

From Information Portals to Intelligent Governance: Public Value Creation through Generative AI Chatbots in Rural Indonesia

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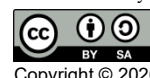
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Abstract

The digital transformation of rural governance remains constrained by limited access to public information and the predominance of passive digital platforms. While village websites have improved information dissemination, their capacity to support interactive and citizen-centred service delivery remains limited. This study develops and implements a generative AI-powered chatbot integrated into the official website of Srigonco Village, Indonesia, to enhance public service accessibility and administrative efficiency. Adopting a Design Science Research (DSR) approach, the study involved needs assessment, knowledge-base development, chatbot design, website integration, testing, and evaluation. The chatbot combines a structured village knowledge base with Large Language Model (LLM) capabilities to provide real-time information on population administration, public services, social assistance, health programs, and village regulations. Findings indicate that the chatbot improves information accessibility, standardises responses to routine inquiries, reduces administrative workload, and strengthens citizen engagement. The study contributes to the digital governance literature by demonstrating how generative AI can create public value and support inclusive, citizen-centred service delivery in rural communities.

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1. Introduction

Digital transformation has become a strategic priority for governments worldwide in response to increasing demands for more accessible, efficient, transparent, and citizen-centred public services. The rapid development of information and communication technologies (ICTs) has fundamentally altered how governments interact with citizens, deliver services, and create public value. Contemporary digital governance extends beyond the digitisation of administrative procedures and increasingly emphasises

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the integration of intelligent technologies that enhance responsiveness, inclusiveness, and citizen engagement (OECD, 2020; United Nations, 2024). Within this context, Artificial Intelligence (AI) has emerged as one of the most transformative technologies capable of reshaping public administration and supporting the evolution from conventional e-government towards intelligent governance.

In Indonesia, digital transformation has become an integral component of public sector reform at national, regional, and local levels. The implementation of e-government initiatives has expanded significantly in recent years, including within village administrations through various digital village programmes. Previous studies have demonstrated the importance of digitalisation in supporting regional economic development, strengthening food resilience, and alleviating poverty in rural communities (Wulandari et al., 2017; Soseco et al., 2024; Soseco et al., 2022). Village governments increasingly utilise websites and digital platforms to disseminate information regarding administrative procedures, development programmes, village regulations, financial transparency, and community activities. Despite these advancements, many village websites continue to function primarily as passive information repositories, providing limited opportunities for interactive communication and real-time service delivery (United Nations, 2024).

The limitations of conventional village information systems are particularly evident in the provision of routine administrative information. Citizens frequently require information regarding identity cards, family registration documents, domicile certificates, business permits, social assistance eligibility, public health services, educational programmes, and village regulations. Because these inquiries are often repetitive, village officials must devote substantial time and administrative resources to responding to routine requests. Such conditions create inefficiencies in public service delivery, particularly in rural communities where administrative capacity, technological resources, and human capital are often constrained. Furthermore, conventional face-to-face service delivery requires citizens to visit village offices during working hours, generating additional transportation costs, waiting times, and administrative burdens while limiting accessibility for elderly residents, individuals with disabilities, migrant workers, and people living in geographically remote areas.

Recent advances in Artificial Intelligence, particularly Natural Language Processing (NLP) and Large Language Models (LLMs), offer new opportunities for addressing these challenges. AI-powered conversational agents, commonly referred to as chatbots, are increasingly being deployed across public and private sectors to provide real-time information, automate routine services, and improve user experiences. Unlike conventional information retrieval systems, LLM-based chatbots are capable of understanding natural language, maintaining conversational context, interpreting diverse linguistic expressions, and generating contextually appropriate responses (Bommasani et al., 2021). These capabilities enable AI systems to provide more intuitive and personalised interactions while reducing the need for continuous human intervention.

The adoption of conversational AI in public administration has expanded rapidly across domains such as healthcare, taxation, higher education, municipal government, immigration services, and public information systems (Adamopoulou & Moussiades, 2020). Existing studies indicate that AI-powered chatbots can improve service accessibility, reduce response times, standardise information delivery, and alleviate administrative workloads while enhancing citizen satisfaction (Wirtz et al., 2019; Sun & Medaglia, 2019; Dwivedi et al., 2023). Furthermore, digital information services contribute to community welfare by reducing information asymmetry, lowering transaction costs, and improving citizens' ability to access public services efficiently (Sen, 1999; World Bank, 2021). For rural communities, where physical access to government services is often constrained by geographical distance and limited transportation infrastructure, conversational AI has considerable potential to strengthen inclusiveness and equity in public service delivery.

Despite growing scholarly interest in AI-enabled public services, existing research remains concentrated within urban government settings, healthcare systems, higher education institutions,

banking services, and commercial customer service environments (Adamopoulou & Moussiades, 2020). Comparatively little attention has been devoted to understanding how generative AI can support rural governance and village administration, particularly within developing-country contexts. In Indonesia, studies of village digitalisation have largely focused on website development, transparency initiatives, and e-government implementation, with limited examination of AI-driven interactive systems capable of supporting citizen engagement and routine administrative service delivery. Consequently, an important knowledge gap remains regarding how conversational AI can be integrated into village governance structures to improve public service accessibility while creating public value in resource-constrained rural settings.

