

## UI UX Design for Mobile Based Foster Parent Information Application (IOTA) Using the Waterfall Method

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### Abstract

The IOTA mobile system (Foster Parent Information Application) addresses the problem of inefficient communication between foster parents, foster children and related institutions. The main goal is to create a smooth communication platform to increase care and coordination for children in foster care. This research uses the waterfall method which includes the stages of needs analysis, design, implementation, testing and maintenance. During the requirements analysis phase, key features such as daily activity logging, messaging, and notifications are identified. The intuitive user interface is designed to ensure ease of use, while the efficient database architecture ensures fast data handling and retrieval. Analysis techniques involve collecting user feedback and analyzing performance metrics to continuously improve application functionality. Comprehensive testing, including unit, integration, system, and user acceptance testing, is performed to ensure application robustness, reliability, and performance. The results showed significant improvements in communication efficiency and user satisfaction. The study concluded that IOTA is a valuable tool in fostering better communication and care coordination, ultimately contributing to the well-being of foster children through an effective and user-friendly platform. This research highlights the potential of technology to transform the care system and improve the support provided to children in foster care.

**Keywords:** Foster Parent Information Application (IOTA), Waterfall Method, Foster Parent Communication, Mobile Application Development, Coordination of Relevant Agencies

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### INTRODUCTION

In the current era of digitalization, technological developments increasingly influence various aspects of life, including in the social and welfare fields. One of the positive impacts of technological progress is easy access to information.

The National Foster Parents Movement Foundation (GNOTA) as a social institution that cares for children, especially from underprivileged families who experience difficulties in education, continues to strive to improve efficiency and effectiveness in providing services to children who need support, especially in the field of education. In order to optimize performance and provide better services, GNOTA considers it important to develop a mobile-based Foster Parent Information Application (iOTA). It is hoped that this application can function as a more efficient communication and information medium between GNOTA, foster parents and children receiving assistance. [1]

Thus, the application of information technology at GNOTA is expected to have a positive impact on data management, information transparency, and meeting the needs of children protected by the foundation. [2]

Currently, the main challenge facing GNOTA is limitations in effective communication and information dissemination between the parties involved. The manual system used previously often caused delays and inaccuracies in the delivery of information.

From existing problems researcher try build or designing A applications that can make it easier delivery information about GNOTA researcher try select an application Figma as a UI design tool is a step up fast in process making design mobile - based applications. With Figma, as a web-based collaborative design platform, Can help researcher produce appropriate design and produce prototypes more effectively. [3] [4]

Previous research shows that technology adoption in social institutions can improve performance and services, but further study is still needed on the implementation of mobile applications in the context of social institutions in Indonesia. Figma users in designing the iOTA application UI are expected to provide results that are visual, functional, and can be easily implemented in mobile-based applications. This research aims to develop and evaluate the effectiveness of the iOTA application in increasing communication efficiency and information

transparency between GNOTA, foster parents and children who receive assistance. In addition, this research aims to evaluate the impact of the application on performance and user satisfaction. [5] [6] [7]

Figma users in designing the IOTA application UI are expected to provide results that are visual, functional, and can be easily implemented in mobile-based applications. [8] [9] [10]

## RESEARCH METHODS

In the research method the author tries to design and analyze the design that will be applied in mobile application development. In this method, this research will focus on analysis and application design based on object-oriented programming principles. This involves identifying and modeling the objects involved in the system, as well as the relationships and interactions between these objects. [11] [12] [13]

This object-based design analysis method aims to create a good and effective design in meeting the needs of application users and ensuring the sustainability and scalability of the application. In this waterfall method methodology, research is focused on understanding information regarding user needs for software, especially the IOTA application. Information collection methods are determined through discussion, observation, surveys and interviews . [14] [15] [16]

