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SYSTEMATIC REVIEW

Mapping AI's role in supporting or hindering the achievement of SDGs: A systematic review for AI in government

[version 1; peer review: 1 approved, 1 approved with reservations]

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Abstract

Governments are increasingly adopting Artificial Intelligence (AI) to enhance decision-making, public services, and infrastructure. However, the rapid integration of AI into government systems presents both opportunities and challenges. The United Nations has highlighted AI's dual role in both advancing and potentially hindering progress toward the Sustainable Development Goals (SDGs). Despite this recognition, a significant research gap remains in understanding the specific impact of AI adoption by governments on SDG achievement. This study addresses that gap through a systematic analysis of whether AI adoption supports or hinders progress toward the SDGs. Using the PRISMA framework, we conducted a systematic review of 73 studies. Our findings highlight AI's transformative potential while emphasizing the need for governments to develop deliberate strategies to mitigate disparities and ensure alignment with broader societal objectives. This research contributes to the evolving discourse on AI in governance and its implications for sustainable development.

Keywords

Artificial Intelligence, Government, Sustainable Development Goals

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Introduction

Artificial Intelligence (AI) refers to systems designed to replicate aspects of human faculties, such as reasoning and language comprehension, enabling machines to operate autonomously and adapt to novel situations (Russell & Norvig, 2022). With the rapid advancement of AI technologies and their growing adoption by governments, cities are increasingly transitioning into intelligent cities (Kassens-Noor *et al.*, 2022). Governments leverage AI to enhance decision-making processes (Van Noordt & Misuraca, 2022), improve the provision and quality of administrative services (Medaglia *et al.*, 2023), optimize resource allocation (Zuiderwijk *et al.*, 2021) and identify crime hotspots (Dakalbab *et al.*, 2022). Furthermore, governments use AI to support policymaking and infrastructure and transportation planning (Sharma *et al.*, 2020) as well as public health initiatives, such as digital surveillance systems to combat pandemics (Sarker *et al.*, 2023).

Therefore, Medaglia, Gil-Garcia, and Pardo (2023); Fatima, Desouza, and Dawson (2020) argued that the power of AI in the public sector lies in its potential to improve internal efficiency, enhance and intensify citizen-government interactions, modernize public services, and foster innovation. However, the rapid integration of AI into government systems also presents significant challenges. For instance, it may reduce citizens' trust in government, compromise privacy, and raise concerns about fairness (Sun & Medaglia, 2019). AI can also reinforce existing biases in datasets, leading to discriminatory predictions against minority groups (Larson *et al.*, 2016). Additionally, the potential for large-scale workforce displacement due to automation is a growing concern (Valle-Cruz *et al.*, 2022), and AI usage can lead to increased greenhouse gas emissions and a high carbon footprint (Liu & Yin, 2024).

The United Nations highlighted AI's dual potential—its ability to drive progress while posing significant risks—in relation to achieving the Sustainable Development Goals (SDGs). Recognized as a transformative tool for sustainable development, AI has the potential to accelerate advancements across a wide range of sectors, including climate action and poverty eradication (Jasper, 2024; UNSDG, 2024). However, the UN also cautions that unchecked AI deployment could exacerbate inequalities, undermine ethical standards, and heighten environmental challenges burdens (Jasper, 2024; UNSDG, 2024).

To fully harness AI's potential for sustainable development, it is crucial to understand its specific implications for each SDG. Scholars have already begun systematically analyzing AI's impact across SDG targets. For instance, studies have leveraged expert consensus to assess AI's influence across all 169 SDG targets (Vinuesa *et al.*, 2020), explored AI representation within diverse datasets to identify opportunities and gaps in aligning AI with sustainability goals (Nasir *et al.*, 2023), and investigated AI and sustainable development goals in specific sectors, such as the construction industry (Regona *et al.*, 2024).

However, a significant research gap persists in examining how government adoption of AI specifically affects the achievement of these goals. Understanding this relationship is crucial because governments play a central role in driving, coordinating, and implementing SDG efforts (Li *et al.*, 2025; United Nations, 2015). As emphasized in the 2030 Agenda for Sustainable Development: "Governments have the primary responsibility for follow-up and review, at the national, regional and global levels, in relation to the progress made in implementing the Goals and targets" (United Nations, 2015). This paper addresses the gap by conducting a systematic review to evaluate whether the adoption of AI by governments hinders or supports the achievement of the SDGs. In addition, this study incorporates contextual information, such as the country and specific AI technologies mentioned in research articles, to provide a more comprehensive understanding of the findings.

