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User Interface Design for a Mobile Super App of DISKOMINFOTIK Bengkulu Province Using the Design Thinking Method

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Abstract*—The DISKOMINFOTIK of Bengkulu Province does not yet have an integrated digital platform capable of consolidating various public services—such as commodity information, education, tourism, healthcare, taxation, employment, and public complaints—into a single application that is easily accessible to the public. This condition requires citizens to access multiple separate channels, resulting in low efficiency of government digital services. This study aims to: (1) identify user needs for government digital services in Bengkulu, (2) design the user interface of a DISKOMINFOTIK mobile Super App using the Design Thinking method, and (3) produce a UI/UX design prototype ready for testing. The Design Thinking method is implemented through five stages: Empathize, Define, Ideate, Prototype, and Test, with data collected through a document study of the Bengkulu Province Super App masterplan and direct observation at DISKOMINFOTIK. The results of this study produce interface modules including onboarding, home, commodities, education, tourism, healthcare, taxation, employment, and public complaints. Usability testing using the System Usability Scale (SUS) method involving 10 respondents resulted in an average score of 78,00, indicating that the prototype falls within the Acceptable (Good) category according to users.

Keywords- User Interface, Design Thinking, Super App, Usability Testing, System Usability Scale, E-Government, Mobile Application

I. INTRODUCTION

The rapid development of information and communication technology has driven the transformation of public services toward digitalization (e-government). Modern society demands government services that are fast, efficient, and accessible through mobile devices anytime and anywhere [1]. According to a report by the Indonesian Internet Service Providers Association (APJII), the internet penetration rate in Indonesia reached 79.5% in 2024, increasing by 1.4% compared to the previous period [2]. This high level of internet penetration presents a significant opportunity for local governments to deliver more efficient and inclusive digital public services.

The Government of Bengkulu Province, through the Department of Communication, Informatics, and Statistics (DISKOMINFOTIK), faces a significant challenge related to the fragmentation of digital services. Various public information—ranging from commodity price information, school registration, tourism destinations, healthcare information, vehicle tax checks, job vacancies, to public complaint services—is distributed across multiple platforms or channels that are not integrated. This condition leads to inefficiency and hinders the public from accessing services in an integrated manner [3]. Similar issues have also been identified in various studies on e-government in Indonesia, which indicate that fragmentation of local government information systems is a major barrier to improving the quality of digital public services [4].

To address these challenges, the DISKOMINFOTIK of Bengkulu Province has developed a Super App Masterplan as a blueprint for the development of an integrated digital platform. The concept of super apps refers to a single platform that integrates various services into one application, allowing users to access all their needs without switching between different applications [5]. This approach has been successfully implemented in various countries within the context of digital government, and a study by Lee (2022) confirms that mobile-based public service platforms can significantly improve service efficiency and user satisfaction [6].

A well-designed User Interface (UI) cannot be achieved without a deep understanding of user needs. Various methods have been developed for UI/UX design, including User-Centered Design (UCD), Agile UX, Human-Computer Interaction (HCI), and Design Thinking. UCD primarily focuses on developing new systems from the ground up by involving users in every technical iteration [7]. Agile UX integrates design into rapid software development cycles; however, it provides limited room for in-depth exploration of user needs at the early stages [8]. Design Thinking, on the other hand, is an empathy-driven problem-solving approach that explicitly emphasizes understanding user context before designing solutions, making it more suitable when user needs are not yet fully defined [9]. This comparison indicates that Design Thinking is more advantageous for the development of complex government applications with diverse services, as it is capable of generating innovative solutions that are aligned with the actual needs of the public [10].

The Design Thinking method is selected in this study due to its ability to integrate user empathy throughout the entire

design process. Jaskyte and Liedtka (2022) emphasize that Design Thinking is capable of producing more relevant innovations compared to conventional software engineering approaches [11]. Eisenbart et al. (2022) also demonstrate that the implementation of Design Thinking significantly improves solution quality and end-user satisfaction [12]. Previous studies on UI/UX design for government applications using Design Thinking have likewise shown significant improvements in usability scores [13], [14].

Design Thinking is a human-centered and iterative problem-solving approach used to understand users, challenge assumptions, redefine problems, and create innovative solutions through prototyping and testing processes [20]. This approach was first popularized by the Hasso Plattner Institute of Design (d.school) at Stanford University and has since evolved into one of the most widely adopted methodologies in digital product and service development [21]. According to Brown (2008), as cited in various contemporary studies, Design Thinking integrates human needs, technological feasibility, and business viability into a comprehensive approach. In the context of public service application design, Design Thinking has proven to produce interfaces that are more responsive to real user needs compared to conventional methods that rely solely on technical specifications [22]. Irwansyah et al. (2023), in their study on a mobile-based financial application, confirm that the application of Design Thinking results in more intuitive UI/UX designs and measurably improves user satisfaction [23]. Similarly, Fuada et al. (2024) demonstrate that redesigning applications using Design Thinking significantly improves usability scores on the SUS instrument compared to previous designs [24].

