DESIGN OF A SOFTWARE PLATFORM FOR PROCESSING TODDLER HEALTH DATA AS PART OF MEDICAL DATA DIGITIZATION EFFORTS

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ABSTRACT

*Monitoring the health of children under five requires continuous effort through community-accessible health services, such as the *Posyandu* (Integrated Health Post). Many health services still rely on manual processes, leading to issues such as data loss, delayed reporting, and access difficulties for village midwives. To address these challenges, a web-based tool accessible online is needed to process data on children under five digitally. This research aims to develop software for processing such health data to ensure efficient and accurate operations.*

The study employs a descriptive method with a cross-sectional approach, utilizing observation and interviews for data collection. The System Development Life Cycle (SDLC) framework is used for system development.

The software is web-based, utilizing PHP, JavaScript, and CSS programming languages alongside a MySQL database. It handles data inputs regarding mothers, children, staff, immunization types, services provided, weighing and measurements, health examinations, and immunization records.

KEYWORDS Health, Software, Toddlers

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INTRODUCTION

Posyandu is a form of community-based public health initiative managed and implemented by and for the community with their active participation to facilitate access to basic health services and empower the public; its primary goal is to accelerate the reduction of maternal and infant mortality rates (Indonesian Ministry of Health, 2011:11). Posyandu offers various programs and activities, one of which is health services for toddlers and children. These activities involve recording data and generating monthly reports; consequently, data recording is a crucial, routine aspect of Posyandu service delivery.

Currently, the recording of toddler health data at Posyandu is largely performed manually using physical logbooks and paper archives. This manual system presents several challenges, such as a lack of data integration and continuity, difficulties in data retrieval, and the risk of records being damaged or lost. Such conditions can hinder the processing and reporting of toddler health data. Furthermore, manual data recapitulation is time-consuming and carries a risk of errors during both the recording and processing stages.

Utilizing web-based technology offers a solution to enhance the effectiveness of managing health data for children under five. Such systems facilitate the recording, processing, retrieval, and presentation of data in a more structured and efficient manner. Authorized users can access stored data according to their specific needs, thereby making it easier for health volunteers and midwives to obtain the necessary information.

Implementing a digital system also helps mitigate the risks of data loss and incompleteness, as information is stored in a structured database. Data aggregation and report generation can be performed more quickly, reducing the workload of health volunteers. Furthermore, midwives can monitor health data and the developmental progress of children without needing to visit every service location in person. Integrating data from multiple *Posyandu* (Integrated Health Posts) into a single system enables midwives to conduct comprehensive monitoring and supports data-driven decision-making.

The implementation of web-based software is expected to enable the management of health data for children under five to be conducted more effectively, efficiently, accurately, and in an integrated manner. The system can also serve as a means to enhance the quality of Posyandu services by providing health information that is easier to access and manage. Therefore, it is necessary to develop web-based software tailored to the needs of health volunteers and midwives regarding the recording and management of health data for children under five. This web-based software also allows midwives to monitor health progress in real time, thereby increasing monitoring effectiveness through data integration

RESEARCH METHOD

This study employs a descriptive method with a cross-sectional approach. The descriptive method is a research approach used to describe or depict phenomena occurring within society; it is generally utilized to examine current conditions and program implementation, with the resulting findings subsequently applied to the planning of program improvement .

A. Data Collection

The data collection techniques used in this study are interviews and observation

1). Interviews

An interview is a method used to gather data in which the researcher obtains information verbally from a research subject (respondent) through a face-to-face conversation

Interviews were conducted to obtain information. The informants in this study were health workers.

2). Observation

Observation is a planned procedure that involves seeing, hearing, and recording the frequency and level of specific activities or situations relevant to the research problem

The observation involved systematically monitoring and recording the subject of the study: the activities within the health data recording and reporting unit for children under five

B. System Development Methodology

The system development method employed in this study is the System Development Life Cycle (SDLC), comprising the following stages:

1. Planning
   This stage involves preliminary activities, such as a feasibility study for the system to be developed. The results of this stage serve as the foundation for planning and designing the website-based information system for recording data on children under five.
2. Analysis
   This stage involves investigating the system to be developed through interviews and observations to analyze system requirements. The analysis aims to understand these requirements to ensure the system produces information aligned with its intended objectives and expected functionality.
3. Design
   In this stage, the analysis results are translated into a specification of requirements and detailed descriptions. The researcher analyzes object interactions and functions within the proposed information system, designs and creates the database (including table integration), develops the user interface, and designs input, processing, and output components.
4. Implementation
   This stage involves implementing the designs from the previous phase and conducting system testing.
5. Maintenance
   This stage is typically carried out by users or administrators to ensure the system continues to operate effectively and optimally. The outcome is a fully functional and optimized software application that meets the required operational needs.

