

Digital Surveillance in Information System Research: A Hybrid Systematic Literature Review and Bibliometric Analysis

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ABSTRACT

The advancement of digital technology has promoted the application of digital surveillance in many fields, including public health and social risk management. Nonetheless, little research has comprehensively mapped the field of digital surveillance studies. This paper seeks to investigate the publications, scientific structures, and significant topics of digital surveillance research through a systematic literature review integrated with bibliometric and thematic analyses. Records retrieved from Scopus, 2009-2025 resulted in 286 articles that fulfilled the inclusion criteria. Bibliometric analysis was performed using VOSviewer to identify publication trends, main scientific fields, and relationships between keywords. Meanwhile, thematic analysis using NVivo was used to reveal research themes and sub-themes. The results showed that digital surveillance publications had increased significantly since 2020. Social sciences, medicine, and computer science dominated the publications. Thematic analysis revealed that the main research themes focused on the application of digital surveillance in public health, data and information system management, and the use of digital technology. However, issues of governance, ethics, and privacy protection were still underexplored. These findings contribute theoretically by mapping the landscape of digital surveillance research and, practically, by helping academics and practitioners identify opportunities for research and policy development that pay greater attention to ethical and digital governance aspects.

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1. INTRODUCTION

The implementation of supervision of specific jobs or conditions through periodic audits and manual reporting often faces problems related to efficiency, data integration limitations, and limited capacity for continuous monitoring. [1]. Developments in digital technology have changed the way organizations and governments monitor social and operational phenomena. These changes have led to a shift from traditional administrative approaches to more integrated and transparent digital system-based governance mechanisms. [2]. One concrete example of this change is the implementation of digital surveillance as an information-based monitoring tool to improve the quality of monitoring data, public activities, and social dynamics across various sectors. [3]. With the increasing capabilities for real-time data retrieval and processing in information technology, digital surveillance has become an important research area in digital technology.

Coupled with the rising deployment of digital means of organizational control, research on digital surveillance has also expanded. Recent research suggests that e-governance and ICT-based monitoring mechanisms are emerging as two leading issues in the IS and public management

literature [1]. Digital surveillance has been studied across domains such as public health, e-governance, and public services [4]. Specifically, for pandemic response, digital technology appears to be better than traditional methods for surveillance, contact tracing, and health data management [3]. Furthermore, the process of digital surveillance integration into government systems has been analyzed in the literature using a systematic literature review methodology (with data visualization supported by bibliometric software, viz., VOSviewer) to highlight research trends and relationships among concepts [5].

The emergence of digital surveillance technology is a new concern in the consideration of information systems and poses new challenges related to data governance, information security, and user privacy [2, 6]. Digitization not only enables more efficient surveillance but brings with it challenges regarding the density of information to be handled and the associated risks to identification and freedom of expression [7]. Thus, continued appreciation of research advances in digital surveillance is needed to align technological requirements with sound information governance.

However, existing scholarships on digital monitoring remain fragmented. While extensive research addresses applications in specific domains, there is still a lack of an integrated perspective that captures research trends, methodological approaches, and knowledge gaps from an information systems viewpoint. Similar limitations have been identified in prior studies employing systematic literature review and bibliometric methods to map the evolution of digital governance and related technologies [5]. In this context, the objective of this study is to conduct a systematic literature review and a bibliometric analysis of publications on digital surveillance indexed in Scopus. We map the research trends, scientific structures, and emerging key issues in the first place. A hybrid approach is used, combining quantitative analysis via bibliometric visualization and thematic analysis to explore the main themes in the literature [8, 9]. It is hoped that this approach can help academics and information practitioners understand the direction of research development on digital surveillance and the potential for further research, especially related to ethical governance and the social implications of using modern technology.

Previous studies on digital surveillance have predominantly focused on specific application domains, particularly public health surveillance, security monitoring, and innovative governance systems. Several systematic literature reviews and bibliometric studies have examined digital governance, e-government, and health surveillance technologies separately. However, most of these studies emphasize technological effectiveness or policy outcomes, while overlooking the role of digital surveillance as an integrated information system that encompasses data governance, ethical control, and system sustainability.

To address these gaps, this study offers several novel contributions. First, it integrates a systematic literature review, bibliometric analysis using VOSviewer, and thematic analysis using NVivo within a single analytical framework, which remains rarely applied in digital surveillance research. Second, this study explicitly positions digital surveillance as an information systems phenomenon rather than merely a technological or policy-driven tool. Third, by emphasizing governance, ethical, and sustainability dimensions, this study extends existing digital surveillance literature that has predominantly focused on technical effectiveness and sector-specific applications.

Moreover, existing bibliometric reviews tend to rely solely on quantitative mapping without combining in-depth thematic analysis to uncover governance-related research gaps. As a result, literature lacks a holistic understanding of how digital surveillance research has evolved from an information systems perspective, particularly in relation to trust, transparency, and ethical governance. Accordingly, this study examines how: (1) digital surveillance research has evolved when viewed through an information system's perspective; (2) identifies dominant research approaches, methodologies, and (3) reveals underexplored themes and research gaps related to governance and system sustainability.

To achieve these objectives, this study addresses the following research questions: RQ1: How has digital surveillance research evolved in terms of publication trends, scientific disciplines, and application

contexts during 2009-2025, with emphasis on post 2019 trends? RQ2: What methodologies, techniques, and information systems perspectives are most prevalent in digital surveillance

research? RQ3: What recurring governance, ethical, and research gap issues are identified in the literature, particularly those related to trust, transparency, and system sustainability?

