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# Design of Foster Children Data Information System at Rumah Harapan Karawang Foundation

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**Abstract**

The Rumah Harapan Foundation is a social organization dedicated to supporting foster children from diverse backgrounds through education, guidance, and sustainable empowerment programs. Currently, the management of foster child data is conducted manually and centralized within the dormitory division, leading to various inefficiencies such as delayed information access, slow program execution, and reduced service quality for both children and donors. To overcome these challenges, this study designs a web-based information system that enables structured, integrated, and real-time data management according to user access levels. The research applies the Design Thinking methodology, consisting of the stages Empathize, Define, Ideate, Prototype, and Test. Data were obtained through interviews, observations, and literature studies to identify user needs and system requirements. The resulting prototype features core functions such as data entry for foster children and dormitories, search, editing, report generation, and role-based access control for administrators, directors, and users. Based on interface testing, the system operates effectively and aligns with user expectations. It is expected to enhance operational efficiency, accelerate decision-making, and strengthen interdepartmental coordination within the Rumah Harapan Foundation.

***Keywords***: *Social Foundation, Information System, Design Thinking*

## 1. Introduction

A system is an entity consisting of individuals or components working together in a structured manner to achieve a specific goal. Meanwhile, information is processed data that carries meaning and can be utilized in decision-making processes. Thus, an information system can be defined as an organized network involving people, hardware, software, communication networks, and data resources that play a role in collecting, processing, and distributing information within an organization [1]. Today, the presence of information systems has become an unavoidable necessity for every institution or organization, as it plays a vital role in supporting the execution of all operational processes and activities.

In the context of social institutions such as orphanages, information systems play an important role in managing foster children's data. Data management is a crucial aspect because it directly connects to various existing divisions, such as the dormitory division, education, marketing and communication, general affairs (GA), HRD, empowerment, up to the director and secretary to the director levels [2]. Each division has interrelated responsibilities and requires fast and accurate access to foster children's data to support smooth operations and precise decision-making. However, in practice, the foster children's data at the Rumah Harapan Foundation is still centrally managed by the dormitory division. This condition creates obstacles, especially as the number of foster children continues to grow each year, while data updates are frequently delayed. Consequently, other divisions that require data for program implementation are also affected. For instance, the education division needs complete document data of the children for school and higher education requirements; the marketing and communication division requires data to coordinate children who will participate in donor programs; while the empowerment division needs children's data in each dormitory for training activities or other social programs. This limited data access causes delays in work processes and decision-making, which ultimately affects the quality of service provided to both the foster children an the donors.

Based on the problems faced within the Rumah Harapan Foundation, an effective and efficient solution is required to support the management of foster children's data[3]. One strategic step that can be taken is by designing a digital-based foster children data information system [4]. Through the implementation of this system, all divisions within the foundation can access, update, and monitor foster children's data directly and in real-time without relying on a single specific division. The implementation of an integrated information system is expected to accelerate administrative processes, improve inter-divisional coordination, and optimize resource utilization in supporting the

welfare of foster children [5]. Furthermore, this system can also help improve data transparency and accuracy, which supports strategic decision-making processes at the managerial level [6]. This study aims to understand the currently running management system for foster children and dormitory data, design an information system capable of generating information quickly, precisely, and accurately, and provide research results that can serve as a reference for the foundation in determining solutions to existing problems. The benefits of this research are to serve as evaluation material for the current system in use, generate efficient and accurate information in the data collection process [7], and strengthen synergy between divisions through integrated data access [8]. With this innovation in the form of a centralized information system, it is expected that the Rumah Harapan Foundation can improve internal performance efficiency, accelerate information delivery, and provide optimal services for both the foster children and the donors.

# 2. Theoritical Basic

## 2.1. Basic Concepts Information of a System

A system is a collection of elements or components that are interconnected and interact with one another to achieve a specific goal. Fundamentally, a system consists of four main elements: input, process, output, and feedback [7]. Furthermore, a system can also be defined as an entity of elements, components, or variables that are structured, interrelated, interdependent, and function in an integrated manner [8].

Information is the output of processed data that carries meaning and value for its users. Data that is initially raw and originates from various sources will first be processed so that it can be used more effectively according to its context [6]. Therefore, information is the final form of processed data that is capable of providing benefits and added value to those who utilize it appropriately.

An information system is a system within an organization that connects daily transaction processing needs with strategic activities, thereby generating the required reports [4].