RESULT AND DISCUSSION

Based on observations and interviews, it was found that the current process for handling data on toddlers is carried out manually, resulting in slow service and outdated information. An analysis of these issues indicated a need for software to resolve the problems; the software development activities involved are as follows:

A. System design

The system design in this study is divided into several parts, including:

1. Context diagram
   The context diagram for the website-based toddler health data processing software can be seen in the following figure:

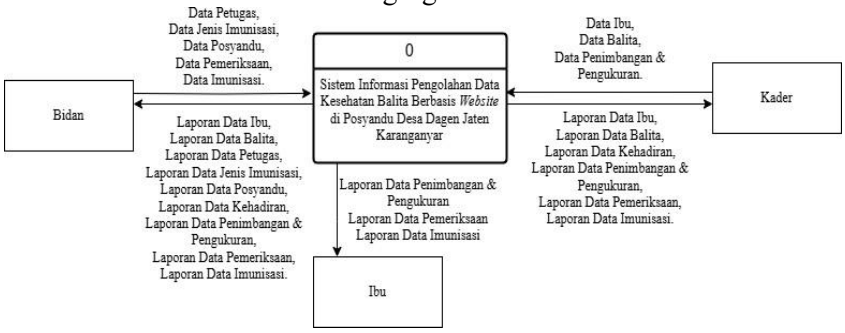


Figure 1. context diagram

Based on the context diagram in Figure 4.3, the website-based health data processing software for toddlers is built incorporating three entities: midwives, health volunteers, and mothers of toddlers. Each entity plays a distinct role in the processing of toddler health data.

2. Database Design

The database is used to store data entered from the system and consists of several tables designed to categorize interrelated data. The tables included in this program are as follows:

a). Mother Table (ibu)

The Mother table stores the identity details of the mothers of toddlers registered in the system. The nik_ibu attribute serves as the primary key, while id_posyandu acts as the foreign key. The structure of the Mother table is as follows:

Table 1. mother table

No.	Nama Field	Type	Width
1.	nik_ibu	Varchar	16
2.	id_posyandu	Int	2
3.	nama_ibu	Varchar	100
4.	tempat_lahir_ibu	Varchar	50
5.	tgl_lahir_ibu	Date	-
6.	agama_ibu	Enum	-
7.	gol_darah_ibu	Enum	-
8.	pendidikan_ibu	Enum	-
9.	pekerjaan_ibu	Varchar	50
10.	alamat_ibu	Varchar	200
11.	no_telp_ibu	Varchar	15
12.	nik_suami	Varchar	16
13.	nama_suami	Varchar	100
14.	password	Varchar	20

b). Toddler Table (balita)

The toddler table is used to store data on toddlers registered in the system. The Primary Key for this table is id_balita, while the Foreign Keys are nik_ibu, nik_petugas, and id_posyandu. The structure of the toddler table is as follows:

Table 2 Toddler table

No.	Nama Field	Type	Width
1.	id_balita	Int	8
2.	nik_ibu	Varchar	16
3.	nik_petugas	Varchar	16
4.	id_posyandu	Int	2
5.	nik_balita	Varchar	16
6.	nama_balita	Varchar	100
7.	tempat_lahir_balita	Varchar	50
8.	tgl_lahir_balita	Date	-
9.	jenis_kelamin	Enum	-

c). Examination Table (pemeriksaan)

The examination table stores data on the health examination results of toddlers. The Primary Key for the examination table is no_periksa, while the Foreign Keys are id_balita, nik_petugas, and id_posyandu.

Table3. examinition table

No	Nama Field	Type	Width
1.	no_periksa	Int	100
2.	id_balita	Int	8
3.	nik_petugas	Varchar	16
4.	id_posyandu	Int	2
5.	tgl_periksa	Date	-
6.	hasil	Varchar	200
7.	pemeriksaan	Enum	-

B. Implementation System

The implementation of the website-based health data processing software for toddlers can be carried out as follows:

1. Program Activation

Program activation begins by connecting the staff member's device to the internet to access the system, followed by opening a web browser to access the system's website.

