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Integrating Village Digitalization and Health Interventions: Inclusive Transformation in Paddinging Village, South Sulawesi

Eljihad Akbari Syukriah Mathory [1*], Juniarto Matasak [2], Nabila Rhamadani [3], Sumayyah HR [4], Moh. Dava Fudail Pontoh [5]

[1*,2,5] Public Sector Business Administration Study Program, Politeknik STIA LAN Makassar, Makassar City, South Sulawesi Province, Indonesia

[3] Apparatus Human Resource Management Study Program, Politeknik STIA LAN Makassar, Makassar City, South Sulawesi Province, Indonesia

[4] State Development Administration Study Program, Politeknik STIA LAN Makassar, Makassar City, South Sulawesi Province, Indonesia

Email: eljihad.asm@stialanmakassar.ac.id [1*], juniartosuppulangi@gmail.com [2], nabilarmhdani77@gmail.com [3], sumayyahhrr@gmail.com [4], brunomatoy@gmail.com [5]

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Abstract

This study aims to address the digital technology gap and the high prevalence of stunting in Paddinging Village, South Sulawesi, through an integrated community service program combining village digitalization and public health intervention. The significance of this initiative lies in its potential to serve as a replicable model for inclusive and sustainable village development, particularly in underdeveloped, frontier, and outermost (3T) areas across Indonesia. A qualitative participatory approach was employed, utilizing observation, semi-structured interviews, training, direct demonstrations, and active coordination with village officials, local youth, Posyandu cadres, and community members. Three main programs were implemented: (1) the creation of a Google Sites-based village website to enhance public information transparency and service accessibility; (2) QRASPIRASI, a QR code-based digital suggestion box system using Google Forms to strengthen citizen participation and government responsiveness; and (3) a stunting prevention intervention through nutrition education, toddler growth monitoring, and healthy food cooking demonstrations in collaboration with Posyandu cadres and Puskesmas health workers. The key findings demonstrate that the village website successfully improved access to public information and governance transparency, QRASPIRASI effectively facilitated two-way communication between residents and the village government with faster documented responses, and the stunting program enhanced parental knowledge of balanced nutrition and early detection of at-risk toddlers. These findings imply that an integrative model combining digital transformation and community health intervention is effective in promoting participatory, transparent, and sustainable village development, and can be adapted for other regions facing similar challenges in alignment with the Sustainable Development Goals and the national village digitalization agenda.

Keywords:
Village Digitalization; QRASPIRASI; Stunting Prevention; Community Participation; Community Service.

1. INTRODUCTION

Village development in the era of the Industrial Revolution 4.0 increasingly demands the integration of digital technology to improve the efficiency, transparency, and participatory quality of public services. In the context of community service, village digitalization is not merely a technological transition, but also a strategic effort to strengthen local governance, expand citizen access to information, and improve the quality of social

services. This issue is highly relevant in Indonesia, where villages play a central role in public administration, community empowerment, and local development. However, despite the growing discourse on digital transformation, the digital divide remains a major challenge, particularly in rural and 3T (underdeveloped, frontier, and outermost) areas, including Paddinging Village, South Sulawesi.

A central component of village digitalization is the establishment of information systems capable of supporting public administration. Such platforms facilitate rapid and accurate delivery of demographic data while enabling systematic management of population records through integrated digital processing (Fatimah, S., & Yulianto, E., 2022). More broadly, digital village initiatives extend beyond mere data management to encompass public transparency ensuring community-accessible information and enhanced delivery of public and social services through information and communication technology (Yulianto, A., & Rokhman, A., 2021). Together, these dimensions confirm that village digitalization carries both administrative and democratic significance.

Although digital-based information technology is expected to improve public services through the Village Digitalization program, implementation in practice has not fully met expectations. Significant structural barriers remain. According to data published by the Ministry of Communication and Information of the Republic of Indonesia, out of 83,218 villages and sub-districts, 12,548 still do not have access to 4G internet services (Prasasti, 2022). In addition, Dedy Permadi, Special Staff of the Minister of Communication and Information, reported that out of more than 500,000 public service centers, around 150,000 still lack adequate internet access. These figures demonstrate that infrastructure inequality continues to constrain the effectiveness of digital transformation programs, especially in remote villages. Beyond infrastructure, other challenges include the limited availability of digital devices and the low level of digital literacy among rural communities.

In Paddinging Village, these challenges are especially evident in governance and digital innovation for public engagement. Community participation in village development a cornerstone of transparent and accountable governance remains constrained by the absence of effective communication channels. Currently, residents submit complaints and suggestions through physical suggestion boxes or village officers, methods that tend to be sluggish, poorly documented, and insufficiently responsive (Setiyono, B., 2020). Digital suggestion boxes represent a promising avenue for overcoming these barriers. Studies on e-participation tools demonstrate that online platforms can widen citizens' access to public discourse, reduce information asymmetry, and enhance governmental responsiveness (Wirtz, B. W., Becker, I., & Weyerer, J. C., 2021). Practical experience in Indonesia reinforces this view: the LAPOR! complaint platform deployed in Sleman Regency cut average government response time from seven days to two days (Kominfo, 2022). These outcomes underscore the strategic value of digital participation tools in strengthening rural governance.