Operationally, Design Thinking consists of five interrelated and non-linear stages [21]. The first stage, Empathize, serves as the foundation of the entire process, in which designers strive to deeply understand the context, needs, motivations, and challenges faced by users through observation, interviews, and document studies [21]. The second stage, Define, aims to analyze and synthesize all findings from the empathy stage to formulate a user-centered problem statement, often accompanied by the development of user personas and empathy maps [21]. The third stage, Ideate, is a phase of creative solution exploration through techniques such as brainstorming, mind mapping, and "how-might-we," where teams are encouraged to generate as many ideas as possible without constraints [21]. The fourth stage, Prototype, transforms selected ideas into tangible representations—either in the form of low-fidelity wireframes or high-fidelity prototypes—that can be interacted with and evaluated by real users [25]. The fifth stage, Test, involves evaluating the prototype with target users to gather feedback, identify design weaknesses, and conduct iterative improvements [21]. Ansori et al. (2023) demonstrate that the systematic application of these five Design Thinking stages in the development of government mobile applications results in interfaces that are easier to understand and use by diverse user groups [25]. This finding is further supported by studies in the Indonesian e-government context, which report significant improvements in SUS scores following the implementation of Design Thinking in public service applications [22].

This study aims to: (1) identify the needs of users of digital public services in Bengkulu Province through a masterplan document study, (2) design the user interface of the DISKOMINFOTIK Super App using the Design Thinking method, and (3) produce a comprehensive UI/UX design prototype along with usability testing results using the System Usability Scale (SUS).

II. Research Method

This study employs the Design Thinking method with a descriptive qualitative approach. The design process is carried out through five systematic stages referring to the Design Thinking framework developed by the Hasso Plattner Institute of Design (d.school), Stanford [9], as illustrated in Figure 1.

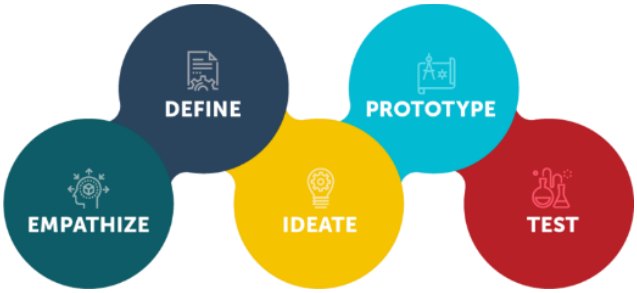


Fig. 1. Stages of the Design Thinking Method

Table 1 below presents the Design Thinking stages applied in the Super App development.

Table 1. Design Thinking Research Stages

No	Stage	Activities	Outputs
1	Empathize	Document study of the DISKOMINFOTIK Bengkulu Province Super App Masterplan; analysis of public service needs	User needs, list of priority services, pain points
2	Define	Document data analysis, formulation of problem statements, user personas, and empathy maps	Problem statement, user persona, empathy map
3	Ideate	Feature brainstorming, development of information architecture, user flow, and module sitemap	User flow, sitemap, list of application features
4	Prototype	Design of low-fidelity wireframes and high-fidelity interfaces using Figma for UI modules	Interactive high-fidelity prototype

No	Stage	Activities	Outputs
5	Test	Prototype testing using the System Usability Scale (SUS) method involving 10 respondents	SUS scores, improvement recommendations

Data collection in the Empathize stage was conducted through a document study of the DISKOMINFOTIK Bengkulu Province Super App Masterplan and field observation during the internship period. The document study approach was selected because DISKOMINFOTIK has established a comprehensive planning document as the foundation for platform development. The collected data were analyzed thematically to identify user needs and existing digital service issues. The prototype was designed using Figma as the design tool, producing high-fidelity interfaces for the application modules. Usability testing was conducted using the System Usability Scale (SUS), which consists of 10 questions measured on a 5-point Likert scale and involved 10 respondents.

III. RESULT AND DISCUSSION

This section presents the results of the user interface design for the DISKOMINFOTIK Bengkulu Province Super App based on the Design Thinking stages. Subsection 3.1 discusses the Empathize stage through document study. Subsection 3.2 presents the results of the Define stage. Subsection 3.3 discusses the Ideate stage. Subsection 3.4 presents the prototype results for each module. Subsection 3.5 discusses the results of usability testing.

A. Empathize

In the Empathize stage, data were collected through a document study of the DISKOMINFOTIK Bengkulu Province Super App Masterplan. This approach was chosen because DISKOMINFOTIK has developed a comprehensive planning document that includes service requirements, target users, and the platform development roadmap. The document analysis revealed five main issues that form the basis of the design: (1) the absence of a single access point for public services, (2) non-real-time commodity price information, (3) difficulty in finding scholarship and educational information, (4) limited digital promotion of tourism destinations, and (5) a lack of transparency in public complaint processes.

The results of the document study were synthesized into an empathy map that summarizes what potential users think, feel, say, and do. This empathy map serves as the primary foundation for the Define stage in formulating specific problems. The visualization of the Bengkulu Province Super App empathy map can be seen in Figure 2.

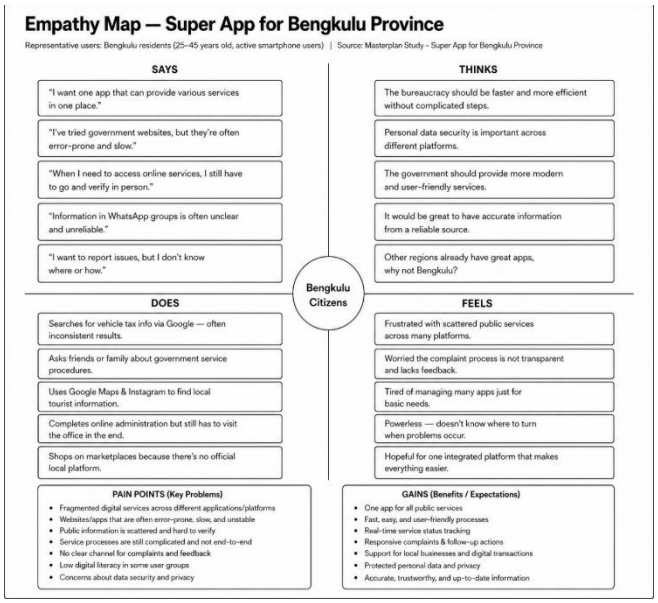


Fig. 2. Empathy Map of DISKOMINFOTIK Super App Users

B. Define

Based on the findings from the Empathize stage, the Define stage produces user personas and a problem statement that specifically describe user needs and challenges. The user personas are designed to represent two main user groups: (1) the general public who require access to public service information, and (2) DISKOMINFOTIK staff as content administrators.

