

Mapping the Landscape of E-Government Research in Village Governance: Trends, Challenges, and Opportunities

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Abstract: This study aims to map the development and research trends of e-government in village governance. The research method applied is a systematic literature review using 538 scientific articles from the Scopus database published between 2019 and 2024. The review was conducted using bibliometric analysis processed through R-Studio (Biblioshiny) and Tableau applications. The study results revealed a steady increase in publication trends, the formation of multiple author collaboration networks, and the identification of key thematic clusters such as digitalization, public service delivery, governance frameworks, trust, and technology adoption. The thematic evolution analysis also demonstrated the emergence of new research areas, including blockchain, cybersecurity, and participatory governance. The limitation of this study is that the articles used are only sourced from the Scopus database, which may not fully represent the broader landscape of global research on village-level e-government. Future research needs to incorporate scientific articles from other reputable international databases, such as Web of Science and Dimensions Scholars, to provide a more comprehensive understanding of the evolving discourse in this field.

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INTRODUCTION

In recent years, e-government has become a transformative force in public sector innovation, enabling governments at different administrative levels to improve transparency, efficiency and citizen engagement (Razak et al., 2024). Although much scholarly attention has been paid to e-government initiatives at the national and municipal levels, the implementation of e-government in village or rural governments is still an area of interest (Kolopaking et al., 2022). Village governments, especially in developing countries, serve as the closest administrative unit to citizens, where public service delivery, administrative efficiency, and local development intersect directly (Nurlinah & Haryanto, 2020). The integration of digital technologies at the village level offers significant potential to improve service accessibility, administrative transparency, and participatory governance, but at the same time faces challenges related to resource constraints, digital literacy gaps, and infrastructure gaps (Wang & Tang, 2023).

Several recent studies offer insight into this developing field. For example, (Mukhsin et al., 2018) provided a bibliometric analysis of digital transformation in village financial management, noting significant growth but a lack of structured frameworks for village-

level finance digitalization (Yuhefizar et al., 2024), conducted a case study using the UTAUT model on a smart-village initiative in West Sumatra, revealing persistent challenges in digital literacy and cultural adaptation (Manapa Sampetoding & ER, 2024), performed a systematic review of digital transformation in smart villages, highlighting common themes but also emphasizing regional disparities and scant focus on governance mechanisms. Furthermore, recent macro-level analyses in China show digital village initiatives are positively correlated with improvements in public services and rural revitalization (Mao et al., 2024). These studies underscore both the rapid growth in research and the fragmented, domain-specific focus of existing work.

Despite these contributions, no prior study has systematically mapped the intellectual structure and thematic development of e-government in village governance through a combined bibliometric and systematic literature review (SLR) (Mukti et al., 2022). While bibliometric analyses have been conducted for national-level e-government and rural tourism, and SLRs have focused on e-governance frameworks, a consolidated, dual-method review centered on village-level governance remains absent (Lubis et al., 2024). Our research fills this gap by offering the first integrated bibliometric–SLR study in this specific niche, uncovering thematic clusters, identifying influential authors and institutions, and highlighting research directions uniquely pertinent to village administration (Lestari et al., 2023; Martins et al., 2024).

This study addresses the following research questions: (1) What are the publication trends, lead authors, and collaboration networks in village-level e-government research? (2) What thematic clusters and research gaps emerge from keyword emergence and systematic literature synthesis? We used bibliometric methods with the help of R-Studio application combined with SLR guided by PRISMA, analyzing peer-reviewed research from Scopus database from 2019 and 2024. Our contributions include: a comprehensive mapping of intellectual trends; identification of emerging themes and unexplored areas; and an actionable research agenda that aims to strengthen theory, improve policy frameworks, and advance digital governance practices at the village level.