2. RESEARCH METHOD

2.1 Systematic Mapping Approach

This study employs a systematic mapping approach combined with bibliometric and thematic analyses to examine the development of digital surveillance research within the field of information systems. Systematic mapping is particularly suitable for studies that aim to provide a broad overview of research trends, dominant themes, and underexplored areas rather than answering narrowly defined research questions [10, 11]. Unlike traditional systematic literature reviews that often focus on effect sizes or specific interventions, systematic mapping emphasizes classification, categorization, and visualization of existing research [12]. This approach enables the identification of publication patterns, research methods, application domains, and conceptual gaps related to digital surveillance.

The methodological design integrates three analytical components: (1) a systematic literature review to ensure transparent and reproducible article selection, (2) bibliometric analysis using VOSviewer to map publication trends, citation networks, and keyword co-occurrences, and (3) thematic analysis using NVivo to identify recurring governance, ethical, and sustainability-related issues. The integration of these components allows for both quantitative mapping and qualitative interpretation of the research landscape [8, 9]. Although the dataset spans publications from 2009 to 2025, analytical emphasis is placed on the 2019–2025 period to capture recent developments in digital surveillance research.

2.2 Quality Appraisal Procedure

A simplified quality appraisal was applied as described in Table 1 to ensure methodological robustness. Only studies meeting at least three of the five quality criteria were retained for further analysis.

Table 1. Quality Appraisal Criteria for Included Studies

No	Quality Criterion	Description
QA1	Clarity of Objectives	The study clearly states its research objectives, scope, and research questions related to digital surveillance.
QA2	Methodological Transparency	The research design, data sources, and analytical methods are explicitly described and reproducible.
QA3	Data Validity and Reliability	The study uses valid data sources and demonstrates reliability through empirical evidence or methodological justification.
QA4	Relevance to Digital Surveillance	The study explicitly addresses digital surveillance systems, practices, or governance within an information system or related context.
QA5	Analytical Rigor	The analysis is systematic, theoretically grounded, and supported by appropriate analytical or evaluative techniques.

Scoring rule:

Each criterion was scored as 1 (Yes) or 0 (No).

Studies achieving a minimum score of ≥ 3 out of 5 were included in the final analysis.

To ensure the methodological robustness of the selected studies, a simplified quality appraisal was conducted before data synthesis. The appraisal framework was adapted from established systematic review guidelines and tailored to the interdisciplinary nature of digital surveillance research. Five quality criteria were applied, namely: clarity of research objectives, methodological transparency, data validity, relevance to digital surveillance, and analytical rigor. Each included study was independently evaluated against these criteria using a binary scoring scheme (Yes = 1; No = 0). Studies meeting at least three out of five criteria were retained for further bibliometric and thematic analysis. This threshold was selected to balance inclusiveness with methodological quality, particularly given the emerging and multidisciplinary character of digital surveillance research. The quality appraisal process served as a filtering mechanism to exclude conceptually weak or methodologically opaque studies, while maintaining sufficient coverage of the research landscape.

Several potential sources of bias were considered and mitigated during the review process. First, selection bias was minimized by applying predefined inclusion, exclusion, and quality assessment criteria consistently across all retrieved studies. Second, to reduce subjective interpretation during quality appraisal, clearly defined assessment indicators were used for each criterion. Third, database bias was addressed by focusing on Scopus-indexed publications, ensuring a standardized level of peer-review quality while acknowledging that relevant studies indicated elsewhere may not be captured. Finally, the integration of bibliometric analysis and thematic analysis helped mitigate analytical bias by combining quantitative mapping with qualitative interpretation, allowing for triangulation of findings and enhancing the overall validity of the review.

Based on quality appraisal, most of the included studies demonstrated adequate methodological quality. Approximately 82% of the reviewed articles clearly articulated their research objectives (QA1) and provided sufficient methodological transparency (QA2). Relevance to digital surveillance (QA4) was observed in all included studies, while analytical rigor (QA5) was evident in 71% of the publications. Only studies meeting at least three quality criteria were retained for further bibliometric and thematic analysis. These results demonstrate that the final dataset is methodologically adequate for bibliometric and thematic synthesis.

In this study, digital surveillance is operationally defined as technology-mediated systems used for continuous data collection, monitoring, and analysis of individuals or populations, excluding purely manual or non-digital monitoring practices. To ensure methodological transparency and reproducibility, each stage of the mapping process, including literature search, screening, classification, and synthesis, was explicitly documented.

2.3 Database and Search Strategy

This approach is suitable for multidisciplinary research fields. It offers an extensive review of both investigated and less explored research fields [8]. Scopus was selected as the primary database due to its broad journal coverage, high-quality metadata, and suitability for bibliometric analysis. Previous studies in information systems research have demonstrated that Scopus provides consistent citation indexing and comprehensive disciplinary coverage, making it appropriate for systematic mapping and bibliometric studies [9]. The screening stages consisted of identification, duplicate removal, title and abstract screening, and full-text eligibility assessment. The stages of selection were article identification, de-duplication, title and abstract screening (formal aspect), and full-text evaluation (previously established inclusion and exclusion criteria) [13]. We selected the articles and categorized them based on an information systems (IS) perspective: research focus, methodological approach, technological features, and governance perspective. This Classification enabled a structured analysis to identify research gaps in the domain of information systems-based surveillance.

The literature search was conducted on December 22, 2025, using the following query: *TITLE-ABS-KEY ("digital surveillance" OR "technology-based surveillance" OR "algorithmic surveillance" OR "digital monitoring") AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (DOCTYPE, "ar"))*.

Only peer-reviewed journal articles written in English were considered. Conference papers, book chapters, editorials, and other non-article document types were excluded to ensure consistency in peer-review standards. The article selection process followed the PRISMA 2020 guidelines to ensure transparency, traceability, and reproducibility of the review process [13, 14]. The screening stages consisted of identification, duplicate removal, title and abstract screening, and full-text eligibility assessment.