The definition of information is often equated with that of data, even though the two possess different meanings. Data can be in the form of language, mathematical symbols, or other forms used as raw material to describe objects, events, or concepts. Meanwhile, information has a broader scope than data because it has undergone a processing phase. Referring to this definition, an information system can be explained as a human-designed system consisting of a number of components within an organization, which are interconnected and work in an integrated manner to produce information [6].

## 2.2. Database

Quoting Gordon B. Davis, data is the initial form or raw material of information, defined as a set of regularly arranged and non-random symbols that represent numbers, actions, events, or other matters [9].

Meanwhile, a database is a collection of data arranged in the form of several tables that are either interrelated or stand-alone [9]. Furthermore, a database is a structured and cooperative set of data stored in computer storage media, which can be accessed and managed through specific applications. The primary purpose of using a database is to store, arrange, and organize data. Based on these two perspectives, it can be concluded that a database is a systematically arranged collection of data, both in the form of interrelated or stand-alone tables, stored in computer media [10].

The use of a database enables efficient, secure, and orderly data management processes through the aid of specific applications, allowing information to be accessed and used easily [5]. Data processing is also a stage carried out after data has been successfully collected. The objective is to ensure that the generated information can be presented to users easily, precisely, and accurately [11].

## 2.3. Prototype

A prototype is a method in software engineering used to build the initial design of a system before it is fully developed [12]. A prototype is an early version of software designed rapidly to visualize user requirements, test the system interface, and evaluate core functions prior to comprehensive system development. In the context of developing a children's data information system, the prototype approach becomes highly essential because such systems are generally utilized by non-technical stakeholders, such as foundation administrators, early childhood education (PAUD) teachers, integrated health post (posyandu) cadres, and parents. Through a prototype, they can directly participate in testing and providing feedback on the system design.

The prototype method emphasizes an iterative process involving the stages of requirements gathering, quick design, initial model construction, user testing, and repeated refinement [13]. This approach is considered more flexible and adaptive to changing user requirements compared to the waterfall method. This is demonstrated in a study by Nurhayati and Ifalahma, who developed a prototype-based toddler growth and development information system for posyandu [14]. In their research, the prototype method proved capable of helping cadres understand and provide feedback on the system, ensuring that features such as recording weight, height, and screening results could be tailored to field requirements. Another study also indicates that the prototype approach is effective in developing monitoring information systems for children with special needs. The system built using this prototype approach is capable of supporting collaboration between teachers and parents in digitally monitoring children's development.

# 3. Research Methodology

This study utilizes the Design Thinking method, a user-centered design approach to system development consisting of five stages: Empathize, Define, Ideate, Prototype, and Test. [15]. This method was selected because it is effective in generating innovative solutions based on user experience. Design Thinking consists of five stages, which include:

**a. Empathize**

The researcher conducted interviews and observations with the administrators of the Rumah Harapan Foundation to understand the foster children's data management process as well as the obstacles encountered.

**b. Define**
Field data was analyzed to formulate the core problems, such as delays in data updates and difficulties in inter-divisional access.

**c. Ideate**
This stage generated system design ideas for a web-based system featuring role-based access controls for admins, administrators, and the director.

**d. Prototype**
The system design was developed into a prototype using Figma, showcasing the login workflow, data management, and reporting features.

**e. Test**
The prototype was evaluated using black box testing alongside users to ensure the system's functionality and ease of use.

## 4. System Analysis and Design

System design is carried out to explain in detail how a system is designed to operate according to user requirements and resolve issues in the existing system. At this stage, the author creates designs in the form of use case diagrams and activity diagrams that illustrate the processes within the foster children's data system as follows:

