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DIGITAL LEADERSHIP COMPETENCIES AND SKILLS IN THE PUBLIC SECTOR: A SYSTEMATIC LITERATURE REVIEW AND FUTURE RESEARCH AGENDA

Mohamed Al Hammadi[1]*, Basheer Al-haimi[2]

[1]Azman Hashim International Business School (AHIBS), Universiti Teknologi Malaysia, Malaysia
ahmedali.m@graduate.utm.my https://orcid.org/0009-0004-0841-3747

[2]Senior Lecturer, Azman Hashim International Business School (AHIBS), Universiti Teknologi Malaysia, Malaysia
mabasheer@utm.my https://orcid.org/0000-0001-5660-7977

*Corresponding Author

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Abstract:

Digital transformation has become a very important agenda and a strategic imperative for modern governments, revolutionising public service delivery, organisational processes and typically bureaucratic administrative decision-making. Thus, digital leadership competencies have evolved into a critical enabler of successful transformation. Nonetheless, although there is a growing interest from the academic and policy world, the field remains theoretically fragmented and empirically underdeveloped. Ultimately, there is little clarity about which competencies matter, how they operate, and how they integrate with broader governance and public sector management practices. This systematic literature review (SLR) critically synthesises peer-reviewed studies published between 2020 and 2025 across Scopus and Web of Science to map, classify and critically review current knowledge on digital leadership competencies and skills in the public sector. An analysis of major conceptual trends, regularities, and substantive gaps in the field reveals inconsistencies in definitions, a lack of empirical validation, and the absence of sector-specific competency frameworks. Drawing on evidence from the 29 studies included, the review proposes a synthesised competency framework for government contexts comprising four main competency domains and skills within these domains: digital vision and strategic direction, digital literacy, behavioural and relational leadership, and change management. This framework offers a foundation for advancing theory, guiding empirical research, and informing competency-building initiatives for public-sector leaders and policymakers seeking to strengthen digital leadership capacity across government institutions.

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Digital Competencies; Digital Leadership; Digital Skills; Digital Transformation; Public Sector; Systematic Literature Review (Slr)

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Introduction

The global emergence of the continued, speedy, and rapid development of digital technologies has restructured organisations' systems, operations, management, and strategies (Lin, 2025). The shift toward digital transformation enables organisations to increase flexibility, productivity, and efficiency (Jeschke & Endress, 2023). It has become a robust method to respond promptly to sudden market changes, promote innovation, and maximise the benefits of analytical predictions for gaining competitive advantages (Siregar & Akhter, 2024). The move toward digital transformation relates not only to technology usage but also to transforming the work environment, raising the level of flexibility, and improving performance (Siregar & Akhter, 2024). Such a movement has steered organisations of various sizes in both the public and private sectors to adopt technology-based platforms more extensively than ever before (Ushaka Adie et al., 2024).

In organisations with a low degree of digitalisation, employees accomplish several tasks via mobile applications, conduct virtual meetings, and share information through digital platforms (Karakose et al., 2022). Organisations face challenges due to the continuously escalating pace of technology development (Tate et al., 2023). The public sector is not excluded from these digital transformation challenges, and they can be even greater than those faced in the private sector (Halsbenning et al., 2021). Examples of these challenges include enhancing service delivery, promoting transparent information, safeguarding data security, and managing limited resources amid the profound digital transformation required (Ushaka Adie et al., 2024).

Previously, governments used traditional methods in designing stakeholder services, such as offline meetings where information was shared by the government and discussed until problems were well understood, in order to develop joint solutions to enhance public services (Mu & Wang, 2022). In recent years, governments have shifted toward e-participation with stakeholders to build online public services based on their needs (Tai et al., 2020). Solutions to public problems are now based on government open data initiatives as well as the development of communications technologies driven by the emergence of the internet (Mu & Wang, 2022). Moreover, digital technology has proven its ability to make the world more decentralised, especially during the COVID-19 pandemic, when people effectively maintained robust connectivity by transforming how they react, think, and interact while forced to maintain social distancing (Tigre et al., 2023). Steering such a transformation has become particularly

complicated for public sector leaders and managers, who face varied advice on confronting and adapting to the digital era (Hunnius & Schuppan, 2013). Therefore, traditional leadership must be combined with digital leadership skills and competencies to cope with the digital era (Karakose et al., 2022).

The introduction of digital technologies has exposed leaders to rapid technological changes, such as artificial intelligence, innovative mobile applications, virtual reality, the Internet of Things, big data, and more, that affect work and social environments (Karakose et al., 2022). Leaders who are knowledgeable in managing the digital world can therefore effectively contribute to digital transformation in their organisations (Brett, 2019). This transformation has introduced new digital tools that have become crucial for leaders to use in the workplace (Erhan et al., 2022). Moreover, leaders are responsible for motivating employees to enhance their digital skills to cope with the new digital workplace environment (Cortellazzo et al., 2019). In this regard, leaders must acquire specific digital skills and competencies, which has led to the emergence of digital leadership as a distinct leadership style.

Digital leadership emerged with the industry 4.0 revolution (Bach & Sulíková, 2021). While the previous three industrial revolutions focused on mechanical production, electrical production, and information technology respectively, the fourth revolution introduced new business models via the Internet of Things and upskilled communication between devices and humans (Karakose et al., 2022). Hargitai and Bencsik (2023) define digital leadership in the context of Industry 4.0 as utilising digital technology while driving the organisation through digital transformation. Factors such as leadership behaviour and training, organisational learning, digital literacy and usage, and trust cannot be neglected during this process (de Moura Souza & Pietrafesa, 2023). Benitez et al. (2022) emphasise the behavioural attributes of the leader, defining digital leadership as the ability to motivate employees to take advantage of digital transformation within the organisation. It serves as a digital enabler that drives innovation and significantly affects employees' behaviour, performance, and attributes (Abbu et al., 2020).

