



Improving Public Administrative Services through Strengthening Digital Systems with Data Validation: A Community Service Study in Pejeruk Subdistrict

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Abstract. This community service activity aims to improve the quality of citizen administration services by strengthening the digital system with the addition of a data validation mechanism in Pejeruk Subdistrict, Ampenan District, Mataram City. The method used is a participatory approach with stages of socialization, training, technology implementation, mentoring and evaluation, and program sustainability. System strengthening is carried out through the integration of data validation features to ensure the completeness, consistency, and accuracy of data before further processing in the administration system. The results of the activity showed a significant improvement in service performance indicators, namely the system usage rate increased from 40% to 85%, data errors decreased from an average of 10 cases to 3 cases per week (down 70%), and service time decreased from 22 minutes to 8 minutes (64% more efficient). In addition, the user experience evaluation showed positive results with an average score above 1.5 in all dimensions, indicating that the system is easy to use, efficient, and well-received by users. These findings demonstrate that the combination of digital system strengthening, data validation, and user support can effectively, efficiently, and sustainably improve the quality of administrative services, potentially replicating the model in other local government agencies. Future developments could include integrating the system with broader government platforms and strengthening longitudinal evaluation to measure the long-term sustainability of the system's impact.

Keywords: Data Validation, Digital Systems, Public Services.

1 Introduction

Digital transformation in the government sector focuses not only on the use of technology but also encompasses changes in work processes, organizational governance, and increased human resource capacity (Ciancarini et al., 2023). In the context of local government, digital transformation enables the government to provide more responsive and accessible services to the public (OECD, 2020). Various studies have shown that digital-based public service transformation can improve service effectiveness and quality (Indar et al., 2024; Priyowidodo et al., 2024; Vebtasvili et al., 2024). However, the success of digital transformation is largely determined by the integration of technology, processes, and organizational readiness (Alenezi, 2022). This

situation indicates that implementing digital transformation requires contextual adjustments at every level of government. In this context, Pejeruk Subdistrict, Ampenan District, Mataram City, has developed a web-based digital administrative service system to support public services (Ambara et al., 2025). The system was developed to facilitate online letter submission and assist subdistrict officials in managing administrative data in a more structured manner. Initial implementation of the system demonstrated increased efficiency compared to previous manual methods. However, observations indicated that system utilization was still suboptimal, particularly in data management and maximizing system feature utilization.

In addition to system usability, data quality is a crucial factor in determining the success of digital administrative services. The information system success model developed by Delone & McLean (2003) places information quality as one of the main indicators of system success. Research by Ojo (2017) shows that low data quality can impact service quality and user trust. Furthermore, Petter et al. (2013) emphasize that data and information quality are directly related to the benefits obtained from information systems. In the context of public services, poorly validated data has the potential to lead to misinformation, data duplication, and document inconsistencies.

Based on these conditions, this community service activity is carried out through a mentoring approach and strengthening of the digital administrative service system by implementing data validation mechanisms. The mentoring focuses on increasing the capacity of officials in managing the digital system, while system strengthening is carried out through feature optimization and the addition of data validation mechanisms. These efforts are expected to improve data accuracy, service efficiency, and the quality of administrative services received by the public. In addition to providing practical benefits for partners, this activity also contributes to supporting the digital transformation of public services at the local government level.

2 Methodology

This project employed a participatory community service approach, emphasizing the active involvement of partners in all stages of the project (Chambers 1994). The project was conducted in Pejeruk Subdistrict, Ampenan District, Mataram City, with participants including subdistrict officials as system managers and the community as service users. Primary and secondary data were collected through observations, interviews, service documentation, administrative records, and existing systems using a qualitative approach to understand the conditions contextually and in depth (Creswell, 2014).