From a theoretical perspective, this gap is particularly relevant because digital governance research increasingly emphasises the creation of public value through intelligent technologies. Public value creation involves improving citizens' access to services, strengthening participation, enhancing transparency, reducing administrative burdens, and increasing governmental responsiveness (Moore, 1997; Mergel et al., 2019). Understanding how generative AI contributes to these outcomes is essential for advancing contemporary discussions surrounding intelligent governance and responsible AI implementation within the public sector.

Against this background, this study develops and implements a generative AI-powered chatbot integrated into the official website of Srignonco Village, Malang Regency, Indonesia. Using a Design Science Research (DSR) approach, the study designs a chatbot supported by a structured village knowledge base containing information on population administration, public services, social assistance programmes, public health initiatives, village regulations, and community welfare services. The study seeks to demonstrate how conversational AI can transform village websites from passive information portals into interactive public service platforms capable of improving information accessibility, reducing administrative workloads, and strengthening citizen engagement.

Accordingly, this study contributes to the digital governance literature in two important ways. First, it extends existing knowledge regarding the application of generative AI within rural governance environments, where empirical evidence remains limited. Second, it demonstrates how AI-enabled conversational systems can support public value creation by improving accessibility, responsiveness, and inclusiveness in village-level public service delivery. Through this contribution, the study advances understanding of the role of intelligent technologies in fostering more citizen-centred and sustainable digital governance in rural communities.

2. Literature Review

Digital Transformation in Village Governance

Digital transformation has become a fundamental pillar of contemporary public administration, reshaping how governments design, deliver, and evaluate public services. Beyond the adoption of information and communication technologies (ICT), digital transformation encompasses organisational, managerial, and institutional changes that enable governments to become more efficient, transparent, responsive, and citizen-oriented (OECD, 2020; United Nations, 2024). Contemporary digital governance therefore extends beyond the traditional e-government paradigm, which primarily focused on digitising administrative processes, towards integrated digital ecosystems that emphasise service integration, citizen participation, inter-organisational collaboration, and public value creation (Mergel et al., 2019). Digital technologies are increasingly viewed as strategic instruments for strengthening

accountability, inclusiveness, transparency, and trust in public institutions while improving administrative performance and service quality.

Within developing countries, digital transformation has become an essential mechanism for addressing long-standing governance challenges, including limited administrative capacity, information asymmetry, bureaucratic inefficiencies, and unequal access to public services. Indonesia has actively promoted digital government initiatives at multiple levels of governance, including village administrations through digital village and smart village programs. The importance of village-level digitalisation extends beyond administrative modernisation because digital infrastructure also contributes to broader development outcomes, including economic growth, food resilience, and poverty reduction (Wulandari et al., 2017; Soseco et al., 2024; Soseco et al., 2022).

Village websites have emerged as one of the most common digital governance instruments used by local governments. These platforms provide information regarding administrative procedures, development planning, financial transparency, public announcements, village regulations, and community activities. However, despite their widespread adoption, many village websites continue to function primarily as static information repositories that provide one-way communication with limited opportunities for interaction, personalisation, or online service delivery (United Nations, 2024). Consequently, citizens frequently remain dependent on face-to-face communication and direct visits to village offices to obtain information regarding administrative procedures and public services.

This limitation creates challenges for rural communities where geographical distance, transportation constraints, and limited administrative resources can significantly hinder access to public services. Citizens often require information regarding population administration, business permits, civil registration, social assistance eligibility, health services, educational programs, and village regulations. Because these inquiries are repetitive and frequently requested, village officials devote substantial time to responding to routine questions, thereby reducing administrative efficiency and limiting opportunities to focus on more complex service demands.

The growing emphasis on citizen-centred governance suggests that digital platforms should evolve beyond passive information dissemination toward more interactive and responsive service models. Such transformation requires the integration of intelligent technologies capable of supporting real-time communication, personalised information retrieval, and continuous service accessibility. Within this context, Artificial Intelligence represents a promising technological innovation capable of enhancing the functionality of village digital infrastructure while supporting broader goals of inclusive digital governance.

Artificial Intelligence and Chatbots in Public Services

Artificial Intelligence (AI) has emerged as one of the most influential technologies driving the next generation of digital government. Recent developments in Natural Language Processing (NLP), machine learning, and Large Language Models (LLMs) have significantly expanded the ability of AI systems to understand, interpret, and generate human language. These advances have facilitated the development of conversational agents, commonly referred to as chatbots, capable of interacting with users in natural language while providing information and assistance in real time (Dwivedi et al., 2023).

Unlike conventional information retrieval systems that rely on keyword matching and hierarchical navigation structures, AI-powered chatbots can interpret diverse user expressions, maintain conversational context, and generate contextually appropriate responses. Contemporary LLM-based systems further enhance these capabilities by enabling more flexible, adaptive, and personalised interactions. Through natural language conversations, users can access information more intuitively without requiring specialised technical knowledge or familiarity with website structures (Adamopoulou & Moussiades, 2020; Dwivedi et al., 2023).

The application of AI chatbots has expanded rapidly across both public and private sectors. In public administration, conversational AI is increasingly employed to provide government information, automate routine administrative services, support citizen communication, and improve service accessibility. Previous studies indicate that chatbot implementation can reduce administrative workloads, improve consistency in information delivery, shorten response times, and enhance user satisfaction (Wirtz et al., 2019; Sun & Medaglia, 2019). Furthermore, AI systems offer the advantage of continuous service availability, allowing citizens to obtain information beyond standard office hours and thereby increasing service accessibility.