2.4 Inclusion, Exclusion, and Quality Assessment

The literature search strategy was conducted by formulating specific inclusion criteria. The inclusion criteria were defined as follows: (1) peer-reviewed journal articles published between 2009 and 2025, (2) publications written in English, and (3) studies explicitly addressing digital surveillance as a technology-mediated monitoring system. A simplified quality assessment was applied as described in Section 2.1. Only studies meeting at least three quality criteria were retained for further analysis. Conference papers, book chapters, editorials, and non-article

document types were excluded to ensure consistency in peer-review standards, although this may limit early-stage innovations commonly published in computer science venues. Language restrictions may introduce regional bias; however, this decision was taken to ensure analytical consistency.

2.5 PRISMA Screening and Dataset Refinement

The literature selection process followed the PRISMA 2020 guidelines to ensure transparency and reproducibility. The initial search yielded 16,921 records from the Scopus database. Through successive stages of keyword refinement, screening, eligibility assessment, and quality appraisal, relevant studies were systematically filtered. Figure 1 presents the PRISMA flow diagram illustrating each screening stage and the corresponding exclusion criteria.

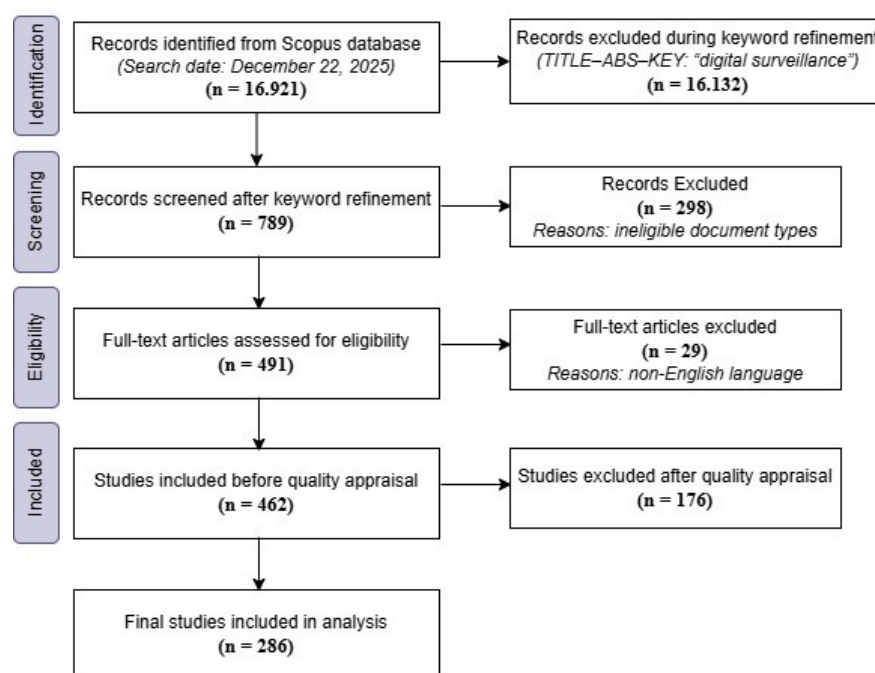


Figure 1. Systematic Literature Review information flow using PRISMA

As shown in Figure 1, keyword refinement reduced the initial dataset to 789 records, followed by the exclusion of ineligible document types and non-English publications. After quality appraisal, a total of 286 studies were retained for the final bibliometric and thematic analysis.

2.6 Integrated Data Analysis

Bibliometric analysis was performed using VOSviewer to visualize publication trends, citation networks, author collaborations, and keyword co-occurrence patterns [15, 16]. This analysis provided a structural overview of dominant research clusters and thematic concentrations within digital surveillance studies. Thematic analysis was subsequently conducted using NVivo to examine governance, ethical, and sustainability-related issues across the selected articles. The coding process followed an inductive approach, allowing themes to emerge from the data while being informed by information systems governance concepts.

The bibliometric results informed the thematic coding process by identifying influential clusters and keywords, thereby enabling an integrated interpretation of quantitative patterns and qualitative themes. Text mining/bibliometric analysis and systematic literature review can then be combined to integrate empirical knowledge about an area and develop a structured landscape map [9, 8]. The combined perspectives offer complete insights into the past, present, and future of information surveillance.

As a first step, the author developed a macro (top-down) search strategy to gain an overview, followed by specifying the topic of interest [17]. This approach helps researchers search

across a wide range of literature and sense-make topics that are more pertinent to the research objectives. Given the fragmented nature of prior research on digital surveillance, digital surveillance' was selected as the main keyword in this research. The copy of this keyword was performed in the title, abstract, and keywords of the articles to obtain related search finds. In the literature collection process, the Scopus database was used as the primary source due to its ability to provide quality scientific publications. This supports the implementation of a systematic literature review and facilitates the identification of key researchers and the monitoring of research trends in the domain of information systems-based digital surveillance [8].

The bibliometric clusters provided an initial structural map of the field, which subsequently informed the thematic coding process in NVivo. Studies within the "health surveillance" cluster predominantly aligned with implementation-oriented themes, while governance-related themes were sparsely distributed across clusters, reinforcing the observed research gap.

3. RESULTS AND DISCUSSION

For example, the study included 286 Scopus articles on digital surveillance. The number of published articles in relation to 2009-2025 and the journal source were also identified. The study also investigated the most influential factors in digital surveillance, such as authors, affiliations, and countries involved in research.

3.1 Publication Trends, Disciplines, and Application Contexts

After applying the PRISMA 2020 guidelines, a total of 286 Scopus-indexed journal articles were included for analysis. Figure 2 illustrates the annual distribution of publications on digital surveillance between 2009 and 2025. The results show that publication activity remained relatively limited before 2019, with fewer than ten articles published annually. A marked increase is observed from 2020 onwards, with publication counts exceeding 40 articles per year during the 2021–2025 period. This surge coincides with accelerated digital transformation and the widespread adoption of digital monitoring systems across sectors.

