

DESIGNING D-LAPOR FOR PUBLIC COMPLAINT AND BUDGET TRANSPARENCY USING USER-CENTERED DESIGN

Arief Ridzki Darmawan¹, Akmal Nabil Fikri¹, Fathurrahman Kesuma Ridwan¹, Nobel Julian Bintang¹, Wisnu Nugroho¹, Utandra Nur Ahmad Jais¹

¹Department of Computer Science, Universitas Indonesia, Depok, Indonesia

*Correspondence author: lariefridzki08@gmail.com

ARTICLE INFO

Article history:

Receive: March 12, 2026

Revised: March 25, 2026

Accepted: April 14, 2026

Available Online:

17 April, 2026

Published:

28 April, 2026

Keyword:

Budget Transparency,
Civic Reporting,
Information Architecture,
User-Centered Design,
User Experience

ABSTRACT

Public service reporting systems play an important role in supporting smart governance, transparency, and citizen participation in urban areas. However, the absence of integrated reporting platforms, limited transparency in government budget information, and unclear follow up mechanisms often reduce public trust and participation. This study aims to design D-Lapor, a public complaint and budget transparency application for the City of Depok using a User Centered Design (UCD) approach. The research employed qualitative descriptive methods through semi structured interviews with citizens, students, and public officers to identify user needs and usability problems. The collected data were analyzed using user persona development, user journey mapping, task analysis, and information architecture design. The findings indicate that users require a reporting platform that is simple, transparent, responsive, and capable of tracking complaint progress in real time. In addition, users emphasized the importance of anonymous reporting, automatic GPS integration, visualized budget dashboards, and responsive notification systems. Based on these findings, the study developed wireframe and prototype designs that address both citizen and administrator requirements. The proposed system contributes to improving user experience, enhancing civic engagement, and supporting transparent digital governance. Furthermore, the integration of complaint management and budget transparency features demonstrates the potential of D-Lapor as a smart city solution that encourages participatory public services and strengthens public trust in local government institutions.

© 2026. This is an open access article under the [CC-BY 4.0](https://creativecommons.org/licenses/by-sa/4.0/) license.



INTRODUCTION

The rapid development of information technology has encouraged governments to adopt digital transformation in public services as part of smart city initiatives (Alkhalifah, 2025; Wei, 2023). Digital governance systems are increasingly utilized to improve public

participation, efficiency, transparency, and accountability in government administration across different regions (Randma Liiv et al., 2026). One important aspect of smart governance is the availability of digital platforms that allow citizens to report public infrastructure problems and monitor government responses transparently (Hossain et al., 2026).

In urban areas such as Depok City, public facilities remain unevenly distributed and frequently experience maintenance issues. Problems such as damaged sidewalks, malfunctioning streetlights, inadequate pedestrian bridges, and poor transportation infrastructure are commonly encountered by citizens. However, many citizens do not report these issues due to the absence of clear reporting mechanisms and integrated complaint systems. Based on the interview findings, several participants stated that they had never submitted reports because they did not know where or how to report public facility problems. This condition demonstrates the need for a digital reporting platform that is accessible, transparent, and user friendly (Atnan & Imran, 2024; Firtin et al., 2026).

In addition to infrastructure reporting, transparency in government budget management has become an important concern in public administration. Transparency is closely related to public trust and civic participation in governance processes (Almuqrin et al., 2022). Citizens increasingly expect governments to provide open access to information regarding budget allocation and expenditure. Nevertheless, existing systems often fail to present financial information in a manner that is understandable and accessible to the public (Ansari et al., 2022; Mesquita et al., 2026). Consequently, there is a growing need for integrated platforms that combine public complaint systems with transparent budget dashboards.

Previous studies have highlighted the importance of User Centered Design (UCD) in developing digital public services (Junior & Silva, 2025; Hashim et al., 2022). UCD emphasizes the involvement of end users throughout the design process to ensure that systems meet user needs, preferences, and expectations, thereby reducing the digital divide and accommodating marginalized voices (Schneller et al., 2026; Khan, 2023). Furthermore, user experience methods such as user journey mapping, task analysis, and information architecture are widely used to identify usability issues and improve interaction quality (Bachmaier & O'Donohoe, 2022; Ghamri et al., 2026). Several smart city applications have implemented complaint management systems; however, most platforms focus solely on complaint submission without integrating budget transparency and progress tracking features (Lubis et al., 2025).

