Digital Population Identity Application: Interface Redesign and User Experience Optimization

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Abstract: The goal of this study is to improve the user experience of Digital Population Identity Application (DPIA), known as Identitas Kependudukan Digital (IKD), by redesigning its interface used in public administration services in Indonesia. This study utilized a user-centered design-based approach. This study's steps are divided into five: studying user experience, outlining challenges, proposing ideas, developing prototypes, and testing. The data is gathered through interviews with application users and firsthand observation of the application usage process. The application prototype was redesigned in response to the difficulties discovered and then tested on users using quantitative evaluation methodologies in the form of surveys with questions about the application's ease of use. Following the redesign process, the testing results revealed a considerable boost in ease of use, application navigation efficiency, and comfort. The findings of this study are intended to contribute to the development of user-friendly public service applications and can be used as a model for the creation of additional digital systems that entail direct interaction between the community and government services.

Keywords: User experience; interface; redesign; digital population identity apps; user-centered design.

1. Introduction

The use of information technology in the Indonesian government sector fosters the digitization of public services, making them more efficient, rapid, and easily available to the public. Public services that were once manual have recently grown into online-based services by using digital information systems [1]. The government is also changing by providing digital services that have advantages in terms of processing speed, easier standards, and lowest prices [2]. The Digital Population Identity Application (DPIA), known as Identitas Kependudukan Digital (IKD), is an official portal created by the Directorate General of Dukcapil, Ministry of Home Affairs of Indonesia, to digitize population identity documents [3]. Through the Digital Population identification Application (DPIA), citizens who have an electronic Indonesian Identity Card, known as Elektronik Kartu Tanda Penduduk (E-KTP), and have activated it can access population documents in electronic form that function as a digital identification as well as valid personal data [3].

Several issues were discovered during installation, affecting the perceived and user experience of the DPIA. According to data from the Antara news, the number of DPIA users nationwide has reached 9,407,945 [4]. However, the results of a study in the CO-SCIENCE Journal entitled "Sentiment Analysis of Digital Population Identity Application Reviews on the Play Store Using the Naive Bayes Method" showed that user reviews were dominated by negative sentiment, which was 619.62% and positive sentiment was 381.38% [5]. The paper also provides a word frequency analysis, which demonstrates that negative words such as "difficult" and "please" commonly appear in reviews [5]. This implies that users are dissatisfied with the application.

Furthermore, the Journal of Scientific Studies of Informatics and Computers' article "Sentiment Classification of Digital Population Identity Applications Using Naive Bayes and SVM Algorithms" confirms similar conclusions. The research in the journal revealed that the DPIA is not yet ideal, and users continue to confront various challenges [6]. The investigation revealed that there were 1049 unfavorable attitudes, or approximately 53.46%, and 914 good sentiments, or about 46.54%, towards the DPIA [6]. Meanwhile, the Lentera BITEP Journal article "Sentiment Analysis Review of Digital Population Identity Applications Using Support Vector Machine Algorithms" explains that user satisfaction is lower than expected. The study employed RapidMiner and obtained an accuracy of 82.61% with 52 positive data (class precision 7.13%) and 243 negative data (class recall 82.37%) [7]. Positive evaluations with low precision values are difficult to distinguish, but negative remarks with high recall are quickly spotted by the algorithm..

Furthermore, the Tambusai Education Journal's article "Exploration of User Experience in Using the DPIA Services at the Padang City Population and Civil Registry Office" discovered issues with the Digital Population Identity Application's user experience. The issues discovered include poor system response and trouble navigating the interface

[8]. Not only that, the DPIA received many one-star reviews, the influence of which can be seen in the rating achieved 3.7 out of a total of 5 on the application distribution platform [9]. More over half of the approximately 30,000 reviews are unfavorable. This condition demonstrates that the application's service quality did not meet the expectations of the majority of users [9]. Furthermore, this demonstrates that the process of socialization and adoption of the DPIA has not been as expected, as shown in the pattern of incoming reviews [9].

