Artificial intelligence in action: shaping the future of public sector

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Abstract

Purpose – *Artificial intelligence (AI) has transformed various sectors, including automotive, finance, media, travel and retail by leveraging new-age technologies. Education, banking, health care, social policy and regulation, within the public sector have witnessed significant AI applications and substantial benefits. The importance of AI in the public sector includes enhanced efficiency, improved decision-making, cost savings, citizen-centric services, etc. Despite these advancements, a mindful discussion on the societal impact of AI in the public sector demands comprehension regarding its subjugation. Therefore, this study aims to analyze the role of AI in transforming the public sector using a bibliometric analysis of recent trends and challenges.*

Design/methodology/approach – *This study has used bibliometric analysis to trace the intellectual patterns of previous research. It comprises 231 articles from 2000 to 2024 from Scopus through the Scientific Procedures and Rationales for Systematic Literature Reviews protocol. This protocol has adopted a three-step process for identifying articles, i.e. assembling, arranging and assessing.*

Findings – *The publication trend shows an upward trajectory since 2017, whereas network visualization protrudes with the recent trends and thematic expressions, namely, Global AI ethics and policy challenges in public sectors, AI adoption and governance in public sector, challenges and opportunities of implementing AI in public administration and AI's role in economic and public transformation.*

Research limitations/implications – *The findings suggest AI adoption in the public sector enhances transparency and efficiency but demands ethical guidelines, legal frameworks and stakeholder governance to address challenges such as data privacy, algorithmic bias and public trust. Policies should promote responsible AI use, balancing innovation with accountability to improve public service delivery and uphold democratic values.*

Originality/value – *This paper enhances the limited literature on the integration of AI in the public sector, focusing on emerging themes and trending topics with future research directions to furnish a holistic perspective. It aims to guide researchers and policymakers in exploring areas for further investigation in this domain.*

Keywords *Artificial intelligence, Public sector, Governance, Bibliometric analysis, SPAR 4 SLR*

Paper type *Research paper*

1. Introduction

In recent years, artificial intelligence (AI) has advanced significantly. Owing to the versatility of the applications, AI has gained paramount importance, which has widened the potential possibilities and uses through different technologies such as natural language processing (NLP), computer vision and machine learning, as well as the proliferation of data availability for algorithm training (Bornet *et al.*, 2021). According to Thórisson *et al.* (2015), artificial intelligence aids in our comprehension or learning of intellectual tasks carried out by people. "The ability of machines to mimic intelligent human behavior and specifically to 'cognitive' functions that we associate with the human mind, including problem-solving and learning," according to Syam and Sharma (2018, p. 136), is what artificial intelligence (AI) is thought to be. Chen and Zhou (2021, p. 2) further support these definitions by defining AI as the "intelligence displayed by machines, in contrast to the instinctive intelligence exhibited by humans." AI has been assumed to be one of the most critical technologies of the recent

century (Di Noia *et al.*, 2022) and is anticipated to have a major role in resolving both minor and major societal issues that affect both the public and private sectors as well as individuals (Sousa *et al.*, 2019). According to Chui (2017), AI – as an impactful disruptive technology, has shaped a wide range of industries (e.g. automotive, financial, media, retail and travel) and its ramification is also observed within the public sector (Desouza, 2018). Some significant examples of embracement of artificial intelligence in the public sector are in education (Rockoff *et al.*, 2010), banking (Ho and Chow, 2023), social policy (Chandler *et al.*, 2011) and regulation (Kang *et al.*, 2013) additionally, the health sector draws prodigious investment for implementing new technology (Yang *et al.*, 2012). In public sector, most AI applications involve virtual assistants, such as chatbots or virtual agents, answering questions or delivering official information such as company policies, product details or service updates (Androutsopoulou *et al.*, 2019; Van Noordt and Misuraca, 2022). More sophisticated uses include fraud detection by tax administrations (OECD, 2022), analysis and early warning to prevent fraud and boost accountability (Bassey *et al.*, 2022), traffic management (Oldani *et al.*, 2017) and pattern detection to enhance information modeling during disaster responses (Margetts and Dorobantu, 2019; Tan *et al.*, 2021).

Regarding the public sector, e-government has been highly praised for providing new incentives to support timely and efficient service delivery (Mbatha and Ocholla, 2011). Therefore, transforming how the public sector operates requires the incorporation of AI into the e-government universe. Through time-sensitive evaluation frameworks, AI is essential to changing the institutional culture of the public sector and making it more transparent and data-driven (Arinder, 2016). Furthermore, when defining the potentially transformative effects of AI in the public sector, these frameworks emphasize evidence-based decision-making and longitudinal cost–benefit analyses during critical policymaking moments. According to Agbozo and Spassov (2018), the shift from traditional to AI-based management highlights the importance of relatively new AI technologies and the relevance of AI research in government. Other technologies such as NLP have been used to gauge public sentiment, provide input to the government and help the public sector enhance relevant policies (Zhang *et al.*, 2021a, 2021b). Many academics have used data from social media platforms such as Facebook and Twitter to extract public posts or comments to find various insights, particularly during COVID-19 (Madanian *et al.*, 2021). To improve energy efficiency management, other technologies, such as machine learning (ML) models, can forecast energy usage (Zekić-Sušac *et al.*, 2020). By tackling social issues and enabling data-driven decision-making (ML) is also revolutionizing e-government. There are obstacles to its implementation even if it has several advantages for the public sector. The technology's expanding significance in public administration is demonstrated by its potential for use in various governmental applications (Alexopoulos *et al.*, 2019).

It is evident from a Scopus search that a significant amount of empirical, conceptual and technological research on AI within the public sector (AIPS) has arisen, particularly in the previous five years. For instance, many real-world instances of AI used by national and international government organizations are documented in practitioner and academic sources. However, the abundance of bibliometric studies creates uncertainty and confusion regarding the state of research at the moment, the authors and sources that contribute, emerging topics in AI and the public sector and likely future research queries. The topic needs to be sufficiently addressed by the few review articles that are now available because AIPS is an ever-evolving and dynamic field of research. The published research studies have significantly expanded, particularly during and after COVID-19, highlighting the need for up-to-date bibliometric analysis to stay current with scientific advancement and practical applications. A quick summary of the review papers that are now available in the area of "AI in the Public Sector" and the necessity of a current bibliometric analysis is provided in Table 1.