Despite these benefits, AI adoption within government settings also presents important challenges. Public sector organisations must address issues related to information accuracy, transparency, accountability, ethical governance, and public trust. The risk of generating inaccurate or misleading information remains particularly relevant for generative AI applications. Consequently, recent scholarship emphasises the importance of responsible AI governance, including human oversight, validated information sources, transparency mechanisms, and institutional safeguards to ensure service reliability and accountability (Bommasani et al., 2021; OECD, 2024).

The growing adoption of conversational AI reflects a broader transformation from conventional e-government toward intelligent government systems that combine human expertise with AI-supported decision assistance and service delivery. Rather than replacing public officials, AI applications increasingly function as complementary tools that enhance administrative capacity, automate repetitive processes, and improve service responsiveness while preserving human responsibility for complex administrative decisions (Mergel et al., 2019; United Nations, 2024).

Public Value Creation through Conversational AI

The concept of public value has become increasingly influential in digital governance research because it provides a framework for evaluating how technological innovations contribute to societal welfare beyond operational efficiency. Public value encompasses improved service accessibility, transparency, responsiveness, citizen participation, trust, and administrative effectiveness. Within digital governance, technological innovations are expected not only to improve internal government performance but also to generate meaningful benefits for citizens and communities (Mergel et al., 2019).

AI-enabled digital services contribute to public value creation through several mechanisms. First, conversational AI improves information accessibility by providing immediate access to public information through natural language interaction. This reduces barriers associated with navigating complex administrative systems and lowers transaction costs for citizens seeking government services. Second, AI systems improve administrative efficiency by automating responses to repetitive inquiries, allowing public officials to allocate more time to activities requiring professional judgment and personalised assistance. Third, continuous service availability promotes inclusiveness by enabling citizens to access information regardless of location or time constraints. These benefits are particularly significant within rural communities where physical access to government offices may be limited by geographical distance and transportation barriers (World Bank, 2021).

Conversational AI also contributes to citizen engagement by facilitating more interactive government-citizen communication. Traditional village websites typically provide one-way information dissemination, whereas AI chatbots enable two-way interactions that allow citizens to ask questions, clarify procedures, and obtain personalised information (See Table 1). Such interactions strengthen communication channels between governments and citizens while improving responsiveness and service quality.

Table 1. Public Value Mechanisms of AI-Supported Village Services

Public Value Dimension	Conventional Digital Services	AI-Supported Services
Accessibility	Limited to website navigation and office hours	24/7 conversational access
Responsiveness	Manual response processes	Real-time automated responses
Information Consistency	Dependent on individual staff	Standardised knowledge-based responses
Citizen Engagement	One-way communication	Interactive two-way communication
Administrative Efficiency	High routine workload	Automated routine information services
Digital Inclusion	Limited by digital literacy	Natural language interaction

Source: Adapted from the conceptual discussion and implementation findings in the study.

Research Gap and Conceptual Positioning

Although the literature on AI chatbots has expanded considerably, existing research remains concentrated within urban government services, healthcare systems, higher education institutions, banking, and commercial customer service environments (Adamopoulou & Moussiades, 2020). Comparatively little scholarly attention has been devoted to rural governance and village administration, particularly within developing-country contexts where administrative resources, technological infrastructure, and digital capabilities are often more constrained.

In Indonesia, studies of village digitalisation have primarily focused on website development, transparency initiatives, and e-government implementation. Limited research has examined the integration of generative AI into village governance systems or investigated how conversational AI can transform village websites from passive information portals into intelligent public service platforms. As a result, important questions remain regarding the ability of AI-enabled systems to strengthen citizen engagement, improve administrative efficiency, and create public value within rural governance settings.

This study addresses this gap by developing and implementing an AI-powered chatbot integrated into the official website of Srigonco Village, Indonesia. By combining a Large Language Model with a structured village knowledge base, the study demonstrates how conversational AI can support information accessibility, administrative efficiency, citizen engagement, and inclusive digital governance. In doing so, the study contributes to the emerging literature on intelligent governance and public value creation through AI-enabled public services in rural communities.

3. Methodology

Research Design

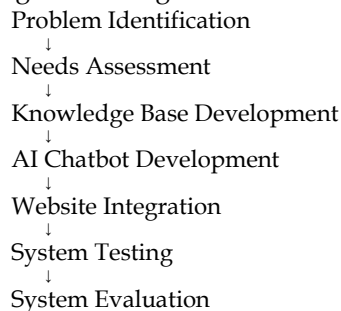
This study employed a Design Science Research (DSR) approach to develop and evaluate an Artificial Intelligence-powered chatbot integrated into the official website of Srigonco Village (See Figure 1). Design Science Research is widely recognised in information systems research because it focuses on the design, development, implementation, and evaluation of innovative artefacts that address practical problems while simultaneously contributing to scientific knowledge (Hevner et al., 2004; Peffers et al., 2007).

Consistent with DSR principles, the study followed six sequential stages: Problem Identification and Needs Assessment, Knowledge-Base Development, AI Chatbot Development, Website Integration, System Testing, System Evaluation, these stages enabled the systematic development of an intelligent digital service capable of addressing the information needs of village residents while ensuring alignment with administrative requirements and public service objectives.

