Development of PeduliLindungi Application Features Using Design Thinking

Lila Setiyani ✉, Inpresta Natali, Jasmine Fitriyah Yamani

Department of Information System, ROSMA College of Informatics and Computer Management, Indonesia, 41311

✉ lila.setiyani@dosen.rosma.ac.id

doi https://doi.org/10.37339/e-komtek.v7i1.1165

Abstract

The PeduliLindungi app has supported the government in controlling the spread of COVID-19. The purpose of this research is to explore new user needs and create design prototypes for the latest features of the PeduliLindungi application. Design thinking is used to know empathizing, define, ideate, and prototype. Figma Tools was chosen to develop a prototype that visualizes the latest features of the PeduliLindungi application. The results of this research are information about pain points from application users, problem statements, problem solving ideas, and user interface features for the new PeduliLindungi application. Based on the results of user pain points, the features developed are covid-19 event advertisements, Online Registration, Night Mode, Covid-19 educational videos, Tourist Visits, and Vaccine History. Based on the evaluation results using the Single Easy Question (SEQ), it is found that advertising, registration, night mode, and vaccine history are worth 7, meaning that the level of use is basic to use. Tourist visits and educational videos are worth 5.75, which means that improvements need to be made by taking into account notes from respondents during the testing process.

Keywords: PeduliLindungi User Requiremen; Design Thinking, Figma

Abstrak

Aplikasi PeduliLindungi telah mendukung pemerintah dalam mengendalikan penyebaran COVID-19. Tujuan penelitian ini untuk menggali kebutuhan baru pengguna dan membuat prototipe desain untuk fitur-fitur terbaru aplikasi PeduliLindungi. Design thinking digunakan untuk mengetahui empathizing, define, ideate, dan prototype. Figma Tools dipilih untuk mengembangkan prototipe yang memvisualisasikan fitur-fitur terbaru dari aplikasi PeduliLindungi. Hasil dari penelitian ini berupa informasi mengenai pain point dari pengguna aplikasi, pernyataan masalah, ide pemecahan masalah, dan fitur user interface untuk aplikasi PeduliLindungi yang baru. Berdasarkan hasil pain point pengguna, fitur yang dikembangkan adalah iklan event covid-19, Registrasi Online, Mode Malam, Video edukasi Covid-19, Kunjungan Wisatawan, dan Riwayat Vaksin. Berdasarkan hasil evaluasi menggunakan Single Easy Question (SEQ), didapatkan bahwa iklan, registrasi, mode malam, dan riwayat vaksin bernilai 7, artinya tingkat penggunaan adalah dasar untuk digunakan. Kunjungan wisata dan video edukasi bernilai 5,75, yang berarti perlu dilakukan perbaikan dengan memperhatikan catatan dari responden selama proses pengujian.

Kata-kata kunci: PeduliLindungi, Rekomendasi Pengguna, Desain Pemikiran, Figma

1.   Introduction

The PeduliLindungi application has supported the government during covid-19, with support controlling the spread of covid-19. This application has several features, such as notification to the public when entering the rehabilitation area covid-19, location of health facilities, and tracking if people are potentially infected with the covid-19 virus [1] [2]. Researchers have widely discussed the successful implementation of the PeduliLindungi application. Nurmansyah et al. state that self-efficacy, system quality, and information quality have successfully used satisfaction [3]. Besides that, the PeduliLindungi application succeeded as a model of information systems in the tourism sector [4]. Seeing the increasing number of users of the PeduliLindungi application encourages researchers to develop features of the PeduliLindungi application so that the application will continue to use data and impact the community in the field of public health management. Software development contains stages, including system requirements, design, development, implementation, and testing. However, the booming activity in that stage involves information or data from users because software development was created to meet user needs. One of the concepts that can support software development activities is design thinking. Design thinking is conceptualized as a human-centered approach inspired by the designer that leads transformation and innovation that got from identifying and satisfying user needs [5]. This concept is a creative way of working and is defined as a formal method for creative problem-solving [6]. Some innovations got from the design thinking framework. Gesualdo et al. stated that design thinking supports developing digital tools that solve problems in the covid-19 era [7]. Parazi et al. describes design thinking used to integrate into software development activities [8]. It is proved that design thinking is necessary to adopt in software development. This study aimed to explore new features from the PeduliLindungi application that meet user needs. Some researchers have been using design thinking in software development.

