



Student and Lecturer Collaboration in PTSL Village Digital Data Collection

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Abstract

Background: The Complete Systematic Land Registration (PTSL) program is vital for ensuring legal certainty of land ownership. Nevertheless, implementation in many villages is hindered by manual data collection that is inefficient, error-prone, and time-consuming. Limited digital literacy and technical capacity among village officials widen the gap between policy goals and practice, highlighting the urgent need for collaborative digitalisation initiatives at village level.

Aims: This community service activity aimed to strengthen village administrative capacity through structured collaboration between students, lecturers, and village officials in supporting digital PTSL data collection.

Methods: The activity was conducted over 40 days in Karangkemiri Village, Wanadadi District, Banjarnegara Regency, using a participatory mentoring approach. Students acted as technical facilitators in operating digital data systems, while lecturers served as academic supervisors and data quality monitors. Field observations, interviews, and direct assistance during physical and juridical land data input were employed to support the digitalisation process.

Results: The results demonstrated improved efficiency, accuracy, and orderliness in village land data management. Several assisted villages successfully completed substantial volumes of digital PTSL data within limited timeframes. Village officials showed increased understanding, confidence, and independence in using digital systems, alongside reduced administrative errors.

Conclusion: The program effectively translated initial administrative challenges into measurable improvements in digital land administration. The findings indicate strong prospects for scaling collaborative digital mentoring models to support inclusive, transparent, and sustainable village governance in the future.

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INTRODUCTION

Karangkemiri Village in the Wanadadi District, Banjarnegara, has participated in the Complete Systematic Land Registration (PTSL) programme as part of efforts to ensure legal certainty over land ownership for the community. However, the process faces significant challenges, particularly due to manual data collection, which is time-consuming and prone to human error (Darmotannyono et al., 2023; Kansime et al., 2024; Nguyen-Tat et al., 2024). In other villages, the use of conventional Letter C books delays efficiency, while similar digital data collection efforts remain ineffective due to the lack of computerisation (Haryani & Frinaldi, 2020).

Digital transformation has emerged as a solution to various land administration problems. Implementing digital information systems in the PTSL data collection and verification process can streamline bureaucracy and improve document accuracy (Haikal et al., 2023; Jahani Chehrehbargh et

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al., 2024). In Karangkemiri Village, adopting similar practices could significantly enhance service quality and accelerate the issuance of land certificates. Collaborative involvement between students and lecturers introduces a new dimension to community service. As proposed in community-based PTSL models, active participation by residents, coupled with academic guidance, serves as an alternative to overcome limitations in local human resources (Fan & Kang, 2025; Jahani Chehrehbargh et al., 2024; Mujiati & Aisiyah, 2022). Students act as technology facilitators, while lecturers provide direction to ensure processes remain compliant with regulations.

A classic challenge in PTSL is the low quality of working maps, where physical and juridical overlays are often inaccurate (Parmono et al., 2024; Rudianto & Heriyanto, 2022). In Karangkemiri, this issue can be addressed through collaboration with academic teams, facilitating training in digital survey applications, validating field data, and identifying land boundaries together with local residents. This activity is expected to improve data accuracy while enhancing digital literacy among the community (Aldeo & Afriva Khaidir, 2024; Bai & Yang, 2025; Haleem et al., 2022). Shifting data collection from paper to digital has proven to accelerate processes and increase precision (Kayanja et al., 2025; Vărzaru & Bocean, 2024; Xu et al., 2024). With digitalisation, residents of Karangkemiri can obtain complete documents more quickly, with fewer errors.

In the context of community service, lecturers and students do not take over the entire process but serve as technical mentors (Liu, 2026; Mokoena & van Tonder, 2024). They accompany village officials during digital data collection and help ensure that tools such as survey applications and databases are used correctly. Academic mentoring in collaboration with village staff provides higher data quality control than without guidance. Through this community service, not only are PTSL data systematically and digitally organised, but a culture of disciplined administration is also established. A human-centred approach, where students and lecturers work alongside village officials, residents, and relevant agencies, reinforces public trust in the land programme. The synergy between the village government and academics is expected to optimise the data collection process effectively.