Previously, papers like Lawelai *et al.* (2023) and Di Vaio *et al.* (2022) have done bibliometrics, but their research had no thematic analysis, whereas Wirtz *et al.* (2021) had

Table 1 Different review studies in AI and public sector

Sl No.	Authors	Journal	Database	Method	Papers	Gap
1	Di Vaio *et al.* (2022)	*Technological Forecasting and Social Change*	Scopus, WOS and Google Scholar	BA	161	This study does not present a thematic analysis and lacks knowledge of the future research sector. The data was up to 2021
2	Wirtz *et al.* (2021)	*International Journal of Public Administration*	EBSCO database, Google Scholar and Science Direct	SLR	189	The authors could not consider global databases, such as Scopus or WOS, which must have excluded some iconic papers
3	Yolvi *et al.* (2022)	*Metaverse*	No database	GR	none	The authors only focused on challenges and opportunities in the adoption of AI in the public sector
4	Sousa *et al.* (2019)	*Government Information Quarterly*	Science Direct, EBSCO, WOS, Gale and ProQuest	SLR	59	The authors did not focus on the Scopus database and there was no bibliometric analysis performed
5	Zuiderwijk *et al.* (2021)	*Government Information Quarterly*	Web of Science, Scopus, DGRL	SLR	26	Owing to the authors' relevance criteria, a small number of studies have been considered in this paper along with the absence of bibliometric analysis
6	Madan and Ashok (2023)	*Government Information Quarterly*	EBSCO, Web of Science, Google Scholar	SLR	73	Less number of documents. No bibliometric analysis was performed. This paper does not look at the overall perspective on AIPS
7	Lawelai *et al.* (2023)	*TEM Journal*	Scopus	BA	183	Considered data from 2013 to 2022. Absence of thematic analysis, current trends and future research questions

Notes: BA = bibliometric analysis; SLR = systematic literature review; GR = general review
Source: Authors' own creation

considered the papers published before 2020. Therefore, our bibliometric will be the most recent with adequate thematic analysis, laying the foundations for future research opportunities. Thus, this article seeks to close this gap by offering a literature review of documents published from 2000 to 2024, focusing on AI's impact in the public sector. Therefore, the following four research questions lead this bibliometric analysis to answer the unanswered questions among the scientific practitioner communities:

RQ1. In what ways did the AIPS study expand in terms of publications and citations between 2000 and 2024?

RQ2. Who are the productive authors, sources, countries and organizations in AIPS research?

RQ3. What are the existing research themes in AIPS?

RQ4. What are the trending topics in AIPS?

RQ5. What prospects exist for further research and publishing in AIPS studies?

A total of 231 articles were redeemed from the global database – Scopus, using the query phrase adapted for this study. Bibliometric analysis, including cluster analysis, keyword analysis and citation analysis, was used to study them. The research is divided are as follows. Section 2 will consist of methodology, Section 3will describe performance analysis, Section 4 will focus on thematic analysis, Section 5 will focus on discussion, Section 6 will consist of limitations and future research direction and finally Section 7 will discuss the implication of research and conclusion.

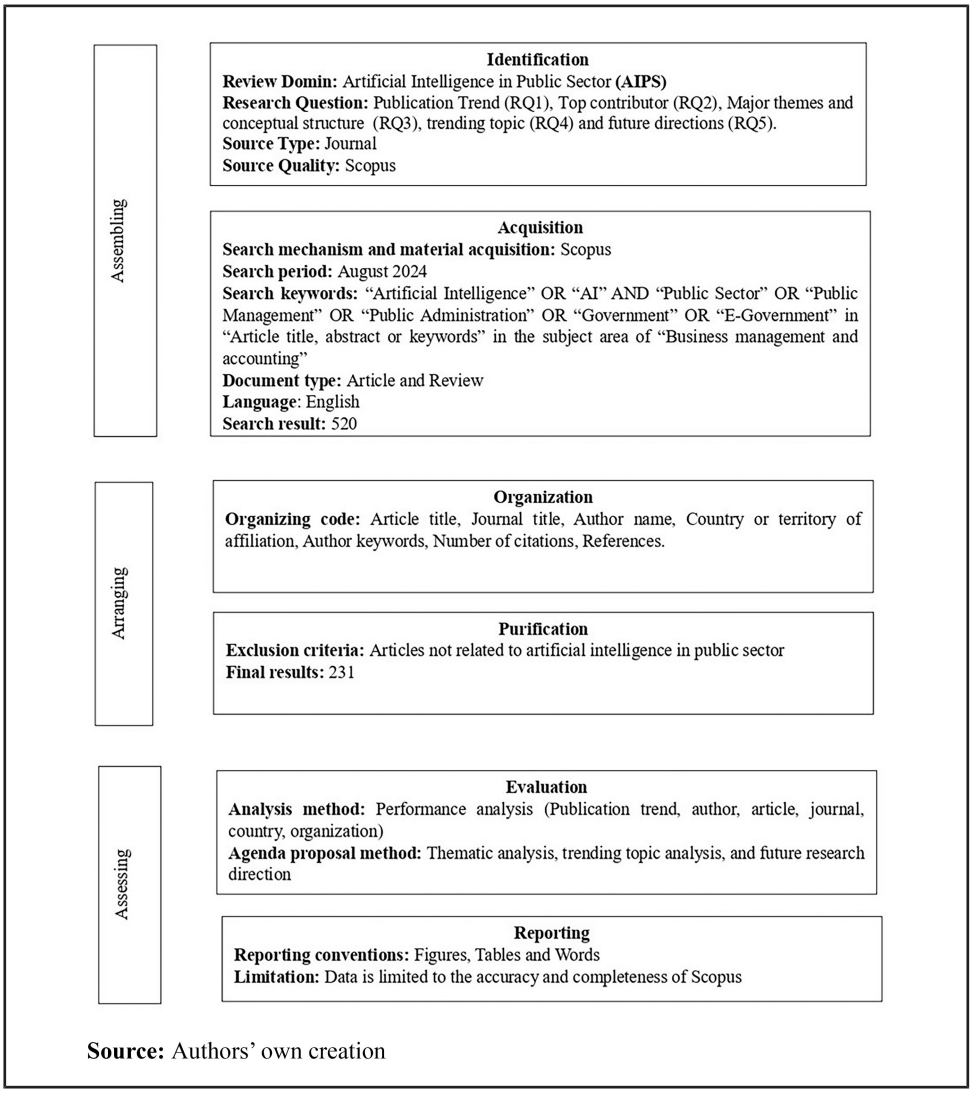
2. Methodology Scientific Procedures and Rationales for Systematic Literature Reviews