Concurrently, Paddinging Village confronts a pressing public health concern: stunting affects 25% of toddlers, a figure notably above the national average of 21.6%. Persistent stunting carries severe long-term ramifications for children's physical growth, intellectual capacity, and lifetime economic contribution (Victora, et al 2008). Key contributing factors in the village include insufficient parental understanding of balanced nutrition, limited access to nutrient-dense foods, and inadequate awareness of regular growth monitoring through Posyandu. Nutritional support during the critical first 1,000 days of life is broadly recognized as the most impactful preventive strategy against stunting (Ministry of Health of the Republic of Indonesia, 2023). Accordingly, village development in the digital era must address not only governance modernization but also health education and preventive interventions supported by digital means.

Existing studies have discussed village information systems, public transparency, digital participation, and stunting prevention separately. However, there is still a gap in the literature and in community service practice regarding integrated interventions that combine village digitalization, citizen participation, and public health improvement in one rural setting. In particular, few community service initiatives have explored how digital tools such as village information systems and digital suggestion boxes can be simultaneously utilized to improve administrative services, strengthen participatory governance, and support stunting prevention in underserved villages. This gap is especially relevant in villages like Paddinging, where technological limitations and public health vulnerabilities coexist.

Based on this context, the main problem addressed in this study is how a community service initiative can support village digital transformation in Paddinging Village while also addressing low community participation and the high prevalence of stunting. More specifically, this study seeks to answer the following questions: How can digital-based public service innovations improve the efficiency and transparency of village administration? How can digital suggestion boxes strengthen citizen participation and responsiveness in local governance? And how can digital community empowerment, involving youth and health cadres, contribute to stunting prevention efforts?

Accordingly, the main objective of this study is to describe and analyze a community service initiative in Paddinging Village that integrates digital village development with participatory governance and stunting prevention. This study specifically aims to: (1) strengthen village administrative services through digital information systems; (2) promote more effective community participation through the introduction of a digital suggestion box; (3) increase digital literacy and youth involvement in village digital transformation; and (4) support stunting prevention through community education and collaboration with village health cadres.

Through these objectives, the study expects to demonstrate how digital innovation can be adapted to rural conditions in a practical and community-centered manner.

The significance of this study lies in its potential contribution to the field of community service and rural development. Academically, it enriches the discussion on integrated village digitalization by linking public administration, civic participation, and public health intervention. Practically, it offers a contextual model for villages facing similar challenges of limited digital infrastructure, weak participatory mechanisms, and persistent health problems. The initiative also highlights the strategic role of universities in supporting government priorities related to sustainable village transformation and stunting reduction. In addition, the involvement of youth as digital facilitators and village website operators shows how local human resources can become key actors in sustaining digital innovation at the village level.

This paper is organized as follows. The methodology section explains the design of the community service program, the location and participants involved, the stages of implementation, and the methods of data collection and evaluation. The results section presents the main findings from the implementation of the digital village initiatives and stunting prevention activities in Paddinging Village. The discussion section analyzes the implications of these findings in relation to village digitalization, participatory governance, and rural public health. Finally, the conclusion summarizes the major findings and provides recommendations for future community service programs and further research.

2. METHOD

2.1. Research Design

This study employed a qualitative participatory community service approach with descriptive analysis to examine the implementation of an integrated village empowerment program in Paddinging Village, South Sulawesi. The method was chosen because the main objective of the study was not only to document program implementation, but also to understand how digitalization initiatives and public health interventions were introduced, adapted, and accepted by the local community. A qualitative design was considered appropriate because it allows the researchers to explore field conditions, community needs, stakeholder responses, and implementation processes in depth.

The community service activities were structured around a participatory model, integrating field observation, semi-structured interviews, capacity-building training, practical demonstrations, and sustained coordination across multiple village stakeholder groups. This design aligns with community empowerment principles that prioritize responsiveness to local needs, civic engagement, and long-term sustainability. Methodologically, it reflects the understanding that village digitalization encompasses not only technology adoption but also public transparency and the enhancement of social services through information and communication technology ((Yulianto, A., & Rokhman, A., 2021).). Furthermore, the approach recognizes that effective digital information systems in village administration require organized, stakeholder-inclusive data management processes (Fatimah, S., & Yulianto, E. ,2022).

2.2. Population and Sample

The participants in this study consisted of the main community groups directly involved in the implementation of the programs in Paddinging Village. These included:

a. Village government officials, such as the village head and administrative staff, who were involved in identifying public information needs, providing institutional support, and receiving training on website and complaint management.
b. Local youth, who were involved as prospective village website operators and facilitators of digital transformation.
c. Posyandu cadres and health workers from the Puskesmas, who participated in the implementation of stunting education, growth monitoring, and health counseling activities.
d. Village residents, especially parents and caregivers of toddlers, who became the main target group for stunting prevention education and also users of digital public service innovations.

A purposive sampling strategy was applied, with participants selected based on their specific relevance to program objectives. In practice, this meant that village officials (including the village head and four administrative staff members) were engaged because of their direct authority over governance functions and public service delivery. Ten local youth aged 18–30 was recruited based on their demonstrated interest in technology and their availability to serve as sustained operators of digital platforms. Eight Posyandu cadres and three health workers from the local Puskesmas were involved on account of their established roles in child health monitoring and community outreach. Approximately 35 parents and caregivers of toddlers aged 0 – 59 months were enrolled as the primary beneficiaries of the stunting prevention component, identified through coordination with Posyandu cadres. This selection process ensured that each participant group contributed meaningfully to one or more program objectives while allowing the team to gather diverse perspectives on community needs and implementation outcomes.

2.3. Data Collection Method

Data were collected using several techniques to ensure a comprehensive understanding of the implementation process.

