DATA HEALTH PROTOTYPES AS HEALTHCARE SOLUTIONS WITH DESIGN THINKING

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ABSTRACT

This study discusses the inefficiency of the registration process in health facilities that can affect patient satisfaction and comfort. Through the design thinking approach method, this study identifies common problems in the registration process, which cause patient discomfort. This research proposes an innovative solution in the form of DataHealth, as a business idea that can be a solution in overcoming healthcare challenges, by utilizing Near Field Communication (NFC) technology to simplify the registration process. This technology allows users to store their personal data and health history into NFC tags integrated with the DataHealth mobile app, which can make it easy to access personal data with just one touch. In addition to improving patient comfort and healthcare effectiveness, DataHealth is also aligned with the Sustainable Development Goals (SDGs) by promoting resilient infrastructure in the healthcare industry. The trial stage and positive feedback from respondents proved that DataHealth understands the problems and needs that exist in the health industry.

Keywords: Optimization of the Registration Process, Health Technology Innovation, NFC Technology in the Health Sector, Improvement of Health Services, Digital Health Applications, SDGs 3, SDGs 9.

1. INTRODUCTION

Technological advances are well received from various areas of people's lives, for example in the field of business, social life, including the health sector [1]. The use of information technology in health services gave birth to a term called digital health [2]. Digital health is a form of innovation in the use of information and communication technology to meet the needs of health services and provide effective health interventions [3]. Digital health has an important role in the health sector, especially in health services. With Digital health, it will make it easier and provide solutions for patients, doctors and medical personnel in dealing with health problems [4].

One form of digital health is a digital-based health application that can store personal data and patient medical records. Electronic medical records are medical records made using electronic systems [5]. This system becomes a warehouse of electronic information containing health status and health services obtained by patients throughout their lives [5]. Health application technology that utilizes the storage of personal data and patient medical records can be useful in the registration process at health facilities and improve the effectiveness of services.

Patient registration is the initial activity in the health service process, where the patient's identity data and initial information are recorded and processed to build an electronic medical record (RME) [6]. Patient registration aims to be a reference for the implementation of measures for services at the registration counter so that it runs precisely, quickly, smoothly, and in accordance with procedures [7]. However, in Indonesia, the registration process at health facilities often faces challenges that can affect the effectiveness of health services. In the registration section, there is a long queue that results in patients waiting for a long time to get services, causing patient discomfort [8]. The registration process, which is still done manually, including data entry and patient summoning, often leads to snake hospital queues [9]. Another problem faced by patients is when there is an emergency but patients are still asked to fill in personal data.

To overcome this problem, innovations are needed that can increase the effectiveness of health service performance. One of the technologies that can be used to overcome this problem is the integration of Near Field Communication (NFC) technology to store personal data and patient medical records. This technology allows for easy and fast use of data access in just one tap without the need to fill out the registration form manually. By integrating NFC technology, DataHealth is present as a solution to face challenges in the registration process and management of patient data.

These innovations not only offer convenience for patients, but also support innovative solutions in the healthcare sector, in line with Sustainable Development Goals (SDGs) 9 to build resilient infrastructure, promote inclusive and sustainable industries, and encourage innovation [10].

2. METHODS

This study uses a design thinking approach method. Design thinking is an approach method that focuses on the need to use it to solve problems creatively. Design thinking is used as an analysis method through the process of understanding user needs and focusing on human shapes, relationships, behaviors, interactions and emotions to produce an optimal solution [11]. There are five stages in the design thinking method, namely emphatize, define, ideation, prototype, and test [12].

a. Empathize
In the Empathize stage, the goal is to gain an in-depth understanding of the challenges faced by users related to the registration process in healthcare facilities. The authors conducted a survey using Google Forms to collect information about patients' experiences in the registration process.

b. Define
In the Define stage, an observational analysis of the information that has been collected is carried out to determine the core problem. From the results of the observation, the author determined the core of the problem, namely the lack of efficiency in the registration process.

c. Ideate
The Ideate stage is the stage of developing solutions into ideas that focus on overcoming problems that have been analyzed in the previous stage.

d. Prototype
In the prototype stage, the ideas that make up DataHealth's business concept are designed into the design stage. In this study, the design of DataHealth and Tap NFC DataHealth applications will be further developed.

e. Test
The pilot phase is the final stage that includes the evaluation of DataHealth's business concept. The author pitched to get feedback related to the business concept design that has been developed.