This present study developed a comprehensive corpus of relevant articles on AIPS using the Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol. The SPAR-4-SLR process is a tripartite process that was followed in sequence. First is the assembly stage, wherein pertinent articles are searched and gathered; second is the arranging stage, where the articles are organized and refined. The third is the assessing stage, the content of the articles was evaluated for suitability regarding selecting articles for bibliometric analysis based on approaches adopted in similar studies (Basu *et al.*, 2023). The assessment has been done to conform to the research questions of the present study, as adopted in established bibliometric research methods. Figure 1 presents the review protocol.

2.1 Assembling

This very stage implicates identifying and collecting literature not previously integrated (Paul *et al.*, 2021). The Scopus database was used in that context, and the subject area was restricted

Figure 1 SPAR 4 SLR (Paul *et al.*, 2021)



Source: Authors' own creation

to "Business Management and Accounting." The selected subject area is confined to "Business Management and Accounting" to ensure, that the present study furnishes the relevance to organizational performance, organizational behavior, project management, cost management, risk management and decision-making. The articles were searched using a set of discrete keywords relevant to artificial intelligence and the public sector, such as "Artificial Intelligence" and "Public Sector", to capture a wide variety of relevant articles, synonyms and associated terms included "Artificial Intelligence" and "Public sector". This study has been restricted to articles and reviews only, turning a preliminary set of 231 articles. The keywords, chosen for the present study primarily were "Artificial Intelligence" and "Public Sector" which is aligned with the recommendation made by Lim *et al.* (2022) for using a single keyword search in the context of global review domains. While previous studies (Zuiderwijk *et al.*, 2021; Sousa *et al.*, 2019) have made a choice for their studies to use the same and similar keywords. Adding to this the other keywords such as "public management" or "public administration" were carefully selected, which would yield similar results. As the study focussed on the operationalization of AI in public sector, keywords, such as above were significantly relevant. On the other hand, if the keywords, for instance, "private sector," "administration" or "management" were used, it might provide alternative information that is not technically related to public sector.

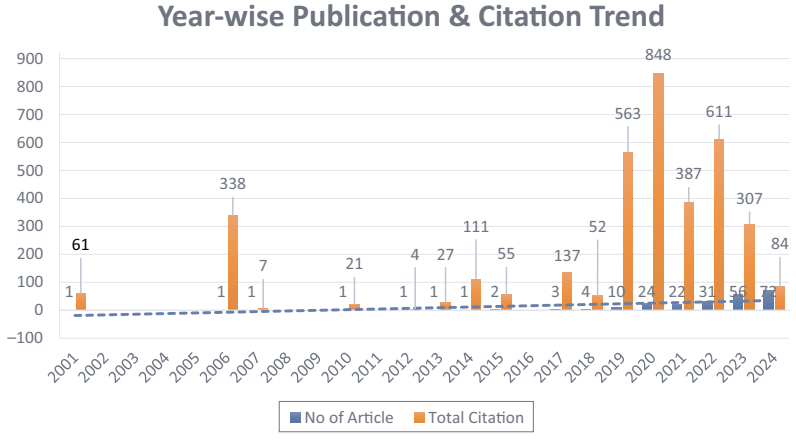
2.2 Arranging

During the arranging phase of the SPAR 4 SLR, the materials are refined and organized with codes to categorize the literature (Paul *et al.*, 2021). The article selection was confined to journals indexed in Scopus. The search timeframe was restricted from 2001 to August 2024, As the earliest noteworthy publication on AIPS emerged in 2001, as shown in Figure 2. Consequently, this method yielded 231 articles for the final review.

2.3 Assessing

The closing step of the SPAR-4-SLR process is the evaluation phase, which involves assessing the reviewed articles, including the proposed research agenda and analytical methods and their presentation, such as reporting standards, limitations and funding sources. In this evaluation process, bibliometric analysis was performed, using software tools to identify historical and current trends for AIPS research. Microsoft Excel calculates publication patterns and performance metrics for journals, articles, authors and countries/territories. Additionally, Biblioshiny and

Figure 2 Publication and citation trend in AIPS research



Source: Authors' own creation

VOSviewer (Van Eck and Waltman, 2010) were engaged to examine and visually depict the research content in this field. Biblioshiny and VOS viewer were extensively used by researchers for bibliometric clustering and mapping activities (Van Eck *et al.*, 2010; Lim *et al.*, 2022) and have been used to analyze and visualize data related to emerging themes. This approach aligns with previous bibliometric reviews aimed at presenting comprehensive bibliometric insights. Future research directions were formulated through a reflective analysis of the field, combined with an exploration of emerging trends, leveraging these widely adopted tools.

A review of previous studies was conducted alongside identifying emerging trends to propose ideas for future research. For presentation, as seen in prior studies (e.g. Donthu *et al.*, 2021; Kumar *et al.*, 2022, 2021), the findings are displayed through graphical network representations, tables using bibliometric methods and accompanying narratives. However, the scope of bibliometric evaluations and the reliability and quality of data available on Scopus may limit the ability to draw definitive conclusions.

