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Community Assistance in Zakat Management Using an Intelligent Web-Based Application for Mustahik Mapping in Kuantan Singingi Regency

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Abstract

This community service program aimed to strengthen the effectiveness, transparency, and accountability of zakat management through the implementation of an intelligent web-based application for mustahik mapping in Kuantan Singingi Regency. The program employed an educational and participatory approach involving mustahik, zakat administrators, and zakat management practitioners. Activities were conducted through interactive assistance, application demonstrations, Focus Group Discussions (FGDs), and evaluation sessions. Data were collected through observation, discussion documentation, and semi-structured interviews, and analyzed using qualitative descriptive analysis. The results indicate that the application improved the accuracy of mustahik data management, reduced duplication and misclassification, and accelerated data retrieval and decision-making processes. FGDs played a critical role in strengthening stakeholder participation, fostering collective problem-solving, and enhancing a sense of ownership toward the system. Participants demonstrated improved understanding of digital zakat management, increased confidence in using technology-based systems, and greater readiness to adopt data-driven practices. Overall, the program concludes that intelligent web-based applications, when supported by participatory implementation and capacity-building activities, have strong potential to improve the quality, fairness, and sustainability of zakat management at the local level.

Keywords: Intelligent Web-Based Application, Mustahik Mapping, Digital Zakat Management, Stakeholder Participation, Zakat Governance.

INTRODUCTION

Zakat is a strategic instrument within the Islamic economic system that plays a vital role in poverty alleviation and the improvement of community welfare. As a socio-economic obligation, zakat is expected not only to fulfill religious mandates but also to function as a sustainable mechanism for reducing inequality and empowering disadvantaged communities. Along with the rapid development of information technology, zakat management is increasingly required to adapt in order to become more transparent, accountable, and efficient. The utilization of web-based applications in zakat management has therefore emerged as an innovative solution to address these evolving demands, particularly in enhancing public trust and institutional performance.

Digital-based zakat management enables *muzakki* to monitor the collection and distribution of zakat in real time, thereby strengthening transparency and accountability. In addition, digitalization improves operational efficiency by reducing administrative costs, minimizing human error, and accelerating service delivery. Well-structured digital data systems also support auditing, monitoring, and evaluation processes, which are essential for professional zakat governance in contemporary contexts.

Despite these advantages, conventional zakat management systems continue to face significant limitations, especially in *mustahik* mapping and zakat distribution processes. Manual data collection methods, which often rely on community reports or limited surveys, are prone to data duplication, misclassification of recipients, and inaccurate targeting. The

distribution of zakat through conventional mechanisms is also relatively slow due to lengthy administrative procedures. Moreover, transparency remains limited because reporting is generally conducted periodically and is not easily accessible to the public, thereby weakening institutional accountability and stakeholder trust.

In contrast, intelligent web-based zakat management systems offer substantial improvements. These systems facilitate automated and integrated mustahik mapping, resulting in more accurate and reliable data while eliminating duplication. Intelligent applications are also capable of providing distribution recommendations that are better aligned with mustahik needs and zakat allocation categories. The availability of real-time and publicly accessible reports further enhances transparency, while automation significantly reduces administrative workload, time, and operational costs. Such systems support a more professional, data-driven, and accountable zakat management framework.

Contemporary zakat management discourse also emphasizes an empowerment-oriented approach. A significant proportion of zakat funds up to 50% or more can be allocated for productive purposes, such as business capital assistance, skills training, and seed funding, enabling mustahik to achieve sustainable livelihoods and gradually reduce dependency on zakat (Rezeki, 2022; Irawan et al., 2022). This approach aligns with broader government strategies for poverty reduction and economic empowerment, positioning zakat as a long-term development instrument rather than merely consumptive assistance.

From an institutional perspective, professional zakat governance is increasingly emphasized. Putra and Muthoifin (2023) highlight the views of Didin Hafidhuddin, who introduced the concept of professional zakat, particularly zakat on professional income, as a response to modern economic dynamics. This perspective underscores the necessity of integrating zakat into contemporary Islamic financial systems through transparent, accountable, and technology-supported institutional management. Consequently, strengthening digital zakat management systems is a critical requirement for optimizing zakat's socio-economic impact.

Although the National Zakat Board (BAZNAS) has implemented several digital services—such as online zakat payments, zakat calculators, bank transfers, QRIS, and ZIS confirmation systems—significant challenges remain. Existing platforms have not yet provided comprehensive mustahik data integration, effective verification mechanisms, or location-based distribution features. As a result, zakat managers and muzakki face difficulties in ensuring accurate recipient targeting. These challenges are particularly evident in Kuantan Singingi Regency, where the need for accurate mustahik mapping and transparent zakat distribution systems is increasingly urgent.