RESEARCH METHOD

This study uses a combination of bibliometric analysis and systematic literature review (SLR) to comprehensively map the intellectual structure, research trends, and emerging themes (Lawelai & Nurmandi, 2024), related to e-government in village governance. The bibliometric approach enables quantitative and objective mapping of scientific literature by analyzing publication patterns, citation networks, and keyword occurrence (Gautam, 2019). Meanwhile, systematic literature reviews offer a qualitative synthesis of the content, ensuring that thematic depth and contextual insights are systematically captured (Kraus et al., 2020; Purssell & McCrae, 2024). The integration of these two methods is widely recognized to produce robust knowledge mapping, especially in emerging research fields where the literature is still fragmented (Katsurai & Ono, 2019; Trujillo & Long, 2018). R-Studio enables advanced statistical and network analysis through tools like Bibliometrix, while Tableau provides interactive visualizations for clearer insights. Combined, they ensure rigorous analysis and effective communication of bibliometric findings (Karaca & Kilcan, 2023). This combination is also

suitable for identifying influential authors, emerging topics, and research gaps that can inform future theory development and policy recommendations.

The data for this study were retrieved exclusively from the Scopus database, given its comprehensive coverage of high-quality, peer-reviewed publications across multiple disciplines. The search was conducted using the following query string: TITLE-ABS-KEY ("E-Government") OR TITLE-ABS-KEY ("Village Governance") AND PUBYEAR > 2019 AND PUBYEAR < 2024 AND (LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all")). This search strategy was designed to ensure that only relevant, peer-reviewed journal articles written in English from the field of Social Sciences and published between 2019 and 2024 were included. The focus on journal articles (document type: "ar") ensures scientific rigor and excludes content that has not been peer-reviewed such as conference proceedings, book chapters, or editorials. Open access filtering was applied to improve data accessibility and reproducibility. The following figure shows the process flow of including and excluding through the prism work flow process on the Scopus database.