Therefore, this study aims to design D-Lapor, a public complaint and government budget transparency application using a User Centered Design approach. Specifically, the research seeks to: (1) identify user needs and usability problems in public reporting systems, (2) develop user personas and user journey maps, (3) design the information architecture and interaction flow of the application, and (4) develop wireframe and prototype designs that support transparent and participatory public services.

METHOD

This study employed a qualitative descriptive approach using the User Centered Design (UCD) methodology, which has proven effective in evaluating government digital portals (Pilongo et al., 2025; Sellung & Kiss, 2024). UCD was selected because it prioritizes user needs, behaviors, and experiences throughout the design process, enabling the development of systems that are more usable and effective for public procurement and civic services (Mior Ibrahim et al., 2023).

Research Stages

The research consisted of several stages, including user requirement analysis, persona development, user journey mapping, information architecture design, and prototype development.

User Requirement Analysis

Data collection was conducted through semi structured interviews involving five participants consisting of university students, citizens of Depok, and public officers. The interviews aimed to identify user experiences, challenges, expectations, and perceptions regarding public facility reporting systems and budget transparency platforms. The interview questions focused on several aspects, including:

1. User experience in utilizing public facilities;
2. User behavior in reporting damaged facilities;
3. Expectations regarding public complaint applications;
4. Transparency of government budget information;
5. User preferences for application usability and interface design.

User Persona Development

Based on the interview results, two user personas were developed to represent the primary users of the system:

1. Citizen/User Persona (Arif);
2. Public Service Officer/Admin Persona (Rizky).

The personas were created to represent user characteristics, goals, frustrations, and behavioral patterns in interacting with the application.

User Journey Mapping and Task Analysis

User journey mapping and task analysis were conducted to identify user interaction flows, emotional responses, pain points, and opportunities for improvement. The analysis covered several major activities:

1. Creating public reports;
2. Checking complaint progress;
3. Viewing government budget information;
4. Processing citizen complaints;
5. Publishing budget information.

Information Architecture Design

Information architecture was designed to organize application content and navigation structures systematically. This stage aimed to improve usability and help users easily access features and information within the application.

Prototype Development

The prototype was developed using Figma. The design process included low fidelity wireframes and high fidelity prototypes for both user and administrator interfaces.

Data Analysis

The collected qualitative data were analyzed using thematic analysis techniques. The findings were categorized into user needs, usability problems, emotional responses, and potential design solutions.

RESULTS AND DISCUSSION

User Interview Results

The interview results revealed several important findings regarding public facility reporting and budget transparency systems. Most participants considered public facilities in Depok to be unevenly distributed and inadequately maintained, especially outside the Margonda area. Participants also stated that they rarely reported infrastructure problems because they lacked information regarding reporting mechanisms. Furthermore, participants emphasized the importance of having an integrated reporting application that is simple, transparent, and easy to use. Features such as anonymous reporting, GPS based location input, photo uploads, complaint tracking, and progress notifications were considered essential. In addition, respondents highlighted the importance of transparent budget dashboards that provide accessible and understandable financial information. These findings indicate that usability, transparency, and responsiveness are critical factors influencing citizen participation in digital public services.

User Persona Analysis

Two primary personas were identified during the study. The first persona, Arif, represents citizens who actively use public facilities and require a convenient reporting platform to report infrastructure issues efficiently. Arif expects a system that is intuitive, responsive, and capable of providing progress updates. The second persona, Rizky, represents public service officers responsible for handling citizen complaints. Rizky requires an integrated system capable of organizing reports systematically, simplifying complaint verification, and improving coordination between government agencies. The development of personas helped the researchers understand user behaviors, emotional responses, and interaction expectations more comprehensively.