Based on the issues identified, it may be concluded that the DPIA requires an interface overhaul. Redesign is required so that this program can be easier to use, sensitive to user needs, and capable of providing maximum digital services, which was the main purpose of its construction. The Redesign process is carried out utilizing the Design Thinking method, with the primary purpose of optimizing the user experience. User experience (UX) design plays a crucial part in designing a Mobile application that is in accordance with the needs and easy to use [10]. The UX design process also considers user interactions when accessing the program to ensure comfort, promote motivation, and give user pleasure [10].

Two prior studies shown the efficacy of the Design Thinking method in enhancing UI/UX. The study on the eClinic website successfully fixed the display and navigation concerns, and the SEQ test results show ease of use [11]. Meanwhile, research on the Amikom Center E-Learning site has successfully solved the problem of searching for content and information structure through user-focused redesign [12]. Both stressed that using a user-centered approach with the Design Thinking process results in more efficient and appropriate design solutions.

2. Research Methods

This study employs a qualitative approach and the Design Thinking method. The goal of this method is to revamp the Digital Population Identity Application (DPIA) interface based on user requirements and experience. This trial ran from October to December 2024. Data gathering took place both in person and online, utilizing the Meeting Online media. The Figma program was used to design the prototype, and testing was done with a usability level measurement tool called the System Usability Scale. The research subjects were 14 active users of the application, with six persons involved from the start as main participants and eight additional respondents added during the testing phase. The subjects were chosen purposefully in order to collect data relevant to the context of application use.

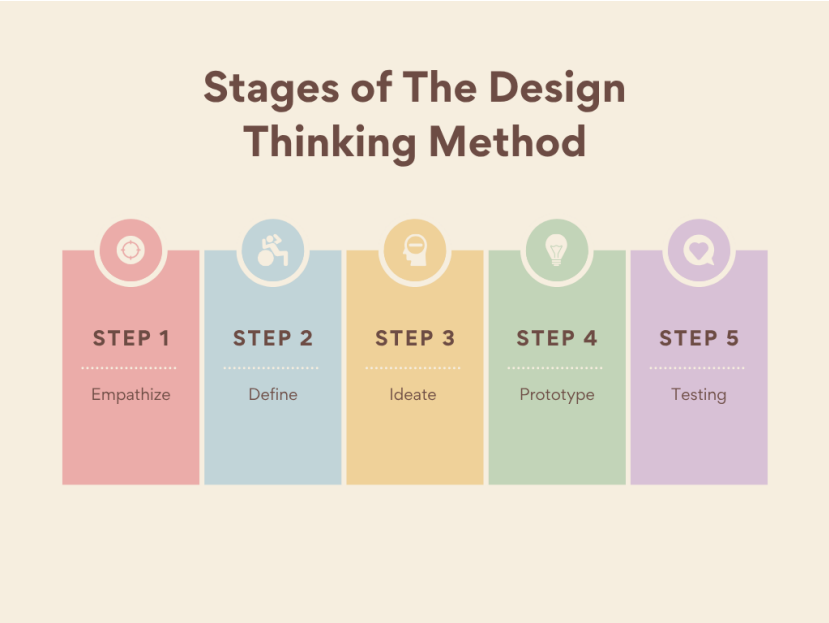

Figure 1. Stages of the Design Thinking Method

Design Thinking is a problem-solving method that focuses on cooperation with customers to produce acceptable solutions based on their needs. The primary advantage of this technique is that it fosters the generation of innovative ideas during the process of inspiration, idea development, and implementation into a prototype [13]. This technique combines logical analysis, practical skills, and aspects of creativity to generate a process that is structured, innovative, and oriented toward effective issue solving [14]. In practice, this procedure is dynamic and flexible, allowing for repetition at each stage of development to meet the needs [13]. With these characteristics, Design Thinking allows considerable opportunity for testing and refining solutions until an appropriate and efficient design is created [13].

Figure 1 shows the five stages of the Design Thinking method: understanding users (Empathize), defining challenges (Define), developing ideas (Ideate), producing prototypes, and conducting testing (Test) [15].