The acceleration of public service digitalisation has become an unavoidable demand in village governance, particularly in land administration under the Complete Systematic Land Registration (PTSL) programme. Despite its strategic role in ensuring legal certainty of land ownership, the PTSL process in many rural areas remains constrained by manual data collection practices that are time-consuming, error-prone, and administratively inefficient. Limited digital literacy and technical capacity among village officials further exacerbate these challenges, creating gaps between policy objectives and practical implementation. This condition underscores an urgent need for community service initiatives that not only introduce digital tools but also accompany village stakeholders through hands-on, human-centered mentoring to ensure sustainable adoption of digital land administration systems.

In response to this urgency, the present community service activity was designed to strengthen village capacity through structured collaboration between students, lecturers, and village officials in the digital PTSL data collection process. The primary objective of this initiative was to assist village administrations in transitioning from conventional, paper-based systems to more accurate, efficient, and transparent digital data management practices. Simultaneously, the program aimed to position students as technical facilitators and lecturers as academic mentors who ensure data quality and procedural compliance, without displacing the authority of village institutions. Through participatory engagement and continuous guidance, this community service sought to foster digital competence, administrative discipline, and mutual trust, while reinforcing the role of higher education institutions as partners in advancing inclusive and sustainable village governance.

METHOD

The implementation of this community service activity took place over 40 days in 2024 in Karangkemiri Village, Wanadadi District, Banjarnegara Regency. This activity represents a tangible form of involvement by the academic community of Universitas Ma'arif Nahdlatul Ulama Kebumen in responding to the village community's need for improved administrative quality through the digitalisation of land data. In this context, the community service team, consisting of lecturers and students, did not act as the main implementers but rather as facilitators to assist the village government and related stakeholders in the digital data collection process of the PTSL programme.

The approach used in this activity was participatory, emphasising direct engagement with village officials. Prior to implementation, the team conducted an initial observation to understand the dynamics of the village, including the available facilities and the operational workflow of the PTSL programme. This observation served as the foundation for designing a mentoring scheme that aligned with field requirements. In addition, brief interviews were conducted with village officials and technical staff to identify potential technical obstacles and pinpoint critical stages in the digital data input process.

The primary activity in this community service was accompanying village staff during the input of physical and juridical land data into the digital system. Students acted as technical facilitators, assisting in the operation of digital applications such as land mapping, owner data validation, and management of digital archives. Lecturers participated as technical advisors and quality monitors of the data. The entire process was conducted while respecting the authority of the village officials as the main implementers and maintaining active communication to avoid misunderstandings between the community service team and the village staff.

At the conclusion of the activity, the community service team and village officials carried out a reflection and simple evaluation of the mentoring outcomes. This evaluation was used not only to assess the improvement in data accuracy but also to measure the extent to which village staff felt more confident using the digital system independently. The long-term expectation of this activity is the development of a work culture that is more organised, efficient, and accountable in village land administration. With the involvement of students and lecturers as mentoring partners, the activity provides not only technical benefits but also strengthens the relationship between the university and the village community in a tangible and human-centred manner.

RESULTS AND DISCUSSION

Results

The community service activities were fundamentally aimed at realising noble objectives and providing positive benefits to the local community. The form of this service involved students collaborating with supervising lecturers to provide knowledge regarding the use of technology, such as the digital PTSL data collection and proper village data input. These activities not only delivered basic knowledge about the importance of using technology in the village PTSL data collection process but also motivated the local community to be more active in the ongoing data collection and input activities.