The formulated problem statement is: *"The people of Bengkulu Province require an integrated digital platform that facilitates access to public information services—commodities, education, tourism, healthcare, taxation, employment, and public complaints—in a real-time, transparent manner and accessible through mobile devices."* This problem statement serves as a guideline throughout the ideation and design processes.

C. Ideate

The Ideate stage produces the information architecture and user flows for the application modules through a structured brainstorming process. The main navigation adopts a bottom navigation bar pattern, providing quick access to frequently used modules. The user flow illustrates the sequence of user interactions from onboarding to task completion within each module. The visualization of the user flow for the Bengkulu Province Super App can be seen in Figure 3.

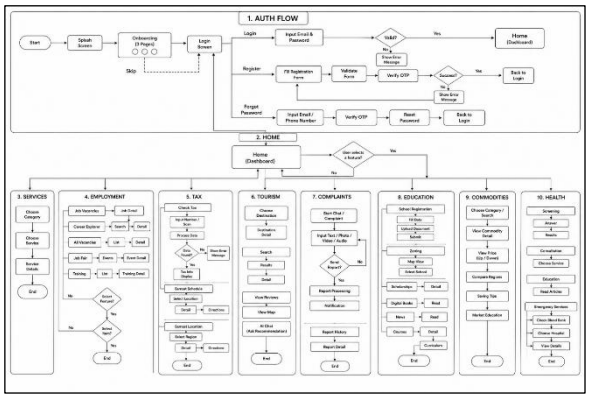


Fig 3. User Flow of the Super App

The sitemap or information architecture of the Bengkulu Province Super App is presented in Figure 4.

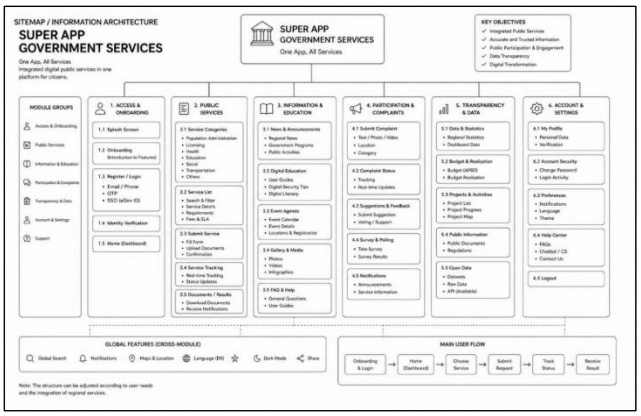


Fig 4. Sitemap of the DISKOMINFOTIK Super App Application

The ideation results produce a list of features for nine main modules, prioritized based on user needs identified in the masterplan document. In addition to the core modules identified during the Define stage—namely Commodities, Education, Tourism, Healthcare, Taxation, Employment, and Public Complaints—the structured brainstorming process and field observations conducted during the internship period at DISKOMINFOTIK revealed additional user needs not fully captured in the initial masterplan document. Specifically, high demand was identified for a digital health clinic queue management feature and an emergency panic button, both of which are directly relevant to the smart city governance context of Bengkulu Province. These auxiliary features were therefore integrated into the prototype design to produce a more comprehensive and citizen-responsive platform. Each module is designed with clear information hierarchy principles, intuitive navigation, and visual consistency [15].

D. Prototype

In the Prototype stage, the generated ideas are translated into high-fidelity prototypes using Figma. The design adopts a blue color scheme (#1B4FFF) as the dominant color, reflecting a professional and trustworthy government identity [16], along with clean system-based typography and consistent card-based components across all modules.

Onboarding and Authentication Module

The onboarding module is designed with three splash screens introducing the main features (Smart Government, Smart Report, Smart Apps), followed by login and registration pages. The design utilizes modern, user-friendly vector illustrations. The interface of the onboarding and authentication module of the Bengkulu Province Super App can be seen in Figure 5.