The first article on digital surveillance, published in 2009, discussed resistance to digital surveillance involving actors outside the monitored parties, including government agencies, companies, technology providers, and international bodies. This requires an interdisciplinary and multi-actor framework [18]. Articles in 2025 discuss increased surveillance of people's daily habits [19, 20, 21].

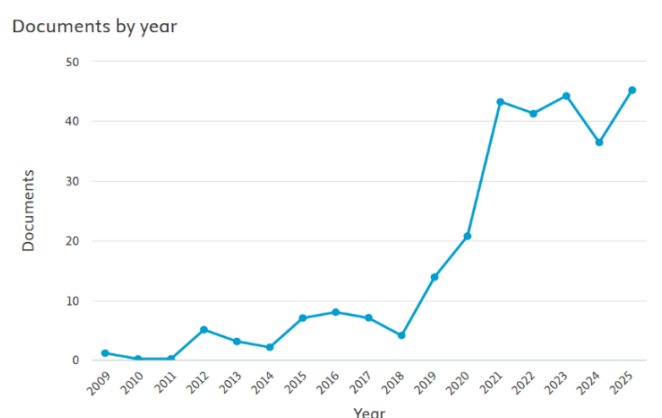


Figure 2. Number of publications (Source: Scopus Database)

From a disciplinary perspective (Figure 3), digital surveillance research is predominantly published in Social Sciences (31.5%), followed by Medicine (22.8%) and Computer Science (9.8%). Additional contributions originate from Arts and Humanities (6.6%), Business, Management, and Accounting (3.5%), and several other fields, including Environmental Science and Engineering. This distribution results in *digital surveillance* being a strong interdisciplinary topic, with a primary focus on social, health, and information technology aspects. The dominance of the Social Sciences and Medicine fields shows that discussions about *digital surveillance* do not

only focus on technological development, but also on its impact on society, governance, and institutional practices. Contributions from the fields of Computer Science and Business confirm the role of information systems and digital technology as the main drivers of digital surveillance. [22, 23, 24].

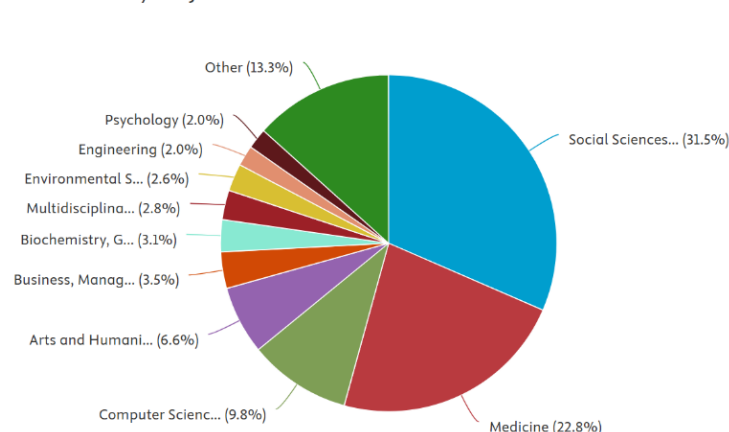


Figure 3. Subject Area (Source: Scopus Database)

The sharp increase in publications after 2019 reflects a structural shift in digital surveillance research rather than a temporary surge in scholarly interest. These findings suggest a transition from isolated discussions of surveillance technologies toward integrated information systems that enable real-time data collection, cross-organizational interoperability, and data-driven decision-making. From an information systems perspective, the increasing involvement of Social Sciences and Medicine highlights the growing recognition of digital surveillance as a socio-technical system embedded within institutional, regulatory, and organizational contexts, rather than a purely technical artifact. This trend coincides with increased adoption of digital monitoring systems across sectors.

3.2 Methods, Technologies, and IS Approaches

To address RQ2, a bibliometric analysis was conducted using VOSviewer, resulting in a keyword co-occurrence network that maps the intellectual structure of digital surveillance research (Figure 4). The keyword “digital surveillance” emerges as the most central node, exhibiting the highest frequency and connectivity.

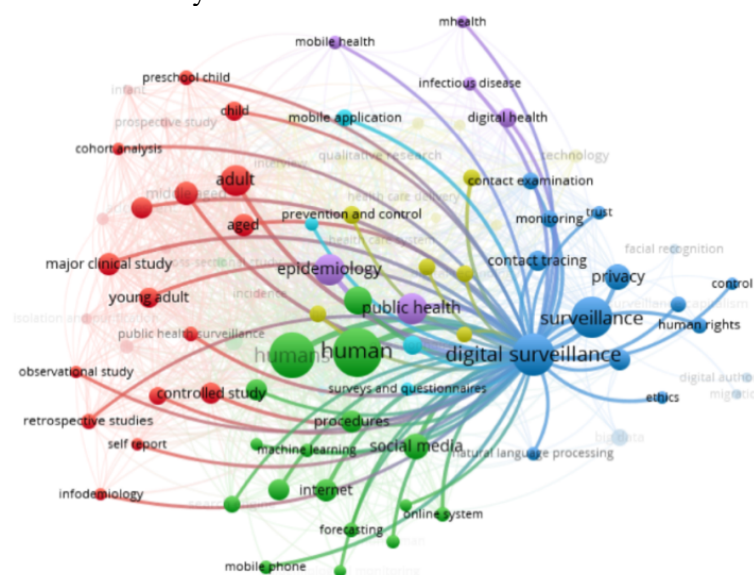


Figure 4. Cluster Network Visualization (*Source: : Data processed in Vosviewer*)

The analysis identifies four major clusters.