Methods

We conducted a systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol. We chose this method because of its transparency: the procedures make it easy for the reader to understand the selection process and improve the reporting quality of the systematic review (Knobloch *et al.*, 2011). The PRISMA procedures are divided into four phases: (a) identification, (b) screening, (c) eligibility, and (d) inclusion (Moher *et al.*, 2009).

(a) In the identification phase, we used Web of Science (WOS) and Science Direct (SD) to identify scientific studies. WOS, owned by Clarivate Analytics, is a large multidisciplinary citation database spanning all disciplines[1] and SD, provided by Elsevier, is the world's leading database of peer-reviewed, full-text scientific, technical, and health literature.[2] We searched both databases using titles and abstracts, with the search terms: ("AI" OR "artificial intelligence") AND ("government" OR "public sector").

Furthermore, we defined the scope of the studies of interest in alignment with our research aim, following Moher *et al.* (2009)'s outlined guidelines. The scope encompassed studies centered on narratives related to AI use cases and their overall implications (benefits or detriments), which we refer to as the AI Factor. This approach enabled us to clearly establish the research objective and set precise inclusion and exclusion criteria for database searches.

Inclusion criteria:

1. Academic research focusing on the adoption of AI by the public sector in all areas and at all levels of government (municipal, state, and federal) across all regions.
2. Articles written in English.
3. Research conducted between 2022 and 2024. We included ten literature review (LR) articles, as identified in Table 1. The most recent LR article covered studies up to 2021, forming

[1] https://mjl.clarivate.com/home

[2] https://www.elsevier.com/products/sciencedirect

Table 1. Summarizes information about included literature review articles.

Author	Review Article Name	Analysis Period	Publication Type
(Medaglia *et al.*, 2023)	Artificial Intelligence in Government: Taking Stock and Moving Forward	2020 – 2021	Academic journal.
(Zuiderwijk *et al.*, 2021)	Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda	2018 to 2020	Academic journal.
(Ahn & Chen, 2020)	Artificial intelligence in government: Potentials, challenges, and the future	NA	Conference proceedings.
(Sharma *et al.*, 2020)	Artificial intelligence and effective governance: A review, critique and research agenda	1983–2019	Academic journal.
(Desouza *et al.*, 2020)	Designing, developing, and deploying artificial intelligence systems: Lessons from and for the public sector	NA	Academic journal.
(De Sousa *et al.*, 2019)	How and where is artificial intelligence in the public sector going? A literature review and research agenda	January 2000 – October 2018	Academic journal.
(Reis *et al.*, 2019a)	Artificial intelligence in government services: A systematic literature review	Not specified – October 8, 2018	Book chapter.
(Reis *et al.*, 2019b)	Impacts of artificial intelligence on public administration: A systematic literature review	Not specified – January 2, 2019	Conference proceedings.
(Valle-Cruz *et al.*, 2019)	A review of artificial intelligence in government and its potential from a public policy perspective	1970 – 2018	Conference proceedings.
(Wirtz *et al.*, 2019)	Artificial intelligence and the public sector—Applications and challenges	NA	Academic journal.

the foundation of this research. Subsequently, we reviewed and included papers published from 2022 to the present to ensure incorporating up-to-date findings and insights.

Exclusion criteria:

1. Academic research focused on solutions for private organizations.
2. Articles not specific to the public sector or lack a clear definition of benefits for the public.
3. Studies focused only on technical aspects: restricted to the technical aspect.
4. Articles that are not written in English.
5. Research conducted outside the period between 2022 and 2024.

(b) In the screening phase, we manually verified the alignment with the inclusion and exclusion criteria based on the titles and abstracts of the articles. (c) We carried out the eligibility phase on the sample yielded by the previous phase, applying the same criteria checks but on the full text of all samples. Finally, in the (d) inclusion phase, we analyzed the remaining included studies. One researcher performed the screening and eligibility assessments, applying the inclusion and exclusion criteria at each phase. The research team then reviewed the results to ensure consistency, address uncertainties, and validate the final selection of studies.