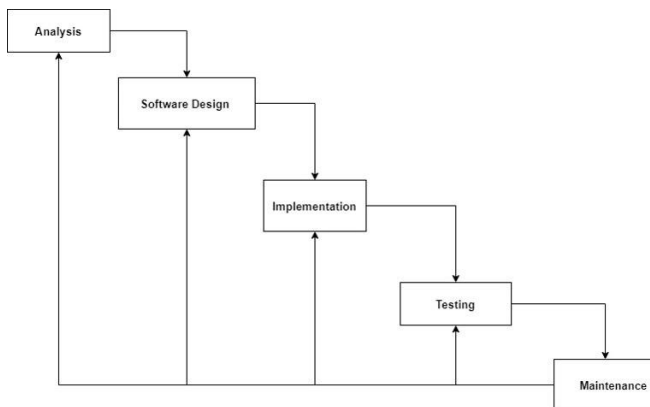


Figure 1. Waterfall method

### 2.1. Analysis

It is important to identify the user needs and goals of the IOTA application. Before developing software, a developer must properly understand the user's needs for their device. This information gathering method can be in the form of discussion, observation, interviews, and other methods. The information collected is then processed and analyzed to obtain complete data regarding the specifications of user needs for the software to be developed.

### 2.2 System and Software Design

Information regarding requirements specifications from the Requirements Analysis stage is analyzed further at this stage to be implemented into the design. The aim of this stage is to provide a clear picture of what needs to be done. Apart from that, this stage also helps developers prepare hardware requirements to build the overall software system architecture. UI design concept that includes layout, navigation and user interface components. Use the figma design tool to create an interactive UI prototype.

### 2.3 Implementation and Unit Testing

Unique implementation and testing is part of the programming process. At this stage the software is broken down into small modules which will then be combined at the next stage. Apart from that, testing and checking the functionality of these modules is also carried out to ensure they meet the desired criteria.

### 2.4. System Integration and Testing

After all units or modules have been developed and tested at the implementation stage, the next step is to integrate all these components into the overall system. After integration is complete, a thorough system inspection and testing is carried out to identify potential failures in the system.

### 2.5. Operation and Maintenance

In the final stage of the waterfall method, the software that has been developed begins to be operated by the user and maintenance is carried out. This maintenance allows developers to fix errors, improve the implementation of the system unit, as well as carry out improvements and adjustments to the system according to the needs of the mobile application.

## RESULTS AND DISCUSSION

In this case the author wants to develop a design that becomes a mobile application. With the mobile application, it will be easier for donors to access and use existing features and be able to view donations. In this case the author wants to develop an existing design into a mobile application. With the mobile application, it will be easier for donors to access and use existing features and be able to view donations. Below the author will display several diagrams to make it easier to create applications. [17] [18]

### 3.1. Use Case Admin and Users

The image below explains the function of actors in the application that I developed. The usage flow explains the functions of actors, admin, donors and visitors.

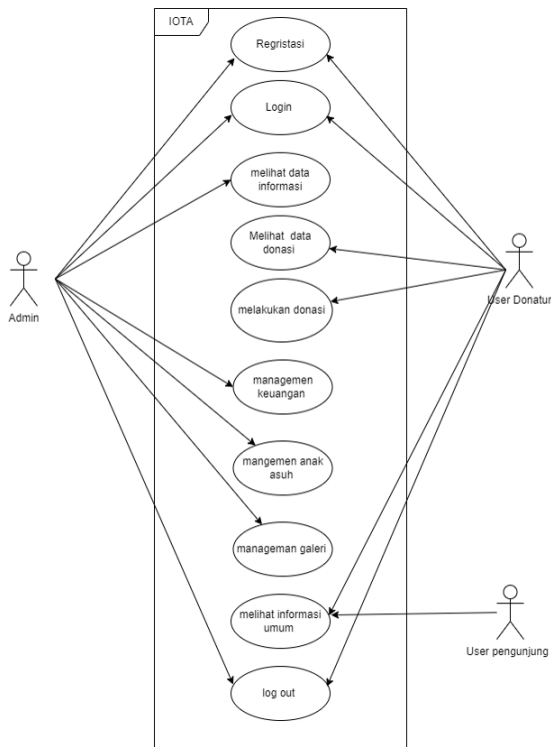


Figure 2. Admin and User Use Case

### 3.2. Admin Activity Diagram

The image below is an admin Use Case Activity Diagram which explains what processes are carried out by an admin and then processed by the application system, starting with opening the application.