Based on these conditions, this community service program aims to design and implement an intelligent web-based application for mustahik mapping and zakat distribution in Kuantan Singingi Regency. The objectives of this initiative are to improve the effectiveness, efficiency, transparency, and accountability of zakat management through digital innovation, while also strengthening stakeholder participation and institutional capacity. Furthermore, the developed system is expected to have scalability potential for broader implementation across Riau Province, thereby contributing to the advancement of professional and modern zakat governance.

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RESEARCH METHODS

This study was conducted as a community service program using an educational and participatory approach, grounded in participatory development and community engagement theory (Cornwall, 2018; Hickey & Mohan, 2020). The subjects of the program consisted of mustahik, members of the Kuantan Singingi Zakat Board (Badan Amil Zakat Kuantan Singingi), and zakat management practitioners. The main material studied was the implementation of an intelligent web-based application for mustahik mapping and zakat management.

The tools used in this program included presentation materials, an intelligent web-based zakat management application, and interview guidelines. The program employed a descriptive participatory design, implemented through interactive assistance, Focus Group Discussion (FGD), structured discussion sessions, and evaluation activities. Participants were selected using a purposive sampling technique, based on their roles and involvement in zakat management at the institutional and community levels.

The variables observed included participants' understanding of digital zakat management, ability to operate the web-based application, and perceptions of system usefulness and applicability. Data were collected through direct observation, FGD documentation, and semi-structured interviews conducted after program implementation.

Data analysis was carried out using qualitative descriptive analysis, focusing on thematic patterns derived from participant responses and observations. This approach allowed for an in-depth understanding of participants' experiences and the effectiveness of the program without employing complex statistical models. The overall analytical framework followed principles of stakeholder-based and utilization-oriented evaluation (Patton, 2022), ensuring that findings were directly applicable to program improvement and sustainability.

RESULTS AND DISCUSSION

Improvement of Participants' Understanding of Digital Zakat Management

The results of the community service program demonstrate a meaningful improvement in participants' understanding of digital-based zakat management. This improvement was observed across mustahik, members of the Kuantan Singingi Zakat Board (Badan Amil Zakat Kuansing), and zakat management practitioners following interactive assistance, demonstrations, and focused group discussions.

Participants showed increased awareness of the importance of integrated data systems for mustahik mapping. Prior to the program, zakat administration largely depended on manual records and fragmented community-based reports. After engagement with the intelligent web-based application, participants were able to articulate the value of centralized digital data in preventing duplication and improving recipient classification. These changes are summarized in Table 1, which presents shifts in participants' conceptual understanding before and after program implementation.

This finding aligns with adult learning theory, which posits that learning is most effective when participants are actively involved in addressing problems that are directly relevant to their professional roles and real-life responsibilities, enabling them to connect new knowledge with prior experience and apply it meaningfully in practice (Knowles et al., 2020).

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Table 1. Participants' understanding of key aspects of digital zakat management

Aspect of understanding	Initial condition	After implementation
Integrated mustahik data	Fragmented/manual	Centralized/digital
Transparency mechanism	Periodic reporting	Real-time access
Administrative workflow	Time-intensive	Automated
Data verification	Limited	System-based

Source: Community service program documentation (2025)

Improved awareness of transparency and accountability mechanisms also emerged as a central result. Through hands-on application use, participants were able to access dashboard-based summaries and interpret zakat distribution information independently. This capability strengthened participants' perception that digital reporting could enhance public trust, particularly among muzakki.

Another notable outcome was the shift in participants' perceptions regarding efficiency. Initial discussions revealed concerns that digital systems would increase administrative complexity. However, after practical workshops, participants acknowledged that automated data entry and reporting significantly streamlined routine tasks. Rather than emphasizing numerical reductions, participants highlighted qualitative improvements such as faster decision-making and reduced procedural repetition, as reflected in Table 2.

Table 2. Perceived changes in zakat management workflow efficiency

Workflow component	Conventional system	Digital system
Data entry	Manual repetition	Single-entry automation
Report preparation	Multi-stage	Dashboard-based
Verification	Informal	System-supported
Workflow component	Conventional system	Digital system

Source: Focus Group Discussion results (2025)

Participants also demonstrated improved understanding of data accuracy and verification mechanisms. During practical sessions, they were able to cross-check eligibility categories and socioeconomic indicators within the system. This capability reduced uncertainty in beneficiary selection and strengthened confidence in distribution decisions. Such outcomes support broader findings in zakat governance literature that emphasize the role of digital verification in improving targeting accuracy and institutional credibility (Rezeki, 2022; Irawan et al., 2022).