As illustrated in Figure 1, the search of the two databases conducted between March and May 2024 yielded 1,103 results. After removing duplicates, we retrained 1,094 studies. Applying the exclusion criteria to the titles, abstracts, keywords, introduction, and conclusion resulted in 127 studies qualifying for a full-text review. After thoroughly reviewing the full texts and considering only articles that met the inclusion criteria, 64 studies were excluded. Ultimately, 73 papers were selected for the final analysis. Refer to the **Data Availability** section for the complete list of included articles.

We followed these steps for the final analysis of the selected articles. First, we indexed the articles by documenting the title of each paper and assigning a unique index number to each one, facilitating efficient reference and organization without needing to repeatedly use the full title or author names. Second, we conducted content extraction, reviewing each article to extract the mentioned AI factors and listing each one separately when multiple factors were addressed. Third, we correlated each AI Factor to one or more Sustainable Development Goals (SDGs) based on the authors' evaluations of its direct contributions. Even if the articles did not explicitly mention any SDGs, we inferred potential direct linkages based on the characteristics of the AI Factor.

Fourth, we assigned each AI Factor a numerical score to evaluate its impact on the linked SDGs based on the content

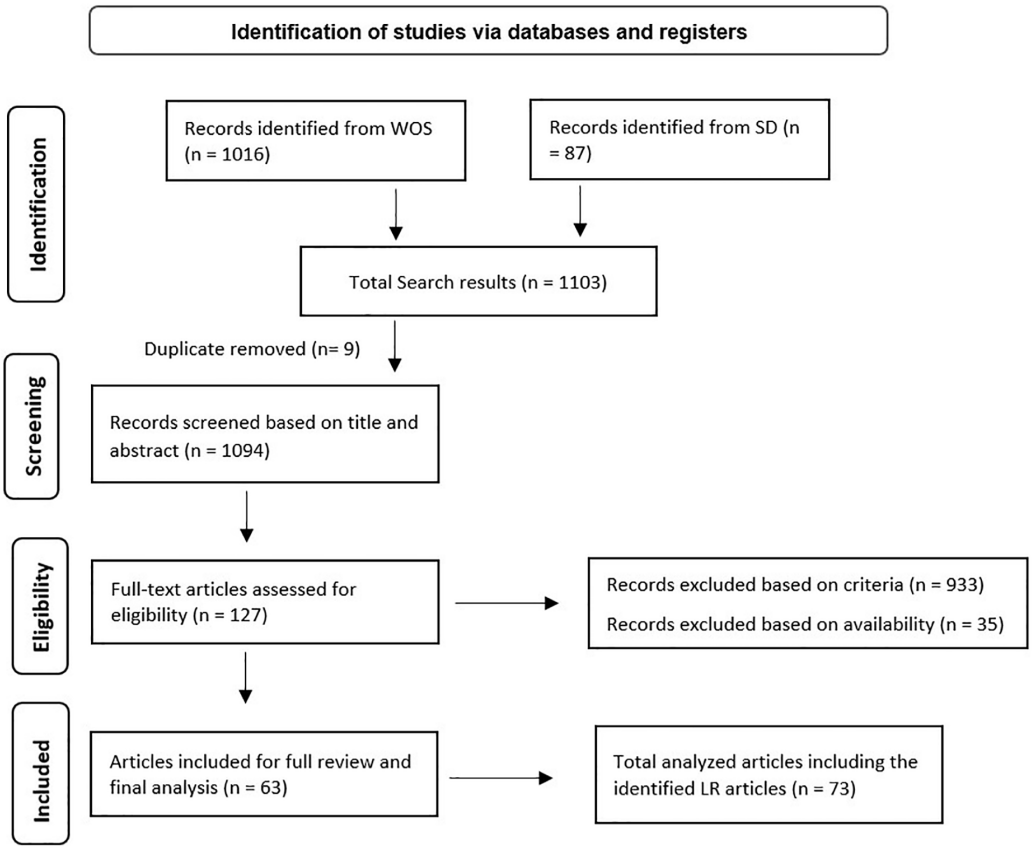

Figure 1. PRISMA flow chart. (Adapted from Moher *et al.*, 2009).