3. RESULTS AND DISCUSSION

EMPHATIZE

In the initial step, the authors collected data through a survey that was disseminated to potential users online using Google Forms. The goal is to obtain information about respondents' experiences with patient registration services at health facilities. In addition, this survey aims to understand the feelings of respondents who experience difficulties in the registration process. The results of this survey reveal three common problems during the registration process, which are outlined in **TABLE 1**.

TABLE 1. Problems that Occur During the Registration Process at Health Facilities

No	Problems	Number of Percentage
1	Long queues Extensive data registration process during emergencies	53.85%
2	Data-heavy registration process during emergencies	38.46%
3	Treating alone	7.69%

A common problem felt by respondents is the large data registration process, especially during emergencies, because health services often ask for a lot of data information, such as KTP, KK, BPJS, health cards, and ask for referral letters. Another problem is that long queues often occur due to the large number of patients and the time-consuming registration process. Service waiting time is a problem that often causes patient complaints in several hospitals [13].

In addition, treating alone is a challenge for many patients, especially for those who are traveling. Patients who seek treatment alone often feel confused and anxious, especially when they are sick but are still asked for personal data or filling out forms.

From the results of this survey, the author also identified that all respondents agreed on the importance of easy access to personal data and health history. This shows the need to improve registration services in health facilities. Health institutions must pay attention to the quality of their services, including patient waiting times because it can affect patient satisfaction [14]. The respondents' agreement on the importance of easy access to personal data and health history indicates an opportunity to design an idea that can be a solution to this problem in health services.

TABLE 2. Pentingnya Kemudahan Akses Data di Fasilitas Kesehatan

No	Tingkat Kepentingan	Number of Percentage
1	Very Important	61.54%
2	I*mportant*	38.46%

DEFINE

Based on the results of the analysis of the previous survey, the author identified that the main problem that occurs in health services is the level of health services that is not optimal due to the limitations of the registration system. The results of the survey highlighted that many respondents experienced obstacles when registering, which had an impact on the discomfort of respondents. This research will be focused on developing an idea as an innovative solution that can overcome the problem. The goal is to increase the effectiveness of health services by simplifying the registration process at health facilities.

IDEATE

By following up on the problems that have been identified, the solution determined is DataHealth. DataHealth is an innovative solution by utilizing Near Field Communication (NFC) technology that can be used to store personal data and medical records in the form of NFC tags. This NFC technology is integrated with the DataHealth mobile application which is useful to make it easier for users to access personal data and medical records anytime and anywhere. Later, this NFC technology will be used to simplify the healthcare process, from the registration process to the management of patients' medical records, everything can be done with just one touch.

PROTOTYPE

Next, the author created a mobile application prototype and DataHealth usage flow. The following is a prototype of the DataHealth mobile application described in **FIGURE 1**.