The implementation phase of the program is carried out systematically through five main stages (as shown in Figure 1): socialization, training, technology implementation, mentoring and evaluation, and program sustainability. These stages refer to the systematic and sustainable community empowerment-based program implementation model (Wandersman et al., 2008). The socialization phase identifies partner needs and aligns perceptions regarding strengthening the digital administrative service system. The training phase focuses on increasing the capacity of staff in managing the digital

system using a learning-by-doing approach, which has proven effective in improving user technical skills (Noe & Kodwani, 2018).

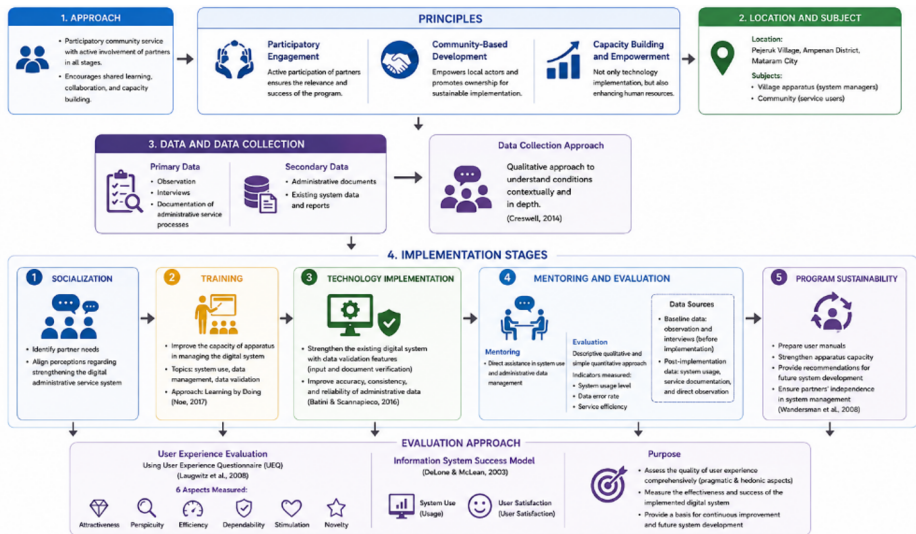


Figure 1. Stages of Community Service Activities

The technology implementation phase strengthened the existing administrative service system by adding validation to data-entry and document-verification processes. The mechanism checks completeness, format, consistency, and duplication before further processing, thereby supporting administrative data accuracy and reliability (Batini & Scannapieco, 2016). Mentoring was then provided during routine system use. Evaluation combined descriptive operational indicators—system usage, weekly data errors, and average service time—with baseline information from service records, observations, and officer interviews and post-implementation information from corresponding system logs, documents, and observations.

The strengthened system uses a layered web architecture (as shown in Figure 2). Citizens and subdistrict officers interact through the online submission interface and administrative dashboard. Application services manage authentication, workflows, and letter generation; the validation layer checks required fields, formats, consistency, and duplication before records are stored. The data layer maintains citizen data, service records, documents, and activity logs. This separation supports reliable processing, traceability, and maintainability.

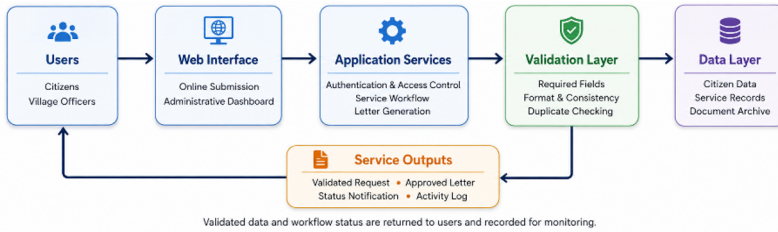


Figure 2. Digital Administrative Service System Architecture

User experience was assessed after implementation using the User Experience Questionnaire (UEQ), which covers attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty (Laugwitz et al., 2008; Schrepp et al., 2017). The questionnaire was completed by 10 subdistrict officers who used the system, and scale means were interpreted using the established UEQ benchmark. Sustainability activities included usage guidelines, officer capacity strengthening, and recommendations for future development. Thus, the method integrated technological improvement with participatory training, mentoring, evaluation, and sustainability planning.