Study Area

This study was conducted in Srignonco Village, Bantur District, Malang Regency, East Java, Indonesia. Srignonco Village has adopted digital governance through its official website as a platform for disseminating public information and supporting administrative communication. Despite this digital presence, most public services continued to rely heavily on conventional face-to-face interactions. Citizens frequently visited the village office to obtain information regarding population administration, social assistance programs, health services, and village regulations, resulting in repetitive inquiries and increased administrative workloads for village officials. These conditions created service accessibility challenges, particularly for residents unable to visit the village office during operating hours. Consequently, Srignonco Village provides an appropriate empirical setting for examining the integration of Artificial Intelligence into rural digital governance systems. The village also represents many Indonesian rural communities that have developed basic digital infrastructure but have not yet implemented intelligent public service technologies capable of supporting interactive service delivery.

Figure 1. Design Science Research Framework



Source: Adapted from Hevner et al. (2004) and Peffers et al. (2007) and implemented in the Srignonco Village chatbot development process.

Needs Assessment and Knowledge-Base Development

The first stage focused on identifying the information requirements of both village officials and community members. Data were collected through direct observation of village administrative services, semi-structured interviews with village officials, and analysis of frequently requested public information. The objective was to ensure that chatbot development addressed actual service demands rather than introducing technology without practical relevance.

The assessment revealed several categories of information that generated the highest frequency of citizen inquiries, including Population administration services, Identity card (KTP) requirements, Family registration documents (KK), Domicile certificates, Business certificates, Civil registration services, social assistance programs, Public health services, Posyandu programs, BPJS information, Stunting prevention programs.

Based on these findings, a structured knowledge base was developed to provide authoritative information for the chatbot. Information sources included village regulations, administrative service guidelines, organisational documents, public service directories, population administration requirements, government regulations, public health materials, and social assistance information (See Table 2). The knowledge base served as the primary source of verified information used during chatbot response generation.

Table 2. Knowledge Domains Incorporated into the Chatbot Database

Information Domain	Main Contents
Population Administration	KTP, KK, domicile certificates, business certificates
Civil Registration	Birth certificates and related procedures
Public Services	Administrative requirements and procedures
Social Assistance	Eligibility criteria and service information
Public Health	Posyandu, BPJS, stunting prevention
Village Regulations	Local regulations and governance information
Village Profile	Organisational structure and village information

Source: Developed from needs assessment findings.

AI Chatbot Development

The third stage involved the development of an AI-powered chatbot using a Large Language Model (LLM) integrated with Natural Language Processing (NLP) techniques to support conversational interactions in Bahasa Indonesia. The chatbot was designed to facilitate natural language communication between residents and the village information system while providing responses based exclusively on verified village information.

The system architecture consisted of four principal components: User Interface, Query Processing, Knowledge Retrieval, Response Generation (See Figure 2). When users submit questions through the website interface, the system preprocesses the input, identifies user intent, retrieves relevant information from the structured knowledge base, and generates context-aware responses through prompt-engineering techniques.

To improve response quality, system prompts were designed to ensure that the chatbot: Uses only verified village information. Avoids unsupported or speculative responses. Produces concise and understandable answers. Maintains consistency with official government procedures. Recommends contacting village officials when requested information is unavailable.

Website Integration and System Testing

Following chatbot development, the system was integrated into the official website of Srigonco Village using a web-based conversational interface. The chatbot was implemented as a floating chat widget embedded directly within the website. This approach allowed residents to access services through desktop computers, tablets, and smartphones without requiring application installation or user registration. The interface design followed user-centred design principles to maximise accessibility, usability, and ease of interaction (International Organization for Standardization [ISO], 2019; Norman & Berkrot, 2013).

Before public deployment, the chatbot underwent functional testing to verify system performance across multiple dimensions. Testing focused on: Intent recognition, Response generation, Knowledge retrieval accuracy, Interface functionality, Website integration, Response consistency, Error handling.

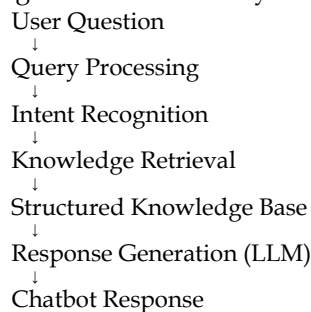
Representative user queries covering different categories of village administrative services were used to evaluate whether the chatbot generated accurate and relevant responses consistent with official village information. Identified errors were corrected through iterative refinement of prompts, retrieval mechanisms, and knowledge-base content before deployment.

System Evaluation

Following deployment, the chatbot was evaluated during its initial operational period using qualitative observations and stakeholder feedback. The evaluation focused on four primary dimensions: Accessibility, Accuracy, Efficiency, Usability.

These dimensions were selected because they directly reflect the primary objectives of digital public service innovation and intelligent governance. Accessibility refers to citizens' ability to obtain information conveniently through conversational interaction. Accuracy reflects the consistency and reliability of information generated from the structured knowledge base. Efficiency relates to reductions in repetitive administrative workloads, while usability concerns the ease with which residents interact with the chatbot interface.

Figure 2. AI Chatbot System Architecture



Source: Developed by the authors based on the chatbot architecture implemented in Srigonco Village.

The evaluation approach aligns with Design Science Research principles, where the effectiveness of an artefact is assessed according to its ability to address identified practical problems while generating broader implications for digital governance and public service innovation (Hevner et al., 2004; Peffers et al., 2007). The findings from this evaluation subsequently informed the assessment of the chatbot's contribution to information accessibility, citizen engagement, administrative efficiency, and public value creation within rural governance settings.