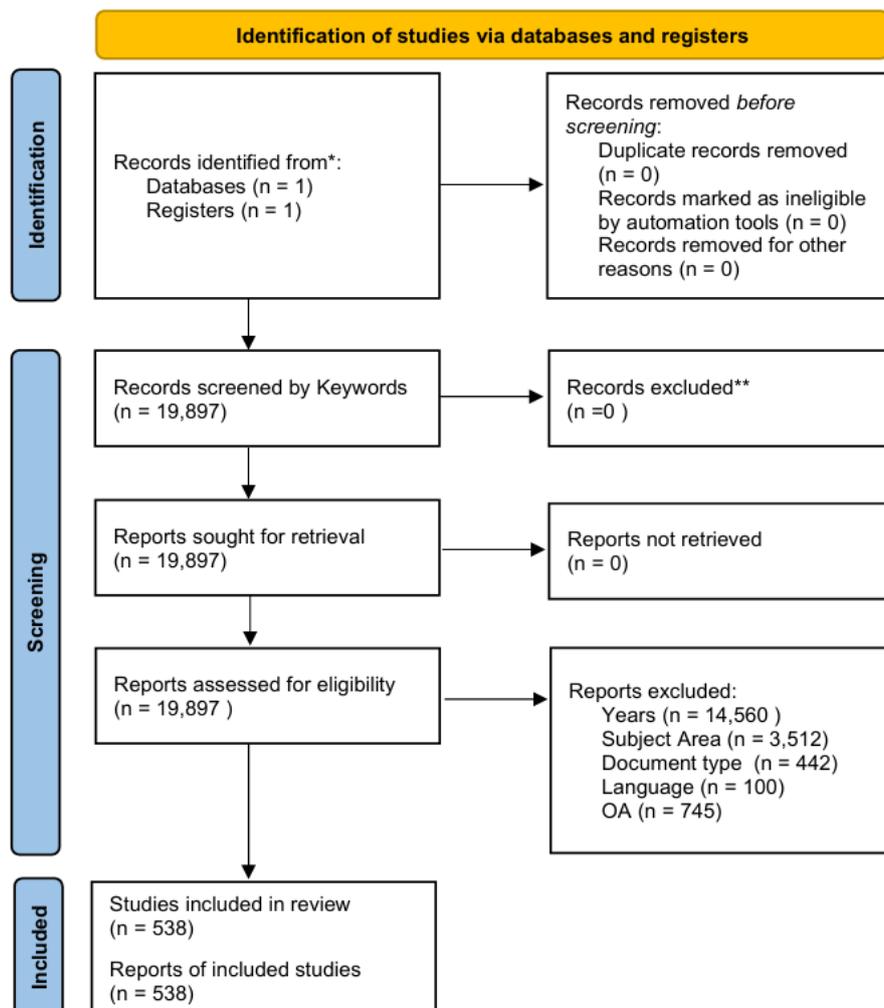


Figure 1. Process Flowchart of Prisma

Source: Created by the author

RESULTS AND DISCUSSION

Main Information

The initial descriptive analysis provides an overview of the dataset used in this study (Decastro-García et al., 2019). This includes basic bibliometric indicators such as the total number of articles, sources (journals), authors, collaboration index, and annual scientific production (Rejeb et al., 2023). These main information metrics offer a foundational understanding of the size, growth, and general characteristics of the research landscape on e-government in village governance, serving as a starting point for deeper bibliometric and thematic analysis in the following sections.

Key information from the bibliometric analysis in Figure 2 shows that during the 2019-2024 period, a total of 538 documents related to e-government and village governance have been published in 227 journal sources. The field showed a healthy annual growth rate of 13.3%, indicating increased scholarly attention. These publications involved 1,509 authors, with an average of 3.11 co-authors per document, and 27.51% of the publications were the result of international collaboration, reflecting moderate global research engagement. The dataset includes 1,731 unique author keywords and cites a total of 30,644 references, with an average document age of 3.16 years. Each article received an average of 15.24 citations per document, indicating a relatively strong citation impact for a specialized and emerging research field.



Figure 2. Main Bibliometric Indicators of E-Government and Village Governance Research (2019–2024)