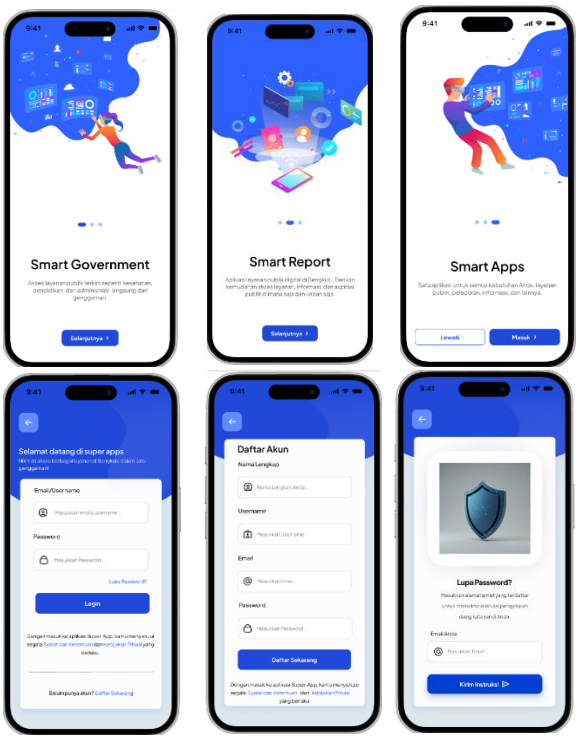
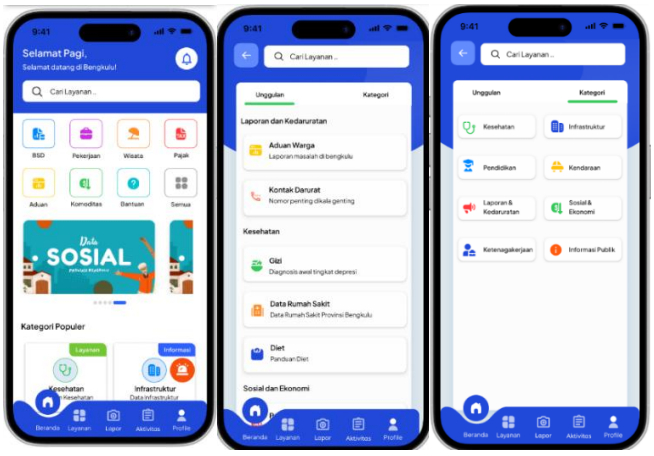


Fig 5. Onboarding and Authentication Interface

Home Module

The home module is designed as the central navigation hub, providing shortcuts to all modules, the latest news from Bengkulu Province, today's weather, and service notifications. The interface adopts a responsive and scannable card-based layout. A global search feature is available at the top of the interface. The interface of the Bengkulu Province Super App home page can be seen in Figure 6.



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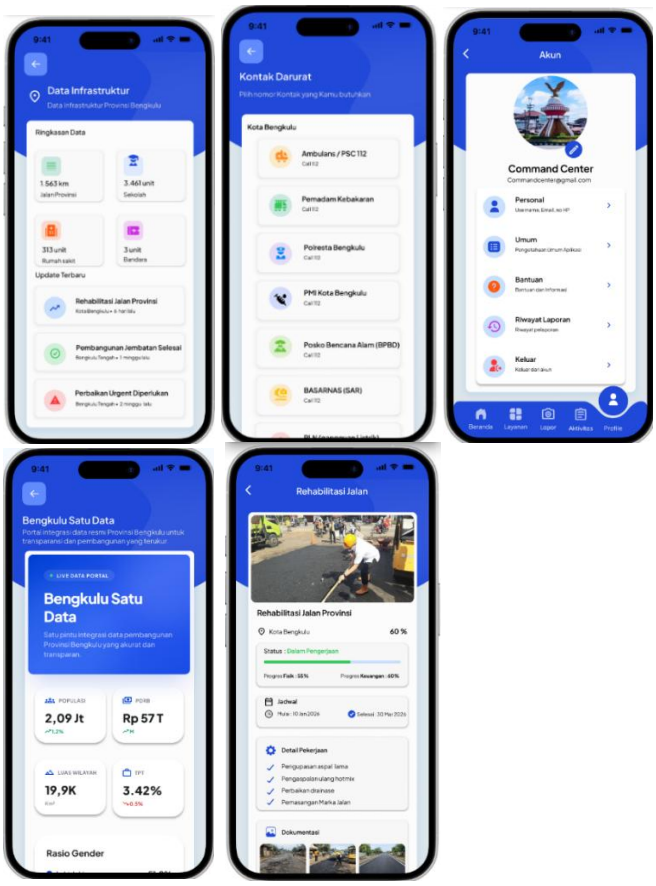
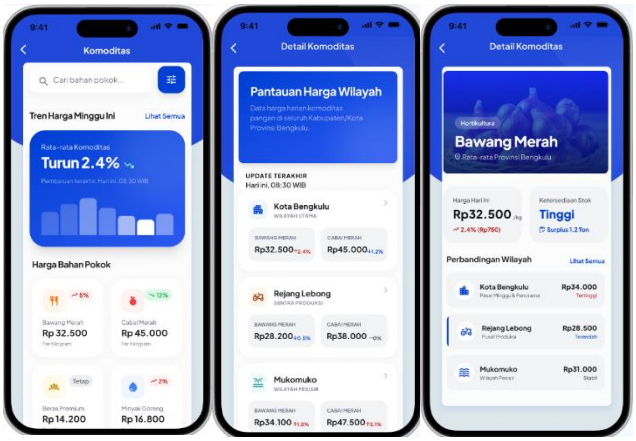


Fig 6. Home Module Interface

Commodities Module

The commodities module presents real-time information on staple goods prices, accompanied by price trend indicators (increase/decrease). Users can filter data based on regencies/cities within Bengkulu Province and view price comparisons across regions using graphical visualizations. The interface of the Bengkulu Province Super App commodities module can be seen in Figure 7.