The importance of digital leadership is growing rapidly among researchers and scholars, which has created some conceptual confusion. For example, some studies have linked digital leadership with e-leadership without a clear differentiation between the two (Kashive et al., 2022; Soon & Salamzadeh, 2021). In fact, digital leadership is more involved than e-leadership in driving fundamental change across the three levels of an organisation: leaders, employees, and the organisation itself (Jameson et al., 2022). It is a social influence process aimed at supporting and enhancing employees' behaviour toward digital change (Karakose et al., 2022). This requires digital leaders to balance the management of the digital transformation process with various leadership approaches, depending on the circumstances, while demonstrating strong decision-making and communication skills (Sow & Aborbie, 2018). Furthermore, Promsri (2019) highlighted key competencies of digital leadership, such as being visionary, a risk taker, digitally educated, and supportive of the organisation.

There is a unified perception in the literature that digital leadership goes beyond merely setting up a computer network and making it function (Karakose et al., 2022). In this line, it is not alarming that debates continue to ensue among scholars on what skills should be defined as part of digital leadership competencies in order to enhance organisational performance (Ushaka Adie et al., 2024). Competencies here refer to the integrated set of knowledge, skills, and behaviours that public-sector leaders need to guide digital transformation whilst skills pertain

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to specific, trainable abilities nested within those competencies. As such, prior studies generally divide digital leadership into four clusters: digital, social, business and general leadership competencies – each of which groups related skills as items of those clusters (Hearsum, 2015; Zeike et al., 2019; Ogonek & Becker, 2018; Rüth & Netzer, 2020). Whilst this grouping is useful, it is not sector-specific, and this review builds on these works only as a starting point. It is vital to add that within this scope, core competencies such as agility, trust, vision, knowledge and diversity are fundamental to getting the most out of digital transformation efforts (Hearsum, 2015). The digital skills, on the other hand, relate to the technological aspect, which includes technical knowledge, experience, and specialisation (Zeike et al., 2019). Robust business competencies are no doubt necessary for digital leadership to align organisational strategy with innovative transformation initiatives (Ogonek & Becker, 2018). Furthermore, soft skills like innovation, communication, team building and creativity are highly relevant to the social cluster (Rüth & Netzer, 2020). Karakose et al. (2022), in their elaboration, opined on the critical need for extensive training and human resource development on the use of technologies to draw closer to the full benefits of digital transformation, particularly among leadership candidates.

Globally, governments have witnessed the capabilities and revolutionary abilities of digital technology. Digital technologies hold the potential to increase governments' operational capacity and efficiency quotient, improve overall effectiveness of achieving set goals and objectives, and generate public value through public sector excellence (Criado & Gil-Garcia, 2019). Nonetheless, complexities associated with digitisation, stemming from the necessity to transform and redesign government services and adapt internally and externally to the fulfilment of users' requirements, pose a serious challenge (Mergel et al., 2018). Government organisations, therefore, see digital transformation as a significant shift of public sector administrative processes and work environment, not just a technological update (Gong et al., 2020). Digital transformation is therefore to be examined as a comprehensive process where leadership plays a significant role (Branderhorst & Ruijer, 2025; Frick et al., 2021).

While the literature presented here underscores the importance of digital leadership in driving public sector transformation, there remains a lack of clarity regarding the specific skills and competencies that leaders need to successfully navigate this process in a government setting (Pittaway & Montazemi, 2020). Much of the field is still written for private or mixed organisational contexts, which ends up treating digital leadership as a firm-level problem of innovation, agility, and competitive advantage (Karakose et al., 2022; Lin, 2025). This framing disregards the unique conditions of public sector leadership. Government roles are politically mandated and publicly accountable; public sector institutional leaders must answer to ministers, legislatures, auditors, and citizens rather than to a single market principal (Pittaway & Montazemi, 2020). Governance arrangements, procurement rules, data-protection duties, inter-agency protocols, and fiscal controls are unique from private or quasi private contexts, and these contextual artefacts limit how far a digital vision can be exercised and which skills can be used in practice (Mergel et al., 2018; Gong et al., 2020).

Bureaucratic environments characteristic of public sector leadership contexts introduces further constraints in the forms of hierarchy, tenure systems, and risk-averse cultures that altogether slow digital adoption and make change management a core leadership competency rather than an optional add-on (Halsbenning et al., 2021; Ushaka Adie et al., 2024). In essence, competency lists transferred from industry remain fragmented when applied to the public sector and rarely specify which competencies matter for government leaders, how they operate under

these constraints, or how they connect to public governance (Lin, 2025). This SLR therefore addresses that sector-specific gap by synthesising the competencies and the skills they comprise that government organisation leaders need when interacting with digital transformation. More precisely, this study addresses the following research question:

RQ1. What are the competencies and the skills they comprise that government organisation leaders should adopt while interacting with the digital transformation process?

The remaining sections of this paper are structured as follows: the next section describes the methodology, followed by the findings of the SLR, discussion of the results, implications for theory and practice, future research agenda, limitations, and finally the conclusion.

Methodology

This SLR follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009). As part of the review methodology, the search strategy, databases, selection criteria, data extraction, and analysis procedures are presented. This protocol and methodology ensured that the methods and findings are reliable, replicable, and bias-minimised (Liberati et al., 2009).

Eligibility Criteria

Eligibility criteria include studies that were conducted in the public sector, defined here as the three central components of the economy controlled by the government: (1) direct public services such as public transportation, schools, and hospitals; (2) services delivered by private companies under government contracts; and (3) financially supported sectors operating under government regulation to enhance public services (De Vries et al., 2016). This paper focused on English-language peer-reviewed works that revolve around digital leadership competencies. Both empirical and theoretical studies were eligible. Inclusion was also extended to studies examining e-leadership as an evolutionary precursor to digital leadership, as well as studies exploring leadership competencies and the skills they comprise, in the context of digital transformation, even if the exact term “digital leadership” was not used. Only articles published between January 2020, and December 2025 were included. This window follows the post-2019 expansion of digital and e-leadership research, including in government, which reviews associate with COVID-era digitalisation (Karakose et al., 2022; Elmatsani et al., 2024). That denser public-sector corpus is what makes a competency-focused synthesis feasible. Finally, inclusion was limited to peer-reviewed journal articles indexed in the Scopus and Web of Science Core Collections. Studies were excluded if they were dissertations, conference papers, or book chapters. Papers or publications outside the scope of the public sector were completely omitted. Likewise, papers that discussed broader concepts related to digital leadership without a specific focus on competencies and associated skills were excluded.