3. Performance analysis of artificial intelligence on public sector research

3.1 Article publishing trend (RQ1) on artificial intelligence within the public sector research

The research on AIPS has shown an increasing tendency through more than 20 years of publishing, demonstrating its established position and expanding significance from 2001 to 2024. Even though the first paper under the domain appeared in 2001, a negligible number of papers were observed to be published until 2017. It is also witnessed that there needs to be more uniformity in publishing articles, pointing to the years 2002, 2003, 2004, 2005, 2008, 2009, 2011 and 2016, which marked no publishing within the tenure. Years before 2017 account only for approximately 3.9% of the entire publication, whereas 96.10% is coined to last eight years. It may be attributed to the fact that, in the initial days, artificial intelligence was underutilized in different public sectors. Thus, the notion of artificial intelligence in public sectors (AIPSs) evolved slowly and irregularly. The year 2019 accelerated the number of publications, and 2024 holds the highest publishing year so far (i.e. 72 articles). The total number of citations (TC) and Total published papers (TP) for each year are shown in Table 2 and Figure 2. Additionally, the table shows the number of articles that obtained different citation levels; the minimum citation levels are set at >500, >250, >100, >50, >25, >10 and >1. According to Table 2, over 38.09% of publications obtained at least one citation.

Table 2 Publication and citation trend of AIPS research

Year	*No. of article*	*Total citation*	*> 500*	*>250*	*> 100*	*>50*	*>25*	*≥10*	*≥1 < 10*
2001	1	61				1			
2006	1	338		1					
2007	1	7							1
2010	1	21						1	
2012	1	4							1
2013	1	27					1		
2014	1	111			1				
2015	2	55					1	1	
2017	3	137				1		2	
2018	4	52					1	1	1
2019	10	563		1		2	1	2	4
2020	24	848			2	5	1	5	7
2021	22	387		1		4	2		14
2022	31	611			1	2	3	9	13
2023	56	307						1	21
2024	72	84					3	6	26

Source: Authors' own creation

3.2 Most productive journals, articles, authors, countries and organizations in artificial intelligence within the public sector research (RQ2)

To answer the *RQ2*, we collected information on research papers about AIPS from the Scopus database to determine the leading journals, articles, authors, countries and organizations that significantly contributed to the present topic. The most prolific journal was found to be *Technology in Society,* having a publication of 17 articles with 414 citations cumulatively. Consequently, *technological forecasting and social change*, *computer law and security review, digital policy, regulation and governance* and *telecommunications policy* were the prominent journals among the top 10, corresponding to 10,6,6,5 total counts of published articles and 133, 149,61 and 274 citations, respectively (Table 3). The top 10 articles contributed 28.58% of published research and 45.61% of total citations. "While delineating the top articles, Artificial Intelligence and the Public Sector—Applications and Challenges" (Wirtz *et al.*, 2019) was the most cited (338 citations) in this domain. Followed by "Artificial Intelligence and the 'Good Society': the US, EU, and the UK Approach" (Cath *et al.*, 2018), "AI Governance in the Public Sector: Three tales from the frontiers of automated decision-making in democratic settings" (Kuziemski and Misuraca, 2020), "Artificial intelligence, systemic risks, and sustainability" (Galaz *et al.*, 2021) and "Designing, developing, and deploying artificial intelligence systems: Lessons from and for the public sector" (Desouza *et al.*, 2020) were the top five having 318, 186, 135 and 120 citations, respectively. The top ten articles received 43.73% of total citations (Table 3). Regarding the most prolific author in this field, Wirtz B.W. was a prominent name with three publications and 463 citations. The following list of contributing authors are listed in Table 2.

Among the top listed countries, the Asian countries, namely, India, China and South Korea were significant in producing research in the domain, besides the USA, Australia and European countries (Table 4 and Figure 3). The top ten nations solely subscribed 82.68% of total publication and 89.51% of total citations. The distinguished organizations were the German University of Administrative Sciences Speyer, Ahlia University and Tarbiat Modares University, which secured the top three organizations (Table 4). Notably, the top ten organizations cumulatively received 41.35% of total citations.

4. Emerging themes (*RQ3*) through bibliographic coupling

The emerging themes are protruded when the method of bibliographic coupling is used. The analysis through bibliographic coupling involves identifying to what extent the primary documents

Table 3 Most productive journals, authors and articles on AIPS research

Rank	*Journal*	*Count*	*Citation*	*Article*	*Citation*	*Author*	*Count*	*Citation*
1	*Technology in Society*	17	414	Wirtz *et al.* (2006)	338	Wirtz B.W.	3	463
2	*Technological Forecasting and Social Change*	10	133	Cath *et al.* (2018)	318	Saheb T.	3	19
3	*Computer Law and Security Review*	6	149	Kuziemski and Misuraca (2020)	186	Zhang J.	3	8
4	*Digital Policy, Regulation and Governance*	6	61	Galaz *et al.* (2021)	135	Taeihagh A.	3	4
5	*Telecommunications Policy*	5	274	Desouza *et al.* (2020)	120	Weyerer J.C.	2	444
6	*Humanities and Social Sciences Communications*	5	201	Sharma *et al.* (2020)	111	Taddeo M.	2	343
7	*Public Administration Review*	5	17	Wirtz *et al.* (2021)	106	Floridi L.	2	343
8	*Science and Engineering Ethics*	4	390	Agarwal (2018)	94	Desouza K.C.	2	127
9	*Business and Politics*	4	7	Robinson (2020)	89	Sharma G.D.	2	112
10	*IEEE Transactions on Engineering Management*	4	2	Abdeldayem and Aldulaimi (2020)	83	Narkhede BE	2	39