1. Use Case Diagrams

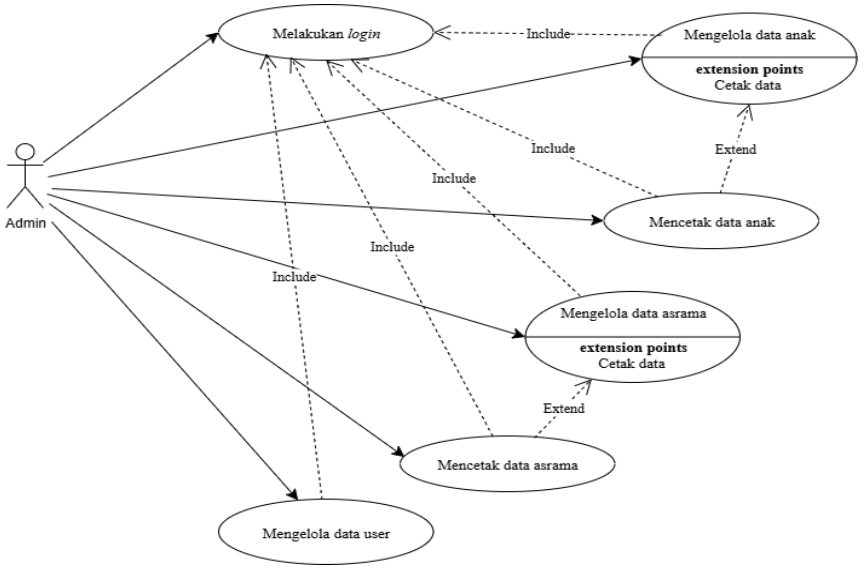


**Fig. 1:** Use Case Diagrams Admin

The admin use case diagram is designed to meet the system requirements, namely: the admin can log in and the admin can manage user data.

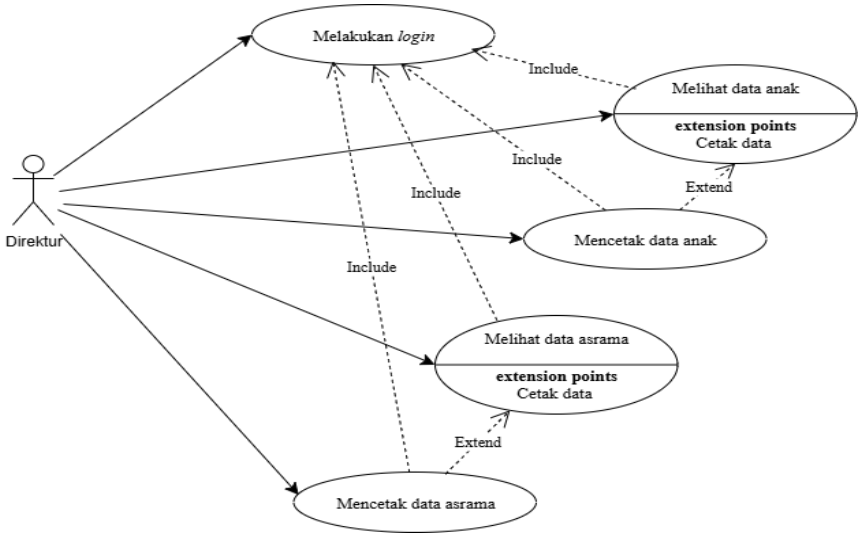


**Fig. 2:** Use Case Diagrams Direktur

The director use case diagram is designed to identify the director’s requirements, namely that the director can log in and print dormitory data.

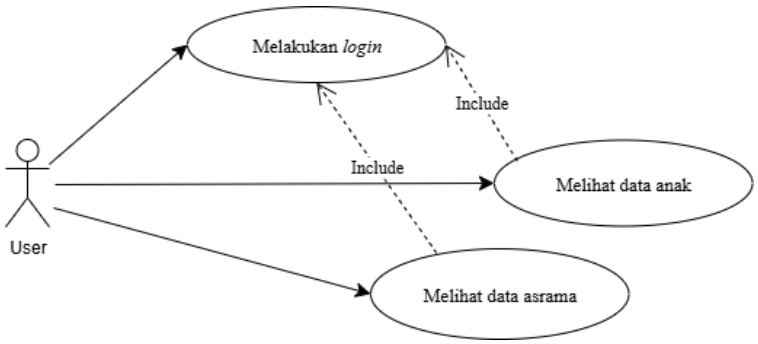


**Fig. 3:** Use Case Diagrams User

The user use case diagram is designed to identify the user's requirements, namely that the user can log in, view children's data, and view dormitory data.

2. Activity Diagrams

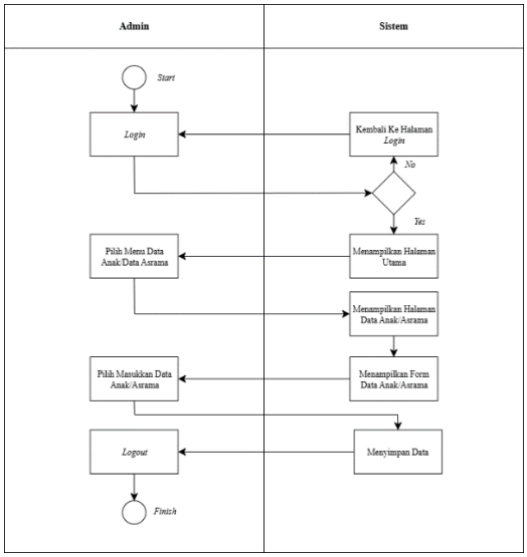


**Fig. 4:** Activity Diagrams Admin

In the admin activity diagram, there are business activities starting from accessing the admin page and managing children's data in the dormitory.