Table 2. Four major clusters

Cluster	Description
Digital Surveillance, Privacy, and Governance	Cluster 1 (blue), so the most indicative words are surveillance, digital surveillance, privacy, human rights, ethics, and monitoring trust [25]. This is a problematic instrument because it collapses the privacy-policy dimension into consideration of how efficiently the practices and systems in the room function as an information system. The connection between surveillance systems and privacy is to show that the deployment of digital surveillance solutions never occurs without considering ethics and data protection [26].
Digital Health and Monitoring Systems	Cluster 2 (purple and yellow) indicates the relations between digital surveillance, public health and epidemiology, digital health, and health, as well as contact tracing. This cluster represents the prevalence of studies on digital information systems for disease surveillance and control in health [27, 28]. The proximate relationship between digital surveillance and contact tracing underscores the importance of technology-enabled systems for tracking and data-driven health decision-making.
Data-Based and Digital Media Approaches	Cluster 3 (green) takes a supporting role related to technology and data-basing methods. At the same time, words such as social media, machine learning, internet, online systems, forecasting, etc., are considered necessary. This constellation suggests that digital surveillance is pervasive, as evidenced by analyses of data retrieved from online platforms and social media. This method favors information systems as the primary means of accumulating, elaborating, and analyzing health data at a large scale for surveillance [29, 30].
Research Methodology and Population Studies	Cluster 4 Items related to the keywords of study designs and empirical methods, observational study, cohort analysis, controlled study, and population categories (adult, child, and aged) are emphasized in cluster 4 (color: red). References this cluster emphasizes that digital surveillance research concerns not just technology but also methodological approaches for assessing the effectiveness of systems in particular contexts or user communities.

The dominance of governance- and privacy-related keywords within Cluster 1 indicates that digital surveillance research is increasingly concerned with ethical and regulatory considerations. These findings suggest that current digital surveillance research tends to operationalize privacy primarily as a system performance issue, rather than embedding it within broader information systems governance frameworks that address accountability, transparency, and institutional control.

The bibliometric clusters reveal that contemporary digital surveillance research is predominantly shaped by governance-, health-, and data-driven system perspectives. However, the prominence of privacy and ethics-related keywords does not necessarily translate into comprehensive information systems governance frameworks. Instead, privacy is frequently operationalized as a functional or performance-related attribute of surveillance systems, rather than being embedded within broader IS governance structures that address accountability, transparency, and institutional oversight. This pattern demonstrates a state-of-the-art limitation, where digital surveillance is often examined through fragmented technical or policy lenses, leaving integrative IS perspectives underdeveloped.

3.3 Governance, Ethics, and Research Gaps

To answer RQ3, the author used a hierarchical chart in NVivo as a visualization tool to show the dominance and interrelationships of themes from thematic analysis. The analysis results show that literature is dominated by themes related to *digital surveillance*, data, health, systems, and public use. At the same time, aspects of governance and ethics tend to appear implicitly and in fragmented form.

3.3.1 Theme 1: The Dominance of Digital Surveillance in the Context of Public Health

Theme 1 analysis reveals that the terms *digital surveillance* and *surveillance* are the most dominant themes. This theme is often associated with health, disease, and, especially, pandemics such as COVID-19. The results demonstrate that most studies position digital surveillance as a tool for disease monitoring, early detection, and public health risk control. However, the dominance of the health context suggests that digital surveillance is often treated as a technical solution rather than as a complex social and governance phenomenon.

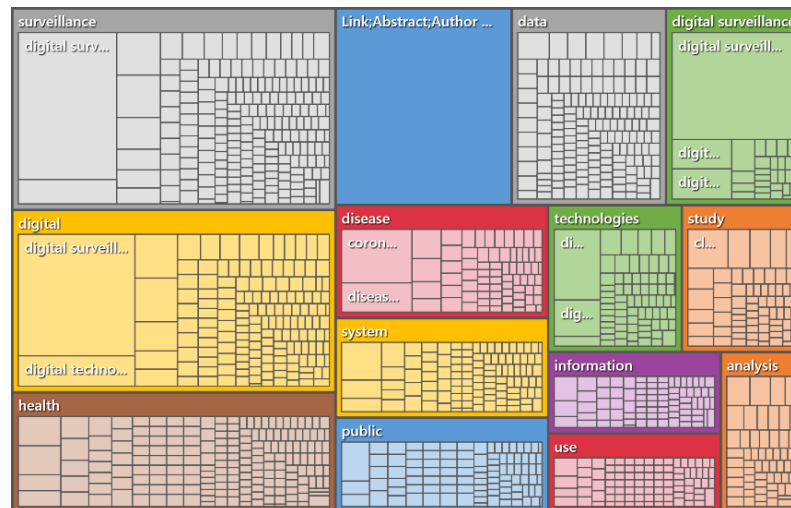


Figure 5. Hierarki Chart Thematic analysis secara keseluruhan (Source: Data processed in NVivo)

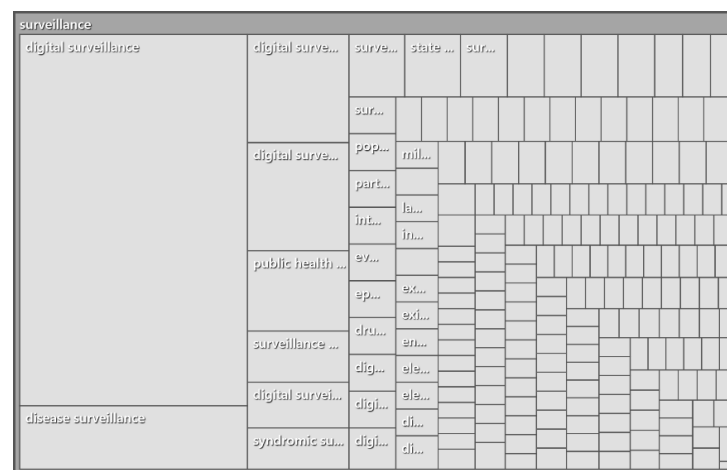


Figure 6. Hierarki Chart Thematic analysis khusus tema digital surveillance (Source: Data processed in NVivo)