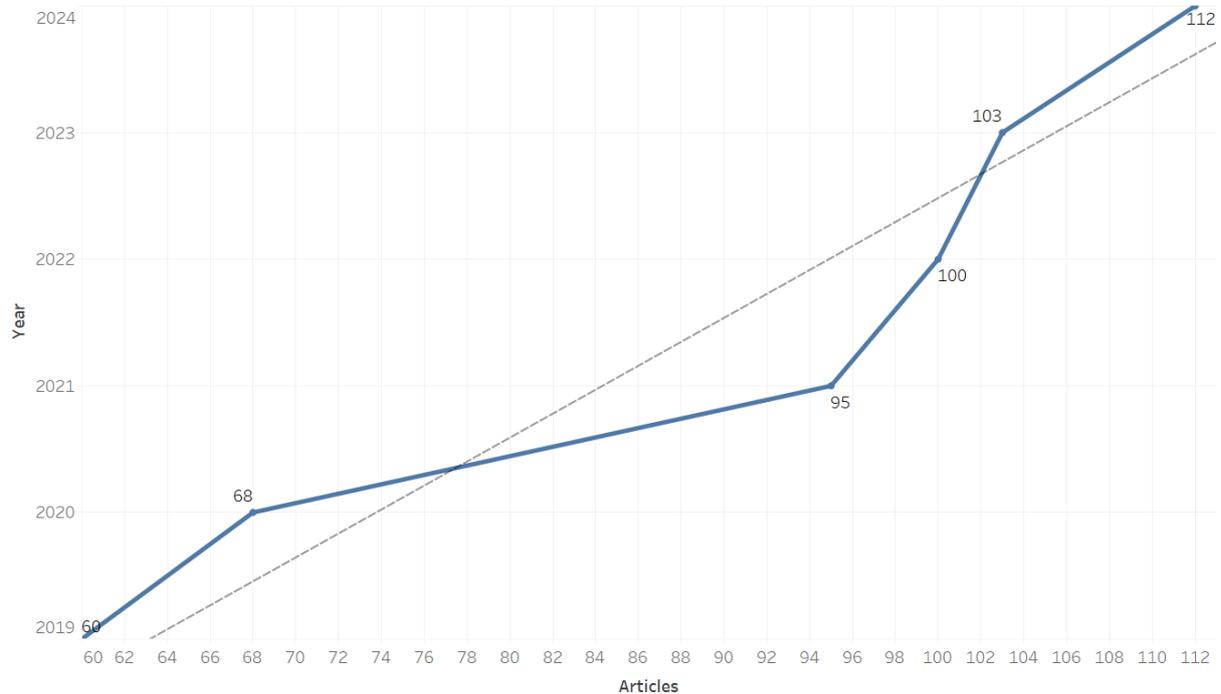
Source: Created Using R-Studio

Publication Trends

Publication trend analysis provides an initial overview of the growth and development of academic interest in the field of e-government in village governance (Lubis et al., 2024). By analyzing the distribution of annual publications, it is possible to observe how academic attention to this topic has evolved over time, reflecting broader technological, policy, and social shifts (Syahputra et al., 2022). The following section presents the dynamics of publications from 2019 to 2024 based on the Scopus-indexed dataset, highlighting research productivity patterns, emerging interests, and potential future directions in this field.

The annual publication trend from 2019 to 2024 in Figure 3 shows consistent and significant growth in research related to e-government and village governance. Starting with 60 articles in 2019, the number of publications gradually increased to 68 in 2020

and 95 in 2021. Significant increases occurred in subsequent years, reaching 100 articles in 2022, 103 in 2023, and peaking at 112 articles in 2024. This upward trend reflects growing academic interest and the relevance of digital governance at the village level, particularly in response to the global digital transformation agenda and the increasing need for public service innovations tailored to local conditions.



The trend of sum of Articles for Year.

Figure 3. Main Bibliometric Indicators of E-Government and Village Governance Research (2019–2024)

Source: Created Using Tableau

Author and Collaboration Networks

Identifying prolific authors and analyzing collaboration networks provides valuable insights into the key contributors and institutional partnerships that shape the development of e-government research in village governance (Fan et al., 2020; Hu et al., 2020). Collaboration patterns reflect the level of scientific cooperation and the existence of a growing research community, while author productivity highlights individual contributions and leadership in the field (Stracqualursi & Agati, 2024). This section presents the most productive authors, co-authorship patterns, and institutional or international collaboration networks resulting from bibliometric analysis.

The analysis of author collaboration in Figure 4 shows a relatively fragmented but growing collaboration network in the field of e-government and village governance. Several separate groups of authors are visible, indicating independent research groups with limited inter-group collaboration. The most productive and influential authors identified include Janssen M, who forms a prominent cluster with collaborators such as Tang T, Matheus R, and Alexopoulos C, as well as Lee J, who is closely connected with Almugrin A, Mutambik I, and Henriksen HZ. Other notable contributors include Weerakkody V, Androniceanu A, Georgescu I, and Connolly C, each representing smaller but active research groups. The existence of several small clusters indicates that while

global interest continues to grow, stronger international collaboration networks are still in the developmental stage in this field. This also reflects the evolving nature of village-level e-government research, which remains concentrated in a few core research teams across different regions.



Figure 4. Co-Authorship Network of Authors in E-Government and Village Governance Research (2019–2024)

Source: Created Using R-Studio

Keyword Co-occurrence Analysis

Keyword co-occurrence analysis reveals the thematic structure and intellectual focus of the research field (Cheng et al., 2018; Sun et al., 2023). By analyzing the frequency and relationships between keywords, it becomes possible to identify dominant research topics, emerging themes, and conceptual clusters that shape the discourse on village-level e-government (Jetsadanuruk & Chansanam, 2023; Narong & Hallinger, 2023). This section presents a visual map of the keyword network, highlighting main topics, relationships between topics, and areas of academic interest that continue to evolve.