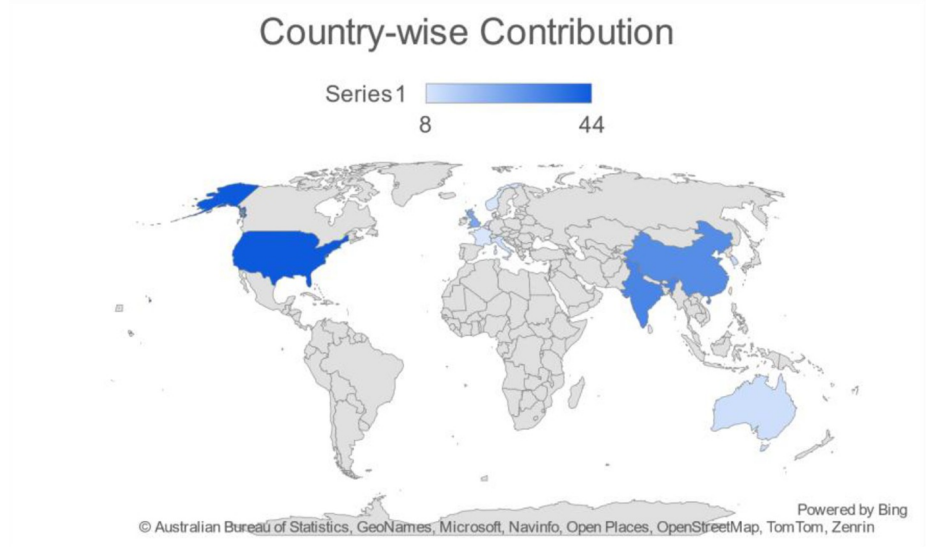
Source: Authors' own creation

Table 4 Most productive countries and organizations in AIPS research

Rank	Country	Count	Citation	Organization	Count	Citation
1	The United States	44	831	German University of Administrative Sciences Speyer	3	463
2	India	33	347	Ahlia University	2	13
3	China	31	234	Tarbiat Modares University	2	10
4	United Kingdom	24	831	National University of Singapore	2	0
5	The Netherlands	12	302	Modern College of Business and Science	2	0
6	South Korea	11	60	Penn State Lehigh Valley	2	0
7	Italy	10	194	University of Oxford	1	318
8	Australia	10	180	The Alan Turing Institute	1	318
9	Norway	8	134	Harvard University	1	186
10	France	8	121	European Commission	1	186

Source: Authors' own creation

Figure 3 Contributing countries in AIPS research



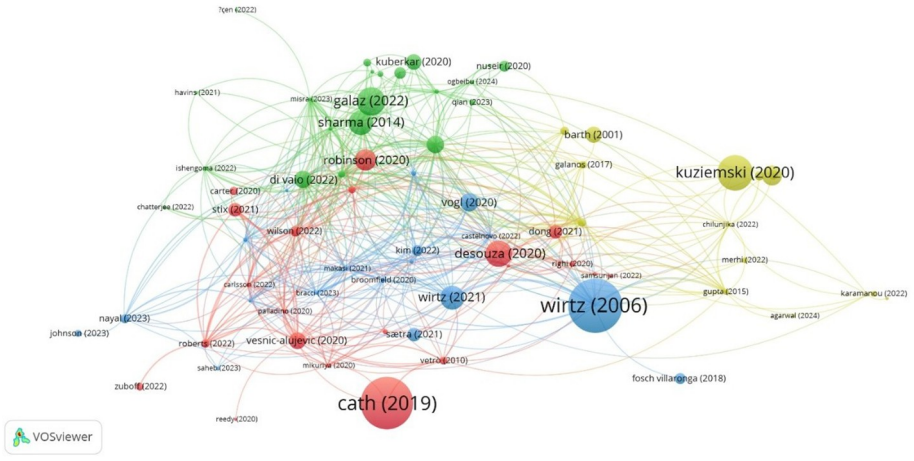
Source: Authors' own creation

share one or more cited references, often termed secondary documents (Donthu *et al.*, 2021). This is an investigation into whether and how the reference lists of the primary documents overlap. In this case, the focus of the overall study becomes that two primary documents share at least one cited reference. A higher degree of ordinary words with other primary documents in the list of references indicates that this document has a muscular coupling strength (Vogel *et al.*, 2021). This method is further used to discover recent research contributions and trends (Vogel and Güttel, 2013). Minimum citation was kept at 5 for the data set and 106 documents qualified. Out of these 106 documents, 76 are bibliographically coupled and formed 4 different clusters which can be observed in Figure 4. attributed to the emerging theme (*RQ3*) of the present study.

4.1 Cluster 1 (red) – global artificial intelligence ethics and policy challenges in public sectors

In the public sector, there have been unprecedented discussions for the past few years concerning the regulation of AI. Zhao and Gómez Fariñas (2023) point out that uncontrolled

Figure 4 Bibliographic coupling among 4 clusters in AIPS research



Source: Authors' own creation

AI endangers the environment, society and economy and must have control through regulation. Wilson and Van Der Velden (2022) take things to a new level by proposing five critical boundary conditions that could inform public sector decision-making about the regulation of AI: diversity, learning ability, self-organization capacity, ordinary meaning and trust. Vesnic-Alujevic *et al.* (2020) further believe that national, European and intergovernmental organizations must align their socio-technical imaginaries to promote more ethical AI through many policy instruments. Vetrò *et al.* (2019) argue that a broader set of ethical principles must be implemented so that AI agents are not designed in risky or socially irresponsible manners. Stix (2021) provides an outline for "Actionable Principles for AI," which gives practical guidance on developing moral AI.

Robinson (2020) also demonstrates how policy AI texts in the Nordic region operate by political culture, which is defined by values related to trust, openness and transparency. In this way, there is a strong indication that societal norms play a part in the tactics involved in governance. Indeed, Carter (2020) demonstrated some of the potential dangers that unconstrained AI poses; the report provides a superb overview of the worldwide regulatory landscape for AI and discusses in detail the situations in the UK. Meanwhile, Carlsson and Rönnblom (2022) show that while ethical rules underpin democratic input values in AI production, EU AI policy provides insufficient attention to accountability and transparency issues, which is crucial in democratic throughput. Bailey (2022) provided recommendations for a preemptive calculated response by mapping the potential negative impacts of new technology on the workplace, labor and society.