The evaluation used a one-group pretest–posttest design to compare the same operational indicators before and after system strengthening. This design was appropriate for the existing public-service setting, where randomization and a control group were not feasible, but results were interpreted descriptively rather than as definitive causal evidence (Capili & Anastasi, 2024). System usage represented adoption, data-error frequency represented information quality, and processing time represented service efficiency, consistent with information-system success theory (Delone & McLean, 2003; Petter et al., 2013). The same workflow was used at baseline and post-implementation: identical definitions were applied to system usage, weekly data errors, and average processing time; values were collected from service records, system logs, interviews, and direct observation; and the results were cross-checked with responsible officers before absolute and percentage changes were calculated. UEQ responses were checked for completeness and scored using the standard procedure and benchmark. Inferential significance testing was not performed because the evaluation involved one service unit, 10 purposively selected users, no comparison group, and aggregated operational indicators rather than repeated individual-level observations. Reporting p-values under these conditions could overstate generalizability and causal certainty; therefore, the findings are presented descriptively.

3 Result and Discussion

3.1 Result

System Usage Measurement Results. System usage was measured by comparing the proportion of administrative services processed digitally before and after the

community service activities. The measurement results showed a substantial descriptive increase in the use of digital systems as the primary medium for administrative services (as shown in Table 1).

Table 1. System Usage Level

Indicator	Before (%)	After (%)	Transformation
Use of digital systems	40	85	45%
Manual use	60	15	-45%

The increase in digital system usage from 40% to 85% indicates a substantial change in the work behavior of subdistrict officials, who previously had not optimally utilized the system due to limited understanding and the lack of integration of service flows. Through mentoring and training activities, officials began to understand the benefits of the system and were able to use it in their daily activities, supported by system improvements in aspects of ease of use and clarity of service flows that encouraged the transition from manual to digital methods. In addition, easy access to online services also increased community participation, so that increased system usage was influenced not only by technological factors, but also by mentoring and changes in work patterns.

Administrative Data Error Measurement Results. Administrative data errors were identified as a major issue before system strengthening. These errors included incomplete data, typographical errors, and data duplication, which resulted in service delays and increased staff workloads. Measurements were conducted by calculating the average number of data error cases per week.

Table 2. Administrative Data Error

Indicator	Before (cases/week)	After (cases/week)	Decrease
Data error	10	3	-70%



Kelurahan Pejeruk

Kabupaten Mataram









Data Pengajuan Surat



LIST PENGAJUAN



BUAT BARU



LAPORAN

Jenis Surat

Surat Keterangan Usaha

NIK

51

Min 16 characters

2 / 16

Deskripsi Surat

nama tersebut di atas memang benar mempunyai usaha

Lengkapi deskripsi sesuai dengan keperluan

Keperluan Surat

Required.

Figure 3. Data Validation Implementation Results

The measurement results in Table 2 show that the number of data errors decreased from an average of 10 to 3 per week. This decrease is a direct result of the implementation of the data validation feature in the system (as shown in Figure 3). Before validation, the data input process relied heavily on user accuracy, resulting in a high potential for error. With automatic validation, the system is able to prevent errors early on, such as incomplete data or inappropriate formats. This reduction in data errors not only improves the quality of administrative data but also increases work efficiency. subdistrict officials no longer need to repeatedly revise documents, significantly reducing the time required to complete services.

Service Process Efficiency Measurement Results. Service efficiency is measured based on the average time required to complete one administrative service. This measurement is conducted by comparing time estimates before and after the implementation of the enhanced digital system.

