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Design and Implementation of Web-Based AMAL to Support Public Service Digitalization in Lumajang Regency

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ABSTRACT

This study designs and implements AMAL (Aplikasi Manajemen Layanan Masyarakat), a web-based application for managing public services in Lumajang Regency. The system responds to the use of informal channels, such as WhatsApp and social media, which often makes service data difficult to record, trace, and monitor. AMAL was developed using the Waterfall method with a three-tier architecture consisting of a web interface, backend/API, and MySQL database. The main features include lost-item reporting, complaints and information requests, interactive dialogue, ticket tracking, validation, monitoring dashboard, and user management. Black Box Testing showed that the main features worked as expected, while evaluation with the DeLone and McLean model involving 25 respondents produced an overall mean score of 4.39.

Keywords: AMAL, Black Box Testing, DeLone-McLean Model, Public Service Digitalization, Waterfall

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INTRODUCTION

The use of information technology in public services has become an important part of digital government transformation. Services that were previously handled face-to-face or through informal conversations are increasingly being moved to digital platforms that can be accessed more quickly and monitored more clearly. In this context, local governments need service channels that are not only easy for citizens to use but also able to record, manage, and track public service data in a systematic way.

In Lumajang Regency, complaints and requests for public information are still often submitted through WhatsApp and social media. These channels are familiar to the community and easy to access, but they create several operational problems for service officers. Service histories are not always stored in a structured format, follow-up actions are difficult to trace, and the progress of each case cannot be monitored consistently. This situation shows the need for a web-based public service management system that can centralize service data and provide ticket-based tracking for users.

Previous studies have discussed the quality of e-government services and the evaluation of digital public service systems using the DeLone and McLean model. However, many of these studies

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mainly evaluate systems that are already in use, while fewer studies combine system development, functional testing, and success evaluation in one research process. This study addresses that gap by designing, implementing, testing, and evaluating AMAL as a local public service management system that is adjusted to the service needs of Lumajang Regency.

The novelty of this study lies in the development of AMAL as a web-based application for three priority services: lost-item reporting, interactive dialogue, and complaint and information-request handling. AMAL is not designed only as a complaint submission form. It is built as a management platform that supports monitoring, validation, ticket tracking, and documented communication between citizens and service officers.

THEORETICAL FRAMEWORK AND HYPOTHESES

E-government refers to the use of information and communication technology in public administration to improve service quality, efficiency, transparency, and accessibility. In digital public services, an information system is expected to simplify service procedures, strengthen accountability, and make the interaction between citizens and government institutions easier to document.

The Waterfall method was selected as the software development framework because it offers clear and sequential stages. These stages include requirements analysis, system design, implementation, testing, evaluation, and documentation. This model is suitable for a government service environment because service requirements can be identified at the beginning, and each development stage needs to be properly documented.

The DeLone and McLean information systems success model was used to evaluate AMAL after implementation. The model covers six dimensions: system quality, information quality, service quality, system use, user satisfaction, and net benefits. These dimensions are relevant because the success of a public service system cannot be judged only from its technical functions. It also depends on how users experience the system and whether the system produces practical benefits for service management.

This study is a system design and development study. Therefore, no statistical hypothesis is formulated. The evaluation focuses on measuring the success of AMAL based on user responses to the six dimensions of the DeLone and McLean model.

METHODS

This study used a Research and Development (R&D) approach from a software engineering perspective. The research object was the Department of Communication and Informatics of Lumajang Regency. Data were collected through observation and informal interviews to understand the existing service flow, user needs, service problems, and system requirements.

The requirements analysis identified several core needs: public service submission forms, service validation, ticket tracking, interactive dialogue, monitoring dashboards, user management, and notification support. The users of the system consist of external users, namely citizens, and internal users, namely administrators, validators, and service officers. The system also requires supporting components for online deployment, including a domain, hosting or server, MySQL database, backend/API, frontend web interface, internet connection, SSL/HTTPS, and SMTP email service.