Search Strategy

A search for eligible papers was conducted across two main databases: Scopus and Web of Science. Whilst paper export mechanisms in these two databases helped with paper identification, paper selection was mainly conducted with the help of Rayyan.ai online tool. Rayyan.ai facilitated the screening process, supported reviewer blinding, managed conflicts, and ensured transparent decision-making in the paper selection process. Paper identification

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started with a clear keyword phrase including digital leadership, competencies, skills, government sector, and public sector. These terms and phrases were supplemented with synonyms and related keywords drawn from previous studies and thesauri, such as e-leadership, technology leadership, digital transformation, technology transformation, technology-enabled transformation, public administration, public service, and civil service. The keywords employed Boolean connectors ("AND" and "OR") and were applied to titles, abstracts, and keyword metadata available within the selected databases. The final search string used in both Scopus and Web of Science was:

(TITLE-ABS-KEY ("digital skill" OR "digital competence*" OR "leadership skill*" OR "digital capability*" OR "ICT" OR "technology skill*")) AND (TITLE-ABS-KEY ("digital leader*" OR "e-leadership" OR "technology leadership" OR "leadership" OR "digital transformation*" OR "technology transformation*" OR "technological transformation*" OR "technology-enabled transformation*")) AND (TITLE-ABS-KEY ("public sector" OR "govern*" OR "public administration*" OR "public service*" OR "civil service*" OR "public organisation*"))*

Study Selection

All identified papers were exported from Scopus and Web of Science using built-in paper exportation tools. The RIS files were then imported into Rayyan.ai, which helped remove duplicates across databases. Following duplicate removal, screening ensued with the help of two independent reviewers, focusing on the titles and abstracts in blind mode. Reviewers mainly excluded studies that clearly did not meet the inclusion or eligibility criteria. Paper extraction underwent full-text assessment by these same two reviewers. Any lack of consensus on whether to include or not include any paper was resolved through discussion until an agreement was reached based on the predefined inclusion and exclusion criteria. Screening proceeded in two stages: titles and abstracts were assessed first against the eligibility criteria, after which remaining papers underwent full-text review. Records were treated as out of scope where the empirical or conceptual setting was not the public sector, or where digital leadership was discussed without a focus on competencies and the skills, they comprise. In total, 1,306 records were identified (Scopus n = 519; Web of Science n = 787), 354 duplicates were removed, 952 titles and abstracts were screened, 123 full texts were assessed, 93 full-text papers were excluded, one article was retracted, and 29 studies were retained.

Data Extraction

At the paper extraction stage, a standardised extraction form was employed. The extracted information comprised author(s), year of publication, country, research context, study design (empirical or theoretical), key findings, identified digital leadership competencies and inherent skills, and the main theoretical or practical contributions. This structured approach ensured consistency and comparability across studies. The SLR identification, selection and extraction phases are summarised in line with the PRISMA protocol in Figure 1. It commenced with 1,306 records (Scopus n=519; Web of Science n=787), with 354 duplicates removed at the very start. At paper selection, 829 unrelated records were excluded during screening by the reviewers. Another 93 papers were removed due to (1) being out of scope, (2) or no proper focus on digital leadership competencies. This resulted in 31 papers, after which 1 paper was found to have been retracted and subsequently removed. A summary of the results is presented in Figure 1.

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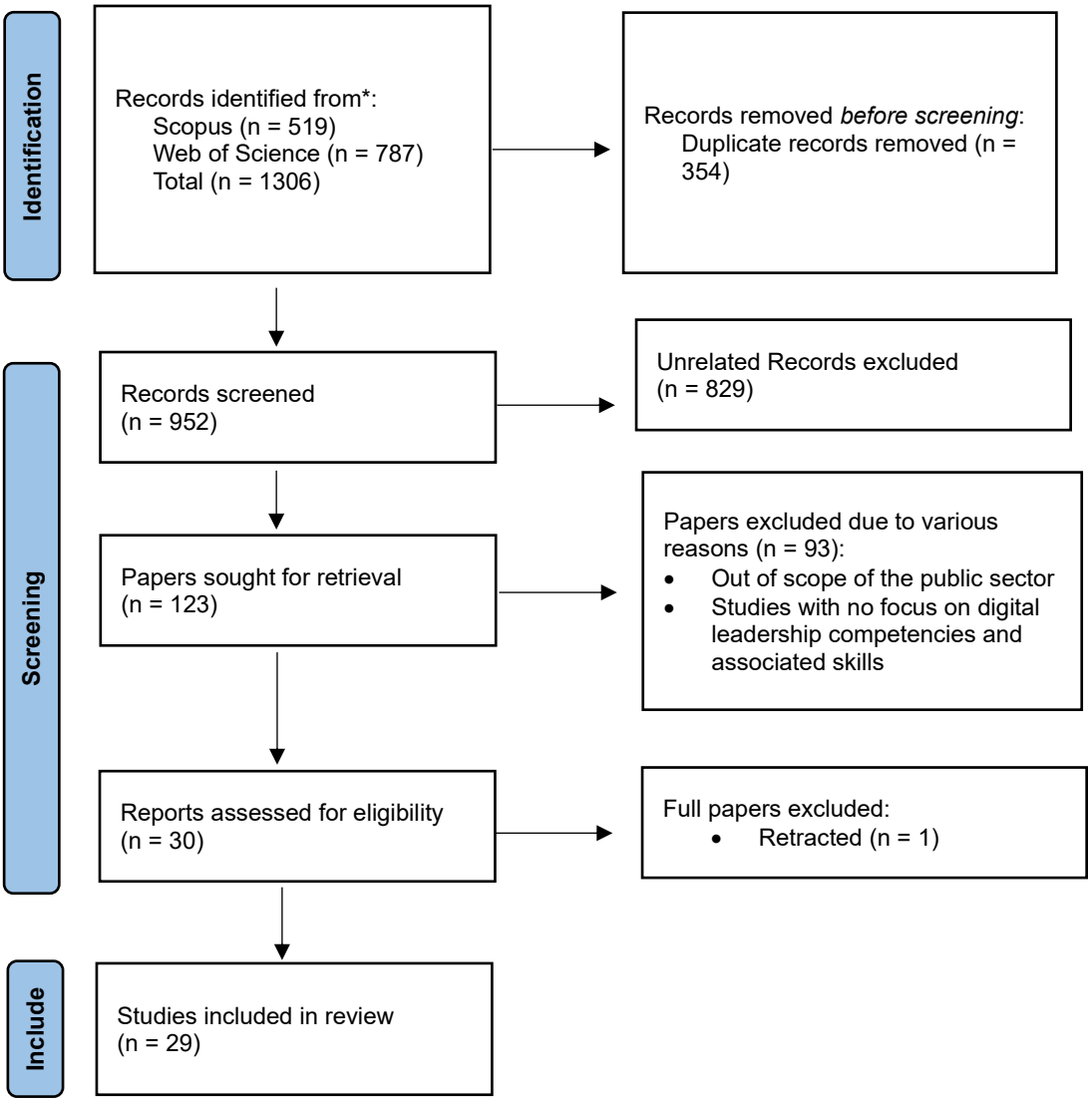