Below is an explanation of each level of the Design Thinking technique [16]:

1. Empathize
   The first stage in the Design Thinking technique is Empathize, which is an exploratory process that involves observation and in-depth study to comprehend users' actions, speech, thoughts, and feelings.
2. Define
   The Define stage is the second step in the Design Thinking technique, and it aims to formulate the core problem based on the Empathize stage findings.
3. Ideate
   The Ideate stage of the Design Thinking technique focuses on generating and developing numerous creative ideas as solutions to previously defined challenges.
4. Prototype
   The Prototype stage is the initial manifestation of ideas produced in the Ideate phase. The purpose is to build an initial representation or prototype of the suggested solution that may be utilized to address user issues.
5. Test
   In the Design Thinking technique, the Testing step entails putting the prototype through its paces with users. This phase collects replies and feedback from users after they test out the prototype that was created.

In this study, data was collected using a semi-structured interview approach for the Empathy stage, participant observation to gather feedback on the designs created in the Ideate and Prototype stages, and a System Usability Scale (SUS) questionnaire for the testing or Test stage. Interview guides, recording equipment, prototypes, and SUS forms were all employed as instruments. To assess the efficiency of the Redesign, qualitative data was analyzed thematically and statistically using SUS scores.

3. Results and Discussion

The findings of this study were acquired by evaluating the Digital Population Identity Application (DPIA) interface prototype with 14 respondents. The System Usability Scale (SUS) instrument was used to assess the level of convenience, efficiency of application use, and comfort following the application's redesign. The average SUS score achieved demonstrated a considerable rise over the previous edition of the program.

Table 1. System Usability Scale Scores Before and After the Redesign

No.	Respondent	SUS Score Before Redesign	SUS Score After Redesign
1	R1	67,5	72,5
2	R2	65	72,5
3	R3	62,5	57,5
4	R4	70	52,5
5	R5	70	65
6	R6	70	82,5
7	R7	67,5	95
8	R8	77,5	95
9	R9	70	77,5
10	R10	75	92,5
11	R11	65	87,5
12	R12	57,5	92,5
13	R13	60	100
14	R14	70	92,5
	Mean	67,67	81,07

The graphic below depicts the redesign of the DPIA interface using the Design Thinking stage. The prototype includes enhancements to the navigation structure and visual layout, as well as the addition of several key features such as online account registration, digital document access with download options, various population service submissions, interactive assistance, notifications, and others. Each display is intended to be more responsive, simple to understand, and deliver a more efficient and enjoyable program usage experience than the previous generation.