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The system design stage covered service flow diagrams, use case diagrams, Data Flow Diagrams (DFD), Entity Relationship Diagram (ERD), interface design, and backend/API design. AMAL was designed using a three-tier architecture that separates the presentation layer, application logic layer, and data layer.

The implementation stage converted the design into a working web-based application. The frontend was developed for both public users and internal users, while the backend/API handles service submissions, ticket generation, validation, status updates, dialogue management, and data exchange with the database. Functional testing was carried out using Black Box Testing by checking the system output against predetermined input scenarios.

System success was evaluated using the DeLone and McLean model. The questionnaire used a five-point Likert scale and involved 25 respondents, consisting of 20 public users and 5 internal users. The mean score for each dimension was calculated and then interpreted using categories ranging from very poor to very good.

RESULTS AND DISCUSSION

The implementation results show that AMAL was successfully developed as a web-based application to support digital public services in Lumajang Regency. The system provides several main features, including lost-item reporting, complaint and information-request services, interactive dialogue, ticket tracking, monitoring dashboards, service history, validation, status updates, and user management.

The use of a three-tier architecture makes the application easier to organize because the user interface, application logic, and database are placed in separate components. The frontend displays service forms and administrative dashboards, the backend/API processes service data and business logic, and the MySQL database stores user data, service records, ticket status, service history, supporting documents, and dialogue records.

Before AMAL was introduced, service handling still relied heavily on informal channels such as WhatsApp and social media. After implementation, users can submit services through the AMAL website, and the submitted data are automatically stored in the database. Administrators or validators review incoming data, service officers provide follow-up actions, and users can monitor the progress of their services through a ticket number.

Table 1. Summary of Black Box Testing Results

No	Feature	Testing Scenario	Status
1	Login	The administrator enters a valid username and password	Successful
2	Lost-Item Service	The user submits a lost-item report form	Successful
3	Complaint Service	The user submits a public complaint	Successful
4	Information Request	The user submits a request for public information	Successful
5	Interactive Dialogue	The user sends a dialogue message	Successful
6	Ticket Tracking	The user checks the service status using a ticket number	Successful
7	Service Validation and Status Update	The officer validates and updates the ticket status	Successful

Source: processed by the authors (2026)

The Black Box Testing results show that all main features produced outputs that matched the expected results. The login feature directed the administrator to the dashboard, the lost-item and

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complaint services saved service data successfully, the interactive dialogue feature sent and displayed messages, and the ticket tracking feature displayed service status based on the ticket number. These results indicate that AMAL has met the functional requirements defined during the design stage.

The success evaluation based on the DeLone and McLean model shows that all dimensions were in the very good category. The system quality dimension obtained the highest mean score, indicating that users considered the system easy to understand, accessible, and stable during use. The service quality dimension obtained the lowest score compared with other dimensions, although it still remained in the very good category. This finding suggests that response speed and notification features should become priorities in future development.

Table 2. DeLone and McLean Evaluation Results

No	Dimension	Mean	Category
1	System Quality	4.61	Very Good
2	Information Quality	4.38	Very Good
3	Service Quality	4.24	Very Good
4	System Use	4.31	Very Good
5	User Satisfaction	4.42	Very Good
6	Net Benefits	4.40	Very Good
	Overall Mean	4.39	Very Good

Source: processed by the authors (2026)

The overall mean score of 4.39 shows that AMAL was rated very good by users. The result indicates that the system can support public service management by providing clearer information, better documentation, and easier service monitoring. For citizens, AMAL offers a more transparent mechanism for submitting and tracking services. For internal users, the system supports service recording, validation, monitoring, and service history management.

Nevertheless, this study still has limitations. The evaluation involved a limited number of respondents, and the current system focuses on three main service types. In addition, the relatively lower score for service quality indicates the need to improve officer response mechanisms, develop automatic notifications, and present ticket tracking information in a more informative way.