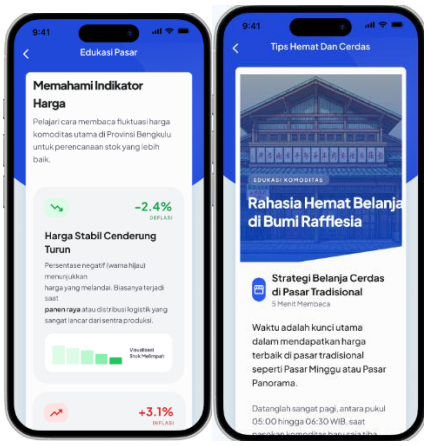
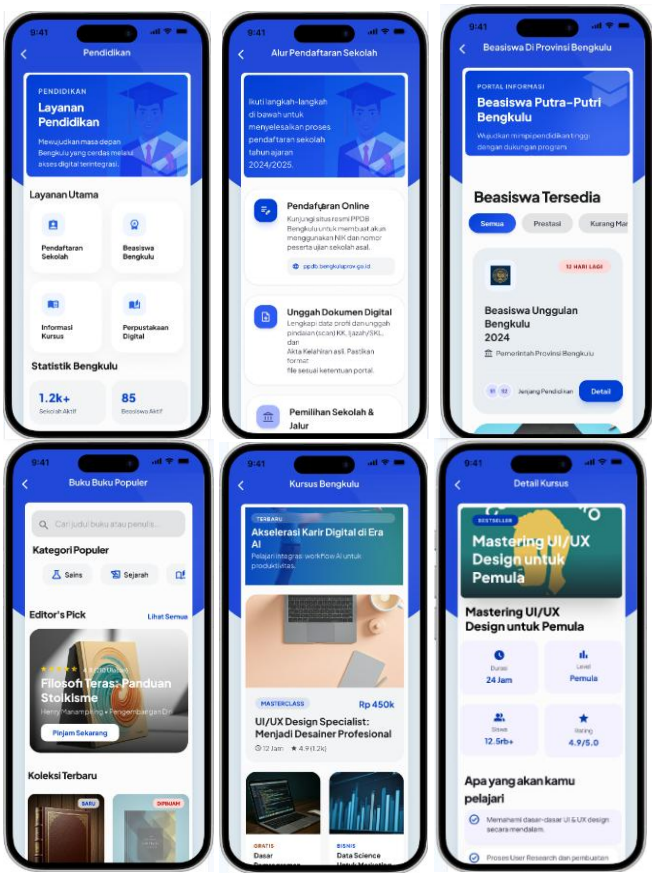


Fig 7. Commodities Module Interface

Education Module

The education module integrates features such as online school registration, scholarship information for Bengkulu Province, a digital library, and online courses. A map-based school zoning feature assists parents in locating the nearest schools. The interface of the Bengkulu Province Super App education module can be seen in Figure 8.



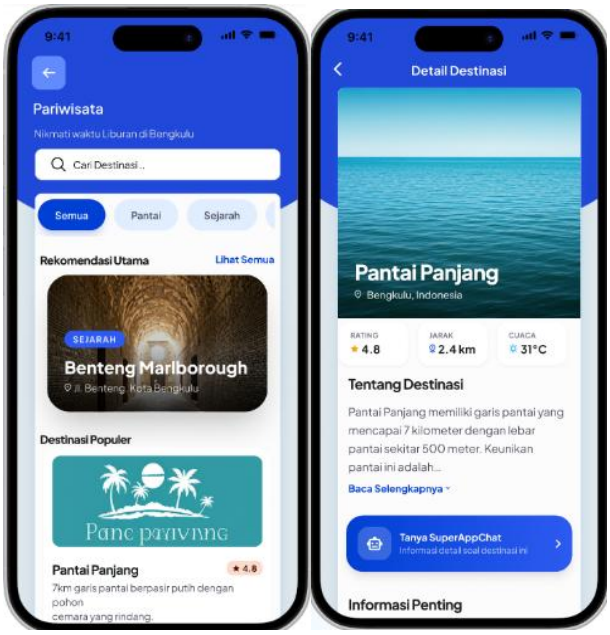
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Fig 8. Education Module Interface

Tourism Module

The tourism module presents featured tourist destinations in Bengkulu, complete with information including location, opening hours, ticket prices, facilities, and visitor reviews. An integrated AI-based SuperAppChat feature provides personalized tourism recommendations. The interface of the Bengkulu Province Super App tourism module can be seen in Figure 9.



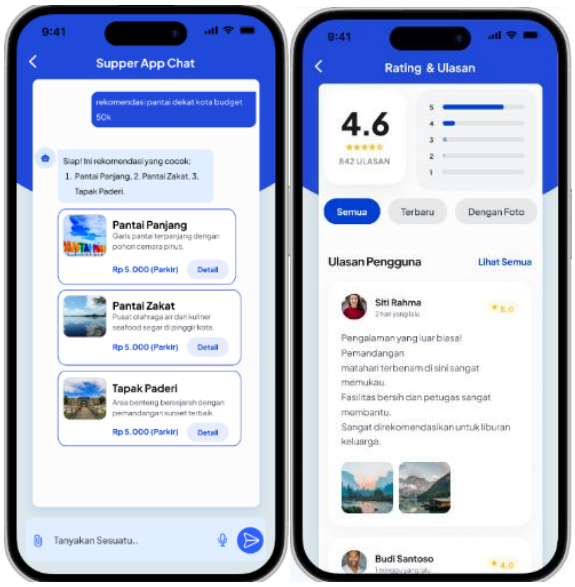
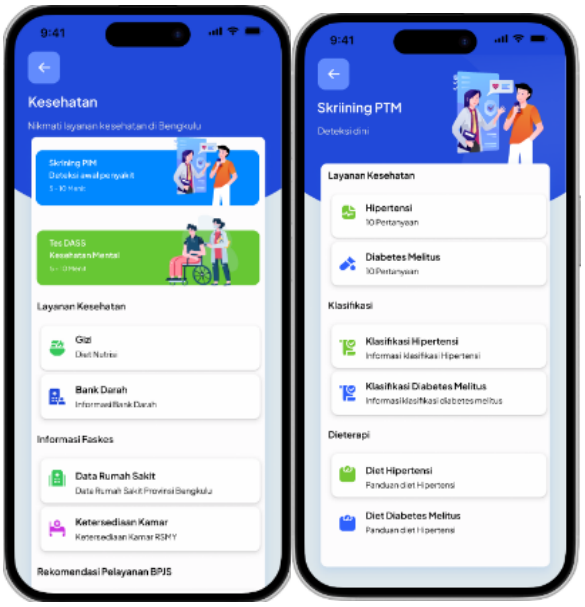