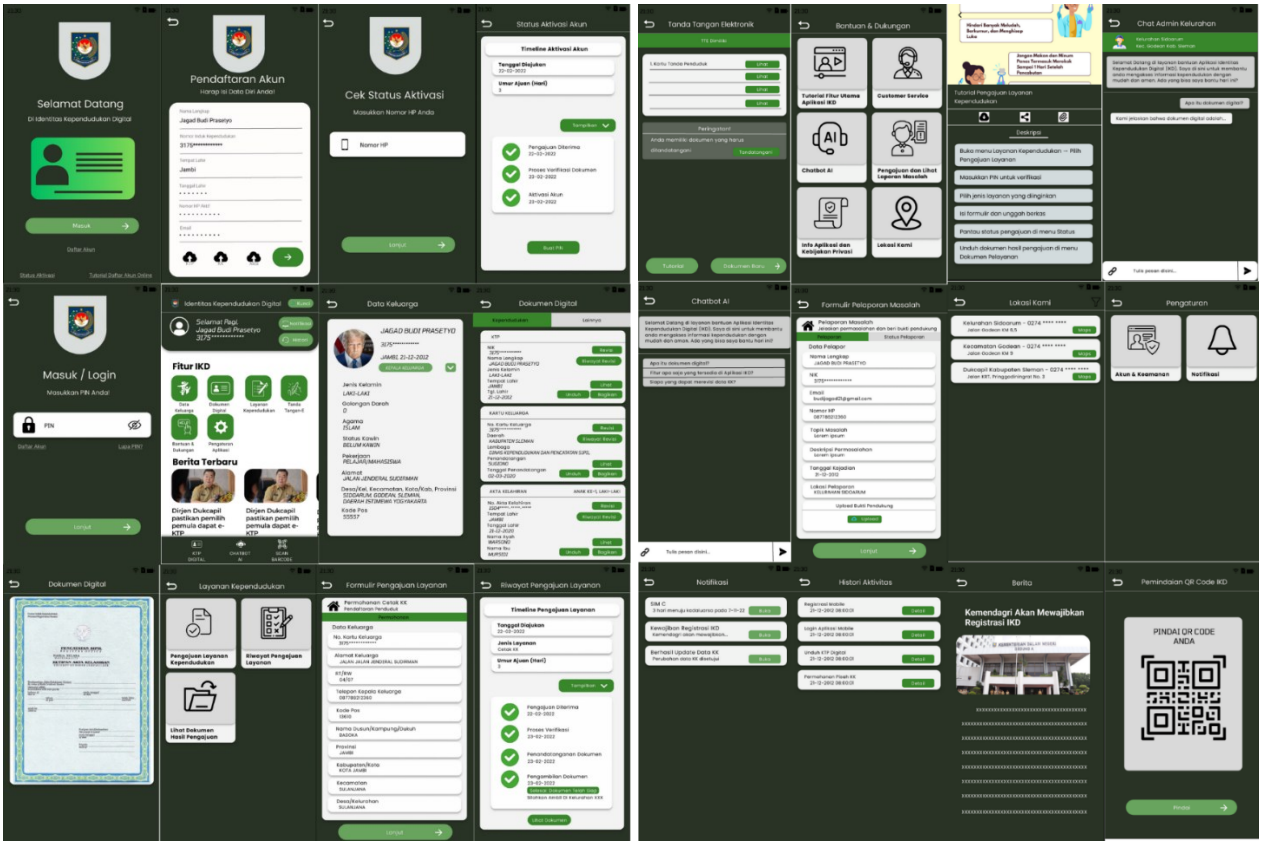

Figure 2. Results of the Digital Population Identity Application (DPIA) Prototype Design

This rise in usability scores demonstrates that the new application design is more responsive to user needs. A cleaner design, simplified navigation, and the addition of services like document downloads, user guides, and service connections have all shown to increase user convenience and trust.

According to the findings of interviews and observations, the previous version's challenges included the inability to register for an online account, the lack of user manuals, and a presentation that was perceived as boring and less helpful. Furthermore, various elements, including buttons, colors, and captcha input, lacked contrast and were not intuitive. Users also noticed a lack of live support features and chatbots, as well as low document resolution when shown. After being rebuilt based on user feedback, the program was deemed easier to grasp, especially by novice users. This is supported by the comparison of the SUS score, which was previously in the Marginal-High category, moving to Acceptable in terms of Acceptability Ratings based on the interpretation of the SUS score proposed by Handayani and Adelin (2019) [17]. Furthermore, throughout testing, users responded well to the application redesign results. Users were also able to perform all the well-tested tasks. A testing procedure can be regarded to be successful if the user is able to perform each task or scenario presented based on the success criteria that have already been specified by Ainurohmah & Irianto (2024) [18]. This success measures how well the design satisfies user demands and expectations throughout testing [10].

The study's conclusions are related to the concepts of user-oriented design stressed by the Design Thinking technique. Theoretically, usability is an important factor in determining the success of an interface. According to ISO 9241-11, usability consists of three major components: effectiveness, efficiency, and application user pleasure [19]. Usability may be determined based on five factors, including the amount of ease of use of the application, efficiency, user memory while using the application, error management, and user happiness [19]. The findings of this study show that redesigning the application interface has enhanced all five aspects. This is apparent in the increased SUS scores and favorable user feedback during the testing phase.

3. Conclusion

This study demonstrates that changing the Digital Population Identity Application (IKD) interface using the Design Thinking approach can increase the quality of user experience. The redesign process, which was based on user feedback, resulted in a more intuitive, simple, and user-friendly interface. These findings demonstrate that a user-centered design strategy can effectively address usability issues in digital-based public services. As a result, in the future, the primary strategy for designing government applications should be to rethink them with user demands in mind. This study is expected to serve as a reference for the development of comparable systems that prioritize accessibility and user pleasure as the primary indicators of application success.

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