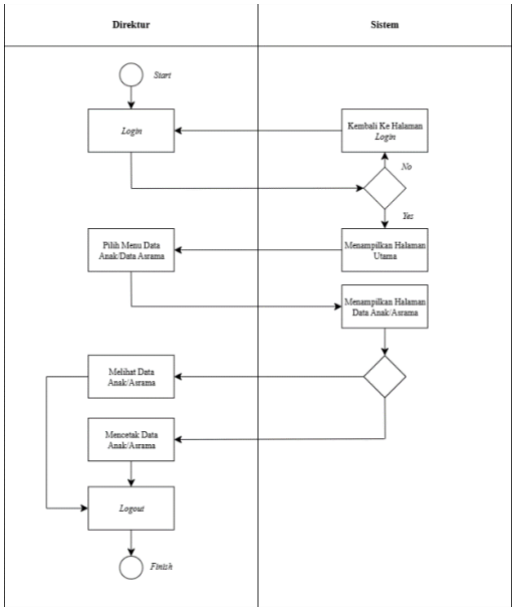


**Fig. 5:** Activity Diagrams Direktur

In the director activity diagram, the business processes are as follows: the director can display and print children's data in the dormitory. The purpose is to facilitate access to the required data.

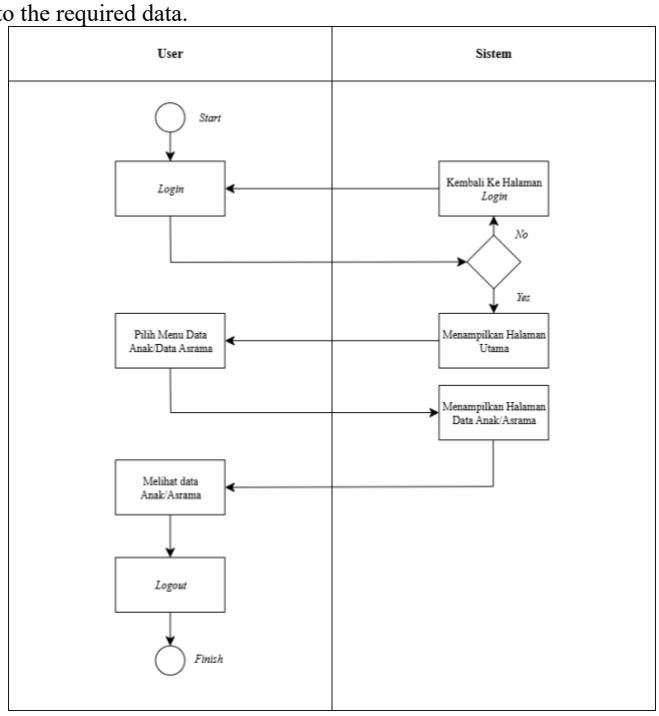


**Fig. 6:** Activity Diagrams User

in the user activity diagram, the business process is as follows: the user can only access the data of children in the dormitory.

3. Interface Design
The next step after defining the requirements of the foster children data information system at Yayasan Rumah Harapan Karawang is to create a prototype as follows:

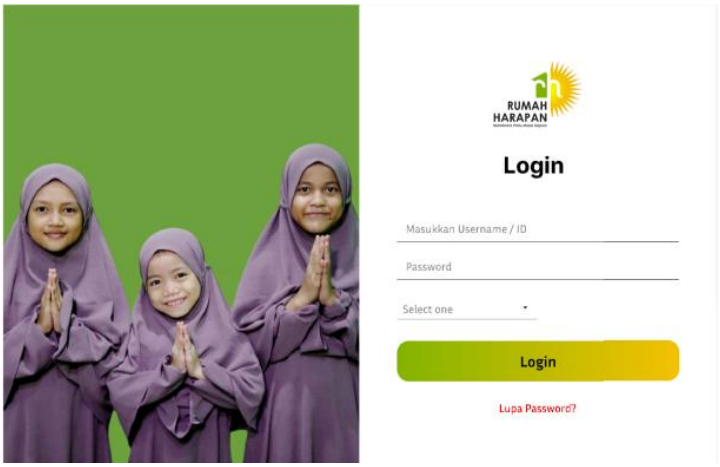


**Fig. 7:** Login Page Interface Design

This login page is used as the entry point for users to access the foster children data information system at Yayasan Rumah Harapan. Users must first enter their Username or ID in the provided field, then input their Password according to their registered account. Next, users select their role or access level in the "Select one" section (such as admin, director, or user). After all the