3.3.2 Theme 2: The Role of Data and Information Systems as the Foundation of Technology

Theme 2 analysis reveals that data, systems, and information are the main foundations in the implementation of digital surveillance. Literature also highlights the role of digital data, system integration, and information analysis in facilitating data-driven decision-making. Yet most research focuses on technical aspects of building effective systems rather than on data management mechanisms, including accountability, transparency, and access control. This pattern reflects that few digital surveillance studies have addressed issues of data governance.

3.3.3 Theme 3: Technology and Analysis as Enablers, Not Ethical Subjects

Theme 3 suggests that different digital technologies develop surveillance capacities. But the technologies themselves are discussed less often in terms of ethical use, potential for misuse, or long-term social impacts. It is a testament to a broader literary disposition toward technology, which tends to treat it as a neutral instrument rather than subject it to critical scrutiny of its effects on individual rights and public freedom.

3.3.4 Theme 4: Public Engagement and Issues of Use

Theme 4 Concern about the application of digital surveillance in public places. But the themes of public acceptance, trust, and consent are somewhat limited and have not been explored in detail. This pattern reflects that the voices and perspectives of end users are not yet fully integrated into digital surveillance research, especially in policy and system implementation.

3.3.5 Theme 5: Research Gap on Governance and Ethics

Theme 5 analysis reveals that despite the dominance of technical and health themes, issues of governance, ethics, and regulation do not emerge as central themes. These findings demonstrate a structural research gap in digital surveillance studies, where governance, ethics, and trust-related issues remain marginal compared to technical and health-oriented themes. Based on the grouping of themes, sub-themes, and indicators extracted using Nvivo, which can be mapped to indicators as keywords representing the intensity of the theme's appearance in the analyzed literature discussion. Governance-related themes appeared in only 18% of the reviewed studies, compared to 47% focusing on health surveillance applications and 35% on algorithmic or social media-based monitoring.

Table 3. Table of Thematic Analysis Mapping

Main Theme	Subtheme	Indicators (Dominant Codes/Keywords)	Analytical Meaning
Digital Surveillance	Implementation of Digital Surveillance	digital surveillance, surveillance, monitoring	Digital surveillance is positioned as the primary mechanism for monitoring and controlling activities, especially in the context of public health and safety.
	Technology-Based Monitoring	digital system, online system, monitoring	Surveillance is understood as a technology-based system that relies on the integration of digital platforms and information systems.
Health	Public Health	Public health, epidemiology, disease surveillance	Digital surveillance is widely used to support public health policies and disease control.
	Disease and Pandemic	disease, coronavirus, infection	The pandemic context has been the main driver for the adoption of digital surveillance in the literature.
Data	Data Collection	data collection, digital data	Data is a key asset in digital surveillance, with a focus on the volume and speed of collection.
	Data Processing and Management	data processing, information system	Research emphasizes the technical aspects of data processing rather than data governance.
System	Information System	system, information system	Digital surveillance is built on an integrated information system that supports decision-making.
	System Integration	digital technology, system integration	System literacy focuses on interoperability and technical efficiency.
Technologies	Digital Technology	digital technology, digital tools	Technology is positioned as an enabler without a critical discussion of its social and ethical impacts.
	Analytics and Automation	analysis, automated monitoring	The use of analytics to improve the effectiveness of surveillance.
Public	Use in Public Spaces	Public use, public monitoring	Digital surveillance is widely used in public spaces for risk control purposes.
	Impact on Society	public impact, social impact	The community's perspective is often implicit and not explored in depth.
Use	System Use	system use, technology use	The research focuses on how the system is used, rather than on user experience or acceptance.
	Acceptance and Adaptation	adoption, implementation	The issue of technology adoption is discussed only in terms of functional aspects.
Governance & Ethics (Implicit)	Digital Governance	governance, regulation (low frequency)	Governance issues arise to a limited extent and are not a dominant theme.
	Ethics and Individual Rights	ethics, privacy, human rights (minor)	Ethical and human rights aspects have not been a significant focus in digital surveillance literature.

The thematic analysis demonstrates a clear structural imbalance within digital surveillance research. While health-related and technical implementation themes dominate the literature, governance, ethical safeguards, and trust-related considerations remain marginal and fragmented. These findings point to a substantive research gap within the current digital surveillance literature, rather than as a governance-sensitive information system. This gap underscores the need for future research to integrate ethical governance, institutional accountability, and system sustainability as core components of digital surveillance design and evaluation.

3.4 Theoretical and Practical Implications

This study contributes to information systems literature by empirically demonstrating that digital surveillance research remains fragmented across disciplinary silos, with limited integration of governance-oriented IS perspectives. By combining systematic mapping, bibliometric analysis, and thematic synthesis, this study advances a holistic understanding of digital surveillance as a socio-technical information system that integrates technology, organizational processes, and governance mechanisms. This integrated approach extends prior digital surveillance research that has primarily emphasized technical performance or sector-specific applications.

From a practical standpoint, the findings highlight the risks of implementing digital surveillance systems without embedded governance and ethical frameworks. Organizations and policymakers should prioritize transparency, accountability, and trust-oriented system design to ensure the sustainable adoption of digital surveillance technologies. Without such considerations, surveillance systems may achieve short-term efficiency gains while undermining long-term institutional legitimacy and user trust.