2.3.1. Observation

Direct observation was conducted at the village office, Posyandu activities, and strategic public locations in the village. Observation was used to identify existing conditions, assess public information needs, map the placement of QR Codes, and monitor community participation during program implementation. This method helped researchers understand the social and technical context of the village, including the accessibility of digital tools and the level of public engagement.

2.3.2. Semi-structured Interviews

Interviews were conducted with the village head, village officials, local youth, Posyandu cadres, and community members. These interviews aimed to identify community needs, institutional readiness, and expectations regarding digital public services, digital suggestion boxes, and stunting prevention programs. Semi-structured interview guidelines were used so that the research team could maintain consistency while still allowing participants to express their perspectives openly.

2.3.3. Training and Demonstration Documentation

Data were also collected through documentation of training sessions and practical demonstrations. In the digitalization program, the team documented website training for village officials and youth, as well as socialization regarding website access and QRASPIRASI usage. In the stunting program, documentation covered educational sessions, healthy food cooking demonstrations, and child growth monitoring activities.

2.3.4. Program Records and Digital Forms

For the QRASPIRASI program, the digital complaint form created through Google Form served as both an intervention tool and a source of data regarding citizen participation. Likewise, the village website content and its use as a digital information platform became part of the implementation record. Health-related data from toddler growth checks, such as weight and height, were also recorded to support the educational intervention.

The use of multiple methods allowed for data triangulation, which strengthened the credibility of the findings by comparing information obtained from different sources and activities.

2.4. Research Procedure

The study was conducted in several sequential stages to ensure systematic implementation of the three main programs.

2.4.1. Preliminary Observation and Coordination

The first stage involved initial observation in Paddinging Village and coordination with village stakeholders. The research team visited the village office and communicated with the village head and officials to identify community problems, administrative service needs, and opportunities for digital innovation. Similar coordination was also carried out with Posyandu cadres and health workers to identify child health issues, particularly related to stunting.

2.4.2. Needs Identification

Based on observations and interviews, the team identified three priority issues: 1) The need for digital-based village information services, 2) The need for a more effective and documented channel for community aspirations, and 3) The need for stunting prevention education and intervention for parents and toddlers.

2.4.3. Program Development and Implementation

2.4.3.1. Digitalization of Information and Services through Village Website

The team designed a simple and accessible village website based on information gathered from village officials. The website was built using Google Site to suit local technical conditions and ensure ease of future management. Initial content included village profiles, public service information, village activity news, and documentation. To improve access, a QR Code linked to the website was created and installed in strategic locations such as the village office, ronda post, and announcement boards. The program concluded with training for village officials and local youth on how to update the website content independently, followed by socialization to the wider community.

2.4.3.2. QRASPIRASI – Village Digital Suggestion Box Innovation

The second program focused on strengthening citizen participation through a QR Code-based digital suggestion box. Following discussion with village officials, the team designed an online form using Google Form that contained columns for aspirations, criticism, and suggestions. The form was converted into a QR

Code and placed in strategic public areas. Community socialization was then carried out to explain how to scan and use the QR Code, while village officials received training on how to monitor and respond to incoming submissions. This initiative was grounded in the principle that digital participation platforms can extend citizens' access to public expression and elevate the transparency of governance responses (Wirtz, B. W., Becker, I., & Weyerer, J. C., 2021). It also drew on documented outcomes from digital complaint systems in Indonesia, such as the LAPOR! platform in Sleman Regency, which demonstrably accelerated government response time (Kominfo, 2022).

2.4.3.3. Stunting Management and Prevention for Healthy Toddlers

The third program addressed stunting through direct education and practical intervention. Educational sessions were conducted for parents and caregivers on balanced nutrition, exclusive breastfeeding, complementary feeding, and immunization, in collaboration with Posyandu cadres and Puskesmas health workers. The team also organized cooking demonstrations featuring affordable and locally available nutritious food ingredients. This practical activity aimed to improve both knowledge and household-level skills in child feeding. Furthermore, toddler growth and development examinations were conducted together with Posyandu cadres, with measurements of weight and height recorded to determine nutritional status. Based on these results, parents received personalized information and recommendations. Leaflets containing nutrition and parenting guidance were distributed to support continued learning at home. This intervention is especially critical given the lasting developmental consequences of stunting on children's growth, cognitive capacity, and economic prospects (Victora, et al 2008), as well as the pivotal importance of adequate nutrition within the first 1,000 days of life (Ministry of Health of the Republic of Indonesia, 2023).

2.4.3.4. Monitoring and Follow-up

After implementation, the team monitored the use of the website and QRASPIRASI system and evaluated participant involvement in the stunting education activities. Follow-up coordination with village officials, youth, and health cadres was conducted to encourage continuity after the formal community service period ended.

2.5. Data Analysis Techniques

All collected data underwent descriptive qualitative analysis following Miles, Huberman, and Saldaña's (2014) interactive model of qualitative data analysis. Data from observations, interview transcripts, field notes, digital documentation, and program records were systematically organized and classified according to the three major program themes: village website digitalization, QRASPIRASI implementation, and stunting prevention activities. Thematic coding was applied to identify recurring patterns, enabling structured interpretation of findings across data sources. The analysis process involved the following steps:

a. Data reduction: selecting and focusing on relevant field data related to implementation processes, stakeholder participation, and early outcomes.
b. Data categorization: grouping data into thematic categories such as digital access, public participation, administrative service support, nutritional education, and community response.
c. Interpretation: examining patterns and relationships among findings to understand how each intervention responded to local needs and contributed to village empowerment.
d. Triangulation: comparing findings across observations, interviews, training documentation, and field records to improve the trustworthiness of the analysis.
e. This analytical approach was intended to produce a contextual understanding of how community service interventions functioned in practice and how they addressed the identified village problems.

