration Form

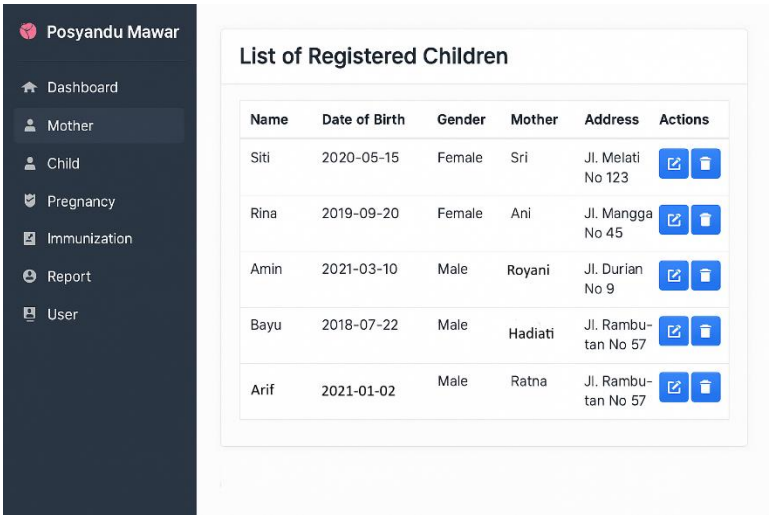

Figure 8. List of Registered Children

Well-structured input fields reduce human error and ensure consistency in demographic data collection.

Growth Monitoring Interface

This module facilitates recording of anthropometric measurements, specifically height, weight, and age in months. It automatically calculates age based on the date of measurement and integrates results with KMS-based growth indicators.

Digitizing this process reduces paperwork and enhances monitoring accuracy over time.

Immunization Tracking Interface

Users can log immunization records, specifying the vaccine type, administration date, and responsible health worker. The table view allows tracking of vaccination completeness.

This feature enables healthcare providers to identify missed or upcoming immunizations, supporting preventive care.

Reporting and Data Export

This module allows admin users to generate and export monthly summary reports in PDF format. Reports include statistics on the number of children served, immunizations conducted, and growth records submitted.

Reports are formatted for ease of submission to external health authorities, bridging the gap between digital and manual systems.

User Management and Access Control

Admin users can manage user accounts, including adding new volunteers, resetting passwords, and assigning roles. This ensures that only authorized individuals have access to sensitive modules.

Role-based access control increases security and supports system governance.

CONCLUSION

This study has successfully designed and implemented a web-based information system for Posyandu Mawar in Dusun Budiawaton, Desa Mujur, Kecamatan Praya Timur, Kabupaten Lombok Tengah. Developed using the CodeIgniter framework, the system responds to the pressing need for more accurate, accessible, and efficient health data management at the community level. It

integrates core features such as child registration, growth monitoring, immunization tracking, and monthly reporting into a user-friendly platform accessible to both health volunteers (*kader*) and midwives.

The design process was guided by the prototyping model, which emphasized iterative feedback from field users to ensure system usability and contextual relevance. The database schema was constructed based on ER modeling principles and normalized to maintain data integrity. Furthermore, the interface was structured with usability in mind, enabling users with minimal digital literacy to navigate and operate the system effectively.

The results demonstrated that each module functioned as intended through structured functional testing. In addition, user acceptance testing involving local *kader* and midwives indicated that the system was well-received, particularly in terms of simplifying administrative processes and improving data accuracy. Suggestions from users were incorporated to refine visual elements and input workflows.

Overall, the Posyandu Mawar Information System offers a practical and replicable model for digital transformation in rural health services. It enhances service delivery while reducing the burden of manual data recording. Future work may focus on integrating this system with broader health networks at the district or provincial level, incorporating mobile device support, and expanding its scope to include maternal health services and early childhood development indicators.

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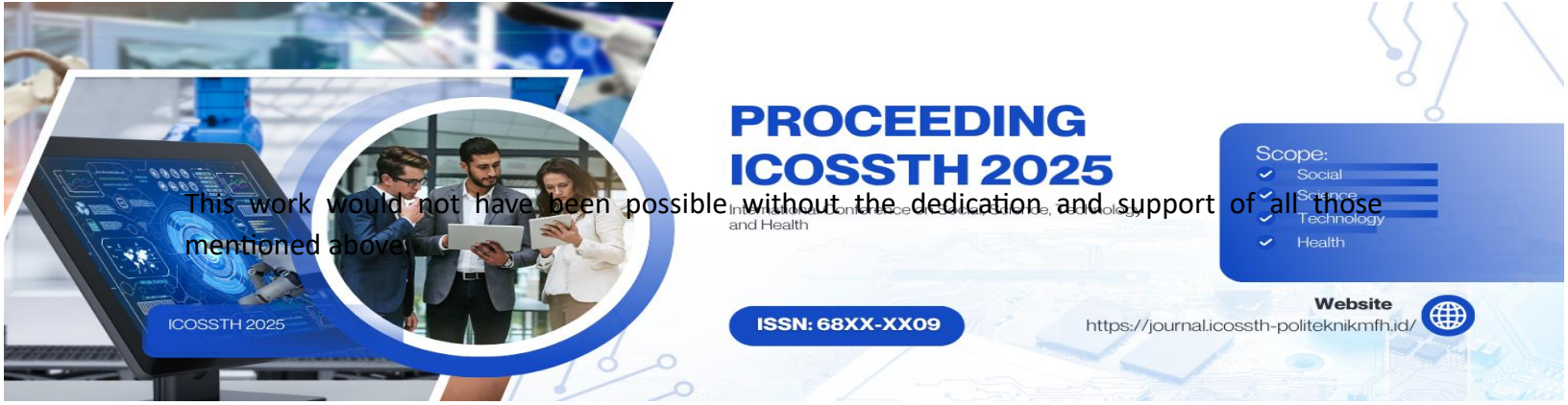

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