User Journey Mapping and Task Analysis

The user journey mapping process identified several usability issues experienced by users during interaction with reporting and budget transparency features. In the complaint submission process, users experienced difficulties in locating reporting menus, completing forms, and navigating the application flow. Emotional responses such as confusion, frustration, and anxiety were frequently identified, matching findings in recent mobile UI evaluation studies (Choma & Zaina, 2024; Sugiana et al., 2024). To address these issues, several design opportunities were proposed, including simplified forms, clear navigation structures, automatic camera integration, and visible submission buttons.

In the complaint progress tracking feature, users expressed dissatisfaction when reports were not followed up promptly. Consequently, features such as progress notifications, complaint status tracking, and public upvote systems were proposed to improve civic engagement and accountability. For budget transparency features, users experienced difficulties understanding dense financial information and navigating long lists of budget data. Therefore, filtering systems, searchable dashboards, visual categorization, and simplified budget previews were designed to improve readability and accessibility. This visual UI approach aligns with contemporary standards for Open Government Data visualization (Sari et al., 2025; Zuo et al., 2023).

Meanwhile, administrators experienced challenges in verifying reports, categorizing complaints, and managing repetitive workflows. To overcome these issues, the system incorporated filtering mechanisms, built in media previews, automated status updates, and structured response templates.

Information Architecture Design

The information architecture of D-Lapor was designed to improve navigation clarity and feature accessibility. The user interface consisted of several primary modules, including Profile, Report, Budget, and Dashboard sections. The Report module included features such as complaint feeds, complaint creation forms, personal reports, report details, and progress tracking. Meanwhile, the Budget module displayed budget lists and detailed project information. For administrators, the architecture included complaint management systems, progress update modules, budget publication features, and budget management dashboards. The hierarchical structure was designed to minimize user confusion and support efficient workflow management, similar to SOA based governance platforms (Habibie et al., 2022).

Prototype Development

The prototype development process produced wireframe and high fidelity interface designs for both citizens and administrators. The reporting interface included simplified forms, map integration, image uploads, and tracking systems. The dashboard utilized card based layouts, filtering systems, and categorized information displays to improve user experience. The prototype design demonstrated that integrating complaint reporting systems with budget transparency features could support participatory governance and improve digital public service accessibility.

Discussion

The findings demonstrate that User Centered Design is effective in identifying user needs and usability problems in civic technology systems. By involving users throughout the design process, the resulting system became more aligned with real world expectations and interaction patterns, supporting transparent civic engagement (Martinez Gil et al., 2025; Rahmat et al., 2026). The integration of public complaint systems and budget transparency dashboards represents an important contribution to smart governance practices. Transparent digital platforms can increase civic participation, strengthen accountability, and improve public trust in government institutions by providing interactive maps and clear data representations (Sano et al., 2023; Zaklova et al., 2024).

Furthermore, the incorporation of user journey mapping and task analysis enabled the identification of emotional responses and pain points that are often overlooked in conventional system development approaches. Mobile governance platforms that provide transparent feedback loops have been shown to drastically improve citizen satisfaction and scaling civic dialogues (Anastasiou et al., 2026; Vijayaraj et al., 2025). As artificial intelligence continues to augment civic engagement, setting a solid UI baseline is a necessary first step (Sarafis et al., 2025; Noor et al., 2026).

CONCLUSION

This study successfully designed D-Lapor, a public complaint and budget transparency application using the User Centered Design approach. The research identified several important user needs, including transparent complaint tracking, anonymous reporting, simplified reporting mechanisms, and accessible budget information. The implementation of user personas, user journey mapping, task analysis, and information architecture contributed significantly to the development of a user friendly and responsive system design. The resulting prototype demonstrates the potential of D-Lapor to improve civic engagement, enhance transparency, and support participatory digital governance.

Future developments may include artificial intelligence integration for complaint classification, usability evaluation using standardized instruments, and full scale implementation in local government environments.

RECOMMENDATION

Future studies are recommended to:

1. Conduct usability testing using instruments such as SUS or UEQ;
2. Integrate artificial intelligence for automated complaint categorization;
3. Develop cross-platform mobile applications;
4. Evaluate the effectiveness of D-Lapor in real government environments.