2.6. Ethical Considerations

This study paid attention to ethical principles throughout the implementation process. Prior to conducting interviews, training, and health-related activities, the research team obtained permission and approval from the village government and coordinated with relevant local actors, including Posyandu cadres and health workers. Participants were informed about the purpose of the activities and their role in the program.

Confidentiality was maintained by presenting the findings in aggregate and descriptive form, without exposing sensitive personal information. For the QRASPIRASI system, participants were encouraged to submit aspirations in a respectful and constructive manner, and access to the submitted forms was limited to authorized village officials and the program team. In the stunting intervention, children's growth data were used only for educational and advisory purposes, and parents were informed directly about their children's results.

The participatory nature of the study also ensured that activities were conducted with respect for local needs, local authority, and community values.

2.7. Methodological Limitations

Several limitations should be acknowledged in this methodology. First, the study was conducted in a single village, which may limit the generalizability of the findings to other rural settings with different social, economic, and technological conditions. Second, as a community service-based qualitative study, the emphasis

was placed on process description and contextual understanding rather than on measuring impact through statistical methods. Third, the success of digital initiatives such as the village website and QRASPIRASI may be influenced by external factors such as internet connectivity, access to smartphones, and the digital literacy level of residents, which remain uneven in many rural areas (Prasasti, 2022). Fourth, the stunting intervention was educational and preventive in nature, so its long-term impact on reducing stunting prevalence could not be fully measured within the short implementation period.

To minimize these limitations, the study used multiple data collection methods, involved diverse stakeholders, and emphasized sustainability through training and local capacity building. The inclusion of village officials, youth, health cadres, and residents also helped strengthen the relevance and practical validity of the findings.

3. RESULTS AND DISCUSSION

The implementation of community service activities in Paddinging Village, South Sulawesi, produced significant outcomes across three integrated program areas: village service digitalization through an official website, the strengthening of citizen participation through the QRASPIRASI digital suggestion box system, and stunting prevention intervention for toddlers and their families. This section presents the main findings from each program, interprets them in light of existing literature and the research objectives, and discusses their practical and theoretical implications.

3.1. Digitalization of Information and Services through the Village Website

3.1.1. Findings and Implementation Outcomes

The village digitalization program resulted in the successful creation and launch of an official village website for Paddinging Village, developed using the Google Sites platform. Prior to the intervention, the community had no digital access to official public information. After implementation, the website became an active medium providing village profiles, government structure information, public service details, news, announcements, and documentation of village activities. The website also serves as a digital promotional platform for local economic potential, including MSMEs, agricultural products, and tourism assets. The implementation process followed seven systematic stages:

a. Observation and Needs Identification: Coordination with village officials to determine information and service needs.
b. Website Design: Structuring and designing a simple, informative, and user-friendly layout.
c. Website Creation: Building the website using Google Sites, considering technical capacity and sustainability.
d. Initial Content Filling: Populating the website with village profile data, service information, and activity documentation.
e. QR Code Creation and Placement: Producing QR codes linked to the website and installing them at strategic locations including the village office, meeting hall, and ronda posts.
f. Website Management Training: Providing training for village officials and local youth on independent content updating.
g. Community Socialization: Educating residents on how to access and use the website as an official information source.

The QR code installation strategy proved particularly effective in bridging the digital divide by allowing community members to access the website without requiring high technical skills (Okonkwo, 2020; Saputra, 2022). The front page of the official village website is shown in Figure 1.

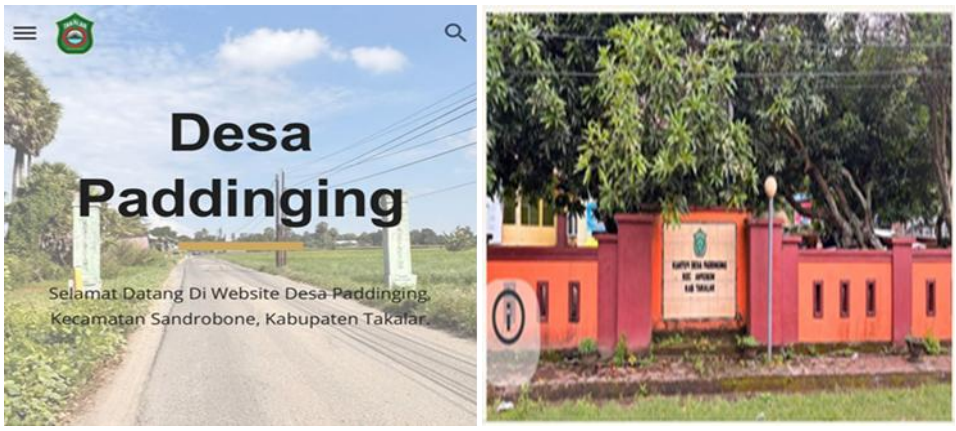

Figure 1. Front Page of the Paddinging Village Website

3.1.2. Discussion

The results of this program align with the principles of open government and e-governance, which emphasize transparency, accountability, and efficiency in village-level public services (Meijer, 2016). The creation of a digital information platform that is freely accessible to all residents represents a fundMeijer, A., & Bolívar, M. P. R. (2016) mental shift in how the village government communicates with its constituents.