Indriasari et al. describe that design thinking as an innovation success in developing digital banking [9]. It is reinforced by Sharma et al. that state design thinking can be implemented in user requirement engineering, that part of software development [10]. Design thinking was used by Gama et al. as a toolbox for recurring design methods in software development [11]. Besides that, Darmawan et al. have been implementing design thinking as an approach for user interface design and user experience on campus academic information systems [12]. Heinz et al. have proved that design thinking can be combined with software requirements engineering to

create human-centered software-intensive systems [13]. Research from Karim & Sandu reported that design thinking in software development applies human-centered design as key to addressing problem-solving needs. Based on the previous research, this study can apply design thinking as a framework to explore new features PeduliLindungi application that meets user needs.

2. Method

Based on the design thinking concept, this study started with empathizing to gain user needs. It continued defining the process to state the problems and explore ideas to solve them as an ideate process. To test the idea, the prototype was developed using the Figma application. Visualization from the prototype is a result design that can be tested in the test phase. The prototype is described in user flow, wireframe, and user interface. Procedures from this study can show in **Figure 1**.
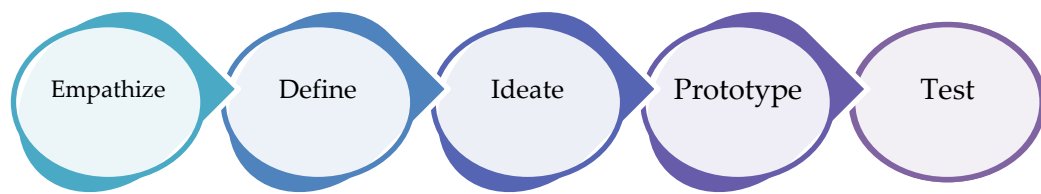

Figure 1. Research procedure adopted from design thinking

Empathize stage produces information about the pain the user PeduliLindungi application feels. Define produce problem statement. Ideate produces an affinity diagram that shows potentials idea for solving the problem. The prototype produces a design user flow diagram, wireframe, and user interface from the new features PeduliLindungi application. Testing is done using the Single Easy Question. Respondents selected to evaluate the latest features of the PeduliLindungi application are respondents who are experts in the field of UI/UX and users of the PeduliLindungi application. These respondents were selected using a purposive sampling method. Four respondents were selected with characteristics including understanding UI/UX concepts, PeduliLindungi application users, and having experience in software development. These characteristics are determined so that the UI/UX design evaluation can provide benefits and convenience in line with the objectives of this research. The ease of this application is measured on a scale of 1 (very difficult) to 7 (very easy).

3. Results and Discussion

3.1 Empathize Phase

At this stage, an interview was conducted with the PeduliLindungi application user. From the interview process, it was found that some of the pains faced by users of the PeduliLindungi application include (1) there is no information on the nearest vaccine holding in the PeduliLindungi application, (2) there is no direct online registration feature in the PeduliLindungi application, so you have to contact the number that provides the vaccine/the committee, (3)there is no tracker for a place you want to visit, and a piece of information so you know the place has exceeded the visitor limit or not, (4)there is no night mode feature in the PeduliLindungi application, it makes the eyes less comfortable with its appearance, (5)there are no videos about preventing covid-19, etc., (6)there is no news about the latest Covid-19 in Indonesia in the application, (7)there is no history of vaccines other than the covid vaccine.

3.2 Define Phase

From empathize process, at the define stage, the problem is determined. Problem statement is presented on **Table 1**.

Table 1. Problem Statement

Pain	Problem Statement
There is no information on the nearest vaccine holding in the PeduliLindungi application.	How to improve a service in the PeduliLindungi application?
There is no direct online registration feature in the PeduliLindungi application, so you have to contact the number that provides the vaccine/the committee	How to provide a feature that makes it easy for users to find out about vaccines and can register immediately without contacting the committee first Formerly?
There is no tracker for a place you want to visit, and a piece of information so you know whether the place has exceeded the visitor limit or not	How to make a feature like a map that can find out or display the number of visitors in the place you want Visiting?
There is no night mode feature in the PeduliLindungi application. It makes the eyes less comfortable with its appearance.	How to update a UI/UX on PeduliLindungi to keep the convenience of a PeduliLindugi application user?
There are no videos about preventing covid-19 etc.	How to provide videos about Covid-19 etc?
There has yet to be any news about the latest Covid-19 in Indonesia in the application.	How do you provide a notification or video feature containing the latest Covid-19 news in Indonesia so that users get all the information?
There is no history of vaccines other than the covid vaccine.	How to develop the features contained in the PeduliLindung application according to the user's wishes?