Keyword co-occurrence analysis in Figure 5 shows that “e-government” remains a central and dominant theme in this field of research, closely related to various sub-themes. Frequently co-occurring keywords include digitization, public services, innovation, adoption, technology adoption, decision-making, and trust, highlighting the multidisciplinary nature of e-government research in the context of village governance. Additional clusters highlight topics such as smart cities, ICT, open data, public sector governance, electronic participation, and accountability, reflecting growing academic attention to technical and governance aspects. New topics such as COVID-19, the digital divide, and corruption reflect the latest global challenges intersecting with e-government implementation at the village level. Overall, the keyword network illustrates the complexity and evolving nature of this field, where issues of technology adoption, governance frameworks, and citizen participation remain key areas of research.

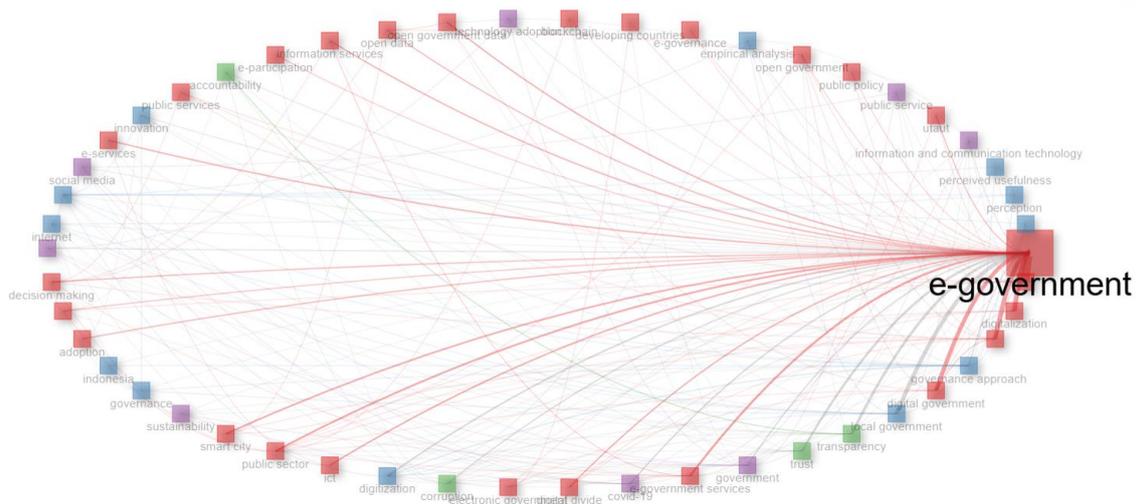


Figure 5. Keyword Co-Occurrence Network in E-Government and Village Governance Research (2019–2024)

Source: Created Using R-Studio

Citation and Impact Analysis

Thematic evolution analysis tracks how research themes have developed and changed over time, providing insights into the maturity and transformation of the field (Khazaneha et al., 2023; Setiawati et al., 2024). By analyzing the temporal dynamics of keyword clusters, this analysis reveals the emergence of new research directions, the persistence of core topics, and the decline of previous themes (González et al., 2018). This section summarizes the evolution of thematic clusters from 2019 to 2024, providing a longitudinal perspective on the intellectual growth of e-government studies in village governance.

The citation analysis highlights the most influential articles in the field of e-government and village governance research. The paper by Lindgren et al. (2019) stands out as the most cited, with 305 total citations (TC), an impressive 43.57 citations per year (TCpY), and the highest Normalized Total Citation (NTC) of 9.33, indicating its strong and sustained impact. This is followed by Matheus et al. (2020) with 237 citations and Pittaway & Montazemi (2020) with 153 citations, both contributing significantly to theoretical and empirical advancements. Other highly cited works include studies by Tangi et al. (2021), Hooda et al. (2022), and de Bruijn et al. (2022), reflecting ongoing interest in topics such as digital government models, public service innovation, and citizen trust. The consistent citation rates across these papers confirm the growing academic engagement and relevance of e-government studies within village and local governance contexts.