The selection of Google Sites as the development platform reflects a carefully considered approach to sustainability and ease of management, particularly in a context where technical capacity is limited. This decision is in accordance with the broader challenge acknowledged in Indonesia, where, according to data from the Ministry of Villages and Disadvantaged Regions Development, only approximately 14,000 out of more than 74,000 villages have utilized village funds for digital initiatives. The program thus contributes to narrowing this gap at the local level.

The training of village youth as website operators aligns with digital capacity-building frameworks that position younger generations as natural facilitators of technology adoption. This outcome is consistent with studies by Karimaliana et al. (2025), who demonstrated that cultivating local digital skills is a decisive factor in the sustained success of e-government programs in rural and remote areas. By embedding website management competencies within the local youth population, the program establishes an enduring foundation for digital governance that persists beyond the formal community service period.

Furthermore, the potential of the website to serve as a digital marketing platform for local MSMEs aligns with the Indonesian government's vision of encouraging village-based MSMEs to go digital, as reflected in national e-commerce development initiatives. The program thus contributes not only to governance transparency but also to economic empowerment at the community level. The integration of public information and economic promotion functions within a single platform demonstrates the multi-dimensional value of village website initiatives.

3.2. QRASPIRASI: Strengthening Village Government Participation and Responsiveness

3.2.1. Findings and Implementation Outcomes

The QRASPIRASI program, also referred to as SIPADDE (Paddinging Village Complaint Information System), successfully established a QR code-based digital suggestion box system using Google Forms. Within one month of implementation, the system actively collected citizen aspirations covering various aspects of village governance and services. The follow-up rate demonstrated by village officials showed a significantly faster and more documented response compared to the previously used manual suggestion box method. The implementation followed four key stages:

a. Needs Identification and Village Approval: Discussion with village officials to determine requirements and obtain institutional support.
b. Digital Form Creation: Designing a Google Form with fields for aspirations, criticisms, and suggestions.
c. QR Code Creation: Converting the form link into a printable QR code.
d. Socialization of Use: Educating residents on how to scan the QR code and submit their aspirations, and training village officials on how to monitor and respond to submissions.

QR codes were installed in strategic public spaces frequented by residents, including the village office, meeting hall, and ronda posts. This placement strategy reflects a deliberate understanding of village community mobility and social interaction patterns. The digital suggestion box is shown in Figure 2.

Figure 2. QRASPIRASI Digital Suggestion Box

3.2.2. Discussion

The QRASPIRASI program demonstrates the practical application of e-participation principles at the village governance level. The program is positioned at what may be described as the consultation level of participation, wherein community members provide input that is considered in village government decision-making. This is consistent with the e-participation framework in e-government, where digital platforms create two-way communication channels between the state and its citizens.

The success of the system in gathering citizen input aligns with the growing body of evidence on e-participation tools, which demonstrates that well-designed digital platforms can broaden the range of voices in governance, reduce informational barriers, and improve the accountability of governmental responses (Wirtz, B. W., Becker, I., & Weyerer, J. C., 2021). The QRASPIRASI system parallels the outcomes recorded for the LAPOR! platform in Sleman Regency, where average government response time dropped from seven days to two days (Kominfo, 2022), further validating the practical effectiveness of digital complaint mechanisms within Indonesian local governance.

An important social dimension of the system is its potential to overcome the "silent majority" phenomenon, wherein community members who were previously reluctant to express opinions directly, due to social or psychological barriers, can now participate more comfortably through digital and anonymous means (Macintosh, 2004). This expands the inclusivity of local democracy and creates space for more representative input in village development planning.

The involvement of youth as digital champions and technical assistants in this program reflects established innovation diffusion principles, which identify community facilitators and early adopters as pivotal drivers of technology uptake within social groups (Fatimah, S., & Yulianto, E. ,2022). By positioning youth as active intermediaries, the program accelerated community comfort with the digital participation system and reinforced conditions for its long-term continuity.

From the perspective of responsive governance, the QRASPIRASI system enables the village government to conduct near real-time monitoring of emerging community concerns. Aspiration data collected can function as an early warning mechanism for potential social tensions and as evidence-based input for bottom-up development planning. However, a notable limitation is the absence of village-specific regulations that formally integrate the QRASPIRASI system into official decision-making mechanisms such as the Village Deliberation (Musrenbangdes) process. This regulatory gap represents a key challenge that must be addressed for the system to achieve its full potential as a structural feature of participatory governance. To realize this potential, village governments should formalize the system through a village regulation (peraturan desa) or official decree that mandates its use as a recognized aspiration channel, obligates officials to respond within a defined timeframe, and requires submission data to be reviewed in Musrenbangdes forums. Without such institutional anchoring, the system risks remaining a supplementary tool rather than a structural driver of inclusive governance. Future collaboration between local governments, universities, and village communities should therefore prioritize policy advocacy alongside technical implementation to ensure lasting integration.

3.3. Stunting Prevention Intervention: Toddler Health as a Priority

3.3.1. Findings and Implementation Outcomes

The stunting prevention and management program involved direct community health education, practical nutrition demonstrations, and toddler growth monitoring in collaboration with Posyandu cadres and Puskesmas health workers. The intervention was carried out through the following activities:

a. Nutrition Education and Counseling: Interactive sessions for parents and caregivers on balanced nutrition, exclusive breastfeeding, complementary feeding practices, and immunization schedules. The counseling and education sessions are documented in Figure 3.
b. Healthy Food Cooking Demonstration: Practical demonstrations of preparing nutritious meals using affordable and locally available ingredients, as illustrated in Figure 4.
c. Toddler Growth and Development Examination: Measurements of weight and height conducted with Posyandu cadres, followed by determination of nutritional status and personalized advice for each family.
d. Distribution of Educational Materials: Leaflets containing nutritional guidelines and parenting advice for toddlers were distributed to support continued learning at home.