4. Results

Needs Assessment and Identification of Service Requirements

The development of the AI-powered chatbot began with a comprehensive needs assessment designed to identify the information requirements of both village officials and residents. This stage was essential to ensure that the proposed technological solution addressed actual administrative challenges and citizen information needs rather than merely introducing new digital technology. Consistent with User-Centred Design (UCD) principles, the assessment focused on understanding the most frequently requested information, existing service bottlenecks, and opportunities to improve public service accessibility through conversational Artificial Intelligence (ISO, 2019; Norman & Berkrot, 2013).

Observations and interviews revealed that a substantial proportion of routine administrative activities involved responding to repetitive inquiries related to population administration, civil registration, social assistance programmes, public health services, and village regulations. Residents frequently sought information concerning identity cards (KTP), family registration documents (KK), domicile certificates, business certificates, BPJS enrolment, Posyandu activities, stunting prevention programmes, and eligibility requirements for social assistance programmes. These inquiries typically required village officials to repeatedly explain identical procedures to different citizens, creating avoidable administrative burdens and reducing the time available for more complex service tasks.

The assessment also demonstrated that while the village website provided relevant information, users often experienced difficulties locating specific information because the platform relied on conventional menu navigation structures. Consequently, many residents continued to contact village officials directly or visit the village office to obtain information that was technically already available online. These findings confirmed the need for a conversational information system capable of improving information retrieval while reducing dependence on direct administrative assistance.

Development of the AI-Powered Chatbot

Following the needs assessment, a structured knowledge base was developed using authoritative village information sources. The knowledge base incorporated village regulations, administrative service guidelines, organisational documents, social assistance information, public health materials, and population administration requirements. This approach ensured that chatbot responses were generated from verified information sources rather than unrestricted internet content.

The chatbot was developed using a Large Language Model (LLM) integrated with Natural Language Processing (NLP) capabilities to support conversational interactions in Bahasa Indonesia. The system architecture enabled users to communicate using natural language rather than relying on predefined commands or rigid menu structures. When a question is submitted, the system processes the input, identifies user intent, retrieves relevant information from the structured knowledge base, and generates a context-aware response using prompt engineering techniques.

A critical feature of the system is the implementation of response safeguards designed to support responsible AI governance. To minimise the risk of hallucination and misinformation, the chatbot was configured to provide responses only when relevant information existed within the verified knowledge base. When requested information could not be verified, the system directed users to contact relevant village officials rather than generating speculative responses. This design supports information reliability while maintaining consistency with official government procedures.

Furthermore, the interface was designed according to user-centred design principles. The chatbot was implemented as a floating conversational widget capable of supporting continuous dialogue, enabling residents to ask follow-up questions and refine previous queries within a single interaction session. Such functionality significantly improves usability and lowers barriers to digital service adoption, particularly among users with varying levels of digital literacy.

Integration of the Chatbot into the Village Website

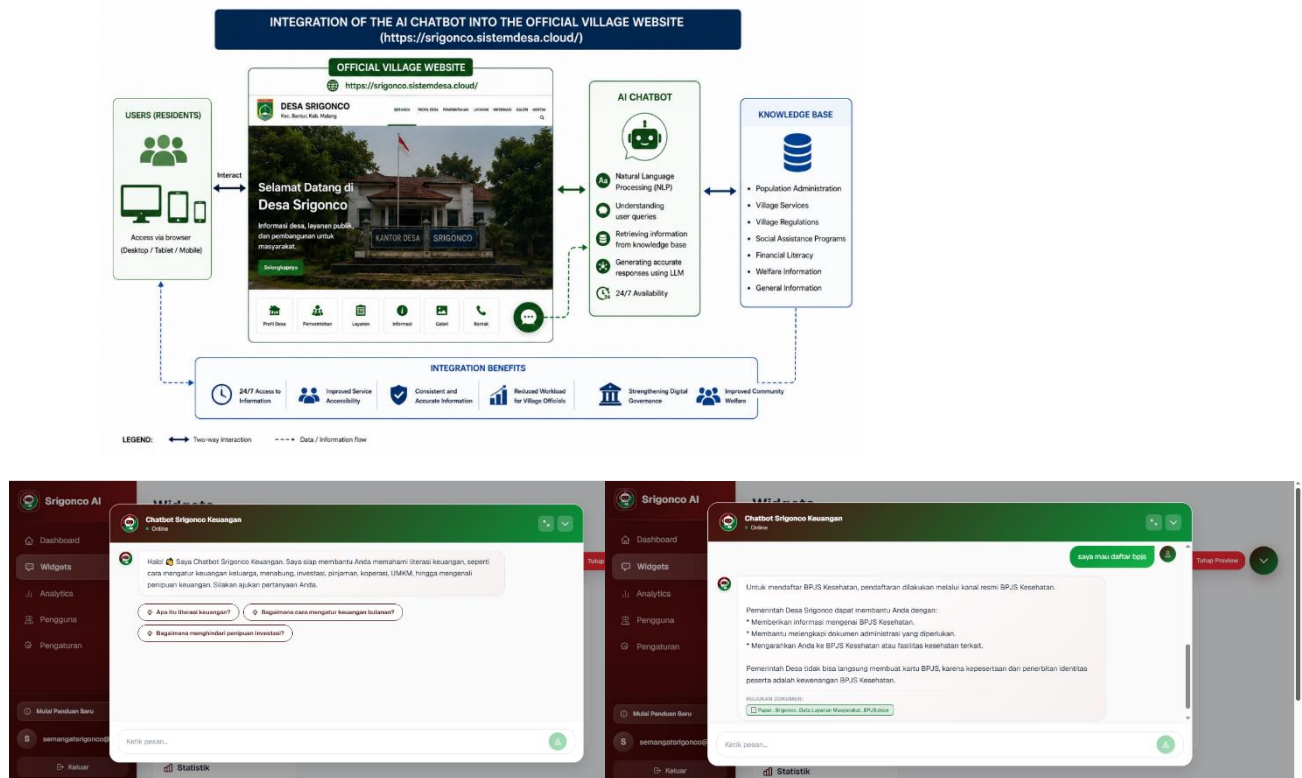
The developed chatbot was subsequently integrated into the official website of Srigonco Village as an embedded conversational service. Rather than functioning as a standalone application, the chatbot was designed to complement existing digital infrastructure while preserving users' familiarity with the village website (See Figure 3). This integration transformed the website from a conventional information repository into an interactive digital public service platform capable of providing real-time responses to citizen inquiries.