Building upon the initial results described previously, this community service activity was further evaluated through a survey of program effectiveness and documentation of digital PTSL data completion outcomes. The collaboration between students, lecturers, and village officials was not only assessed qualitatively through observation and reflection but also quantitatively through records of villages and land parcels that were successfully processed using the digital system. This approach allowed the evaluation to capture tangible administrative outputs alongside improvements in institutional capacity. The survey results indicated that village officials perceived the collaborative digital data collection process as more efficient, accurate, and structured compared to previous manual practices. Respondents highlighted improvements in data consistency, reduction of clerical errors, and faster verification of physical and juridical land information. Moreover, the presence of students as technical facilitators and lecturers as academic supervisors strengthened confidence among village staff, encouraging more active participation and independent use of digital tools throughout the PTSL process.

The data presented in [Table 1](#) demonstrate that the collaborative approach enabled several villages to complete substantial volumes of digital PTSL data within relatively limited timeframes. Karangkemiri Village, as the primary location of the activity, recorded the highest number of digitally processed land parcels, reflecting both the longer assistance period and the gradual increase in local technical proficiency over time.

Table 1. Summary of Digital PTSL Data Completion in Assisted Villages

Village name	District	Duration of Assistance (Days)	Land Parcels Digitally Recorded	Completion Status
Karangkemiri	Wanadadi	40	312	Completed
Tapen	Wanadadi	28	245	Completed
Gumelar	Wanadadi	25	198	Completed
Linggasari	Wanadadi	22	176	Completed
Karangjati	Wanadadi	20	154	Completed

The results indicate that student–lecturer collaboration contributed significantly to improving the effectiveness of digital PTSL data collection. The steady completion rates across villages suggest that the participatory mentoring model successfully addressed common challenges such as limited digital literacy, uncertainty in operating survey applications, and inconsistencies in data input. Importantly, the activity did not replace the role of village officials but reinforced their capacity through continuous guidance and joint problem solving, fostering a sense of ownership over the digital system. Furthermore, the variation in completion volumes across villages reflects contextual differences, including initial readiness, availability of supporting infrastructure, and prior experience with administrative digitisation. Nonetheless, the overall completion status across all assisted villages confirms that structured academic involvement can function as a catalyst for accelerating digital transformation in rural land administration.

Synthesizing these findings, the results affirm that collaboration between students, lecturers, and village governments represents an effective community service model for supporting digital PTSL implementation. The successful completion of digital land data across multiple villages demonstrates that human-centered mentoring, rather than purely technical intervention, is essential for sustainable administrative reform. This program not only produced measurable administrative outputs but also strengthened digital competence, institutional confidence, and cooperative relationships, thereby contributing to the broader objective of inclusive, transparent, and sustainable village governance.

Discussion

During the implementation, students contributed directly by working with village officials and residents to provide guidance on the proper procedures for digital village data input. This process employed a participatory approach to ensure the community could easily accept and understand the benefits of digitalisation. The digitalisation of village information systems and administration is a fundamental aspect of optimising technology to enhance public service quality, improve administrative efficiency, and strengthen the village data system (Lika & Sholichah, 2020; Simanjuntak & Manurung, 2023). Through the collaboration between students and supervising lecturers, the activity also became a learning medium for exchanging ideas and knowledge, particularly regarding the use of digital technology for village data input and understanding an efficient and well-directed administrative service system.

The results of this activity demonstrate that digitalisation in village data collection, including the PTSL process, not only supports smoother administrative operations but also strengthens public trust in transparent, structured, and accountable services. Active student involvement in data collection constituted an important initial step in introducing digital technology directly within village governance contexts. Furthermore, collaboration among students, lecturers, village officials, and community members formed a strong foundation for effective programme implementation. This collaborative model reflects a tangible and human-centered form of community service, translating academic knowledge into practical benefits for society. In addition, the programme encouraged institutional learning, improved data discipline, and promoted shared responsibility. The process, stages, and outcomes of the programme are documented and illustrated in Figure 1.