CONCLUSION

This study successfully designed and implemented AMAL as a web-based community service management application to support public service digitalization in Lumajang Regency. The Waterfall method was applied through sequential stages, including requirements analysis, system design, implementation, testing, evaluation, and documentation. The implementation results show that AMAL provides the main features needed for service management, including lost-item reporting, complaints and information requests, interactive dialogue, ticket tracking, service validation, monitoring dashboard, service history, and user management. Black Box Testing showed that the main features worked according to the predetermined scenarios. The DeLone and McLean evaluation produced an overall mean score of 4.39, which falls into the very good category. Therefore, AMAL can be considered feasible as a supporting system for digital public services that improves documentation, transparency, and service monitoring. Further development should expand service types, improve response speed, and add automatic notification features.

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REFERENCES

Abdelrahman, M. M., Zhan, S., & Chong, A. (n.d.). A three-tier architecture visual-programming platform for building lifecycle data management.

Ahmad, J., & Administrasi, M. (2020). Adopting incremental innovation approaches in the digitalization of village government services. Jurnal Kebijakan dan Administrasi Publik, 24(2), 145–162. https://journal.ugm.ac.id/jkap

Akhmad Ramli, Subiantoro, Zukhrufin, F. K., & Sudadi, S. (2023). Implementation of management information systems in educational institutions Public Vocational School 8 Samarinda. EDUKASI: Jurnal Pendidikan Islam, 11(1), 81–94.

Chan, F. K. Y., Thong, J. Y. L., Brown, S. A., & Venkatesh, V. (2025). Design characteristics and service experience with e-government services: A public value perspective. International Journal of Information Management.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. Journal of Management Information Systems, 19(4), 9–30.

Fett, D., Küsters, R., & Schmitz, G. (2016). A comprehensive formal security analysis of OAuth 2.0. http://arxiv.org/abs/1601.01229

Gartika, D., Widiyanto, A., Diana, M., Hapiah, Y., Khotimah, F. K. H., Gumilar, Nursidiawati, I., Adam, Saputra, A., Ahmad, I., Widyaningsih, T. S., Sanudin, Fauziyah, E., & Ma'rifah, D. (2024). How digital government shapes social cohesion: The role of information quality, service quality, and user satisfaction.

Hasanah, F. N., & Untari, R. S. (2020). Waterfall metode perancangan software untuk pemula. Media Sains Indonesia.

Lips, M. (2020). Digital government: Managing public sector reform in the digital era. Routledge.

Made, N., & Premaiswari, W. (2024). The effectiveness of SP4N-LAPOR! as a national public service complaint management application. Jurnal Kebijakan dan Administrasi Publik, 28(1), 36–51. https://journal.ugm.ac.id/jkap

Pham, L., Limbu, Y. B., Le, M. T. T., & Nguyen, N. L. (2023). E-government service quality, perceived value, satisfaction, and loyalty: Evidence from a newly emerging country. Journal of Public Policy.

Rahmatullah, R., Habibi, A., Khaeruddin, K., Yaqin, L. N., Alharmali, T. M., Fauzee, M. S. O., & Mahat, J. (2025). A study of user satisfaction and net benefits in Indonesia through the DeLone and McLean model.

Red Hat. (2020, May 8). What is a REST API? https://www.redhat.com/en/topics/api/what-is-a-rest-api

Stoykova, S., & Shakev, N. (2023). Artificial intelligence for management information systems: Opportunities, challenges, and future directions. Algorithms, 16(8). https://doi.org/10.3390/a16080357

United Nations. (2022). E-Government Survey 2022: The future of digital government. https://publicadministration.un.org/egovkb

Varastika, D., Wijaya, M. E., Aurelie, M. S. C., Handayani, P. W., & Fitriani, H. (2025). Mobile passport success in Indonesia based on the DeLone-McLean information systems success model. Telematics and Informatics Reports.