and narrative of the articles. The scoring was conducted relatively, meaning that each score was assigned in comparison to other factors rather than as an absolute measure. The scoring scale ranged from -3 to +3, with +3 indicating a significant positive contribution, +2 representing a positive contribution, and +1 reflecting a slight positive contribution. A score of 0 indicated no impact, while negative impacts were scored as -1 for a moderate negative contribution, -2 for a negative contribution, and -3 for a significant negative contribution. We assigned an "NA" score when the AI Factor was mentioned without any specified impact. Fifth, we documented the specific computational AI techniques employed in each AI factor, such as Machine Learning (ML) and Natural Language Processing (NLP). We grouped the AI technologies into broader categories based on the exact application mentioned in the articles. For instance, Chatbots use NLP technologies; however, we analyzed them as separate categories when they were explicitly mentioned.

Sixth, we identified and recorded the country in which each AI factor was mentioned, counting each country once per article. Lastly, we categorized the identified AI factors using the United Nations' Classification of the Functions of Government (COFOG). COFOG is a widely recognized framework that encompasses the various roles and responsibilities of public sector entities in delivering services, maintaining order, and promoting societal well-being. These functions are broadly categorized into key areas: General public services, Defense, Public order and safety, Economic affairs, Environmental protection, Housing and community amenities, Health, Recreation, culture and religion, Education, and social protection (OECD, 2017). We used Excel to extract, organize, and analyze the data throughout this process. One researcher conducted the steps mentioned above. The research team then discussed the results to ensure consistency, resolve uncertainties, and validate the final scoring.

Results

Geographical context of ai in government research

Our analysis of the geographic distribution of AI research revealed dominance by high-income countries, resulting in a significant geographic imbalance. As illustrated in Figure 2, the United States accounted for nearly 15% of all mentions (13 out of 87 mentions), representing the largest share, while Australia and the Netherlands each contributed close to 7%. Other high-income countries, including Japan, the United Kingdom, Germany, and the European Union, accounted for between 4% and 6% of mentions.

Additionally, emerging economies were notably represented, with China ranking second at 8% of mentions and India at 4%. In contrast, low- and middle-income countries were minimally

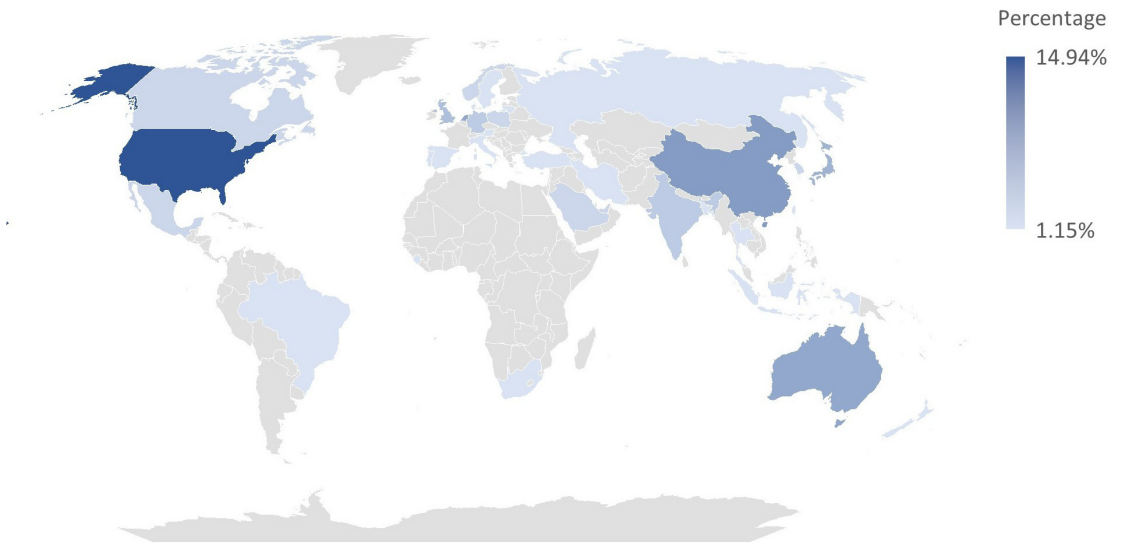

Figure 2. Global distribution of AI research in the reviewed articles, showing the percentage of mentions per country. Source: The Authors.

represented. Countries such as Bangladesh, Brazil, Indonesia, Iran, Sierra Leone, South Africa, and Vanuatu each appeared in only 1% of mentions. This disparity in representation highlights the stark global divide in AI research and development, with publications predominantly focusing on high-income countries.