Figure 1: PRISMA flow diagram of the SLR

Source: Adapted from Liberati et al. (2009)

Data Analysis and Synthesis

The thematic analysis technique was employed to analyse and synthesise the findings. Extracted data were coded to identify recurring patterns and themes related to digital leadership competencies in the public sector. Codes were refined through constant comparison, and overlapping concepts were consolidated. This process resulted in the emergence of four overarching competency domains that structure the findings of this paper. Competency labels and nested skills were extracted from each study, compared across cases, and merged where different papers used overlapping terms for the same government-leadership task. The four domains were therefore induced from the included public-sector evidence.

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Descriptive and Citation Analysis

This section sets out the main features of the 29 studies included, providing important contexts prior to an analysis and discussion of findings. Figure 2 illustrates the distribution of publications between 2020 and 2025, alongside the citations of included papers. Research output was relatively steady from 2020 to 2023, with 3 publications per year, except 2020, which had just 1 publication; this accumulates to 10 papers in the four-year interval. The years that followed, 2024–2025, showed significant growth, with an average of 9.5 publications/year (19 studies over 2 years). This steep increase shows the growing academic interest in digital leadership competencies and inherent skills in the public sector.

The 29 studies were published in unique journals, with the exception of Education and Information Technology; this resulted in a total of 28 individual journals. Geographically (Figure 3), the studies are spread across 18 countries in five continents, indicating the global importance of digital leadership in the public sector. Indonesia was the most common country with 10 studies (34%) across smart cities, tax administration, and local government organisations. Europe contributed 11 papers, mainly led by the Netherlands (n=3), Germany (n=2) and Lithuania (n=2). In the Middle East, Qatar (n=2) and Jordan (n =1) led, whilst Africa is represented by single studies from Ethiopia, Uganda, and Afghanistan. North America includes two studies from Canada and one from the United States.

The studies also cover a diverse range of subject areas. The most frequent contexts are social sciences (n=7), followed by general business management and related subject areas (n=6), and education-related settings—including higher education, schools, and public libraries (n=5). Central government and ministries account for four studies, while smart city and smart government initiatives account for three. The remaining studies focus on police and public safety (n=2), tax administration (n=1), and health (n=1).

Not all the included 29 articles are indexed in both databases (Scopus and Web of Science). (n=24) studies were found on Scopus and (n=22) studies on Web of Science. In Scopus, citations ranged from 0 to 101 (13.5), with a median of 5.0; in Web of Science, citations ranged from 0 to 105 (22.3), with a median of 8.0. Examining AI chatbot adoption in U.S. state government agencies is the most-cited study in Scopus (n=101), followed by the studies titled Public Managers' Attitudes Toward ICT (N=74) and Digital Leadership Typologies in Higher Education (n=44). In Web of Science, the study titled A Longitudinal Examination of Digital Change Agents in German Municipalities was cited the most (n=105), followed by Digital Transformation Pattern in Afghanistan (n=70), followed by On Trade Union Voice During Digitalisation in the UK Public Service Organisations (n=50). Twelce (12) papers were published in 2025 with (n=0) citations, which reflects the time constraints to accumulate citation numbers.

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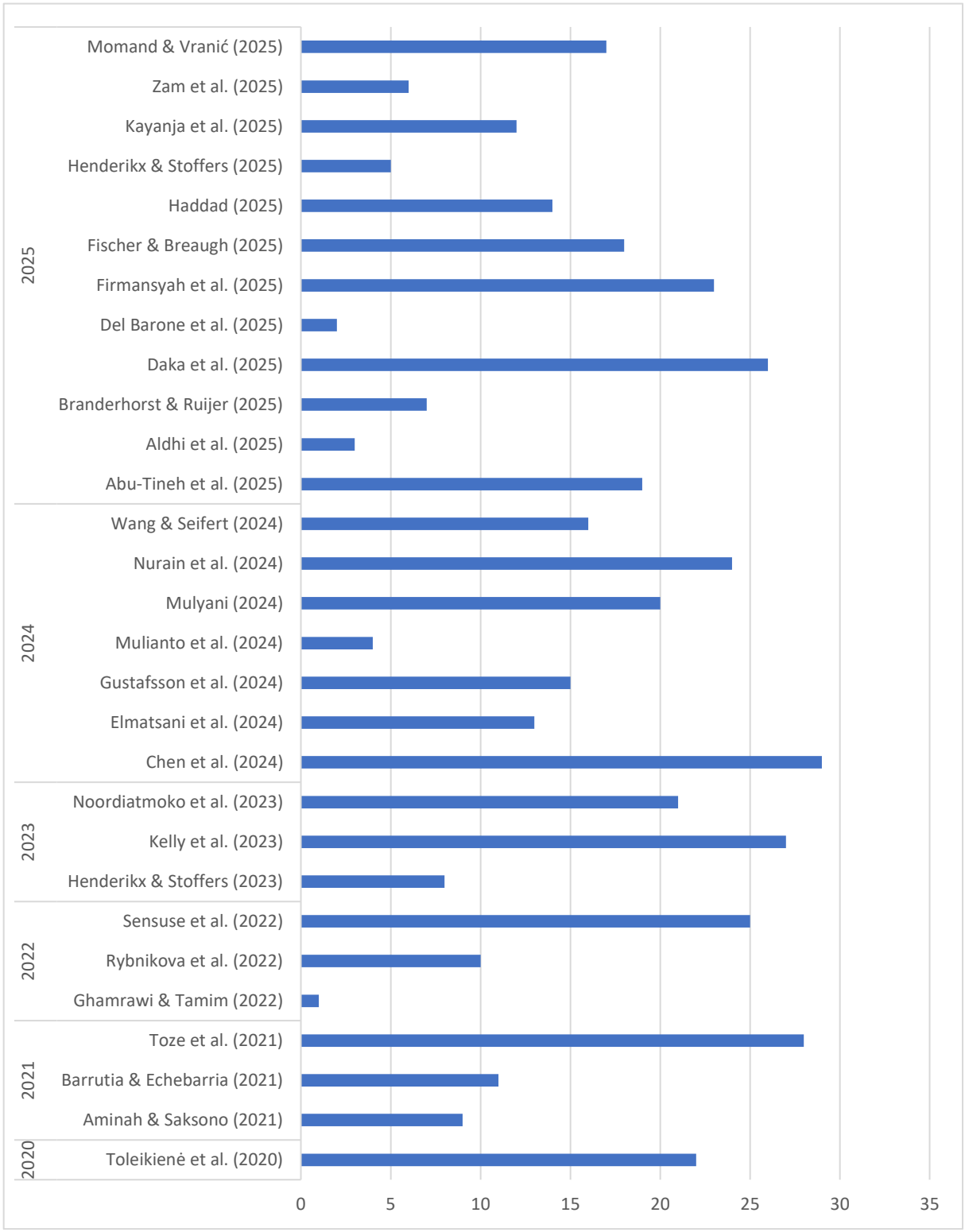