The chatbot interface was implemented as a floating conversational widget positioned on the website homepage. Because the system is web-based, residents can access the service directly using smartphones, tablets, laptops, and desktop computers without installing additional applications or creating user accounts. This design significantly broadens service accessibility while supporting digital inclusion among citizens with diverse technological capabilities and device preferences.

The integrated chatbot provides information across multiple administrative domains, including Population administration; Administrative procedures; Village regulations; Public health services; Social assistance programmes; Community empowerment initiatives; Village organisational information; and frequently asked questions (FAQs).

By consolidating these information services into a single conversational interface, the system eliminates the need for users to navigate multiple webpages and extensive administrative documents. Instead, residents can obtain information through simple natural-language questions, significantly improving the efficiency of information retrieval.

Figure 3. Example of Chatbot Interaction



Source: Developed by the authors

System Evaluation and Contribution to Public Services

The implementation results demonstrate the potential of conversational Artificial Intelligence to strengthen rural digital governance through improvements in information accessibility, administrative efficiency, service consistency, and citizen engagement (See Table 3). During initial deployment, the chatbot successfully delivered real-time information related to population administration, public services, public health programmes, village regulations, and social assistance initiatives through an intuitive conversational interface integrated into the official village website. Unlike conventional digital services that require users to navigate multiple menus and webpages, residents could obtain information simply by asking questions using everyday language. This substantially improved the user experience and reduced information-searching burdens. These findings are consistent with previous studies highlighting the growing contribution of conversational AI to accessibility and responsiveness in public services (Dwivedi et al., 2023; Wirtz et al., 2019).

From the perspective of village administration, the chatbot reduced repetitive administrative workloads by automating responses to frequently asked questions. Routine inquiries concerning document requirements, administrative procedures, public services, and programme eligibility could be answered immediately by the system, allowing village officials to allocate greater attention to activities requiring professional judgement, personalised assistance, and administrative decision-making. This redistribution of administrative effort aligns with the broader objectives of digital government, which seeks to automate routine processes while enabling public servants to focus on higher-value activities (OECD, 2020; United Nations, 2024).

The system also improved information consistency because responses were generated from a structured and verified knowledge base. Unlike conventional service provision, where information may vary depending on the staff member providing assistance, the chatbot delivered standardised information aligned with official village regulations and procedures. Such consistency reduces the risk of conflicting guidance and contributes to improved service reliability.

For residents, continuous service availability significantly enhanced accessibility. Information could be accessed beyond normal office hours without requiring physical visits to village offices. This capability is particularly important within rural communities where geographical distance, transportation costs, and work schedules may constrain access to government services. The chatbot therefore contributes not only to administrative efficiency but also to broader goals of digital inclusion and equitable access to public information.

Table 3. Comparison of Village Public Services Before and After Chatbot Implementation

Service Dimension	Conventional Service	AI-Supported Service	Expected Public Value
Information availability	Limited to office hours and manual website navigation	Available continuously (24/7) through conversational AI	Greater accessibility and service continuity
Information retrieval	Manual searching across webpages or direct consultation with staff	Natural language interaction through a single interface	Reduced search time and improved user experience
Response process	Manual responses by village officials	Automated responses for routine inquiries	Reduced administrative workload
Information consistency	May vary across individual staff	Standardised responses from verified knowledge base	Improved accuracy and reliability
Citizen accessibility	Face-to-face visits or manual web navigation	Accessible through smartphones, tablets, and desktop computers	Enhanced digital inclusion
Government–citizen interaction	One-way information dissemination	Interactive two-way communication	Stronger citizen engagement
Administrative efficiency	Staff time allocated to repetitive inquiries	Routine inquiries automated, allowing focus on complex cases	Better allocation of administrative resources

Source: Study findings.

Overall, the findings demonstrate that integrating a Large Language Model with a structured village knowledge base substantially extends the functionality of village websites beyond passive information dissemination. The chatbot establishes an interactive communication channel that strengthens citizen-government interaction, improves information accessibility, reduces administrative burdens, and supports more transparent, responsive, and inclusive village governance. Consequently,

the implementation provides a practical and scalable model for other rural communities seeking to accelerate digital transformation through intelligent public service innovation (Van Dijk, 2020).