4. CONCLUSION

This study provides a structured and integrative review of *digital surveillance*, conducted through a hybrid systematic literature review and a bibliometric analysis of Scopus-indexed publications from 2019 to 2025. The results show that *digital surveillance* is a rapidly growing field of research with close links to Information Systems studies. The main findings of this study include: (1) a significant increase in publication trends and expansion of the context of *digital surveillance* application, (2) the dominance of data-based information system technologies and approaches and digital platforms, and (3) the continuing existence of research gaps related to governance, ethics, and system integration in the context of certification and professional supervision.

This study contributes by systematically mapping the landscape of *digital surveillance* research and identifying future research opportunities relevant to academics and practitioners of Information Systems. However, this study has limitations in its use of a single database, namely Scopus. Further research is recommended to expand the data sources and empirically examine the implementation of *digital surveillance* in specific organizational contexts. In addition, the application of digital surveillance in other fields that have not yet been analyzed, such as competency certificates, needs further research.

ACKNOWLEDGEMENTS

Theoretical and Practical Implications for Information Systems expands research on digital surveillance within IS, a context characterized by interactions among technology, people, and organizations. This research demonstrates that digital surveillance is interconnected with the system governance and business process contexts. Practically speaking, the findings from this study can be referenced by organizations and policymakers to develop and deploy digital surveillance systems that are orderly, transparent, and accountable. These results could also have relevance to competence design. Biocycle surveillance programs are integrated with digital technology and information system-based surveillance strategies.

In terms of competency certificates, certificate surveillance is an essential part of monitoring the certification holder's competence throughout the certificate's valid lifetime. The issuance of certificates of competence is critical to enhancing staff professionalism, particularly in education, health, and other technical fields. Competency certificates are official recognition of an individual's skills or competencies according to specific standards. [31]. Certificates are also used in enterprises and domains as prerequisites to guarantee the quality of service and operational security. However, because of the increasing complexity of industrial work environments and the spread of digital technologies, new challenges have emerged in effectively controlling the certification phase. Conventional certification, which is paper-based and manual, is susceptible to operational latency, administration errors, and limited transparency in the monitoring of continued competence [32].

In the context of information systems, certificate monitoring is not only administrative work, but it is also a socio-technical system itself, relying on digital support systems, data infrastructure, and technology-induced mechanisms for governance [33]. Information systems can facilitate dynamic linking, real-time control, and the supervision of data workload, thereby improving openness and accountability in the organization's decision-making. Information systems play a foundational role in supporting certification processes by enabling transparency, accountability, and continuous monitoring [2, 6]. Although digital technology has enormous potential to improve certification oversight and quality, many challenges arise, particularly related to governance, the methods used for surveillance, and expectations of professional standards [34]. Some of the main issues frequently identified in the literature include:

1. Differences in digital platforms, namely the existence of many different digital systems for monitoring certification, each with varying protocols and levels of data integration.
2. Governance and accountability aspects, namely that digital surveillance must be balanced with clear policies on data access, personal data protection, and clarity of the certification standards being monitored.
3. Compliance with international standards, namely the emergence of the issue that not all digital certification systems implement governance in accordance with the global framework, creating disparities in the quality of certification output.
4. Lack of a comprehensive literature review, because to date, there has been no systematic review that combines *certificate surveillance* methods in the context of competency certification and an in-depth analysis of governance and existing research gaps.

A comprehensive study is essential to map the research landscape on certificate surveillance in competency certification systems, including the methods used, the governance models presented in the literature, and the research gaps that future studies should address. This study contributes to information systems literature in three ways. Conceptually, it reframes digital surveillance as a socio-technical system that requires alignment between technology, governance, and ethical principles. Methodologically, it demonstrates the value of combining bibliometric visualization and thematic analysis to uncover latent research gaps that are not visible through quantitative mapping alone. Empirically, this study offers an integrative overview of research trends and dominant themes in digital surveillance studies, offering a reference point for future research in governance-oriented surveillance systems.

REFERENCES

- [1] Yan Li, "Performance Evaluation of the Digital Governance of Water Pollution: A Dual Perspective of Digital Monitoring and Digital Administration," *Systems*, vol. 13, no. 6, 26 May 2025.
- [2] Yogesh K. Dwivedi, "Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life," *International Journal of Information Management*, vol. 55, pp. 1-20, 2020.
- [3] Fitrisia Rahma, "Using Digital Technology to Conduct COVID-19 Surveillance: A Systematic Review," *Ianna Journal of Interdisciplinary Studies*, vol. 7, no. 2, p. 358–373, 05 June 2025.
- [4] Leigha Comer, "Short- and Long-Term Predicted and Witnessed Consequences of Digital Surveillance During the COVID-19 Pandemic: A Scoping Review (Preprint)," *JMIR Public Health and Surveillance*, 10 March 2023.
- [5] Muhamad Ilham Wijaya, "Systematic Literature Review (SLR): Perkembangan Penelitian E-Government di Indonesia dengan VOSviewer," *Jurnal Sain dan Teknologi*, vol. 5, no. 3, p. 391–399, 13 November 2025.
- [6] Janowski, "Digital government evolution: From transformation to contextualization," *Government Information Quarterly*, vol. 32, no. 3, pp. 221-236, July 2015.
- [7] Maulana, "Antara Kepentingan Publik Dan Hak Asasi: Analisis Hukum Terhadap Pengawasan Negara Atas Ruang Digital," *Causa: Jurnal Hukum Dan Kewarganegaraan*, vol. 16, no. 1, pp. 2151-2160, 29 November 2025.