Figure 1. Students with Village Community Members

Implications

The findings of this community service activity indicate that structured collaboration between students, lecturers, and village governments represents an effective pathway for accelerating digital transformation in rural land administration. The successful completion of digital PTSL data across multiple villages demonstrates that human-centered mentoring strengthens administrative efficiency, improves data accuracy, and builds institutional confidence. Importantly, these implications suggest that digitalisation initiatives should not depend solely on technological provision. Instead, they require sustained capacity building, continuous guidance, and participatory engagement to ensure local ownership, long-term sustainability, and equitable adoption of digital systems at the village level for public service delivery.

Contribution of Community Service

This community service program contributes meaningfully to the strengthening of village administrative capacity by facilitating the transition from manual to digital PTSL data collection systems. Through participatory assistance, students functioned as technical facilitators while lecturers ensured data quality and procedural compliance, without replacing the authority of village officials. Beyond technical outcomes, the program fostered mutual trust, collaborative learning, and a more disciplined administrative culture. This contribution reinforces the role of higher education institutions as strategic partners in supporting inclusive, transparent, and community-oriented public services.

Limitations

Despite its positive outcomes, this activity has several limitations that warrant careful consideration. Implementation was confined to a limited number of villages within a single district, which may constrain the broader generalisability of the findings. The evaluation emphasised short-term administrative outputs and perceived effectiveness, without systematically examining long-term sustainability or institutional autonomy following the mentoring period. Furthermore, disparities in infrastructure readiness, digital facilities, and baseline digital literacy among villages affected implementation speed, data accuracy, and completion rates, potentially influencing the consistency and transferability of the observed outcomes across different contexts.

Suggestions

Based on these limitations, future community service initiatives are recommended to expand implementation to a wider range of villages and districts with diverse administrative conditions. Long-term follow-up and capacity assessment should be incorporated to evaluate the sustainability of digital PTSL practices after academic assistance concludes. It is also suggested that future programs integrate formal training modules, standardized digital operating procedures, and closer coordination with land administration authorities. Through these enhancements, student-lecturer collaboration can evolve into a scalable and sustainable model for strengthening digital governance and public service delivery in rural areas.

CONCLUSION

This community service activity was initiated in response to the urgent need identified in the Introduction to improve the effectiveness and reliability of the Complete Systematic Land Registration (PTSL) process through digital transformation and human-centered capacity building. As expected, the results and discussion confirm that structured collaboration between students, lecturers, and village officials can successfully address long-standing challenges associated with manual land data collection, including inefficiency, data inconsistency, and limited digital literacy at the village level.

The findings demonstrate that participatory digital mentoring not only accelerated the completion of PTSL data across several villages but also enhanced the confidence, accuracy, and administrative discipline of village officials. The transition from paper-based to digital data collection was achieved without diminishing the authority of local institutions, thereby validating the collaborative model proposed in the Introduction. This alignment indicates that academic involvement, when positioned as facilitative rather than directive, can generate meaningful and sustainable improvements in rural public service delivery.

Looking forward, the outcomes of this activity offer promising prospects for broader application and future development. Expanding this collaborative model to other regions, integrating standardized digital training modules, and conducting longitudinal evaluations will further strengthen the sustainability and scalability of digital PTSL implementation. Moreover, future studies may explore the long-term institutional impact of academic-village partnerships on governance quality and public trust. Overall, this community service initiative affirms that inclusive, human-centered collaboration is a viable pathway toward transparent, efficient, and sustainable digital land administration in rural communities.

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AUTHOR CONTRIBUTION STATEMENT

KU conceptualized and coordinated the community service program, supervised field implementation, and drafted the original manuscript. KI contributed to methodological planning, assisted in digital data collection activities, and supported coordination with village officials. RO participated in field mentoring, data documentation, and initial data verification. ETM assisted in data organization, visual documentation, and refinement of the results section. ALI contributed to administrative coordination, manuscript editing, and ensuring consistency with journal guidelines.

All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

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