5. Discussion

The findings demonstrate that the integration of a generative AI-powered chatbot into the Srigonco Village website represents more than a technological enhancement of existing digital infrastructure. Rather, it reflects a broader transition from conventional digital government toward intelligent governance, where Artificial Intelligence is employed to improve information accessibility, administrative responsiveness, and citizen engagement. The results indicate that the chatbot successfully transformed the village website from a passive information repository into an interactive public service platform capable of supporting real-time communication between government and citizens. This transformation is particularly important within rural governance settings, where administrative resources and service accessibility are often constrained by geographical, institutional, and technological limitations.

From the perspective of digital governance, the findings support the argument that technological innovation can contribute to more citizen-centred public services when designed around actual user needs rather than technological capabilities alone. The Design Science Research approach employed in this study ensured that chatbot development was grounded in the information requirements of both village officials and residents. Consequently, the system addressed practical governance challenges, particularly the need to provide timely, consistent, and accessible information regarding administrative procedures, social assistance programmes, public health services, and village regulations. This outcome aligns with contemporary digital governance frameworks that emphasise responsiveness, inclusiveness, and service accessibility as core objectives of public sector digital transformation (OECD, 2020; United Nations, 2024).

The study also contributes to the growing literature on conversational Artificial Intelligence in public administration. Previous research has demonstrated that AI-powered chatbots can improve service accessibility, reduce response times, and automate routine administrative interactions (Adamopoulou & Moussiades, 2020; Wirtz et al., 2019). The present findings extend this literature by demonstrating that such benefits are not limited to urban government agencies, higher education institutions, healthcare organisations, or commercial environments. Instead, the findings indicate that conversational AI can also generate meaningful benefits within rural governance contexts where administrative capacity is often more limited. The implementation in Srigonco Village suggests that generative AI technologies can support public service innovation even in relatively resource-constrained settings, provided that reliable digital infrastructure and structured knowledge resources are available.

An important contribution of the study concerns administrative efficiency. The findings indicate that the chatbot automated responses to frequently asked questions concerning population administration, public services, public health programmes, and social assistance eligibility. By reducing repetitive interactions, village officials were able to allocate greater attention to activities requiring professional judgement, community engagement, and complex administrative decision-making. This finding supports arguments advanced by Mergel et al. (2019) that Artificial Intelligence should be viewed as an augmentation technology rather than a replacement for public servants. In this case, the chatbot functioned as a complementary administrative tool that enhanced organisational capacity while preserving human oversight over critical governance functions.

The findings are also significant when interpreted through the lens of public value creation. Public value theory suggests that governmental innovations should be evaluated not only according to operational efficiency but also according to their ability to generate benefits for citizens and society. In the context of this study, the chatbot created public value through several mechanisms. First, it improved accessibility by enabling residents to obtain information at any time without visiting the village office. Second, it enhanced responsiveness by providing immediate answers to routine inquiries. Third, it improved consistency by delivering information based on a structured and verified knowledge base. Fourth, it strengthened citizen engagement through interactive communication that was previously unavailable on conventional village websites. Collectively, these outcomes demonstrate how generative AI can contribute to the creation of public value within rural governance systems.

Another important implication relates to digital inclusion. Rural communities frequently face barriers associated with distance, transportation costs, limited administrative resources, and unequal access to government services. The chatbot reduced several of these barriers by providing a web-based conversational interface accessible through smartphones, tablets, and computers. Because interactions occur through natural language, users are not required to possess advanced digital skills or detailed knowledge of website navigation structures. This finding supports previous studies suggesting that conversational AI can reduce information asymmetries and broaden participation in digital public services (World Bank, 2021). Consequently, the chatbot contributes not only to service efficiency but also to more equitable access to public information.

Despite these positive outcomes, the findings also highlight the importance of responsible AI governance. The study intentionally restricted chatbot responses to information contained within a verified village knowledge base to minimise the risk of misinformation and hallucinated outputs. This design choice reflects growing concerns regarding transparency, accountability, and information reliability in generative AI applications (Bommasani et al., 2021; OECD, 2024). The results suggest that successful implementation of AI within public administration requires not only technological capability but also governance mechanisms that ensure accuracy, institutional accountability, and citizen trust. Human oversight remains particularly important when addressing complex administrative cases, legal interpretations, or situations involving discretionary decision-making.

Overall, the findings demonstrate that the integration of generative AI into village governance can serve as a practical pathway toward intelligent governance. By combining conversational AI with structured local knowledge, the system enhanced accessibility, administrative efficiency, information consistency, and citizen engagement while supporting broader objectives of digital inclusion and public value creation. The study therefore extends existing knowledge regarding AI-enabled public services and provides empirical evidence of how intelligent technologies can support sustainable digital transformation in rural communities.

Policy Implications and Recommendations

The findings provide several important implications for policymakers seeking to accelerate digital transformation within rural governance systems. First, village digitalisation strategies should move beyond the development of static information websites toward intelligent service platforms that support interactive communication and real-time information delivery. Conversational AI offers a scalable mechanism for improving accessibility and administrative responsiveness without requiring substantial increases in human resources.

Second, successful implementation requires the establishment of structured and regularly updated knowledge bases containing verified administrative information. The effectiveness of generative AI in public services depends heavily on information quality, accuracy, and institutional oversight. Accordingly, local governments should develop governance protocols covering data management, content verification, system monitoring, and response validation.