AI Use Statement

This study utilized ChatGPT (OpenAI, GPT-5.5) for language refinement and article structuring assistance.

Acknowledgements

The authors would like to thank all interview participants who contributed valuable insights during the research process

Funding Information

This research received no external funding.

Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Arief Ridzki Darmawan	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		
Akmal Nabil Fikri		✓	✓	✓	✓	✓								
Fathurrahman Kesuma Ridwan	✓		✓		✓			✓		✓	✓			
Nobel Julian Bintang		✓		✓			✓			✓		✓		
Wisnu Nugroho			✓	✓	✓			✓				✓		
Utandra Nur Ahmad Jais		✓	✓				✓				✓			

Abbreviations:

C : Conceptualization
M : Methodology
So : Software
Va : Validation
Fo : Formal Analysis

I : Investigation
R : Resources
D : Data Curation
O : Writing – Original Draft
E : Writing – Review & Editing

Vi : Visualization
Su : Supervision
P : Project Administration
Fu : Funding Acquisition

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

Informed Consent

Informed consent was obtained from all participants involved in the study.

Ethical Approval

This research complies with ethical standards for qualitative user research and participant confidentiality.

REFERENCES

- Alkhalifah, E. S. (2025). Metaverse design trends shaping smart cities through sentiment and influencer dynamics. *2nd International Conference on Advanced Innovations in Smart Cities*.
- Almuqrin, A., Mutambik, I., Alomran, A., Gauthier, J., & Abusharhah, M. (2022). Factors influencing public trust in open government data. *Sustainability Switzerland*, 14(15), 9765.
- Anastasiou, L., Moro, A., Ardito, A., Acerbi, E., & De Liddo, A. (2026). From streets to screens: A digital platform for mapping urban narratives and scaling civic dialogue. *Lecture Notes in Computer Science*, 16479.
- Ansari, B., Barati, M., & Martin, E. G. (2022). Enhancing the usability and usefulness of open government data: A comprehensive review of the state of open government data visualization research. *Government Information Quarterly*, 39(1), 101657.
- Atnan, N., & Imran, A. I. (2024). Analysis of dominant factors driving civic engagement on of the Bandung City Government's social media. *Southern Communication Journal*, 89(3).
- Bachmaier, P., & O'Donohoe, C. (2022). Prioritising User Experience (UX) in the provision of digital public services: An introductory examination of how the application of UX research methods can facilitate the development of user centric digital public services. *ACM International Conference Proceeding Series*.
- Choma, J., & Zaina, L. (2024). UX evaluation of IoT based applications for Smart Cities: a rapid systematic review. *27th Ibero American Conference on Software Engineering*.
- Firtin, C. E., Akyuz, M., Bilbil, E. T., & Karkin, N. (2026). Digital accountability through e participation: the moderating role of the digital divide. *Public Money and Management*, 46(5).
- Ghamri, M. A., Abuaddous, H. Y., Shannaq, F., Al Tarawneh, O. H., & Alzabin, L. (2026). Adapting the cognitive walkthrough method to assess the UX for NCRC service: Sanad application as case study. *AIP Conference Proceedings*, 3406(1), 020059.
- Habibie, K., Suhardi, & Muhamad, W. (2022). Designing Open Government Data Management platform through the implementation of data governance based on SOA. *2022 International Conference on Information Technology Systems and Innovation*.
- Hashim, N. L., Yusof, N., Hussain, A., & Ibrahim, M. (2022). User experience dimensions for e procurement: A systematic review. *Journal of Information and Communication Technology*, 21(4).
- Hossain, E., Norowi, N. M., Kamaruddin, A., & Zulzalil, H. (2026). Towards an inclusive user experience evaluation framework for e government mobile applications. *Communications in Computer and Information Science*, 3047.
- Junior, E. F., & Silva, L. C. S. (2025). E Government and user centered design: Pathways to the modernization of public services in Brazil. *Intersecting Public Administration and Technology for Public Trust and Citizen Engagement*.
- Khan, A. (2023). Does citizen government fit matter? An exploration in the context of online civic engagement. *International Conference on Information Systems*.
- Lubis, S., Nurmandi, A., Ahmad, J., Purwaningsih, T., & Jovita Olvez, H. D. (2025). Mapping the intellectual landscape of cybersecurity in e participation: Trends, challenges, and emerging insights. *Cogent Social Sciences*, 11(1), 2549479.