information is filled in correctly, users can click the Login button to access the system. If an issue occurs, such as forgetting the password, users can select the “Forgot Password?” option to initiate the account recovery process.

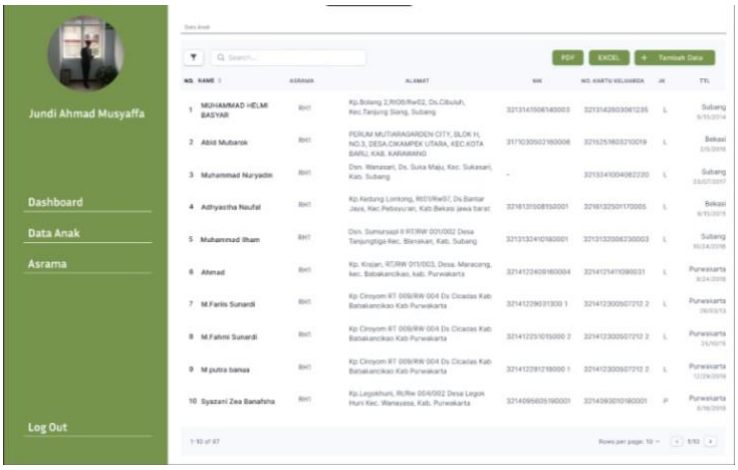


**Fig. 8:** Children Data Page Interface Design

The image shows a dashboard page of a foster children data information system that can be accessed by Admin, User, and Director after logging in, where all three roles can view the foster children data that has been entered by the admin. On the left side, there is a sidebar containing the user profile and navigation menus such as Dashboard, Data Anak (Children Data), Asrama (Dormitory), and Log Out, which facilitate easy navigation between pages. Meanwhile, the main section displays a table of foster children data that includes important information such as name, dormitory, address, and other identification details, along with a search feature to quickly find specific data and export buttons for PDF and Excel formats. Specifically for the Admin, there is an additional feature such as the “Add Data” button to input new data, while Users and Directors only have permission to view the existing data. This interface is designed to make the management and access of foster children data more structured, fast, and efficient.


**Fig 9:** Add Child Data Page Interface Design

The image shows a foster children data input form page in the information system, which is specifically used by the admin to add new foster children data into the system. On the left side, there is a sidebar containing the user profile and navigation menus such as Dashboard, Data Anak (Children Data), Asrama (Dormitory), and Log Out, which make it easier for the admin to navigate between pages. Meanwhile, the main section displays a comprehensive form that must be filled out by the admin, including various important details such as the child’s name, dormitory, address, National Identification Number (NIK), family card number, gender, place and date of birth, age, status (orphan, half-orphan, underprivileged), education level (from pre-school to senior high school), class, and parent information such as the father’s name. Each field is structured with input forms to ensure that the data entered is complete and accurate. This page is designed to facilitate a systematic, accurate, and well-organized data entry process, so that the stored information can be effectively used by relevant stakeholders.

## 5. Conclusion

Based on the discussion regarding the storage of foster children data at Yayasan Rumah Harapan, it can be concluded that the design of the developed information system is able to provide a solution to the problems of data management that were previously handled manually. This system not only helps reduce paper usage and the accumulation of archives, but also improves the effectiveness and efficiency of managing foster children data. In addition, the resulting system is capable of presenting data in a more structured, integrated, and easily accessible manner for each division according to their respective access rights, thereby supporting smoother coordination, decision-making, and improving the quality of services provided by the foundation to foster children and donors. The novelty of this research lies in the

development of a foster children data prototype design at Yayasan Rumah Harapan Karawang, which serves as an initial model for implementing a more modern and systematic data management system. However, the developed system is still in the form of a prototype, and therefore requires further development to be fully and sustainably implemented in the foundation's operations.

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