Figure 2: Authors and Dates of Publication

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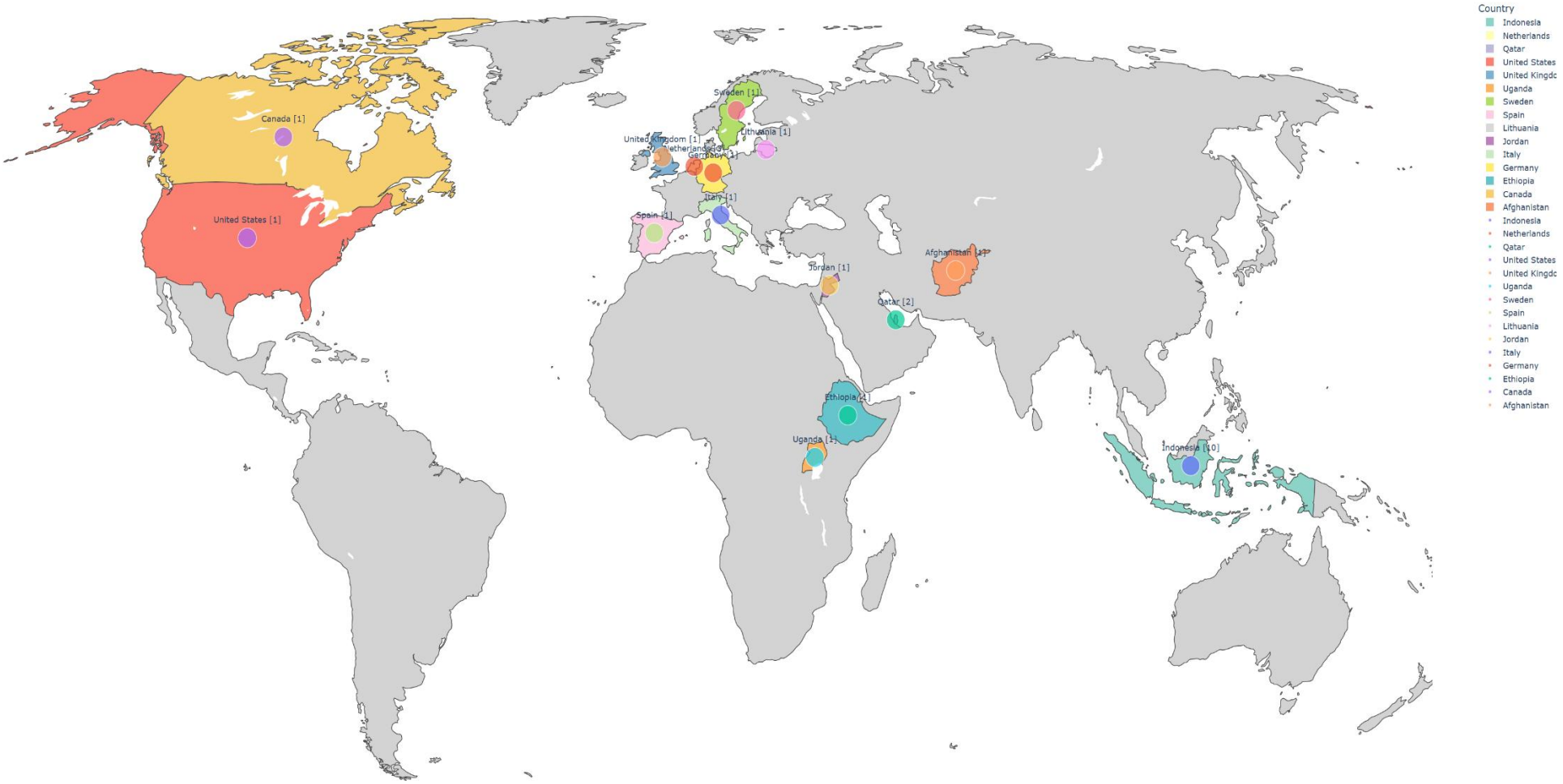


Figure 3: Global Geographic Distribution Of The 29 Included Studies On Digital Leadership Competencies In The Public Sector