AI in government applications

We identified a diverse range of AI technologies employed across various government sectors (see Figure 3). Chatbots and virtual assistants along with machine learning and predictive analytics emerged as the leading technologies, representing nearly 22% (82 out of 377 mentions) and 20% of mentions, respectively. This dominance highlights a strong focus on improving citizen engagement through automated interaction platforms and enhancing data-driven decision-making through predictive modeling. These were followed by big data and data analytics as well as natural language processing and sentiment analysis, each at just under 10% of mentions indicate a moderate but significant focus on tools for evidence-based development and social sentiment tracking. Robotics and autonomous systems along with IoT and smart city technologies each comprised nearly 7% of mentions.

Notably, technologies like computer vision and image processing, facial recognition and emotion detection, and autonomous vehicles and smart traffic systems received just over 2% of mentions, suggesting they remain niche or context specific. Finally, the least frequently mentioned categories—automated process management and human resources and organizational management technologies—accounted for just over 1% of the mentions. Overall, the findings illustrate that government technology research has focused on technologies related to public service enhancement, data-driven development, and emerging infrastructure modernization. Moreover, our findings reflect a stronger emphasis on external-facing applications rather than internal administrative modernization, indicating that internal process automation remains yet to become a significant AI priority.

Overall prevalence of the SDGs mentions

There was a concentrated focus on SDG 16 (Peace, Justice, and Strong Institutions), which accounted for 50% of mentions (659 out of 1,307). This might suggest that scholars view significant potential for AI applications in governance and strengthening institutions. Following this, SDG 11 (Sustainable Cities) accounted for 13% of mentions, and SDG 9 (Industry, Innovation, and Infrastructure) accounted for 9%, reflecting a strong focus on AI's role in urban and technological development. Other SDGs with moderate mentions percentage include SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), SDG 13 (Climate Action), and SDG 4 (Quality Education). (Figure 4)

Lower mentions include SDG 7 (Affordable and Clean Energy), SDG 14 (Life Below Water), SDG 15 (Life on Land), SDG 1 (No Poverty), and SDG 10 (Reduced Inequalities), each slightly above 1%, indicating that these SDGs received limited research attention. At the lower end, SDG 12 (Responsible Consumption and Production), SDG 2 (Zero Hunger), and SDG 6 (Clean Water and Sanitation) each accounted for less than 1%. Notably, SDG 17 (Partnerships for the Goals) at 0.3% and SDG 5 (Gender Equality) at 0.08% of mentions ranked the lowest, signaling potential gaps in research linking AI with global partnerships and gender equality. Overall, the distribution suggests that the current body of AI research is more focused on applications in governance, urban development, and technological innovation, while its potential contributions to social equity and global cooperation appear to be underexplored and require further investigation.