Figure 3. Stunting Prevention Counseling Session

Figure 4. Healthy Food Cooking Demonstration

The program demonstrated measurable outcomes in terms of improved parental knowledge of child nutrition, increased engagement with Posyandu services, and the identification of toddlers at nutritional risk for targeted follow-up. The food-based approach using local ingredients and the strengthening of Posyandu cadres as sustainability agents were identified as key success factors (Torlesse, 2016).

3.3.2. Discussion

The stunting intervention program was developed in direct response to the elevated stunting prevalence of 25% in Paddinging Village, which exceeds the national benchmark of 21.6%. This disparity highlights the urgency of targeted nutritional action, particularly in light of the compounding long-term consequences of chronic undernutrition for children's development and future socioeconomic participation (Victora, et al 2008).

The program's emphasis on the First 1,000 Days of Life (HPK) is consistent with evidence-based recommendations for stunting prevention as endorsed by WHO and the Ministry of Health of the Republic of Indonesia (2023), which recognize this critical period as the most effective window for nutritional intervention. The multi-component approach combining counseling, practical demonstration, and growth screening reflects

the integration of Bandura's Social Cognitive Theory, which emphasizes learning through observation and hands-on practice as effective strategies for behavioral change.

The collaboration with Posyandu cadres as implementing partners and sustainability agents is a strategically sound choice, given their established role in Indonesia's community health infrastructure. Torlesse, (2016) noted that with more than 1.5 million community health workers (kader) nationwide, they are positioned at the forefront of the government's stunting eradication program targeting the year 2030. Their legitimacy, community trust, and deep understanding of local conditions make them indispensable actors in sustaining public health interventions beyond the community service period.

The use of locally available ingredients in the cooking demonstration draws upon the food-based approach emphasized in the Scaling Up Nutrition (SUN) global framework. This strategy ensures that the nutritional interventions provided are not only educationally sound but also economically accessible and culturally acceptable, thus maximizing the likelihood of behavioral adoption at the household level. The principle of behavioral modeling, wherein parents observe and replicate healthy food preparation practices, supports long-term dietary behavior change.

The growth screening component of the program contributed to early detection of toddlers at risk of stunting, enabling timely and personalized intervention before nutritional deficits become irreversible. This aligns with the public health principle of prevention, which prioritizes early detection and proactive responses. Furthermore, increasing maternal knowledge and self-efficacy in child feeding practices has been documented as a significant protective factor against stunting, as mothers who understand nutritional principles are better equipped to make informed dietary decisions for their children.

3.4. Supporting and Hindering Factors of the Program

3.4.1. Supporting Factors

Several factors contributed to the overall success of the three programs:

a. Enthusiasm of village youth and officials in engaging with and managing digital technology (Yulianto, A., & Rokhman, A., 2021), which ensured active involvement in both website management and QRASPIRASI facilitation.
b. Support from Posyandu cadres and Puskesmas health workers in implementing the child nutrition and health programs (Ministry of Health of the Republic of Indonesia, 2023), which gave the stunting intervention both credibility and community acceptance.
c. Needs-based program design that involved all local stakeholders from the planning stage, ensuring that the programs were contextually relevant and aligned with actual community priorities.

3.4.2. Hindering Factors

Despite the overall success, several challenges were identified:

a. Unstable internet connectivity in parts of the village area, which hampered regular website content updates and limited consistent usage of the QRASPIRASI system (Prasasti, 2022).
b. Low digital literacy among elderly residents, who required additional face-to-face guidance and could not independently use digital platforms (Setiyono, B., 2020).
c. Absence of formal village-level regulations that would institutionalize QRASPIRASI as part of official participatory mechanisms such as Village Deliberation forums, limiting its structural integration into governance processes.

These challenges reflect the systemic barriers to rural digital transformation identified in the broader literature. According to data from the Ministry of Communication and Information, 12,548 villages and sub-districts across Indonesia still lack 4G internet access (Prasasti, 2022), underscoring that connectivity infrastructure remains a critical prerequisite for sustainable village digitalization. These limitations do not negate the program's achievements but highlight the need for complementary policy interventions at the national and regional levels.

3.5. Integrated Program Outcomes as Indicators of Success

The three programs collectively produced measurable and observable outcomes that serve as indicators of successful implementation.

Table 1. Program Outcomes

Program	Key Outcomes
Village Website Digitalization	Website actively used and independently managed by village officials and youth; QR codes accessible at strategic public locations
QRASPIRASI Digital Suggestion Box	Citizen aspirations captured digitally; village government response documented and faster than manual methods
Stunting Prevention Intervention	Increased parental knowledge of nutrition; early detection of at-risk toddlers; improved Posyandu engagement

These outcomes provide empirical support for the argument that an integrative model combining digital transformation with public health intervention is effective in promoting inclusive, empowered, and sustainable village development (Antlöv, 2016; Yusuf, 2015).

The synergy among the three programs created a multiplier effect: the village website can serve as a long-term platform for health education and information dissemination, while the QRASPIRASI system has the potential to function as a monitoring and feedback channel for community-based health programs such as Posyandu activities. This convergence between digitalization and public health strengthens the argument that holistic village development requires integrated, multi-sectoral approaches rather than isolated interventions.