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Thematic Analysis

Thematic analysis of the 29 included studies revealed four recurring themes related to digital leadership competencies and inherent skills in the public sector: (1) Digital Vision and Strategic Thinking, (2) Digital Literacy, (3) Relational and Human-Centred Leadership Competency, and (4) Change Management. Digital vision and strategic direction represent the ability to set a politically legitimate digital agenda and align it with public value, mandate, and multi-level government priorities (Branderhorst & Ruijer, 2025; Aminah & Saksono, 2021); relevant skills within this competency domain include strategic foresight, and priority-setting, translating policy into digital programmes (Wang & Seifert, 2024). Digital literacy competency encapsulates sufficient technological understanding for leaders to judge tools, data, and risk (Ghamrawi & Tamim, 2023; Elmatsani et al., 2024). Within this competency domain, ICT and data literacy, informed technology appraisal, and cybersecurity awareness form the core facets (Firmansyah et al., 2025; Momand & Vranić, 2025). Relational and human-centred leadership competency represents human-side influences in hierarchical, rule-bound public sector settings (Haddad, 2025; Henderikx & Stoffers, 2023; Mulianto et al., 2024). They include public leaders' ability to inspire trust, communication, motivation, stakeholder and citizen relations using skills such as communication, empathy, team building, political/stakeholder engagement (Firmansyah et al., 2025; Henderikx & Stoffers, 2023; Nurain et al., 2024; Toleikienė et al., 2020). Finally, change management competency entails public sector leaders' ability to steer adoption through bureaucracy, resistance, culture, and legal constraints, making use of resistance management skills, sequencing reforms, and sustained learning (Del Barone et al., 2026; Henderikx & Stoffers, 2023; Zam et al., 2025).

Strategic Vision: Widely Endorsed, Rarely Operationalised

Digital leadership vision has emerged consistently as a crucial competency across the included studies. It has been identified by Branderhorst & Ruijer (2025) as one of the nine core competency dimensions. Aminah & Saksono (2021) supported this finding, highlighting the importance of a digital leadership vision in preventing e-government failure. Several studies demonstrate that digital vision and strategic thinking go beyond being merely strategic tasks; they are operational necessities that should include a clear foresight and strategic direction to meet technical adoption requirements (Wang & Seifert, 2024). The findings of Elmatsani et al. (2024) demonstrated the strategic role of digital leadership in having a strong vision to guide digital government initiatives as one of the four core competencies. Abu-Tineh et al. (2025) found that a visionary planner is the third strongest and most significant predictor of public-school teachers' digital competencies. Toze et al. (2021) demonstrated the importance of digital leadership vision and strategic direction in steering digital transformation. These patterns are evident across a broader range of public-sector contexts. Del Barone et al. (2026) and Mulianto et al. (2024) highlighted vision and strategic thinking as the most important digital leadership competencies, while Mulyani (2024) prioritised communicating the digital transformation vision as a core competency. Henderikx & Stoffers (2023) and Kayanja et al. (2025) confirmed the importance of strategic planning in aligning digital technologies with organisational goals. Sensuse et al. (2022) found that strategic planning and policy development are key competencies for successfully adopting digital transformation in smart government.

It is important to add that the literature highlights an important paradox. The majority of the digital transformation initiatives reviewed focus mainly on building strong IT infrastructure and improving technical integration. Yet these investments only lead to better public sector

performance when leaders have the digital readiness needed to turn them into real public value (Aldhi et al., 2025). Critical scholars claim that digital leadership is not only about understanding technology but needs to relate digital shifts to particular social problems and institutional values (Branderhorst & Ruijer, 2025). In fact, many city managers recognise their leadership role but face challenges in implementing this vision due to time constraints, lack of information and intensive operational tasks (Branderhorst & Ruijer, 2025). Noordiatmoko et al. (2023) also found a significant negative effect between sustainable government performance and the use of information technology. This shows that the correct implementation conditions, in addition to vision and strategy, are important. So, the main challenge lies not in the choice of technology but in the ability of leaders to create a cognitive framework that promotes a future-oriented vision and overcomes the inertia of existing systems (Elmatsani et al., 2024). In sum, the results verify digital vision and strategic thinking as central digital leadership competency in guiding digital transformation in the public sector. However, in many contexts, there is still a huge implementation gap, where putting the vision into practice is still a huge challenge.

Digital Literacy as a Necessary but Insufficient Competency

Increasingly, and as seen in recent publications, digital leadership has been considered as a way of promoting and leveraging digital literacy. These include the competency-based skills required to improve digital activities in different public sectors. Ghamrawi & Tamim (2023) and Elmatsani et al. (2024) showed that digital skills and ICT literacy are key to digital leadership competency building, with effective leadership potential. In a similar vein, Zam et al. (2025) and Barrutia & Echebarria (2021) found that digital literacy represents a significant factor for civil servants who stand to successfully adopt the use of ICT in the delivery of public services with the aim of enhancing service delivery and innovation. Based on this line of argument, Toze et al. (2021) and Henderikx & Stoffers (2022) posit that the relevance of learning digital knowledge on tools and hardware lies in the simplification of processes. Mulyani (2024) further emphasised the importance of continuous improvement in digital literacy through leadership awareness, while Rybnikova et al. (2022) underscored digital leadership proficiency for effective performance across multiple digital platforms.

This attention to digital literacy spans a variety of contexts. Along with cybersecurity awareness, digital training has been repeatedly identified as a key activity to improve competencies across the entire government workforce (Firmansyah et al., 2025; Momand & Vranić, 2025). Nevertheless, there are major gaps in implementation. ICT infrastructure, standardised training and curricula in the digital field are missing and score lowest among domains (Daka et al., 2025). Similarly, Branderhorst & Ruijer (2025) stated that HR departments often overlook digital skill training and apply it rarely. According to Aldhi et al. (2025), having a robust IT infrastructure and skilled civil servants is insufficient to boost the performance of the public sector if the managerial staff does not have a strong digital readiness. One emerging debate in the literature concerns the relative importance of technical skills versus a digital mindset. Technical skills within this domain, such as data evaluation and information management are important, but many studies suggest that more important leadership competencies are an open mindset, a willingness to change, and “technical intuition” (understanding the limits and possibilities of technology) rather than being a technical expert. This tension is particularly evident where civil servants may have no specialised technical skills (e.g. programming), but the more fundamental barrier is the absence of a broader digital transformation mindset and collaborative culture. Overall, the findings confirm that digital

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literacy continues to be an essential competence for leaders of governments. Notwithstanding, leaders need to constantly cultivate and improve technical skills and the underlying digital mindsets if they will be able to effectively steer digital transformation in the public sector.