Fig 9. Tourism Module Interface

Healthcare Module

The healthcare module provides features for non-communicable disease (NCD) screening, specifically for hypertension and diabetes mellitus, information on nearby healthcare facilities, and therapy guidelines based on clinical standards. The screening flow is designed with step-by-step questions that are easily understood by the general public. The interface of the Bengkulu Province Super App healthcare module can be seen in Figure 10.



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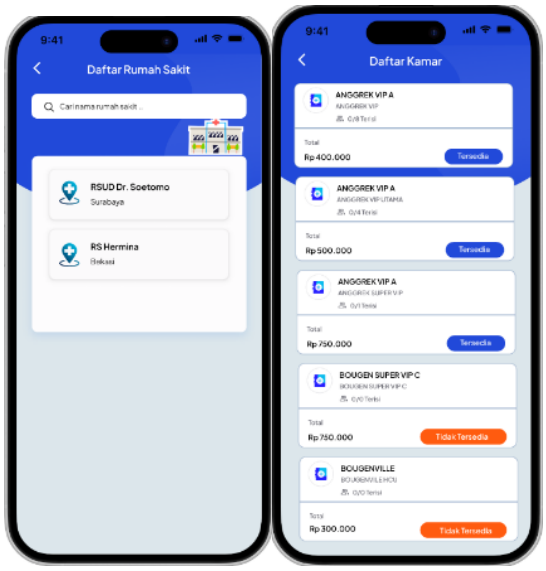
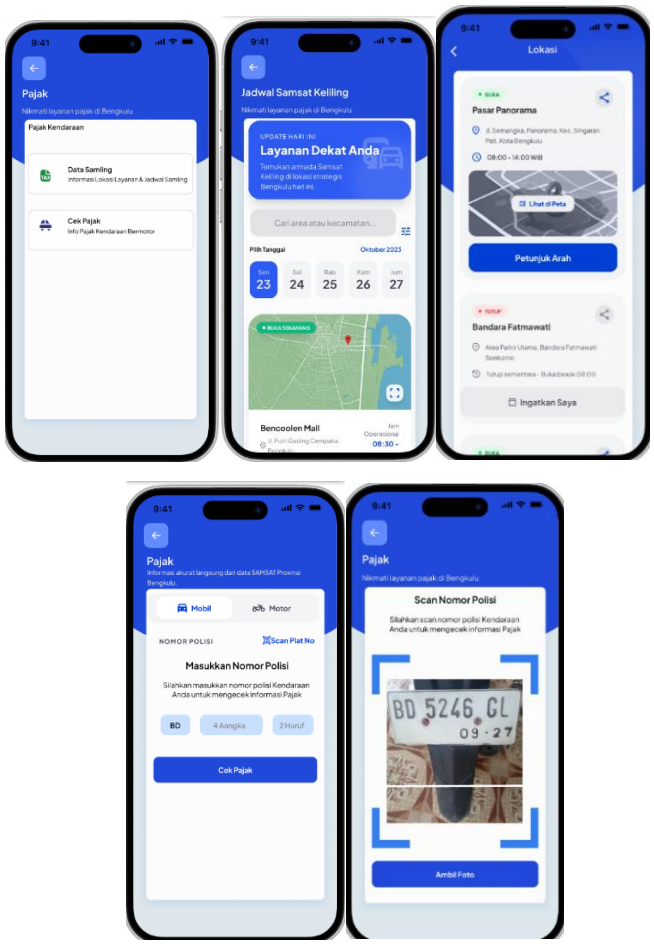


Fig 10. Healthcare Module Interface

Tax and Employment Module

The tax module provides services for checking motor vehicle tax through license plate input or STNK scanning, as well as information on mobile Samsat schedules. The interface of the Bengkulu Province Super App tax module can be seen in Figure 11.