3.6. Implications and Recommendations

3.6.1. Practical Implications

The findings of this community service initiative have several important practical implications. First, the success of the village website and QRASPIRASI programs demonstrates that digital public service innovations can be adapted to low-resource rural environments when they are designed with local technical capacity, community habits, and infrastructure constraints in mind. The use of accessible platforms such as Google Sites and Google Forms, combined with QR code deployment strategies, provides a replicable model for village digitalization in similar 3T contexts across Indonesia.

Second, the involvement of local youth as digital facilitators and content operators offers a sustainable solution to the challenge of institutional capacity in rural digital transformation. This human resource-centered approach should be prioritized in future village digitalization programs, alongside infrastructure development. Critically, sustainability requires not only initial training but also structured, ongoing capacity-building cycles. Village governments and partner institutions are encouraged to establish a regular training schedule at minimum once every six months covering website content management, QRASPIRASI monitoring, and digital literacy for newly appointed village staff. Without continued support, the risk of digital initiative abandonment after the community service period remains high, particularly when trained youth move to other areas or assume different roles.

Third, the stunting prevention intervention demonstrates that community-level health education, when delivered through trusted local partners such as Posyandu cadres and contextualized with locally available resources, can effectively improve parental knowledge and practice. This approach is both cost-effective and culturally appropriate, making it scalable to other villages with comparable challenges.

3.6.2. Theoretical Implications

Theoretically, the findings reinforce the view that village digitalization represents a social and institutional transformation process—one that demands participatory design, multi-stakeholder engagement, and sustained capacity building (Yulianto, A., & Rokhman, A., 2021). The study also advances scholarly discourse on e-participation in local governance by demonstrating that accessible digital tools, when properly socialized and embedded within institutional structures, can meaningfully deepen civic engagement in rural communities.

3.6.3. Limitations

Several limitations of this study should be acknowledged. First, the program was implemented in a single village, which constrains the generalizability of findings to other rural contexts with different socioeconomic, geographic, and cultural characteristics. Second, the evaluation of program outcomes was primarily qualitative and observational, without a control group comparison or longitudinal follow-up. As a result, long-term impacts, particularly regarding stunting prevalence reduction, cannot be fully assessed within the scope of this study. Third, the digital tools used in the programs depend on external platforms whose data security and sovereignty implications have not been fully examined, raising concerns for long-term development (as noted in the discussion of QRASPIRASI).

3.6.4. Recommendations for Further Research

Future research should prioritize longitudinal evaluations of village digitalization programs to rigorously measure sustained impact on governance transparency, citizen participation, and public health outcomes over time. Ideally, such studies would track the same villages across a minimum period of two to three years following program completion, measuring key indicators such as website update frequency, QRASPIRASI submission and response rates, Posyandu attendance trends, and changes in stunting prevalence. This would allow researchers to distinguish genuine behavioral change from short-term novelty effects associated with program presence. Studies with larger, multi-village samples are equally important, as they would enable comparative analysis across different geographic, socioeconomic, and infrastructural contexts, thereby producing findings that are more generalizable beyond the 3T village setting. A comparative design covering villages at different stages of digital readiness could also reveal which program components produce the most consistent results. Additionally, research examining the role of formal regulation in institutionalizing digital participation tools such as QRASPIRASI within village governance structures would be valuable for informing policy. Finally, further investigation into context-specific strategies for improving digital literacy among

elderly and low-literacy populations is needed to ensure that rural digital transformation is truly inclusive and leaves no community member behind.

4. CONCLUSION

This community service program in Paddinging Village, South Sulawesi, demonstrates that an integrated approach combining village digitalization, citizen participation, and public health intervention can effectively respond to rural development challenges in the era of the Industrial Revolution 4.0. The main findings show that the three implemented programs produced meaningful results. First, the village website successfully improved access to public information, increased transparency, and opened opportunities to promote local village potential such as MSMEs, agriculture, and tourism. Second, the QRASPIRASI system proved effective in strengthening citizen participation by providing a more accessible, responsive, and documented channel for public complaints and aspirations. Third, the stunting prevention program improved parents' knowledge of child nutrition, strengthened collaboration with Posyandu cadres, and supported early detection and preventive action for toddlers at risk of stunting.

These findings have important implications both practically and academically. Practically, they confirm that affordable, accessible digital tools such as Google Sites, Google Forms, and QR Codes can be adapted to rural settings when grounded in community participation, youth engagement, and local institutional support. The results further indicate that village digitalization should extend beyond administrative modernization to address broader social objectives, including participatory governance and community health outcomes. Academically, this study enriches the scholarly discussion on village digital transformation by demonstrating that governance innovation and public health intervention can be unified within a single community service framework. This is consistent with the recognition that village digitalization encompasses not only digital information management (Fatimah, S., & Yulianto, E. ,2022), but also public transparency and innovative service delivery (Yulianto, A., & Rokhman, A., 2021).

Based on these findings, several recommendations can be proposed. Future practice should strengthen the sustainability of village digitalization through regular training for village officials and youth, especially in website management and digital complaint handling. There is also a need for village-level regulations or formal mechanisms that integrate QRASPIRASI into official village deliberation and decision-making processes. In the health sector, stunting prevention efforts should be continued through regular nutrition education, Posyandu strengthening, and the use of village digital platforms as media for health promotion. In addition, stakeholders such as local governments, universities, and health institutions should continue collaborating to ensure that digital and health interventions are maintained over time.