Table 3. Service Time

Indicator	Before (cases/week)	After (cases/week)	Transformation
Average Service Time	22	8	-64%

The measurement results in Table 3 show that service time decreased from an average of 22 minutes to 8 minutes (a 64% improvement). Before the implementation of the optimized system, the service process took a relatively long time due to repeated data input errors. After the system was strengthened, various administrative processes can be performed more quickly because all data is validated upon input and storage, making it easier for users to use the system.

User Experience Measurement Results. User Experience Measurement Results. The user experience evaluation results in Table 4 show that the digital administrative service system strengthened through community service activities has an "Excellent" quality in the Perspicuity dimension of 2.15 and the Efficiency dimension of 2.05. This indicates that system strengthening, particularly the integration of data validation features, can help users complete tasks more quickly and in a more structured manner.

Table 4. UEQ Results

UEQ Scale	Score	Interpretation
Attractiveness	1.77	Good
Perspicuity	2.15	Excellent
Efficiency	2.05	Excellent
Dependability	1.60	Good
Stimulation	1.70	Good
Novelty	1.55	Good

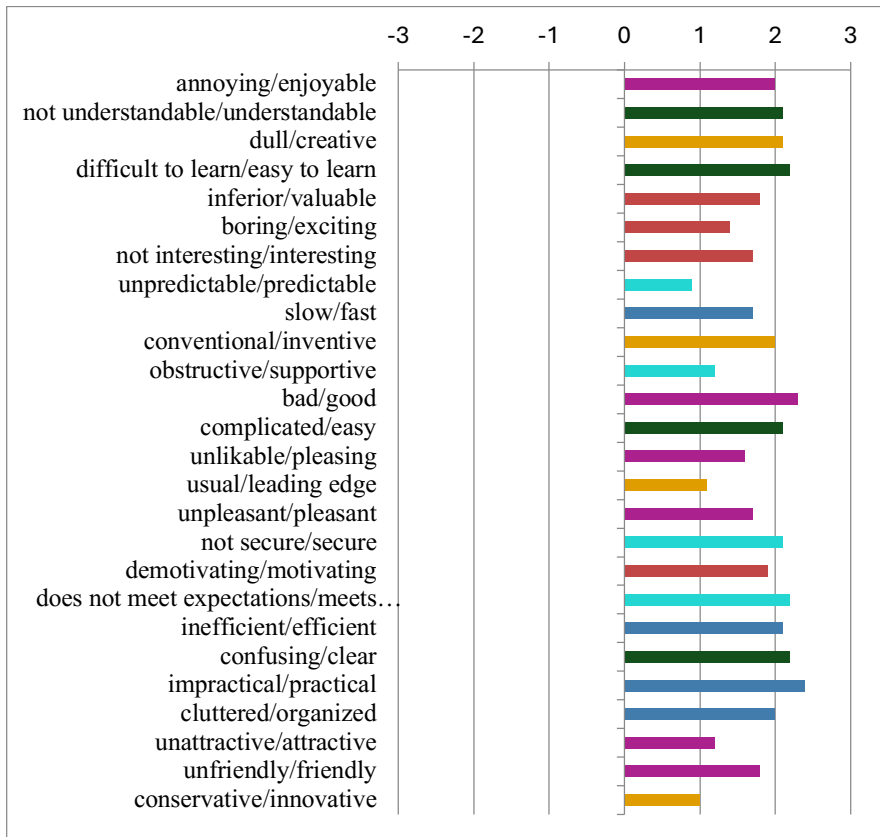


Figure 4. Mean Value per Item

In the Good category, the system continues to demonstrate a positive user experience as a result of the interventions. The Attractiveness (1.77), Stimulation (1.70), Dependability (1.60), and Novelty (1.55) dimensions indicate that the system is considered quite attractive, comfortable to use, and reliable in supporting administrative processes. This is in line with system strengthening and mentoring activities that increase user confidence in utilizing the system optimally, although the development of innovative features can still be improved in the future. Overall, the UEQ results indicate that the combination of digital system strengthening, the addition of data validation mechanisms, and intensive mentoring for users can produce a positive user experience with a dominant value in the Good to Excellent category, as shown by the average for each UEQ item in Figure 4. This confirms that the success of the activity is not only determined by the technological aspect, but also by the implementation strategy that emphasizes increasing user capacity, so that the system can be utilized optimally and sustainably in supporting public administration services.