Table 1. Top 10 Most Cited Articles in E-Government and Village Governance Research (2019–2024)

No	Paper	DOI	TC	TCpY	NTC
1	(Lindgren et al., 2019)	10.1016/j.giq.2019.03.002	305	43.57	9.33
2	(Matheus et al., 2020)	10.1016/j.giq.2018.01.006	237	39.50	9.86
3	(Pittaway & Montazemi, 2020)	10.1016/j.giq.2020.101474	153	25.50	6.37
4	(Tangi et al., 2021)	10.1016/j.ijinfomgt.2021.102356	142	28.40	8.35
5	(Hooda et al., 2022)	10.1016/j.ijinfomgt.2022.102553	131	32.75	8.19
6	(de Bruijn et al., 2022)	10.1016/j.giq.2021.101666	130	32.50	8.13

No	Paper	DOI	TC	TCpY	NTC
7	(Ullah et al., 2021)	10.1007/s41111-020-00167-w	130	26.00	7.64
8	(Martzoukou et al., 2020)	10.1108/JD-03-2020-0041	129	21.50	5.37
9	(Naranjo-Zolotov et al., 2019)	10.1108/ITP-08-2017-0257	127	18.14	3.89
10	(Cordella & Paletti, 2019)	10.1016/j.giq.2019.101409	113	16.14	3.46

Source: Data retrieved using R-Studio

Thematic Synthesis

In addition to quantitative mapping, thematic synthesis provides a qualitative interpretation of the main research themes identified through systematic literature review (Peixoto Rodriguez & Espina-Romero, 2024; Rahman, 2022). This synthesis enables a deeper understanding of how e-government has been conceptualized, implemented, and debated in the context of village governance. By reviewing and categorizing the core findings of the most influential articles, this section identifies key thematic areas, recurring challenges, and emerging opportunities that describe the current state of knowledge in village-level e-government research.

The thematic evolution analysis in Figure 6 visualizes the intellectual structure and maturity of research themes in the fields of e-government and village governance. Key themes such as e-government services, the digital divide, electronic government, service delivery, and open government data are highly developed and central to the discourse, indicating strong interest and deep integration into the core discourse. Foundational themes include e-government, public administration, digitalization, local government, and governance approaches, representing core areas with broad relevance but developing depth. Niche themes such as blockchain, security, emerging technologies, public management, and cybersecurity indicate specialized topics receiving focused yet limited attention. Meanwhile, emerging or declining themes such as trust in government, trust in technology, and informatization reflect peripheral areas that may represent early stages of research or topics with reduced research focus. Overall, this map shows a balanced combination of established and emerging themes, highlighting both consolidation and diversification in research on village-level e-government.

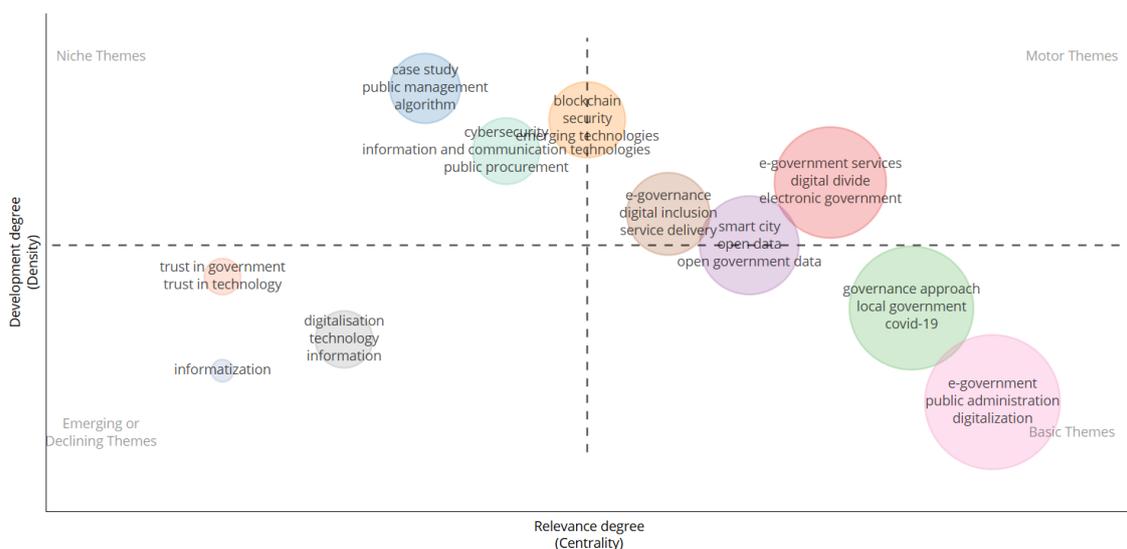


Figure 6. Thematic Evolution Map of E-Government and Village Governance Research (2019–2024)