3.3 Ideate Phase

From define phase, there are the feature that can apply in the new PeduliLindungi application such as (1) create an information center feature for holding the nearest vaccine, (2) create an online registration feature for vaccine doses 1 to booster, (3) provide special visitor features somewhere, (4) create a theme edit feature, (5) make video features about covid-19, (6) providing information features of news about covid-19 through a video, (7) developing a vaccine history feature with child immunizations.

3.4 Prototype Phase

This phase, prototype develop using Figma application. This is some user interface that showing new feature from PeduliLindungi application.

3.5 Features of advertising the event covid-19

This feature was created to provide information to PeduliLindungi application users if there is a vaccine event held in all locations. Features of advertising the event coviid-19 is presented on **Figure 2**.

Figure 2. Features of Advertising the Event Coviid-19

3.6 Online Registration Feature

This feature was created to make it easier for users to register for vaccines and immediately get a queue number, so application users no longer need to contact the committee which is sometimes slow to respond. Online Registration Feature is presented on **Figure 3**.
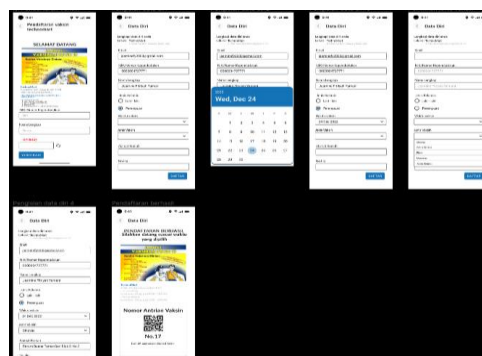

Figure 3. Online Registration Feature

3.7 Tourist Visit Feature

This feature was created to provide information on how many people have visited tourist attractions that users want to visit so that users know whether the place has exceeded capacity, so the tourist attractions are crowded and do not apply health protocols that must keep their distance. Tourist visit feature is presented on **Figure 4**.
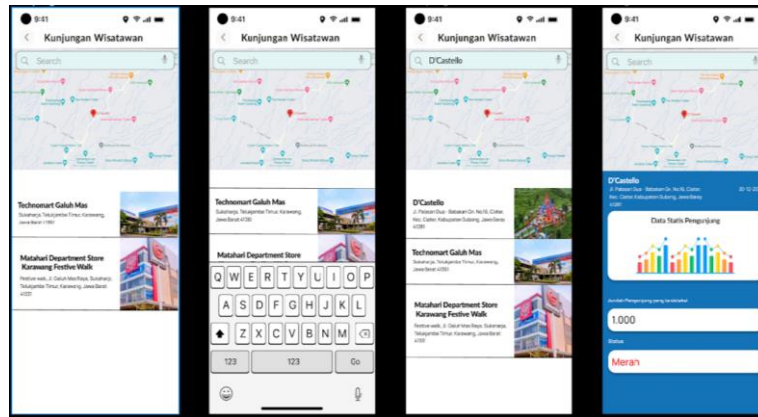

Figure 4. Tourist Visit Feature

3.8 Night Mode Feature

This feature is made to provide comfort to the user's eyes. Night mode can be activated in the theme features that have been provided with the appearance of night mode, the appearance looks not too flashy with all white. Night mode feature is presented in **Figure 5**.