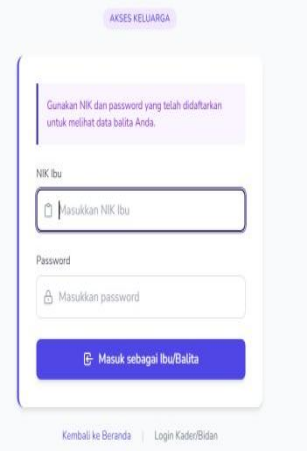


Figure 2 Software login page

To access the system, midwives or health workers must enter their assigned username and password. After logging in, they will be directed to the dashboard or main menu corresponding to their user access rights. The following shows the midwife's dashboard or main menu:

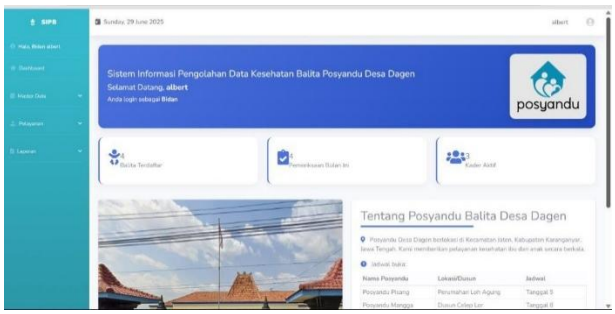


Figure 3. Midwife Dashboard (Main Menu)

2. Implementation of the Master Data and service menu

The master data component of this system provides the necessary functions for managing the foundational data used to process information on toddlers. Examples of master data include the following:

a. Toddler Master Data

Click on the master data menu and then select "Toddler Data" to display the toddler data form, which is used to manage toddler master records. The toddler master data interface is shown below:

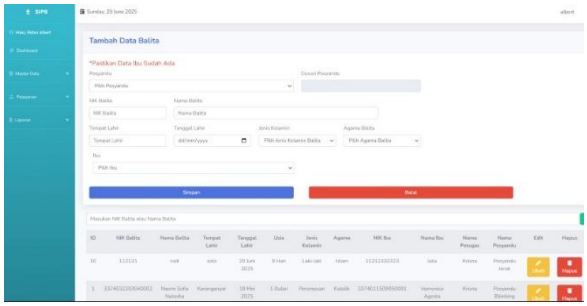


Figure 4. Toddler Master Data Menu

Figure 4. shows the toddler master data menu, which contains fields for entering toddler information; however, ensure that the mother's data already exists in the system before proceeding with the entry. Once the fields are filled in, click "Save" to store the data or "Cancel" to discard the entry.

b. service menu

Click on the services menu, then click on weighing and measurement data; you will then be directed to the following screen:

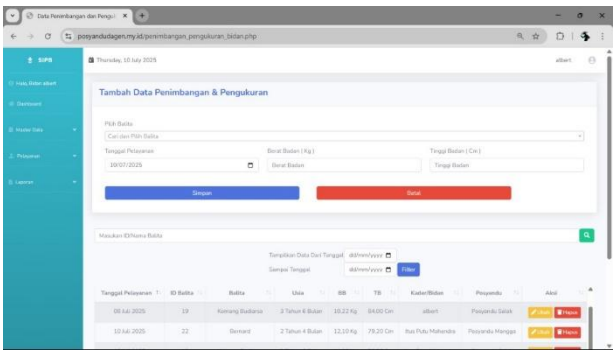


Figure 5. weighing service

Figure 5 Weighing and Measurement Service Menu. This form is used to record the weighing of toddlers whose weight has been measured; select the "Save" button to save the data or the "Cancel" button to cancel the transaction. Users can modify data by clicking the "Edit" button within the weighing menu.

3. Report Implementation
   Report menu is used to display reports based on processed data regarding toddlers; select the "Examination Data Report" option. Click on the report menu and then click "Examination Data" to be directed to the following screen:

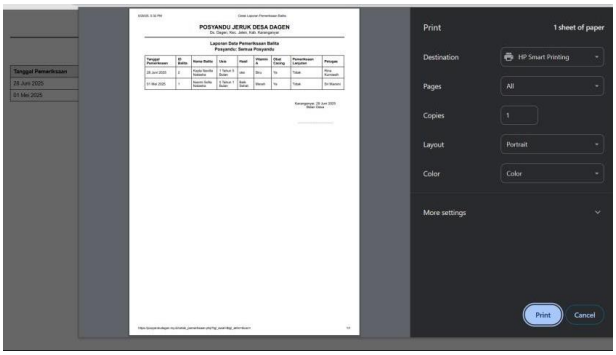


Figure 6. report form

in the report print view, the displayed report results can be printed directly

CONCLUSION

Previously, the recording of health data for children under five was performed manually by midwives; this process has now been developed into a web-based information system using PHP, JavaScript, CSS, and MySQL. The system facilitates the comprehensive and structured recording, processing, and reporting of data regarding children, mothers, personnel, weight measurements, and health check-ups. Implementing this software simplifies data management for personnel, thereby enabling the generation of effective and efficient information.

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