3.2 Discussion

The results show that strengthening the digital administrative service system, accompanied by mentoring and data validation, was associated with substantial improvements in public-service quality. This supports the view that digital transformation depends on both technology and organizational readiness (Dwivedi et al., 2020). The increase in system usage from 40% to 85%, the 70% reduction in data errors, and the 64% improvement in service time indicate positive operational change. These outcomes are consistent with the role of data validation in improving system and information quality (Batini & Scannapieco, 2016). Automatic validation performed at every process in the system has a significant impact on reducing errors in data input.

The UEQ evaluation results indicate that the system has a good user experience across all dimensions, particularly in terms of perspicacity and efficiency. These findings demonstrate that the system is capable of meeting user needs in terms of usability and performance. This aligns with research by Gunawan & Indrawan (2021) and Schrepp et al. (2017), which states that a good user experience is a critical factor in system success. However, the scores for the other four aspects, which are still in the "Good" category, indicate that the system still has room for further development.

The findings are consistent with similar local-government digital transformation studies. Indar et al. (2024) reported improved service effectiveness and information access through online services, while Priyowidodo et al. (2024) and Vehtasvili et al. (2024) emphasized governance readiness, organizational capacity, process integration, and contextual adaptation. This community services adds a focused operational contribution by combining input-level data validation with training and mentoring. This combination was associated with higher system use, faster processing, and a 70% reduction in administrative data errors, indicating that small-scale transformation can produce practical gains when technology and user-capacity development are implemented together.

Overall, the results indicate that digital system strengthening depends on both technology and implementation. Mentoring, training, and partner involvement supported the observed improvements, consistent with Wandersman et al. (2008). However, the evaluation was conducted shortly after implementation in one service unit with 10 purposively selected users and no control group. The findings are therefore context-specific and descriptive. Follow-up evaluations are proposed at 3, 6, and 12 months using the same indicators and repeated UEQ measurement to assess whether adoption, error reduction, processing time, and user experience are sustained. The follow-up should also record staff turnover, technical incidents, maintenance needs, and consistent with continuous long-term UX evaluation (Winter, 2025).

4 Conclusion

This community service activity demonstrated that strengthening the digital administrative service system combined with intensive mentoring and the implementation of data validation substantially improved the observed quality of public services in Pejeruk Subdistrict. This was evidenced by an increase in system usage from

40% to 85%, a decrease in administrative data errors from an average of 10 cases to 3 cases per week (a 70% decrease), and an increase in service efficiency, demonstrated by a decrease in processing time from 22 minutes to 8 minutes (a 64% increase in efficiency). Furthermore, the user experience evaluation using UEQ showed positive values across all dimensions, with an average score above 1.5 in most aspects, indicating that the system has good usability quality and is acceptable to users. These findings confirm that the success of digital transformation is not only determined by technology, but also by a participatory implementation approach and strengthening data quality through validation mechanisms. Practically, the model produced in this activity can be replicated in other local government agencies, while academically it contributes to the development of integration between information systems, data quality, and user experience in the context of public services. For further development, it is recommended to conduct follow-up evaluations at 3, 6, and 12 months, add innovative features, and integrate the system with other government services to assess and strengthen the sustainability of the observed improvements.

Acknowledgment

The author would like to express sincere gratitude for the implementation of this community service activity, which was supported and funded through the institution's DIPA fund under contract number 07056/DST/PL8/DT.06.05/2026 on April 15, 2026. The author also extends appreciation to Pejeruk Subdistrict for its active participation, cooperation, and commitment throughout the implementation of the activity.

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