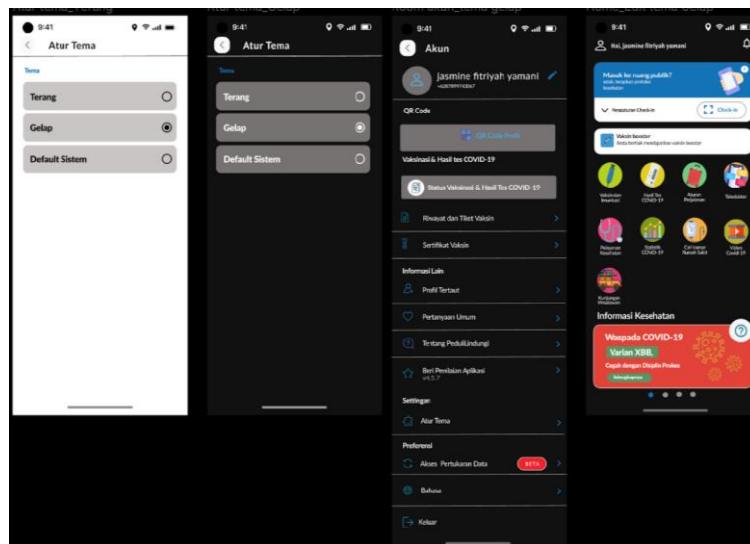

Figure 5. Night mode feature

3.9 Covid-19 educational video feature

This feature was created to provide an educational video and broadcast news about Covid-19 which is the same as TV so that users don't miss information about Covid-19 that is happening in Indonesia. Covid-19 educational video feature is presented in **Figure 6**.
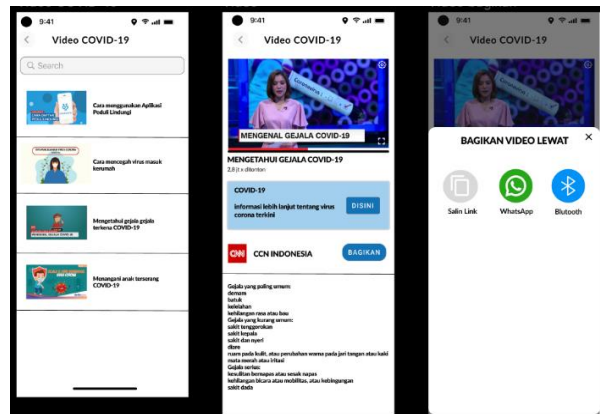
Figure 6. Covid-19 Educational Video Feature

3.10   Vaccine History Feature

This vaccine history feature was created to make it easier for PeduliLindungi application users to view and adding not only children but all members can be added but for children you can view immunization history. Children can be registered from infancy or a few months after birth to make health data easier. And after the age of 6 you will automatically get a vaccine notification. Vaccine history feature is presented in **Figure 7**.
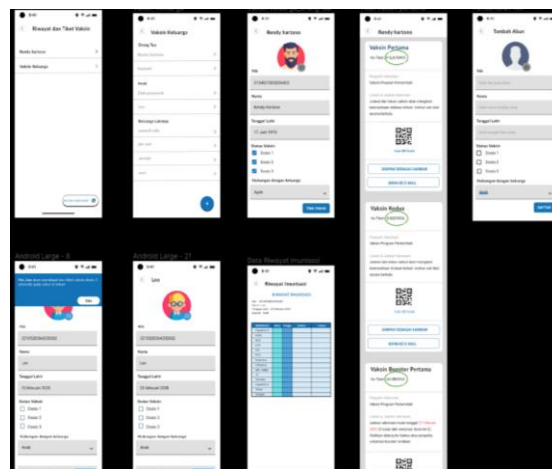

Figure 7. Vaccine History Feature

3.11   Testing Phase

At the stage of testing the new features of the PeduliLindungi application, researchers used a single ease question (SEQ). SEQ which is a standard user experience metric that researchers in usability studies use to find out how difficult or easy it is for a user to perform a task. The respondents used in this testing stage are respondents with Expert characteristics in the field of UI/UX as well as users of the PeduliLindungi application. Single easy question is presented **Table 2**.

Table 2. Single Easy Question

Feature	R 1	R 2	R 3	R 4	Average
Task advertising the event covid-19 feature	7	7	7	7	7
Task online Registration feature	7	7	7	7	7
Task tourist visit feature	5	6	6	6	5,75
Task night mode feature	7	7	7	7	7
Task covid-19 educational video feature	6	5	6	6	5,75
Task vaccine history	7	7	7	7	7

Based on testing carried out using SEQ, it was found that the advertising, registration, night mode, and vaccine history tasks had a score of 7, which means the level of use was very easy, while the tourist visit and video education tasks had a score of 5.75, which means that convenience still needs to be improved.

4. Conclusion

To encourage the use of the PeduliLindungi application on an ongoing basis by its users, in this study the researchers proposed developing features for advertising the event covid-19, Online Registration, Night Mode, Covid-19 educational video, Tourist Visit, Vaccine History. The results of evaluating the user interface and user experience using the new features of the PeduliLindungi application found that the advertising, registration, night mode, and vaccine history tasks had a score of 7, which means the level of use was very easy, while the tourist visit and video education tasks had a score of 5.75, which means that convenience still needs to be improved.