Third, policymakers should integrate responsible AI principles into village digital governance frameworks. These principles should include transparency, accountability, privacy protection, human oversight, and mechanisms for handling inaccurate or incomplete responses. Such safeguards are essential for maintaining public trust and ensuring the ethical use of AI in public administration.

Finally, national and regional governments should consider developing technical assistance programmes that support the diffusion of AI-enabled public service innovations across villages. Standardised implementation guidelines, capacity-building initiatives, and shared technological infrastructure could facilitate wider adoption while reducing implementation costs. Through these measures, generative AI can become a strategic instrument for strengthening inclusive digital governance, improving public service accessibility, and promoting public value creation in rural communities.

6. Conclusion

This study demonstrates that the integration of a generative AI-powered chatbot into the official website of Srigonco Village represents a significant advancement in rural digital governance. Using a Design Science Research (DSR) approach, the study developed and implemented a conversational AI system supported by a structured village knowledge base containing information on population administration, public services, social assistance programmes, public health services, and village regulations. The findings indicate that the chatbot successfully transformed the village website from a passive information portal into an interactive public service platform capable of providing real-time, accessible, and consistent information to citizens.

The study further demonstrates that conversational AI can improve information accessibility, reduce repetitive administrative workloads, enhance service responsiveness, and strengthen citizen engagement within rural governance settings. By automating routine information services while maintaining human oversight for complex administrative matters, the chatbot supports more efficient and citizen-centred public service delivery. These outcomes highlight the potential of generative AI to create public value through improved accessibility, inclusiveness, responsiveness, and administrative effectiveness.

From a theoretical perspective, the study extends the emerging literature on intelligent governance by providing empirical evidence of how generative AI can support public value creation in resource-constrained rural environments. Practically, the implementation offers a scalable model for other villages seeking to strengthen digital transformation through AI-enabled public services. Nevertheless, future research should incorporate quantitative performance evaluation, user satisfaction measurement, and comparative cross-village analysis to further assess the long-term impacts of conversational AI on governance outcomes, citizen trust, and sustainable rural development.

References

- Adamopoulou, E., & Moussiades, L. (2020). An overview of chatbot technology. In *IFIP International Conference on Artificial Intelligence Applications and Innovations* (pp. 373–383). Springer International Publishing.
- Bommasani, R., Hudson, D. A., Adeli, E., Altman, R., Arora, S., von Arx, S., ... Liang, P. (2021). *On the opportunities and risks of foundation models*. arXiv. <https://arxiv.org/abs/2108.07258>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., ... Wright, R. (2023). Opinion paper: “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of

- generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 28(1), 75–105.
- International Organization for Standardization. (2019). *ISO 9241-210:2019 ergonomics of human-system interaction – Part 210: Human-centred design for interactive systems*. International Organization for Standardization. <https://www.iso.org/standard/77520.html>
- Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly*, 36(4), 101385. <https://doi.org/10.1016/j.giq.2019.06.002>
- Moore, M. H. (1997). *Creating public value: Strategic management in government*. Harvard University Press.
- Norman, D. A., & Berkrot, P. (2013). *The design of everyday things* (Vol. 272). New York: Basic books.
- OECD. (2020). *The OECD digital government policy framework: Six dimensions of a digital government*. OECD Publishing.
- OECD. (2024). *OECD framework for the governance of artificial intelligence in the public sector*. OECD Publishing.
- Peffer, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of Management Information Systems*, 24(3), 45–77. <https://doi.org/10.2753/MIS0742-1222240302>
- Sen, A. (1999). *Development as freedom*. Oxford University Press.
- Soseco, T., Hidayah, I., & Rini, A. D. (2022). Gender determinant on multidimensional poverty index: Evidence from Indonesia. *JSP: Jurnal Ilmu Sosial dan Politik*, 26(2), 137–151. <https://doi.org/10.22146/jsp.69320>
- Soseco, T., Hidayah, I., Cahayati, N., & Leksono, F. T. (2024). Access to technology to increase food resilience in rural households in Indonesia. *Economia Agro-Alimentare / Food Economy: An International Journal on Agricultural and Food Systems*, 26(1), Article 5, 1–27. <https://doi.org/10.3280/ecag2024oa16358>
- Sun, T. Q., & Medaglia, R. (2019). Mapping the challenges of artificial intelligence in the public sector: Evidence from public healthcare. *Government Information Quarterly*, 36(2), 368–383. <https://doi.org/10.1016/j.giq.2018.09.008>
- United Nations. (2024). *United Nations e-government survey 2024: Accelerating digital transformation for sustainable development*. United Nations.
- Van Dijk, J. A. G. M. (2020). *The digital divide and the COVID-19 pandemic*. United Nations. <https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/The-Digital-Divide-and-the-Covid-19-Pandemic-1.pdf>
- Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2019). Artificial intelligence and the public sector: Applications and challenges. *International Journal of Public Administration*, 42(7), 596–615. <https://doi.org/10.1080/01900692.2018.1498103>
- World Bank. (2021). *World development report 2021: Data for better lives*. World Bank.
- Wulandari, D., Witjaksono, M., Soseco, T., & Narmaditya, B. S. (2017). The development of productive economy cluster through Siparti 3-S and Triple Helix in Lumajang, Indonesia. *International Journal of Economics and Financial Issues*, 7(2), 25–31.