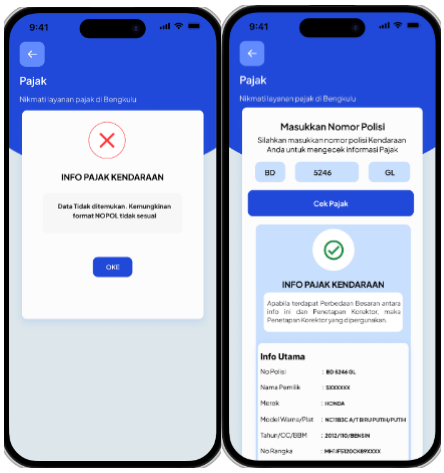
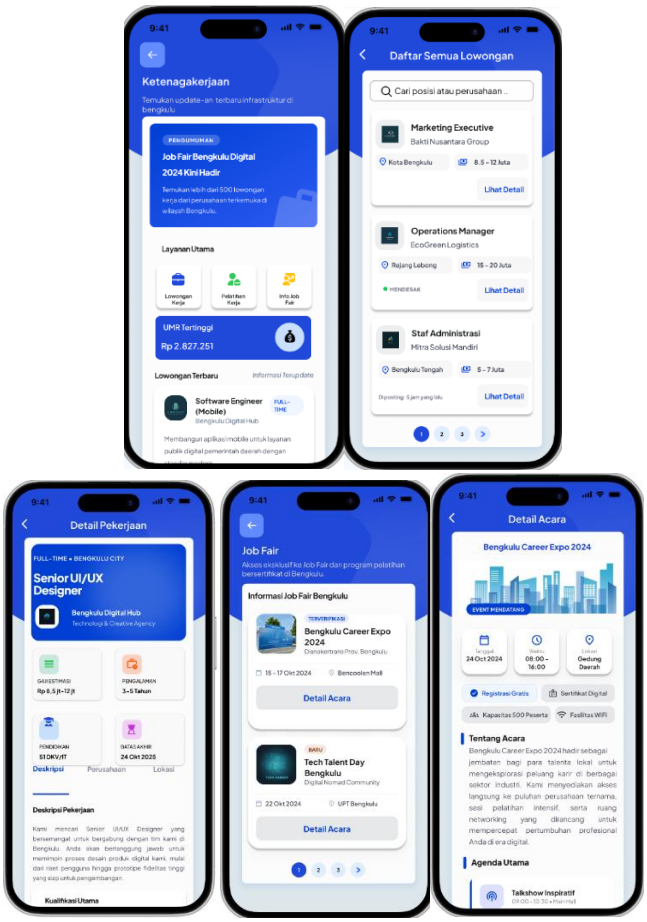


Fig 11. Tax Module Interface

The employment module presents job listings, job fairs, digital training programs, and detailed job vacancy information within the Bengkulu region. The interface of the Bengkulu Province Super App employment module can be seen in Figure 12.



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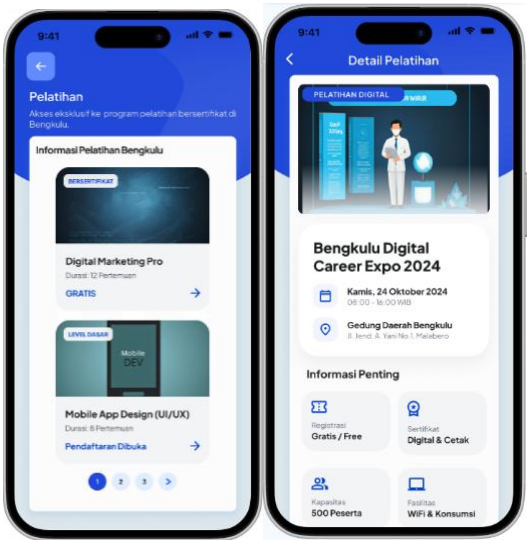


Fig 12. Employment Module Interface

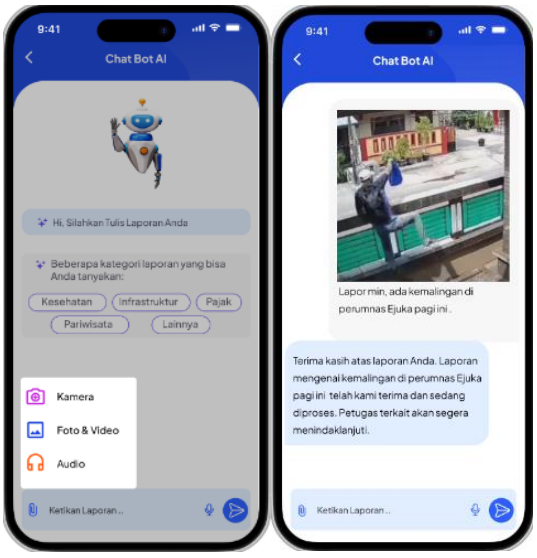
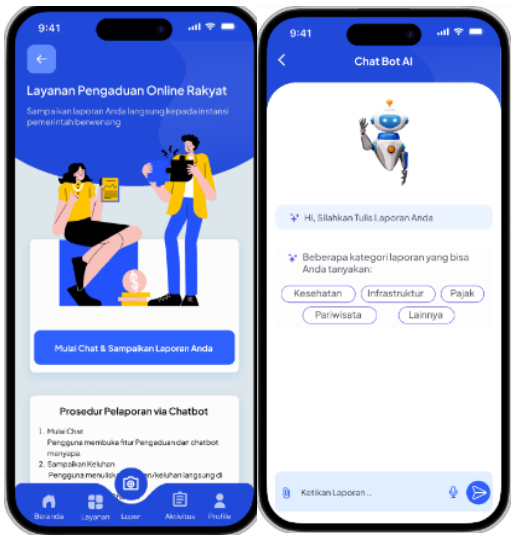


Fig 13. Public Complaint Module Interface

Public Complaint Module

The public complaint module enables citizens to report public issues—particularly road infrastructure conditions—complete with photos, GPS location, and descriptions. The system displays complaint status in real time and ensures transparency in the handling progress by the relevant government agencies. The interface of the Bengkulu Province Super App public complaint module can be seen in Figure 13.



E. System Usability Scale (SUS) Testing Results

Usability testing was conducted using the System Usability Scale (SUS), which consists of 10 standardized statements measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). SUS is a usability testing instrument specifically developed to efficiently evaluate the usability of digital products [17]. SUS was selected due to its efficiency—it does not require a large number of respondents while still providing reliable and statistically valid results [17]. Hyzy et al. (2022), in a meta-analysis of 117 SUS scores in digital health applications, demonstrate that SUS is a reliable and psychometrically valid instrument for usability testing with limited samples, with a global average SUS score of 73.02 [17]. Lewis (2018) also confirms that SUS has strong internal consistency and is applicable across various types of digital products [18]. This testing involved 10 respondents from the general public as potential users of the application, in accordance with approaches used in similar studies [19].