Increased comprehension was reflected in the quality of participant engagement. Compared to early sessions, later discussions featured more focused questions related to system integration, data security, and sustainability strategies. This shift suggests not only cognitive improvement but also growing readiness to institutionalize digital zakat management practices. Similar patterns have been observed in participatory technology adoption programs, where confidence develops alongside understanding through iterative practice and dialogue.

Presentation of Zakat Management through an Intelligent Web-Based Application for Mustahik Mapping

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Overall, the results indicate that the intelligent web-based application effectively supported participants' learning and readiness to adopt digital zakat management. These findings reinforce arguments in contemporary zakat governance discourse that professional, transparent, and technology-supported systems are essential for maximizing the socio-economic impact of zakat in modern contexts (Putra & Muthoifin, 2023).

Effectiveness of the Intelligent Web-Based Application in *Mustahik* Mapping

The implementation of the intelligent web-based application demonstrated a clear improvement in the effectiveness of *mustahik* mapping in Kuantan Singingi Regency. Through assistance activities and practical workshops, zakat administrators were able to input, verify, and update beneficiary data within a centralized system. This approach replaced fragmented manual records previously maintained across different administrative units and enabled structured, integrated data management.

The effectiveness of the application was particularly evident in reducing data duplication and misclassification. By utilizing an integrated database, zakat administrators could verify whether a *mustahik* had already received assistance or was registered under multiple eligibility categories. Feedback collected during Focus Group Discussion sessions indicated that this verification feature supported more equitable zakat allocation by preventing overlapping aid distribution. A summary of observed changes in *mustahik* data management practices is presented in Table 3.

Table 3.
Changes in mustahik mapping practices after application implementation

Aspect of mapping	Before implementation	After implementation
Data storage	Fragmented records	Centralized database
Duplication risk	High	Minimized
Verification process	Manual	System-supported

Source: FGD documentation and field observation (2025)

The application also improved the accuracy of *mustahik* classification based on predefined eligibility criteria, including economic condition, household characteristics, and type of assistance required. During hands-on practice, participants successfully categorized *mustahik* according to actual field conditions, allowing zakat managers to align distribution programs more closely with beneficiary needs. This capability was particularly relevant for productive zakat initiatives focused on economic empowerment, where accurate classification is essential to program effectiveness.

In addition, the system enhanced the speed and efficiency of data retrieval and decision-making. Zakat administrators reported that accessing beneficiary information, which previously required searching through physical documents or separate digital files, could now be performed directly through the application dashboard. This improvement supported faster response times in zakat distribution, especially for urgent or time-sensitive assistance.

This activity included a presentation during the Focus Group Discussion (FGD) with stakeholders and community representatives.

Overall, the intelligent web-based application functioned as an effective tool for strengthening *mustahik* mapping by improving data accuracy, reducing administrative complexity, and supporting data-driven zakat management decisions. These findings are consistent with studies on digital governance and social data integration, which emphasize that intelligent information systems enhance accuracy, targeting, and operational efficiency in social fund management (Janssen et al., 2020; Wirtz et al., 2023). When supported by adequate training and institutional commitment, digital-based *mustahik* mapping systems show strong potential to improve the quality, fairness, and accountability of zakat distribution.

Role of Focus Group Discussion (FGD) in Strengthening Participation and Problem Solving

Focus Group Discussion (FGD) played a strategic role in strengthening stakeholder participation and collective problem-solving during the implementation of the intelligent web-based zakat management program. FGDs functioned not merely as a medium for information dissemination but as a participatory space that encouraged active engagement among zakat administrators, community representatives, and prospective application users. Through this forum, participants were able to exchange experiences, express concerns, and collaboratively reflect on challenges related to mustahik mapping and zakat distribution in Kuantan Singingi Regency.

The participatory nature of FGDs enabled stakeholders to openly discuss limitations of conventional zakat management practices, including fragmented beneficiary data, overlapping aid distribution, and limited transparency. These discussions facilitated critical reflection by allowing participants to compare their existing practices with the capabilities offered by the intelligent web-based application. Such dialogical interaction supports participatory learning and empowerment theory, which emphasizes collective reflection and shared meaning-making as foundations for sustainable community development (Bergold & Thomas, 2018; Cornwall, 2019).

FGDs also strengthened participation by fostering a sense of ownership toward the digital system. Participants were positioned as co-creators rather than passive users of technology. Several inputs emerged during the discussions, particularly regarding the refinement of mustahik categorization, the integration of local socio-economic indicators, and the need for a more intuitive dashboard design. This form of participatory contribution aligns with the argument that community involvement in decision-making enhances contextual relevance and long-term acceptance of development interventions (Cornwall, 2021; Krueger & Casey, 2023).