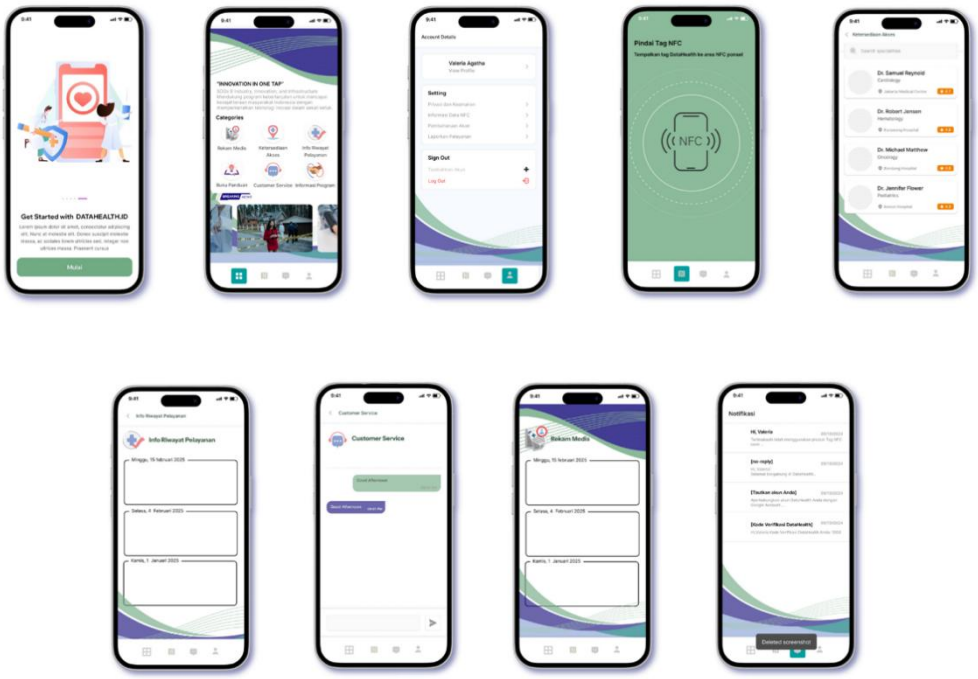

FIGURE 1. DataHealth mobile application prototype

The DataHealth mobile application is designed to provide ease in accessing user health information. On the main display, there is an NFC tag scanning feature as a first step for users before joining DataHealth. The purpose of this scan is to fill in the user's personal data so that the NFC tag can be integrated with the DataHealth mobile application. After success, users can see their data in the profile section. In addition, this application offers features that can help users, such as the user's medical record feature, the availability of DataHealth access with health agencies, information about the service history of health facilities that users have used, DataHealth manuals, customer service, news and information about programs organized by Datahealth.

In addition to the discussion of mobile applications, the author also compiles a flow of using DataHealth when applied in health facilities, as explained in **FIGURE 2**.

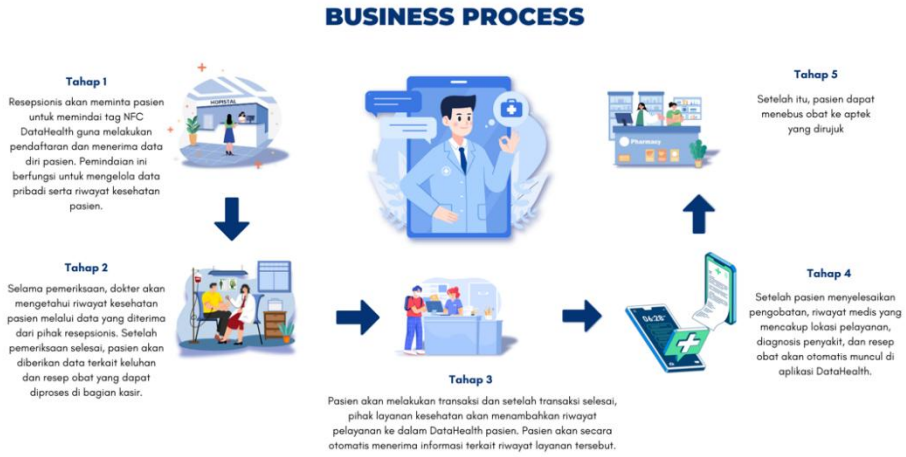

FIGURE 2. DataHealth usage flow

Overall, the DataHealth usage flow is designed to provide convenience for users and improve service efficiency for health agencies, from registration, medical examinations, to health history management. The image of the DataHealth usage flow is designed by the author with the aim that readers can see an overview of how the DataHealth usage process takes place.

TEST

In the final stage, the author conducted a trial with a pitching method to several respondents to get feedback on the concept of DataHealth. The feedback given by the respondents was in the form of a questionnaire through a Google Form consisting of 32 respondents. The feedback collected includes understanding the problem, prototyping as needed, and the potential for success.

TABLE 3. Does This Business Idea Understand the Problem

Skala Rating	Frequency
5	20 Respond
4	7 Respond
3	5 Respond

TABLE 4. Can This Prototype Meet Needs and Expectations

Skala Rating	Frequency
5	17 Respond
4	13 Respond
3	2 Respond

TABLE 5. Can this prototype meet the needs and expectations

Skala Rating	Frequency
5	22 Respond
4	9 Respond
3	1 Respond

From the results of the questionnaire, the author concluded that the results of the trial through this pitching method, that the majority of respondents gave a positive assessment of this business idea and DataHealth prototype. This explains that the DataHealth business concept can be a solution to face challenges in healthcare and has the potential to be further developed.

4. CONCLUSIONS

The author has conducted research using the design thinking method to find solutions in overcoming problems in health services. By developing an idea in the form of DataHealth as a solution. to facilitate the registration process by utilizing Near Field Communication (NFC) technology integrated with mobile applications to make it easier for users to access their medical records. Through the previous trial, DataHealth received a positive response from respondents, which proves that the concept of the DataHealth idea can support the digitalization of health services. In the future, with further development, DataHealth can improve its service features that support BPJS data, insurance, and expand services throughout Indonesia.

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