4.2 Cluster 2 (green) – artificial intelligence adoption and governance in public sector

Researchers are focusing their attention on the public sector's adoption of AI and finding characteristics that influence its application in various disciplines. According to Behl *et al.* (2021), the public sector's adoption of AI is positively impacted by behavioral intentions toward adopting AI technologies for disaster relief operations, which are heavily shaped by resources such as money, time and skills. Chatterjee and NS (2022) believe that the requirement for full-spectrum AI laws to be built is beyond urgent, as they suggest crucial regulatory recommendations. Chen *et al.* (2024) state that factors such as ease of use, leadership, innovative culture and personal experience primarily drive decisions to adopt

chatbots in the public sector. Kuberkar and Singhal (2020) emphasized that factors such as trust, social influence, performance expectancy govern a chatbot's acceptance in public transport. Ho *et al.* (2023) emphasized that although opinions change with familiarity, older and male patients in the public health-care setting generally have a more negative perception of emotional artificial intelligence. According to Khan *et al.* (2024), the intent to adopt AI is increased by the self-efficacy of AI, which is highly enhanced by trust in AI. Misra *et al.* (2023) highlighted 15 critical challenges that were creating barriers to the Indian Government's adoption of AI, and these mainly included sustainability and lack of confidence issues. According to Wang *et al.* (2021), AI voice robots have a positive impact on procedural justice and private value while having a feeble impact on public faith in government. Taken collectively, these studies paint a complex picture of the determinants of AI adoption and point to the role of resources, trust and carefully designed policy.

4.3 Cluster 3 (blue) – challenges and opportunities of implementing artificial intelligence in public administration

Recent studies point out potential and challenges in AI integration into public services. Bracci (2023) states that "AI Algorithms in public services have reorganized the chain of command. Accountability governance and technical solutions are needed to fill the numerous calls for accountability and address resulting gaps." Villaronga (2019) researched the intricacies of the interplay between public and commercial regulatory regimes, especially regarding health-care robots, highlighting the need for regulation to be conducted harmoniously. New AI applications, according to Johnson *et al.* (2022), can revolutionize Human resource practices and upgrade public human capital in human resource management. However, some challenges lie ahead of the widespread applicability of AI. Politics, especially in the public distribution systems, low AI literacy and lack of trust in technology are some challenges Kumar *et al.* (2021) noted. Similarly, Nayal *et al.* (2023) indicate that while AI-ML may be of aid to reduce uncertainty through accurate predictions, significant barriers exist in the Agricultural supply chain from adopting AI-ML, such as weak legislation and data security/privacy concerns. Meanwhile, Wirtz *et al.* (2019, 2020) highlighted the complexity of AI implementation in public sectors by identifying four significant characteristics of AI challenges: implementation, legislation and regulation, ethics and societal implications.

4.4 Cluster 4 (yellow) – artificial intelligence's role in economic and public transformation

Casares (2018) emphasizes how important it is to integrate private AI agents with the public decision-making system to improve governance. Chilunjika *et al.* (2022) demonstrate how AI will help enhance public service delivery in South Africa by automating routine tasks, freeing HR staff to focus on core matters and reducing discrimination in hiring. However, for Gupta (2019), some highly essential challenges concerning trust, ethics and data security would make AI more difficult to use in governance. According to Merhi (2021), project management and high-quality data are essential for implementing data intelligence in the public sector. Meanwhile, Nissim and Simon (2021) advocated for public action to address structural unemployment and envision the future of a job reshaped by AI across the whole of economies. Zhang *et al.* (2021a, 2021b) argue that organizational management, political factors and digital governance all impinge on the effectiveness of AI in governments. It is on these findings that the twin promise of productivity and creativity for AI highlights challenges that require approaches to careful governance.

5. Discussion

The current study on AIPS research adds significant notions to the body of knowledge in several ways. It strengthens the ties between technology and strategy. In the first place, the

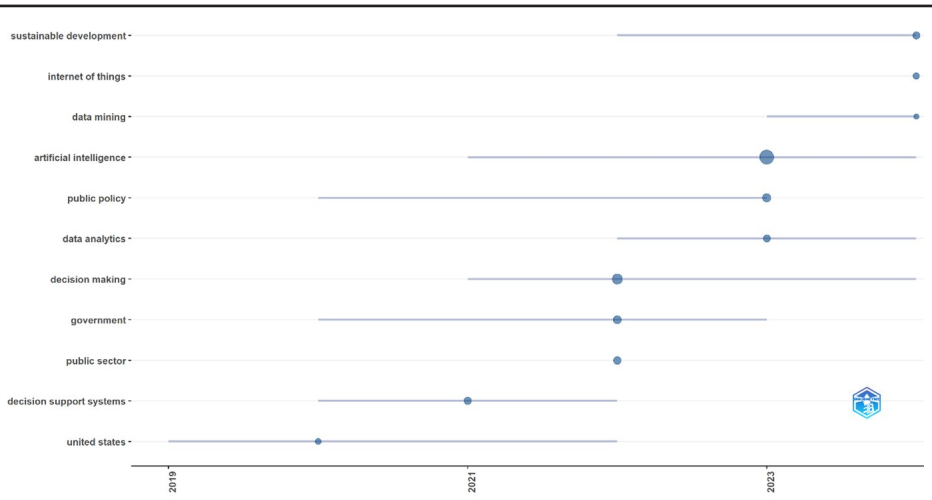
study investigates how artificial intelligence might ramify into different areas of public sectors while providing valuable insights and making a significant contribution to the domain. It monitors the increase in publications (*RQ 1*) – showing an upward trend from its initial publication (2001) up till the current year (2024), pinpoints top contributors (*RQ 2*) – essential writers, namely Wirtz B.W., Saheb T and Zhang J. are found to be the top three in the list. While enumerating the top three journals – *Technology in Society, Technological Forecasting and Social Change*, *Computer Law and Security Review* are publishing more research in this domain. "Artificial Intelligence and the Public Sector–Applications and Challenges" (Wirtz *et al.*, 2019), "Artificial Intelligence and the 'Good Society': the US, EU, and UK Approach" (Cath *et al.*, 2018) and "AI governance in the public sector: Three tales from the frontiers of automated decision-making in democratic settings" (Kuziemski and Misuraca, 2020) are considered to be the top three article that enriched the corpus of information. Analyses of publishing patterns particular to each nation portray the significance of Asian countries and organizations. This performance analysis of the study clarifies how artificial intelligence accelerates changes by offering technological breakthroughs with societal dynamics.