Relational and Human-Centred Leadership Competency

Motivation, digital skills, empowerment, leadership support, emotional intelligence, conflict resolution, creativity, and related behaviours emerged consistently across the 29 studies as crucial relational and human-centred leadership competency (Haddad, 2025; Henderikx & Stoffers, 2023; Mulianto et al., 2024). These skills form the foundation of organisational culture and are often viewed as more critical than purely technical aspects for digital leadership competency to shape employees' mindset toward digital transformation (Toze et al., 2021). Elmatsani et al. (2024) found support for the view that technical skills within the human-centred leadership competency domain should align well with interpersonal competencies for better results. Firmansyah et al. (2025) further noted that digital leadership had no significant moderating effect on intellectual capital when personal and relational aspects were ignored. Building on this, Fischer & Breaugh (2025) identified leader support as the most critical factor in enhancing digital adoption, regardless of motivation level. Both mid- and higher-level managers rated general and personal leadership competencies above digital competencies (Henderikx & Stoffers, 2023). From a digital tool's perspective, Nurain et al. (2024), Kelly et al. (2023), and Toleikienė et al. (2020) demonstrated that digital leadership is a key enabler in modelling ICT adoption, removing participation barriers, and enabling access to digital tools. Gustafsson et al. (2024) found that ICT coordinators became individually oriented and isolated rather than empowered if the municipalities took a general rather than a specific approach, whilst Rybnikova et al. (2022) and Mulianto et al. (2024) highlighted the role of digital leadership in motivating and role-modelling digital behaviour.

Adding to this, an emerging debate in the literature is whether digital leadership is an evolution of traditional leadership or a fundamental paradigm shift. Whilst some authors conceive of it as an advanced form of transformational leadership that is focused on facilitating organisational responses to rapid technological change, another group of scholars advocates a more radical people-oriented approach which is based around emotional intelligence, empathy and employee empowerment. This tension is mirrored in inconsistent empirical findings. Some studies show positive effects on performance while others point to the fact that the direct impact of digital leadership may be insignificant unless mediated by dynamic capabilities and a culture of continuous organisational learning. In short, effective digital leadership in the public sector should be more than just technical competence. To support their workforce on the journey of digital transformation, leaders must actively demonstrate interpersonal and human-centric behaviours and act as catalysts to motivate employees by highlighting personal benefits rather than simply forcing them to adopt.

Change Management and Resistance in the Public Sector

Literature evidence from the included papers reveals a significant amount of resistance to change in the public sector; this is particularly true when the harnessing of digital skills is brought into perspective. Ultimately, there are still significant gaps between the availability of digital tools and their actual use. As Zam et al. (2025) note, digital transformation is a holistic process, and unless the digital leaders address resistance to change, capability building and learning culture, optimal results cannot be achieved. Digital skills such as remote team

management, adaptability and cooperation were also found in the papers to be essential for leading digital change (Henderikx & Stoffers, 2023). According to Aminah & Saksono (2021), digital leadership is important for overcoming resistance to digitalisation, and Del Barone et al. (2026) highlighted change management as a key digital leadership competency. According to Chen et al. (2024), leadership and an innovative culture were identified as critical change enablers from an unexpected environmental shock perspective, such as COVID-19.

The key issue in the literature is whether the main barrier to digital transformation is technical or cultural. According to research, many transformation failures are not due to technical shortcomings, but rather due to cultural resistance, reluctance to change and ongoing bureaucratic silos (Mulianto et al., 2024). This has demonstrated the need for digital guides or change agents that connect strategy and frontline implementation. As Branderhorst & Ruijer (2025) pointed out, digital transformation is as much about the technologies as it is about creating the organisational environment for change to happen. But many efforts fall short in practice. Zam et al. (2025) found that digital leadership cannot directly improve civil servant performance in local government if employees are still resistant, usually due to discomfort with new work processes. Aminah & Saksono (2021) also found that weak leadership commitment, limited competencies and gaps in ICT infrastructure are major barriers. The results reaffirm the importance of change management as a vital competency for digital leadership in the public sector. For successful transformation, we need to go beyond the technology rollout and develop structured change management plans to address employee fears, break old habits and promote user-centred approaches to overcome cultural inertia.

Discussions

This SLR sought to identify the digital leadership competencies needed in the public sector. A critical analysis and synthesis of 29 peer-reviewed studies published between 2020 and 2025 revealed four key themes: digital vision and strategic thinking, digital literacy, digital leadership behaviours and change management. The discussion presented here relates these findings to the broader literature and provides the grounds for highlighting the review's contributions and implications for public sector digital transformation. Reflecting on the persistent focus on digital vision and strategic thinking (Haycock, 2012; Türk, 2023; Khan & Khan, 2019; Van Wart et al., 2017), this review exposes a significant paradox in the public sector. Whilst digital vision is generally accepted as being of utmost importance, public leaders often find it difficult to operationalise it due to time constraints, lack of knowledge and bureaucratic realities (Branderhorst & Ruijer, 2025). In the context of government, digital vision should be seen as an operational requirement rather than a high-level strategic objective. This subtlety is not well highlighted in the current models.

The results on digital literacy are in line with past studies linking digital literacy to improved leadership effectiveness and service delivery (Toleikienė et al., 2020; Al-Mahrezi et al., 2021; Khoeroni et al., 2022). One unique insight from this SLR is the continued gap in implementation. Although there is a general consensus on its importance, training programmes are still lacking and organisational support is often absent, as highlighted by Daka et al. (2025), Branderhorst & Ruijer (2025), Aldhi et al. (2025) and Enaifoghe (2025). Thus, the review findings highlight that digital literacy is a necessary but not sufficient condition without additional infrastructural and managerial readiness.

Looking beyond technical proficiency, the salience of digital leadership behaviours underlies the growing awareness of human-centric competencies in digital transformation. The included papers reinforce the previous calls for empowerment, empathy, and relational competencies; these arguments were witnessed in Baack (2015), Sağbaş (2022), Abbu et al. (2022), Henderikx & Stoffers (2022, 2023) and Khan et al. (2025). The findings from these papers provide insights into the debate that public sector managers are more inclined to general and personal leadership rather than technical skills. This insight further validates the need for leaders to be digital advocates to inspire and empower employees.