This study also has several limitations. The program was conducted in only one village, so the findings cannot be generalized directly to all rural contexts in Indonesia. The analysis mainly relied on qualitative and descriptive observations, which means that long-term quantitative impacts, especially on stunting reduction and sustained digital participation, could not yet be fully measured. In addition, infrastructure limitations such as unstable internet access and uneven digital literacy remain important constraints that may affect the scalability of the program.

Overall, this study provides valuable evidence that integrated community service can become an effective and replicable model for addressing multiple village challenges simultaneously namely limited digital public services, weak citizen participation, and persistent public health burdens. The experience in Paddinging Village demonstrates that when communities are meaningfully engaged from the planning stage through to implementation and monitoring, digital and health initiatives are more likely to be adopted, sustained, and adapted to local conditions. Participatory planning, local capacity building, and cross-sector collaboration among village governments, universities, and health institutions are therefore not merely supportive factors but essential prerequisites for inclusive village development. Importantly, the replicability of this model depends on adapting its core principles community co-ownership, youth empowerment, and institutional partnership to the specific social, geographic, and infrastructural contexts of each target village rather than transplanting the program wholesale. These findings offer a practical and academically grounded reference for future community service initiatives, regulatory frameworks, and further research on rural digitalization and community health in Indonesia.

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REFERENCES

Antlöv, H., Wetterberg, A., & Dhesai, L. (2016). Village funds, local democracy, and rural development in Indonesia. Rural Sociology, 81(3), 434–455. https://doi.org/10.1111/ruso.12109

Aridiyah, F. O., Rohmawati, N., & Ririanty, M. (2015). Faktor-faktor yang mempengaruhi kejadian stunting pada anak balita di wilayah pedesaan dan perkotaan. Pustaka Kesehatan, 3(1), 163–170.

Badan Pusat Statistik. (2022). Statistik telekomunikasi Indonesia 2022. BPS RI. https://www.bps.go.id

Dwiyanto, A. (2021). Mewujudkan good governance melalui pelayanan publik (3rd ed.). Gadjah Mada University Press.

Fatimah, S., & Yulianto, E. (2022). Pengembangan kapasitas digital aparatur desa dalam mendukung e-government di daerah terpencil. Jurnal Ilmu Administrasi Publik, 10(1), 45–58.

Hardjaloka, L. (2014). Studi penerapan e-government di Indonesia dan negara lainnya sebagai solusi pemberantasan korupsi di sektor publik. Jurnal Rechtsvinding, 3(3), 435–452. http://dx.doi.org/10.33331/rechtsvinding.v3i3.35

Kementerian Kesehatan Republik Indonesia. (2022). Pedoman pelaksanaan kader posyandu dalam percepatan penurunan stunting. Kemenkes RI. https://www.kemkes.go.id

Kementerian Kesehatan Republik Indonesia. (2023). Buku saku hasil studi status gizi Indonesia (SSGI) 2022. Kemenkes RI. https://www.kemkes.go.id

Kementerian Komunikasi dan Informatika RI. (2022). Laporan tahunan infrastruktur digital Indonesia 2022. Kominfo RI. https://www.kominfo.go.id

Macintosh, A. (2004). Characterizing e-participation in policy-making. In Proceedings of the 37th Annual Hawaii International Conference on System Sciences. IEEE. https://doi.org/10.1109/HICSS.2004.1265300

Margawati, A., & Astuti, A. M. (2018). Pengetahuan ibu dalam pemberian makan dan status gizi balita stunting di wilayah perkotaan. Media Medika Indonesiana, 52(2), 82–89.

Meijer, A., & Bolívar, M. P. R. (2016). Governing the smart city: A review of the literature on smart urban governance. International Review of Administrative Sciences, 82(2), 392–408. https://doi.org/10.1177/0020852314564308

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook (3rd ed.). SAGE Publications.

Muhyiddin, M., & Nugroho, H. (2021). A year in review: COVID-19 and the future of digital transformation in Indonesia. Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning, 5(1), 1–7. https://doi.org/10.36574/jpp.v5i1.159

Nurmandi, A., & Kim, S. (2015). Making e-procurement work in a decentralized procurement system: A comparison of three Indonesian cities. International Journal of Public Sector Management, 28(3), 198–220. https://doi.org/10.1108/IJPSM-03-2014-0044

Setiyono, B. (2020). Inovasi pelayanan publik berbasis digital di pemerintahan daerah Indonesia. Jurnal Ilmu Sosial dan Ilmu Politik, 23(3), 201–215. https://doi.org/10.22146/jsp.48761

Torlesse, H., Cronin, A. A., Sebayang, S. K., & Nandy, S. (2016). Determinants of stunting in Indonesian children: Evidence from a cross-sectional survey indicate a prominent role for the water, sanitation and hygiene sector in stunting reduction. BMC Public Health, 16(1), 669. https://doi.org/10.1186/s12889-016-3339-8

Victora, C. G., Adair, L., Fall, C., Hallal, P. C., Martorell, R., Richter, L., & Sachdev, H. S. (2008). Maternal and child undernutrition: Consequences for adult health and human capital. The Lancet, 371(9609), 340–357. https://doi.org/10.1016/S0140-6736(07)61692-4

Wirtz, B. W., Becker, I., & Weyerer, J. C. (2021). Antecedents of digital government: An empirical analysis of citizen perceptions. Public Administration Review, 81(6), 1130–1142. https://doi.org/10.1111/puar.13369

Yulianto, A., & Rokhman, A. (2021). Implementasi teknologi informasi dalam tata kelola pemerintahan desa di era digital. Jurnal Kebijakan Publik, 12(2), 112–124.