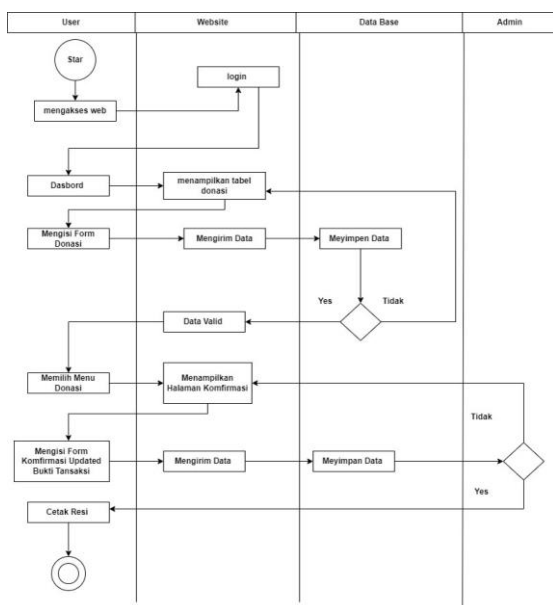


Figure 3. Admin Activity Diagram

### 3.3. Class Diagram

The database class diagram image displays several tables including user data, gallery, activities, income, expenses, and foster child data. The database was designed with Db Designer and implemented using MySQL, a DBMS for creating databases that operates on UNIX, LINUX, and Windows.

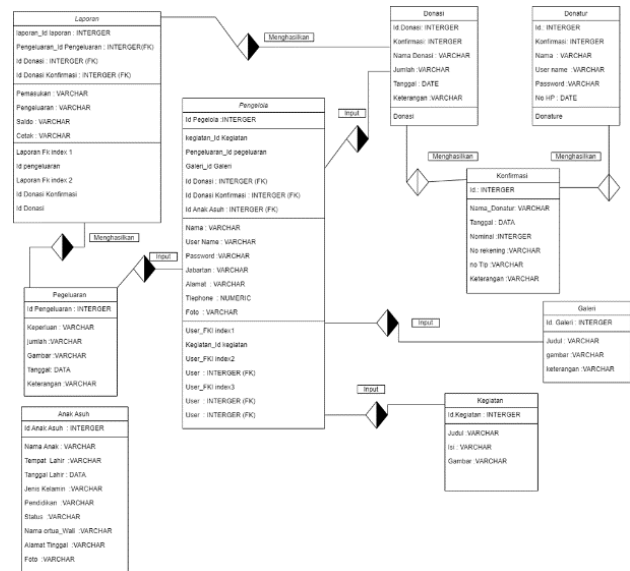
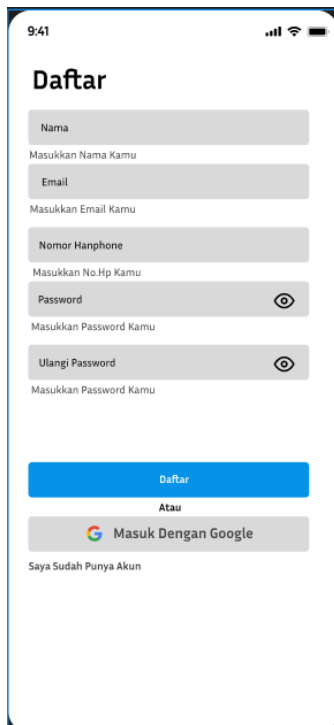


Figure 4. Class Diagram

MySQL is an open source product that can be used by anyone, but the creation of derivative products for commercial purposes is not permitted.