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In terms of problem-solving, FGDs facilitated collective analysis and consensus-building. Participants collaboratively explored practical responses to technical and operational challenges, such as data validation procedures and coordination mechanisms among zakat institutions. Through guided dialogue, stakeholders reached shared understandings regarding best practices for updating beneficiary data and ensuring equitable zakat distribution. This process reflects social learning perspectives that view problem-solving as most effective when conducted within communities of practice through sustained interaction and mutual engagement (Wenger-Trayner et al., 2022).

The team conducted a presentation at the Focus Group Discussion (FGD) to introduce the intelligent web-based application for *mustahik* mapping

The use of FGDs significantly enhanced both participation and problem-solving capacity among stakeholders. The interactive and dialogical character of FGDs supported knowledge exchange, strengthened mutual trust, and enabled adaptive solutions grounded in local realities. As a result, FGDs functioned as a critical mechanism in ensuring that the intelligent web-based zakat management application was not only technically operational but also socially accepted and contextually aligned with the zakat governance framework of Kuantan Singingi Regency.

Challenges and Sustainability of the Program

Despite the positive outcomes, several challenges were identified, particularly related to varying levels of digital literacy and limited internet infrastructure in certain areas. These constraints affected the initial adoption of the application among some participants. However, continuous guidance, peer-assisted learning, and simplification of system features gradually mitigated these challenges.

From a sustainability perspective, these findings align with technology adoption and sustainability theory, which suggests that long-term success of digital innovations depends on continuous capacity building, institutional support, and adaptability to users' capabilities (Venkatesh et al., 2022; Dwivedi et al., 2023). Therefore, sustained mentoring and institutional commitment are essential to ensure the continued use and scalability of the intelligent web-based zakat management system.

Despite the positive outcomes of the intelligent web-based zakat management program, several challenges emerged during its implementation. One of the primary challenges was the varying levels of digital literacy among zakat managers and community stakeholders. While some participants quickly adapted to the application, others required more intensive guidance and repeated mentoring sessions. This finding is consistent with the study by van Dijk (2022), which highlights that digital inequality remains a significant barrier in the adoption of technology-based public service systems, particularly in rural and semi-rural contexts.

Another challenge concerned data accuracy and data updating mechanisms. Although the application provided structured tools for mustahik mapping, maintaining up-to-date and valid socio-economic data required continuous coordination between village officials, zakat institutions, and community representatives. In practice, delays in data entry and verification occasionally occurred due to limited human resources. According to Kitchin (2023), data-driven systems are highly dependent on institutional capacity and governance structures to ensure data reliability and long-term usability.

Technical constraints also influenced program implementation, particularly related to internet connectivity and system maintenance. In some areas of Kuantan Singingi, unstable network access affected the optimal use of the application during field activities. Furthermore, concerns regarding long-term technical support and system updates were raised by participants. These issues align with the findings of Heeks (2021), who argues that sustainability of digital development initiatives requires not only technological solutions but also institutional readiness and ongoing technical support.

In terms of sustainability, the program demonstrated strong potential through community involvement and institutional collaboration. The participatory approach embedded in Focus Group Discussions (FGDs) contributed to a sense of ownership among stakeholders, which is a key factor in sustaining community-based digital initiatives. As emphasized by Ostrom (2022), collective governance and shared responsibility enhance the durability of community-managed systems, including digital platforms.

Moreover, the integration of local values, particularly the spirit of gotong royong, reinforced the social sustainability of the program. This cultural foundation encouraged collaboration, mutual support, and voluntary participation in maintaining the application and updating mustahik data. Such localization strategies are supported by the work of Chambers (2021), who stresses that development programs grounded in local culture are more likely to be accepted and sustained over time.

Overall, while challenges related to digital literacy, data management, and technical infrastructure remain, the sustainability of the program is supported by strong community engagement, cultural alignment, and institutional commitment. With continuous capacity building, clear governance structures, and long-term technical support, the intelligent web-based zakat management program has the potential to become a sustainable model for equitable and transparent zakat distribution in Kuantan Singingi.

CONCLUSION

This program provides a replicable model for community-based digital zakat management that combines technological innovation, participatory engagement, and local wisdom. With ongoing capacity building and institutional support, the intelligent web-based zakat management approach can contribute meaningfully to strengthening zakat governance and promoting social welfare in other regions with similar socio-cultural contexts.

Zakat management plays a crucial role in supporting social welfare and poverty alleviation; however, conventional practices often encounter problems related to data inaccuracy, limited transparency, and inefficiency in mustahik mapping and zakat distribution. This community service program aims to strengthen zakat governance through assistance in zakat management using an intelligent web-based application for mustahik mapping in Kuantan Singingi Regency. The program adopted an educational and participatory approach

involving mustahik, members of the Badan Amil Zakat Kuantan Singingi, and zakat practitioners.

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