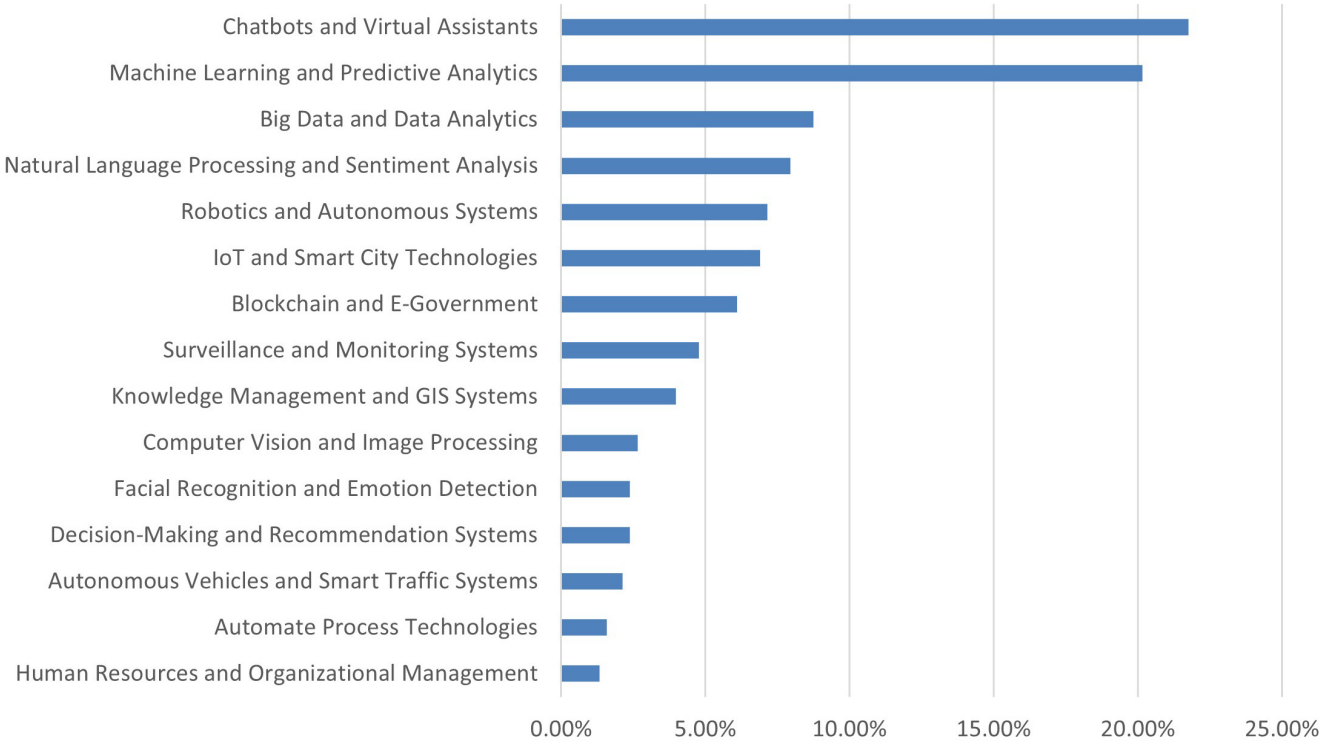

Figure 3. Percentage of discussed AI in government technologies within the reviewed articles. Source: The Authors.