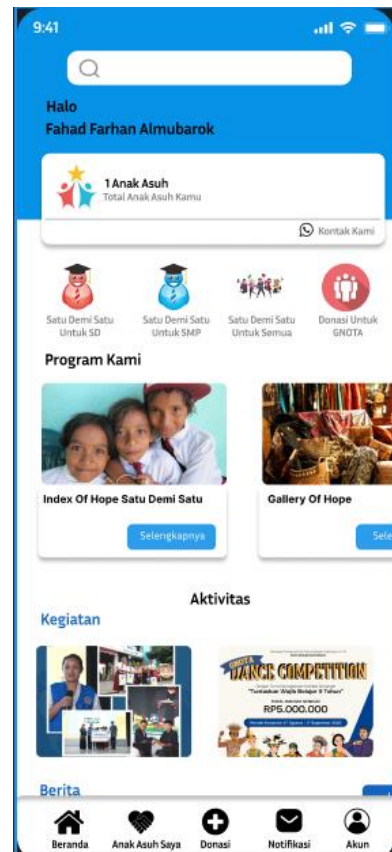
### 3.4. Application

In the next step, the author implements the results of the analysis and design into the Figma application to obtain a mobile application design pattern. At this stage the author uses user examples (UI/UX) produced in this research, including the home page and other supporting pages as seen in the image below. [19] [20]



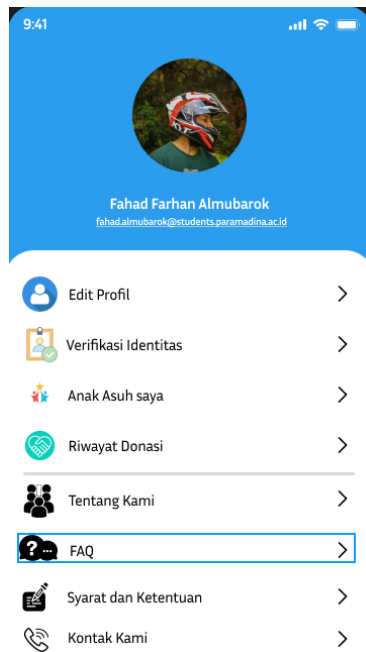
5. Figure Image of the Registration Page

Figure 5 shows the registration page. On the registration page, if the user does not have an account, he can register on the registration page. After that, the user will enter data, namely name, email, telephone number, password that will be used to log in. If the user is valid, he will be directed to the login page, and vice versa, on this login page, if the user has an account, he can enter data, namely email and password, if valid, he will be directed to the home page.



6. Figure Home page

Figure 6 shows the appearance of the homepage after completing the login form process. This home page contains some information and several options such as foundation program information, activity information, as well as features for donating, viewing foster child data, viewing foster parent data, and so on.



7. Figure Account Page

In figure 7 is a page that has options for users such as editing profiles, verifying identity, viewing foster child data, viewing donation history, viewing foundation information, viewing foundation contacts, and there is an option to log out. These pages are linked to each other.



Figure 8. Donation Display

Figure 8 is a picture of the user interface of the donation page. This page is a user interface form for donating, and on this page the user interface can determine the donation package options provided by the foundation. After selecting a donation package, the user interface will proceed to the payment stage.

## CONCLUSION

From the analysis, design and implementation process based on previous activities, the author reached the following conclusions.

1. The author has completed and successfully used the waterfall method analysis to create use case diagrams, activity diagrams and class diagrams as requirements for creating UI UX.
2. Foster parents can carry out or view the foster child donation process more easily and effectively.
3. From the design carried out by researchers with using application figma can help developing the GNOTA website into application in smartphones For makes it easier Foster Parents in do donation for child foster. With This can increasing efficiency in the donation process and providing information.

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