- [8] Massimo Aria, "bibliometrix: An R-tool for comprehensive science mapping analysis," *Journal of Informetrics*, vol. 11, no. 4, pp. 959-975, November 2017.
- [9] Naveen Donthu, "How to conduct a bibliometric analysis: An overview and guidelines," *Journal of Business Research*, vol. 122, September 2021.
- [10] Fiona Campbell, "Mapping reviews, scoping reviews, and evidence and gap maps (EGMs): the same but different—the “Big Picture” review family," *Systematic Reviews*, vol. 12, no. 45, pp. 1-8, 15 March 2023.
- [11] Nurul Yaqien, "Systematic Review and Mapping of Theses in the Management of Islamic Education Program Based on Ontological, Epistemological, and Axiological Studies," *Jurnal Manajemen Pendidikan Islam*, vol. 9, no. 2, pp. 101-113, December 2024.
- [12] Lin Ang, "Mapping of systematic reviews on traditional medicine across health conditions: a protocol for a systematic map," *BMJ Open*, vol. 13, no. 12, pp. 1-6, 11 December 2023.
- [13] Matthew J Page, "The PRISMA 2020 statement: an updated guideline for reporting," *Research Methods and Reporting*, vol. 372, no. 71, pp. 1-9, 29 March 2021.
- [14] Yohannes S, "Systematic Literature Review Dengan Metode Prisma: Integrasi Manajemen Sumber Daya Manusia Berbasis Etika, Keberagaman Dan Keadilan Inklusif, Serta Keadilan Di Tempat Kerja," *Journal of Science Education and Management Business (JOSEAMB)*, vol. 4, no. 3, pp. 795-803, 11 November 2025.
- [15] Arbi Abdul Kahfi, "Pemetaan Bibliometrik Dengan Vosviewer Untuk Pengembangan Penelitian Komitmen Organisasi," *Jurnal Pemikiran Dan Penelitian Bidang Administrasi, Sosial, Humaniora Dan Kebijakan Publik*, vol. 8, no. 2, pp. 256-267, 18 June 2025.
- [16] Yonna Ananda, "Analisis Bibliometrik Artikel Jurnal Bidang Informartion Quality Pada Database Scopus Menggunakan Vosviewer," *Jurnal Pustaka Budaya*, vol. 12, no. 1, 6 January 2025.
- [17] Erin S. Barry, "How to Conduct a State-of-the-Art Literature Review," *Journal of Graduate Medical Education*, p. 663–665, 15 December 2022.
- [18] Aaron K. Martin, "Understanding resistance to digital surveillance Towards a multi-disciplinary, multi-actor framework," *Surveillance and Society*, vol. 6, no. 3, pp. 213-232, 2009.
- [19] Jones, "Anyone Who’s Watching Can See That You’re Watching, Too”: A Case Study of Prosumption and Visibility Labours on Instagram Live," *Surveillance and Society*, vol. 23, no. 1, pp. 71-85, 2025.
- [20] Azadeh Akbari, "Towards a Critical Political Economy of Surveillance and Digital Authoritarianism," *Surveillance and Society*, vol. 23, no. 1, pp. 152-158, 2025.
- [21] Peacock, "Scatological Humour and the Absent Anthropology of Privacy," *Surveillance and Society*, vol. 23, no. 1, pp. 101-112, 2025.
- [22] Thomas Grisold, "Digital Surveillance in Organizations," *Business & Information Systems Engineering*, vol. 66, no. 3, pp. 401-410, 27 June 2024.
- [23] Mika Westerlund, "The Acceptance of Digital Surveillance in an Age of Big Data," *Technology Innovation Management Review*, vol. 11, no. 3, pp. 32-45, March 2021.
- [24] Clarke, "Risks inherent in the digital surveillance economy: A research agenda," *Journal of Information Technology*, vol. 34, no. 1, 4 March 2019.
- [25] Laila Manan, "Digital Surveillance, Migration Control, and Human Rights: Ethical Dilemmas in the Use of Technology to Govern Human Mobility," *Inverge Journal Of Social Sciences*, vol. 4, no. 3, p. 319–336, 17 September 2025.
- [26] Aniello Castiglione, "Ensuring Privacy and Confidentiality in Digital Video Surveillance Systems," in *Privacy Protection Measures and Technologies in Business Organizations: Aspects and Standards*, 2012, p. 245–267.
- [27] Emily Berman, "COVID-19 Surveillance," *Social Science Research Network*, 5 August 2020.

- [28] Divya Ramjee, "COVID-19 and Digital Contact Tracing: Regulating the Future of Public Health Surveillance," *Social Science Research Network*, pp. 101-161, 22 November 2020.
- [29] Heather Rilkoff, "Innovations in public health surveillance: An overview of novel use of data and analytic methods," *CCDR*, pp. 93-101, 30 April 2024.
- [30] Ruba Skaik, "Using Social Media for Mental Health Surveillance: A Review," *ACM Computing Surveys*, vol. 53, no. 6, pp. 1-31, 6 December 2020.
- [31] Pabiangan, "The Effect of Competency Certification on the Working Conditions of Indonesia's Workers," *Journal of Economic Sciences*, vol. 2, no. 2, pp. 78-84, November 2024.
- [32] Siregar, "Peran Pemerintah Terhadap Pelaksanaan Sertifikasi Kompetensi dalam Rangka Peningkatan Profesionalitas Pekerja," *Jurnal Surya Kencana Satu : Dinamika Masalah Hukum Dan Keadilan*, vol. 15, no. 2, pp. 135-147, 04 November 2024.
- [33] Newell, "Surveillance as information practice," *Journal of the Association for Information Science and Technology*, vol. 74, no. 4, p. 444–460, 18 January 2023.
- [34] Joulanda A.M. Rawis, "Digital Education Governance: Implementation of Information Technology-Based Supervision," *Jurnal Masyarakat Digital*, vol. 1, no. 1, November 2024.