Source: Created Using R-Studio

Challenges and Opportunities

The advancement of e-government in village governance presents considerable potential and significant challenges (Chen et al., 2023; Tresiana & Duadji, 2023). One of the most persistent obstacles is the disparity in digital infrastructure. Many villages, particularly in developing countries, struggle with limited internet access, unstable electricity, and insufficient technological equipment, creating unequal readiness for implementing digital public services (Al-Mamary & Alshallaqi, 2023). In parallel, limited human resource capacity and digital literacy hinder the effective utilization of e-government systems (Tassabehji et al., 2019). Village officials and residents often lack sufficient technical skills, while formal capacity-building programs remain scarce, resulting in suboptimal system management and reduced administrative efficiency (Keco et al., 2023).

In addition to technical limitations, institutional and regulatory challenges are also prevalent. Fragmented policy frameworks, overlapping authority, and inconsistent legal guidelines contribute to administrative inefficiencies in system implementation (Goloshchapova et al., 2023). Moreover, the increased collection of sensitive data raises concerns about data security, privacy, and accountability (Hooda et al., 2022); (de Bruijn et al., 2022). Another critical social challenge is the deficit of public trust and engagement, where citizens remain skeptical about system transparency and government responsiveness, often resulting in lower levels of participation in digital governance platforms (Field & Roberts, 2020).

Despite these constraints, several strategic opportunities have emerged. Growing national and global policy support for digital transformation, such as Indonesia's village digitalization programs, has created momentum for strengthening institutional capacity and resource allocation to support village-level e-government (Nurlinah & Haryanto, 2020). Furthermore, the rise of international and interdisciplinary research collaborations is evident in the growing co-authorship networks, enabling cross-border knowledge exchange and disseminating best practices that can enrich local digital governance models.

Finally, the continuous evolution of emerging technologies such as blockchain, AI, open data platforms, and cloud computing opens new possibilities for improving transparency, accountability, and personalized public services in village governance (Ghazi et al., 2022; Kasinathan et al., 2022). Additionally, integrating participatory governance models through digital platforms can foster stronger citizen engagement and community oversight, transforming e-government into a vehicle for inclusive civic participation (Peristeras et al., 2009). The growing research interest in themes such as digital divide, service delivery, governance models, and trust mechanisms, as indicated by the bibliometric analysis, reflects an expanding intellectual frontier and signals ongoing theoretical development within the domain of village-level e-government (Annahar et al., 2023; Rosada & Widya, 2024).

CONCLUSIONS

This study presents a structured overview of village-level e-government research

published from 2019 to 2024, revealing a clear upward trend in scholarly engagement and highlighting key themes such as digitalization, governance, and technology adoption. By identifying leading contributors, thematic clusters, and evolving research directions, the findings address all core research questions and offer a coherent mapping of the intellectual landscape.

The implications of this work are twofold. Academically, it serves as a foundational reference for future investigations by identifying knowledge gaps and emerging domains. Practically, it provides strategic insights for policymakers seeking to improve village governance through targeted digital interventions, with emphasis on bridging infrastructure gaps, enhancing digital competence, and cultivating trust.

At a broader level, this study affirms the growing relevance of digital governance in rural contexts and advocates for inclusive, adaptive frameworks responsive to technological advances. Future research should expand both data sources and methodological approaches, incorporating qualitative analyses and critical case studies. Particular attention should be given to the dynamic roles of blockchain, AI, and ethical considerations in sustaining transformative e-government ecosystems at the grassroots level.

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