Table 2. SUS Questionnaire Items

No.	Statement
1	The color selection is comfortable to the eyes
2	The color combination is visually appealing
3	The font size and type (typography) are easy to read
4	The layout of elements is neat and well-organized
5	The icons are easy to understand and functionally appropriate
6	The design is consistent across all pages
7	The interface reflects the identity of government services

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No.	Statement
8	The contrast between text and background improves readability
9	The spacing and distance between elements are proportional
10	Overall, the interface is attractive and professional

It is important to clarify that the standard SUS formula applies a mixed scoring scheme in which odd-numbered items (positive statements) are scored as (Si − 1) and even-numbered items (negative statements) are scored as (5 − Si), with the total multiplied by 2.5. However, since all 10 questionnaire items in this study are positively worded (favorable), the standard even-item subtraction does not apply. The scoring formula is therefore uniformly adapted as follows: each item score is reduced by 1 (Si − 1), all contributions are summed, and the result is multiplied by 2.5. The calculation formula is: **SUS Score = Σ(S_i − 1) × 2.5**, yielding a score in the range of 0–100. This adaptation is consistent with established practices for all-positive SUS instruments [17] and has been verified to produce a mathematically valid average score of 78.00 based on the individual respondent data presented in Table 3. Bangor et al. (2009), as cited in Hyzy et al. (2022), establish the interpretation categories for SUS scores: scores below 50 are classified as *Not Acceptable*, scores between 51–70 are categorized as *Marginal*, and scores between 71–100 fall into the *Acceptable* category, with adjective ratings ranging from *Good* to *Excellent* [17], [18]. The calculation results for each respondent are presented in Table 3.

Table 3. SUS Score Calculation Results

Resp.	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10	SUS Score
R1	5	5	5	5	5	5	5	5	5	5	100.0
R2	3	4	4	2	4	2	3	4	3	3	55.0
R3	1	1	2	2	1	2	1	2	2	1	12.5
R4	4	4	4	4	4	4	4	4	4	4	75.0
R5	4	4	4	4	5	5	5	5	5	5	90.0
R6	4	4	4	4	4	4	4	4	4	4	75.0
R7	4	4	5	5	5	5	5	5	5	5	95.0
R8	5	5	5	4	5	5	5	5	5	5	97.5
R9	3	5	5	5	5	5	5	5	5	5	95.0
R10	5	4	4	4	5	5	4	4	5	4	85.0
Average	—	—	—	—	—	—	—	—	—	—	**78.00**

Based on the calculation results from 10 respondents, a total SUS score of 780.0 was obtained, with an average score of 78.00. The average score of 78.00 falls within the range of 71–100, thus categorized as Acceptable with an adjective rating of Good. This indicates that the overall user interface of the DISKOMINFOTIK Super App prototype is well accepted by users in terms of color, typography, layout, icons, and visual consistency. This result is consistent with the findings of Hyzy et al. (2022), which report a global average SUS score of 73.02 for digital applications [17]. It is also aligned with the study by Syifa and Rachmawati (2025), which achieved a SUS score of 77.5 (Acceptable category) in the UI/UX redesign of the Info BMKG application using Design Thinking [14], as well as the study by Wardani et al. (2023), which obtained SUS scores above 70 in the development of a Home Care application using the same method [19]. The SUS score interpretation is shown in Figure 14.

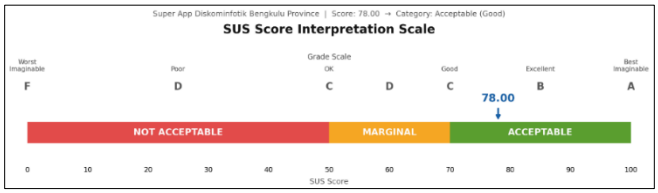


Fig 14. SUS Score Interpretation (Source: Hyzy et al., 2022)

Overall, the designed interface modules successfully address the three research objectives. The consistent use of a color system, clean typography, and card-based components facilitates navigation for all user groups [15]. The main challenge in this study lies in the complexity of integrating modules with diverse data characteristics and user flows. For future research, it is recommended to conduct SUS testing with a minimum of 30 respondents representing various segments of the population [17].

IV. CONCLUSION

This study successfully designs the user interface (UI) of the DISKOMINFOTIK Bengkulu Province mobile Super App using the Design Thinking method. Through the systematic implementation of the five stages of Design Thinking, this study produces: (1) the identification of five key user needs for digital services in Bengkulu based on a masterplan document study, (2) high-fidelity interface designs covering all priority services of DISKOMINFOTIK (onboarding, home, commodities, education, tourism, healthcare, taxation, employment, and public complaints), and (3) a consistent design system aligned with usability and accessibility principles.

The results of the System Usability Scale (SUS) testing involving 10 respondents show an average score of 78.00, which falls within the *Acceptable (Good)* category, indicating that the user interface of the DISKOMINFOTIK Super App prototype is well received by users. This study contributes to the availability of a Super App UI/UX design that can serve as a reference for the development of digital public service systems in Bengkulu Province. Future research is recommended to conduct SUS evaluations with a larger sample size (at least 30 respondents), perform A/B testing, and develop additional service modules.\

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