In a final stretch, the papers revealed that change management is an important competence in line with Kotter's 8-Step Change Model. Whilst influential scholars like Akhmad (2025), Turyadi et al. (2023) and Legner (2017) support this notion, they also point to a significant problem in the public sector, which is cultural inertia and resistance. These two challenges have often acted as barriers to digital leadership initiatives, as further highlighted by Zam et al. (2025), Aminah & Saksono (2021), Mulianto et al. (2024) and Turyadi et al. (2023). These debates and scholarly evidence indicate that successful change management in government calls for not just structured plans, but also intentional efforts to tackle bureaucratic silos and employee fears.

In conclusion, the four themes discussed as part of the SLR findings show considerable alignment with the existing digital leadership literature, but their specific manifestation in the public sector shows important contextual differences. The most important contribution of this study is the identification of repeated implementation gaps in all four areas. This means that having competencies does not automatically mean successful digital transformation of government institutions.

Implications

This review offers several theoretical and practical implications for digital leadership in the public sector.

Theoretical Implications

Theoretically, the study contributes to a persistent gap in the lack of attention to digital leadership, synthesising and critically appraising the latest scholarly work on the area. It contributes to the public sector context by suggesting an integrated competency framework that goes beyond the original four-cluster model. Existing digital-leadership models typically cluster competencies as digital, social, business and general leadership, or treat vision, literacy and change as firm-level capabilities for innovation and competitive advantage (Hearsum, 2015; Karakose et al., 2022; Lin, 2025). The four domains that emerged from this review are not another generic competency list but one organised around the tasks government leaders actually face: setting direction under political mandate, securing literacy in bureaucratic settings, leading people through hierarchy, and managing change where resistance and rules are high.

The findings show the progression from strategic vision and thinking to digital literacy, to improved leadership behaviours and finally to effective change management. Digital vision is framed as politically mandated public-value direction rather than market strategy; digital literacy is the capacity to judge tools and risk inside procurement, audit and data-protection

rules; relational leadership is influence through hierarchy, tenure and citizen accountability rather than team agility alone; and change management is treated as a core competency because bureaucratic resistance and legal constraint are normal, not exceptional. This represents a holistic approach, responding to calls by scholars such as Ushaka Adie et al. (2024), regarding the impact of digital leadership on digital transformation in the public sector. In that sense the four domains re-specify digital leadership for public governance instead of transferring a private-sector typology to government.

This also distinguishes the framework from recent public-sector typologies. Branderhorst and Ruijer (2025), for example, propose nine digital-leadership dimensions for Dutch city managers. Whilst their work is valuable at the local level, it remains a single-context inventory. The four domains here are a cross-study synthesis attempt that collapsed overlapping dimensional lists into government tasks under legal and bureaucratic constraint. To this end, the present study addresses an implementation gap as part of the digital leadership competency problem rather than a residual afterthought.

Practical Implications

The findings offer practical advice for heads of government, policy makers and human resource departments. Governments need to think outside the box of digital leadership as a technology management function, developing full competency profiles that blend strategic vision, digital literacy, human-centred behaviours and change management competencies, are instrumental to tackling the lack of broad-based digital adoption. There is a need for specific government support mechanisms to allow enough time and resource allocations, change management initiatives that are well-structured and continuous digital training programmes. In operational terms, ministries and public sector agencies may operationalise the four domains as a single development and strategy template by mapping the current institutional leadership profiles against the domains, then designing training programs that exploit the embedded synergistic benefits of these domains rather than running such courses in isolation. A public sector business case would show who owns the political mandate and drives the strategic vision, has the competency to judge digital tools, is opened to engaging staff and citizens, whilst managing resistance and legal constraints. Local and central governments may employ the framework to audit capability gaps before acquiring new digital platforms. This is critical to ensure that investment follows leadership readiness rather than precedes it.

Certainly, the human resource departments have an important role in this process. They should design and implement continuous training programmes combining technical skills with soft skills development such as empathy, empowerment and motivational skills. Karakose et al. (2022) and Fischer and Breaugh (2025) emphasise that integrated training is key to unlocking the full potential of digital transformation. Finally, policymakers should move beyond a narrow approach of investing in digital tools and infrastructure to cultivating a wider culture of digital readiness. Strong IT infrastructure and skilled civil servants are also needed, but strong managerial digital readiness is also needed, as emphasised by Aldhi et al. (2025). It is important to create this enabling environment so that digital leadership competencies can be translated into tangible improvements in the delivery of public services and organisational performance.

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Future Research Agenda

The review reveals two major gaps beyond the contributions of the included studies. In the first place, given the geographical concentration of existing research, future research should explore the applicability and effectiveness of the identified competencies in under-represented regions, particularly Africa, South Asia and East Asia, where digital transformation is taking place under different political, economic and cultural contexts. This would enable understanding the extent to which the present findings can be generalised to the world. Second, while this review has reaffirmed the importance of digital leadership competencies, there is still a clear gap between these competencies and their successful implementation in practice. Future research should investigate the specific mechanisms and enabling conditions needed to bridge this gap, including organisational contexts, digital infrastructure readiness, management capacity, and targeted leadership development interventions.

Limitations

This review has some limitations that should be acknowledged. First, most of the included studies are from Indonesia (34%) and Europe (38%), limiting the generalisability of the findings to other regions, such as Africa, South Asia and East Asia. Second, a considerable number of studies were published in 2025. Many of the findings are therefore relatively new and have not yet been replicated or studied over time. Citation counts are also low because of the recency of the publication.

Conclusion

This study synthesised 29 peer-reviewed studies published between 2020 and 2025 following PRISMA protocol, to identify the core digital leadership competencies for successful digital transformation in the public sector. The analysis identified four inter-related areas of focus: strategic vision and thinking; digital literacy; digital leadership behaviours; and change management. Together, these areas constitute an integrated competency profile that can enable public sector leaders to better navigate digital transformation. The main finding of this review is the persistent implementation gap between the recognition of these competencies and their application in government settings. Across contexts, the literature reveals a consistent picture of digital vision being viewed as an operational necessity rather than a strategic aspiration, digital literacy training being neglected, leadership behaviours tending to focus on technical proficiency rather than interpersonal skills, and change management efforts rarely recognising the critical role of organisational culture and managerial readiness. This review addresses these challenges and offers a more holistic competency framework tailored for the public sector to serve as a basis for both theoretical and practical competency-building initiatives. The four competency domains provide a practical basis for government capability building and for leading digital transformation towards improved public services and organisational performance.

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