- Martinez Gil, J., Pichler, M., Lechat, N., Bucchiarone, A., & Marconi, A. (2025). An overview of civic engagement tools for rural communities. *Open Research Europe*, 4, 195.
- Mesquita, K. B. F., Balreira, D. G., Spritzer, A. S., & Freitas, C. M. D. S. (2026). Survey of Brazilian open budget data portals: Query interfaces and dashboards. *Journal of the Brazilian Computer Society*, 32(1).
- Mior Ibrahim, E. N., Kusaini, A., Ismail, J., Abu Hashim, A. H., & Misron, M. M. (2023). Exploratory study on User Experience (UX) of public e procurement system in Malaysia: A qualitative approach. *Proceedings of 2023 9th International Hci and Ux Conference in Indonesia*.
- Noor, M. H., Yusuf, A., Rahmadina, A. N. S., Fauzan, R., & Saputra, W. A. (2026). UX honeycomb for smart governance apps evaluation. *AIP Conference Proceedings*, 3326(1), 070002.
- Pilongo, G. A., David, K. D. T., Jimenez, M. A. P., & Paclar, K. V. R. (2025). Transforming e Government: Enhancing internship portals with user centered design. *Proceedings 2025 5th International Conference on Computer Communication and Information Systems*.
- Rahmat, R., Bestari, P., Masyitoh, I. S., Sidiqah, N., & Juliana, D. D. (2026). Developing a civic crowdfunding platform for Pancasila education to enhance civic engagement to support Sustainable Development Goals (SDGs). *Journal of Engineering Science and Technology*, 21(1).
- Randma Liiv, T., Bortkeviciute, R., Lember, V., Valtenbergs, V., & Nakrosis, V. (2026). Advancing citizen engagement through digital tools: A comparative study of the Baltic States. *International Journal of Public Administration*, 49(9).
- Sano, H., Matheus, R., & Vaz, J. C. (2023). Transparency of COVID 19 information: a comparison of open data transparency dashboards. *Ciencia Da Informacao*, 52(2).
- Sarafis, D., Karamitsios, K., & Kravari, K. (2025). AI and civic engagement: A brief exploration of applications and opportunities. *2025 International Conference on Advancement in Data Science E Learning and Information System*.
- Sari, D. P., Ardhi, D. C., Ma, D. C., & Dumas, C. (2025). Assessing the effectiveness of UI/UX design in open government data portal. *Proceedings of the Association for Information Science and Technology*, 62(1).
- Schneller, M., Bedek, M., De Lera, E., Seier, J., & Albert, D. (2026). Inclusive AI enhanced civic engagement: Empowering marginalized voices. *Societies*, 16(4), 115.
- Sellung, R., & Kiss, L. (2024). User and design research of digital government. *From Electronic to Mobile Government*.
- Sugiana, N. S. S., Hurriyati, R., Dirgantari, P. D., Wahyu Nurjaya, W. K., & Hamdani, D. S. (2024). Human centered design in UI/UX for e promotion in Indonesia's smart cities. *2024 Asian Conference on Communication and Networks*.
- Vijayaraj, A., Jayaseelan, U., Dinesh, S., Balaji Ganesh, K., & Mahalingan, T. (2025). Ward Voice: A mobile governance platform for transparent and interactive civic engagement. *2025 2nd International Conference on Computing and Data Science*.
- Wei, G. (2023). Modelling a sustainable smart city based on human and user centred design. *Strategic Planning for Energy and the Environment*, 42(1).
- Zaklova, K., Hynek, J., & Hruska, T. (2024). Towards transparent governance: Unifying city councils decision making data processing and visualization. *Lecture Notes in Networks and Systems*, 987.

Zuo, C., Ding, L., Liu, X., Zhang, H., & Meng, L. (2023). Map based dashboard design with open government data for learning and analysis of industrial innovation environment. *International Journal of Cartography*, 9(1).