The bibliographic coupling furnishes the significant themes (*RQ3*) that published articles are categorized, directed and organized. The emerging themes are – *global AI ethics and policy challenges in public sectors*, *AI adoption and governance in the public sector, challenges and opportunities of implementing AI in public administration and* its *role in economic and public transformation* would precisely indicate new avenues for investigations (*RQ5*) for the enthusiastic researchers and also the development within the public to public and between the public to private settings. At the same time, the (*RQ4*) is centered around finding the trending topics related to AIPS, which will help the researchers analyze the current trend and identify the possible research areas. The concept of sustainability has gained significant attention in recent decades, with the United Nations Agenda 2030 aiming for sustainable development by the end of the decade (Dixit and Chaudhary, 2020). Therefore, significant growth in sustainable development-related articles can be seen in the current domain of literature in recent times (Song and Dong, 2024; Endris *et al.*, 2024, etc.). Researchers are also keen on working on topics related to the Internet of Things (IoT) (Sangaiah *et al.*, 2023) and data mining (Zhu, 2024; Nzobonimpa, 2023). Significant growth in publications related to AIPS can be witnessed, resulting in topics such as public policy, decision-making and the public sector. The USA is the most productive country in AIPS; therefore, it is also a part of the trending topics list. Other trending topics can be seen in Figure 5.

Considering the previous eminent and significant studies (Di Vaio *et al.*, 2022; Yolvi *et al.*, 2022; Lawelai *et al.*, 2023) had a disintegrated views on AIPS, either delineated the opportunities and challenges in AI adoption or, not incorporated the future direction and thematic overview, emerged from the past literature. While, the studies, such as Wirtz *et al.* (2021) and Sousa *et al.* (2019), could not include the Scopus database. The journals indexed in the Scopus database are more inclusive than their equivalents (such as Web of Science [WOS]), but still meet the strict quality requirements for indexation, so Scopus, being used as a gauge of source quality (Lim *et al.*, 2022; Basu *et al.*, 2023). Additionally, Zuiderwijk *et al.* (2021) and Lawelai *et al.* (2023) presented their distinguished work, with a smaller number of article (Table 1). On the contrary, addressing to the mentioned shortcoming, our study provides a comprehensive understand on AIPS for the policymakers and future scholars.

The most important contribution of this study would be its cluster-wise future research questions (*RQ5*). Theme 1 focused on "Global AI Ethics and Policy Challenges" in public sectors, which draws upon recent talks on AI regulation; ethical oversight and social attention need to be administered to minimize risks in unregulated AI. The essential doctrines for regulation are trust, accountability, transparency and diversity. At least in

Figure 5 Trending topics in AIPS research



Source: Authors' own creation

some regions, the question is whether the governance frameworks can align to promote ethical development in AI. The researchers have also given a call to review the global regulatory framework to ensure AI is created safely and ethically. Hence, in the future, the researchers may focus on the below-mentioned questions to advance this theme:

RQ1. What mechanisms can be implemented to ensure accountability and transparency in public-sector decision-making?

RQ2. What strategies could ensure trust and engagement from ordinary people while shaping different AI policies?

RQ3. How will the stakeholders ensure data security, as the public sector requires massive data to implement AI?

Theme 2 focused on "AI Adoption and Governance in Public Sector," which suggests that public sector adoption of AI remains a subject under research by scholars, with particular attention given to the factors influencing its application in most fields. The general factors that motivate AI adoption include perceived trust, leadership and ease of use, while behavioral intentions are shaped by resources such as money, time, or skills. The most critical factors relating to AI adoption in the public sector include regulatory frameworks, social influence, self-efficacy and performance expectancy. Some of these challenges include the issues concerning sustainability and public trust. Hence, scholars have established that policies must be carefully formulated. Therefore, future research is encouraged to focus on the following *RQs*:

RQ4. How do leadership styles and innovation culture influence AI adoption in public sectors?

RQ5. What are the critical social, ethical and technical barriers to AI adoption in different public sectors, i.e. Health care, education, transportation, etc.?

RQ6. In what ways could AI systems be set up to incorporate the specific needs and values in local or regional public sector contexts in a manner that preserves coherence in governance and ethical standards?

Theme 3 addressed the "Challenges and Opportunities of Implementing AI in Public Administration" and provided an overview of current research on the advantages and disadvantages of integrating AI into public administration. These include revamped accountability frameworks, revolutionary HR procedures and enhanced decision-making

processes. However, adoption is impaired by negative issues such as insufficient AI literacy, mistrust, lax legislation and worries about data security. Harmonized regulations would be necessary for success, especially in agriculture and health care. These factors all work together to complicate AI's application further in the public sector, where careful governance and policy formulation are required. Hence, it would be beneficial for future researchers to delve into these *RQs*:

RQ7. Which new skills should be built in the public sector to make the employees capable enough to interact with AI decision-making systems?

RQ8. What type of investment in digital infrastructure is required for AI implementation in public administration, especially in rural or low-resource areas?

RQ9. What barriers must be overcome to apply AI in public administration to respond to pandemics and natural disasters?