References

[1]   I. W. Sudiarsa and I. G. B. Wiraditya, "Analisis Usability Pada Aplikasi Peduli Lindungi Sebagai Aplikasi Informasi Dan Tracking Covid-19 Dengan Heuristic Evaluation," *INTECOMS J. Inf. Technol. Comput. Sci.*, vol. 3, no. 2, pp. 354–364, 2020, doi: 10.31539/intecoms.v3i2.1901.

[2]   D. Herdiana, "Aplikasi Peduli Lindungi: Perlindungan Masyarakat Dalam Mengakses Fasilitas Publik Di Masa Pemberlakuan Kebijakan Ppkm," *J. Inov. Penelit.*, vol. 2, no. 6, pp. 1685–1694, 2021.

[3]   M. I. Nurmansyah, C. Rosidati, Yustiyani, and N. M. Nasir, "Measuring the Success of PeduliLindungi Application Use for Supporting COVID-19 Prevention: A Case Study

among College Students in Jakarta, Indonesia," *Kesmas*, vol. 17, no. 1, pp. 11–16, 2021, doi: 10.21109/KESMAS.V17ISP1.6057.

[4] S. Hidayatullah, S. Alvianna, A. Z. Sugeha, and W. Astuti, "Model of information systems success Delone and Mclean in using Pedulilindungi application in the tourism sector of Malang City," *J. Pariwisata Pesona*, vol. 7, no. 1, pp. 49–57, 2022, doi: 10.26905/jpp.v7i1.7505.

[5] S. Magistretti, C. Dell'Era, R. Verganti, and M. Bianchi, "The contribution of Design Thinking to the R of R&D in technological innovation," *R D Manag.*, vol. 52, no. 1, pp. 108–125, 2022, doi: 10.1111/radm.12478.

[6] A. Rylander Eklund, U. Navarro Aguiar, and A. Amacker, "Design thinking as sensemaking: Developing a pragmatist theory of practice to (re)introduce sensibility," *J. Prod. Innov. Manag.*, vol. 39, no. 1, pp. 24–43, 2022, doi: 10.1111/jpim.12604.

[7] F. Gesualdo, L. M. Bucci, C. Rizzo, and A. E. Tozzi, "Digital tools, multidisciplinarity and innovation for communicating vaccine safety in the COVID-19 era," *Hum. Vaccines Immunother.*, vol. 18, no. 1, 2022, doi: 10.1080/21645515.2020.1865048.

[8] R. Parizi, M. Prestes, S. Marczak, and T. Conte, "How has design thinking being used and integrated into software development activities? A systematic mapping," *J. Syst. Softw.*, 2022, doi: 10.1016/j.jss.2022.111217.

[9] E. Indriasari, H. Prabowo, F. L. Gaol, and B. Purwandari, "Adoption of Design Thinking, Agile Software Development and Co-creation: A Qualitative Study towards Digital Banking Innovation Success," *Int. J. Emerg. Technol. Adv. Eng.*, vol. 12, no. 1, pp. 111–128, 2022, doi: 10.46338/IJETAE0122_11.

[10] R. Sharma and J. N. Singh, "Design-Thinking and User's Requirement Engineering: Human Centred Development," *Int. J. Mech. Eng.*, vol. 6, pp. 108–114, 2021.

[11] K. Gama, G. Valença, P. Alessio, R. Formiga, A. Neves, and N. Lacerda, "The Developers' Design Thinking Toolbox in Hackathons: A Study on the Recurring Design Methods in Software Development Marathons," *Int. J. Hum. Comput. Interact.*, pp. 1–38, 2022, doi: 10.1080/10447318.2022.2075601.

[12] I. Darmawan, M. S. Anwar, A. Rahmatulloh, and H. Sulastri, "Design Thinking Approach for User Interface Design and User Experience on Campus Academic Information Systems," *Int. J. Informatics Vis.*, vol. 6, no. 2, pp. 327–334, 2022, doi: 10.30630/joiv.6.2.997.

[13] J. Hehn and D. Mendez, "Combining Design Thinking and Software Requirements Engineering to Create Human-Centered Software-Intensive Systems," pp. 11–60, 2022, doi: 10.1007/978-3-030-90594-1_2.