Theme 4 emphasized "AI's Role in Economic and Public Transformation," which suggests that AI can make service delivery more effective by eliminating repetitive work. Some problems that hold back its widespread use include data security issues, ethical concerns and doubts about its usage. Good project management and quality data are required to be successful in the application of AI. The adoption of AI in the public sector is also influenced by organizational management, considerations for political will and digital governance. All these problems must be solved fully to make the potential of AI helpful in improving productivity and innovation in governance. Thus, we invite future researchers to ponder over these specific questions:

RQ10. How would artificial intelligence influence the public sector workforce?

RQ11. What actions can be taken so that structural unemployment and job displacement become the minimum impact of AI?

RQ12. How can AI become an instrument of economic equality, and which policies will be necessary to ensure that AI does not worsen existing inequalities?

6. Limitation and future research opportunities

Even though this paper made every effort to provide a concise overview of AI's position in the public sector, several restrictions remain to consider. The bibliometric studies indicate that this work is helpful only in business, management and accounting for getting a broad picture of the state of "AI in the public sector." Because AI is important in many fields, scholars can concentrate on transdisciplinary reviews in the future. This study examined two categories of scholarly publications sourced from Scopus: articles and reviews. Therefore, additional document types need to be considered in future bibliometric analyses. It is also crucial to remember that, besides Scopus, other equally significant databases may include top-notch articles from journals that Scopus does not index. Hence in future, the researchers can include the documents from other databases, i.e. WOS, PubMed, etc. Only English language publications were included in this review because of the writers' fluency; however, articles written in other languages must be considered in subsequent research. Although the authors have tried to include as many keywords related to AIPS, but there are still some scopes for new keyword inclusion. Therefore, we urge the future researchers to include some of the additional keywords in the search string to produce better results.

7. Implications

7.1 Theoretical implications

The public sector is increasingly interested in implementing AI as governments worldwide want to increase system transparency, particularly during the COVID-19 pandemic (Yerlikaya and Erzurumlu, 2021). Our study adds to the literature from a theoretical perspective by highlighting the essential topics in AI and public sector contexts. This literature study calls for

an ethical set of guidelines to apply AI in the public sector in addition to the studies already conducted. In the contemporary setting, more research on the four themes of thematic analysis might be done, especially in developing and poor nations (Kshetri, 2020). This study adds to the tradition of accumulating knowledge by building upon existing AI literature (cf. Metcalfe, 2004). By carefully defining the conceptual framework and famous subjects, this study adds to the body of knowledge already available about the application of AI in the public sector. It also recommends expanding on the current body of literature by examining 12 potential research topics. The research extends earlier studies by demonstrating and acknowledging a solid growth in AI adoption and implementation in public sector organizations (Lawelai *et al.*, 2023; Di Vaio *et al.*, 2022; Wirtz *et al.*, 2021).

7.2 Practical implications

The first issue for decision-makers regarding using AI applications in public organizations is that active users (e.g. employees) and passive users (e.g. candidates or citizens) may be averse to algorithms. In situations where AI is inevitable, practitioners must cultivate trust among the general public (Burton *et al.*, 2020). To build a transparent system that will win the general public's trust, public sector managers should take heed of the research now available addressing the prospects and problems associated with AI adoption and implementation (Bracci, 2023). In the context of practitioners, the governance of AI systems in government must consider the many stakeholder groups and the various stages of development and operation. In particular, the study's conclusions point to public authorities needing to play a more significant role than the general public at every step of creating AI systems. In contrast, the general public should concentrate on using these systems. Our findings demonstrate the existence of divergent and occasionally contradictory perspectives regarding the obstacles to AI adoption in the public sector. This calls for a governance approach that balances stakeholder disagreements while upholding the stability necessary for public action.

7.3 Policy implications

The bibliometric analysis of this subject demonstrates how AI is increasingly being incorporated into government operations, changing everything from decision-making and data management to operations and service delivery. The deployment of AI in government operations has significant policy ramifications for business, management and accounting domains. The emphasis on openness, ethical standards and algorithmic fairness promoted for the public administration does fit within a corporate governance purpose, particularly regarding compliance with environmental, social and governance criteria (Rane *et al.*, 2024). Businesses can use AI ethical frameworks that ensure fair decision-making and accountability in hiring, performance reviews and customer relations. Private sectors might concentrate on the operational optimization potential offered by AI-driven breakthroughs such as resource management tools and predictive analytics, much like governments about productivity and cost-effectiveness (Alhosani and Alhashmi, 2024). Furthermore, public administration's legislative frameworks for AI accountability and transparency align with the requirements for compliance in highly regulated industries like accounting and financial management, where AI improves financial reporting, auditing and fraud detection (Felzmann *et al.*, 2019). Furthermore, stakeholder participation in business strategy is reflected in governance in AI policy, which would introduce a range of viewpoints into AI deployment and design. Businesses can successfully balance innovation and accountability by incorporating these concepts and using AI to improve operations while adhering to legal and ethical requirements.

8. Conclusions

This work advances our understanding of the field by using bibliometric analysis to examine published articles on artificial intelligence (AI) in the public sector. The landscape of AIPS

research has undergone drastic changes in the past years, with only 3.9% of total publications before 2017, while a remarkable 96.1% emerged over the past eight years. It indicates that AI was relatively underutilized in the public domain and is significantly more prominent today. Dominant contributors in this field include Wirtz BW, Technology in Society and institutions such as the USA and the German University of Administrative Sciences. Dominant themes have emerged, including global AI ethics and policy challenges, AI adoption and governance, implementation challenges in public administration and AI's role in economic and public transformation. The literature of recent times indicates a rising trend in concern for sustainable development (Song and Dong, 2024; Endris *et al.*, 2024), next to growing interests in topics such as the IoT (Sangaiah *et al.*, 2023) and data mining (Zhu, 2024; Nzobonimpa, 2023). This foregoing growth signifies that AI plays the most crucial role in the transformation of public policy and decision-making in the governance context. To ensure the effectiveness of stakeholders associated with the public sector, researchers need to focus on suggested future research questions (*RQ5*) to improve this domain of literature.

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