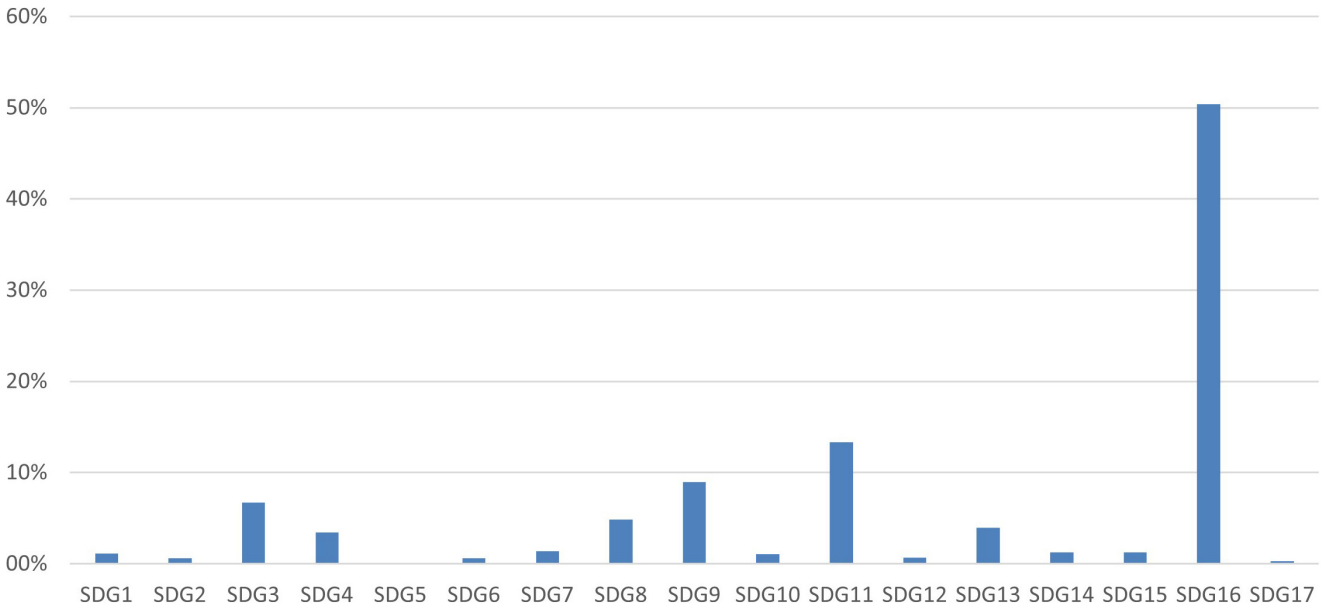

Figure 4. Percentage of AI factors mentioned per SDG in the reviewed articles. Source: The Authors.

Average AI in government impact across the SDGs

AI's average impact across the SDGs demonstrated generally positive contributions, with notable variations across different goals. SDG 6 (Clean Water and Sanitation) recorded the highest average impact, nearing 2, highlighting a strong perceived potential for AI-driven improvements in water management and sanitation systems. Similarly, SDG 4 (Quality Education) and SDG 12 (Responsible Consumption and Production) recorded averages of just under 1.5. Mid-range impacts included SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 7

(Affordable and Clean Energy), and SDG 9 (Industry, Innovation, and Infrastructure), each scoring around 1.3, indicating moderate AI contributions to sectors like healthcare, food security, and infrastructure.

We noted moderate averages scores of approximately 1 for SDG 5 (Gender Equality), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), SDG 15 (Life on Land), SDG 16 (Peace, Justice, and Strong Institutions), and SDG 17 (Partnerships for the Goals). This suggests that while AI is recognized as beneficial in these areas, its impact may be constrained. At the lower end, SDG 8 (Decent Work and Economic Growth) and SDG 14 (Life Below Water) scored below 1, while SDG 1 (No Poverty) records an exceptionally low average of 0.2, reflecting minimal perceived relevance or effectiveness of AI in poverty reduction efforts. SDG 10 (Reduced Inequalities) is the only goal with a slightly negative average impact, indicating that AI has the potential to worsen inequalities. (Figure 5)

The recorded AI factors demonstrated a wide range of positive impacts across multiple domains. The most prominent benefit lies in the improvement of efficiency, achieved by enhancing decision-making through data-driven insights, streamlining service delivery via automation, and fostering stronger citizen-government interactions through personalized services and feedback mechanisms. AI also reduces administrative burdens and operational costs, resulting in substantial savings and creating public value. In the field of public health, AI has played a critical role in pandemic management by aiding disease tracking and diagnostics. Additionally, AI contributes to safety and security by supporting law enforcement, emergency response, and surveillance efforts. It drives economic growth and productivity by optimizing resource allocation and promoting innovation while advancing environmental sustainability through climate monitoring and resource management.

Conversely, we identified that about 15% of the AI factors (155 out of 989) are associated with negative impacts. These impacts highlight AI's potential to increase unemployment by automating roles traditionally performed by humans, thereby exacerbating social inequality and economic disruption. Additionally, AI integration may intensify biases, reinforcing racial and social prejudices, which can erode public trust in institutions. Privacy concerns were also notable; AI systems might generate false positives or misidentify individuals, raising significant ethical and legal issues regarding personal data security. Furthermore, environmental challenges arise from the resource-intensive nature of AI operations, which can produce harmful externalities and strain natural resources.

Average AI impact on SDGs categorized by government functions

Out of the ten government functions, General Public Services dominated by receiving nearly 50% of the mentions (521 out of 1,082), indicating a significant emphasis on AI's role in governance, administration, and public-sector efficiency, while Economic Affairs ranked second at 12% (see Figure 6). Areas like Public Order and Safety (10%), Health (7%), Environmental Protection and Housing and Community Amenities (each at 6%) received moderate attention. In contrast, Education and Social Protection received a smaller focus at 3% each, while Defense (1%) and Recreation, Culture, and Religion (almost 0%) registered only minimal mentions. The analysis highlights a strong emphasis on AI usage in public services, economic growth, and safety, while sectors like education, social protection, and recreation remain underexplored. This uneven distribution suggests opportunities to expand AI integration into less prioritized areas.

AI application across government functions showed varying impacts on the SDGs. The distribution highlights a perception

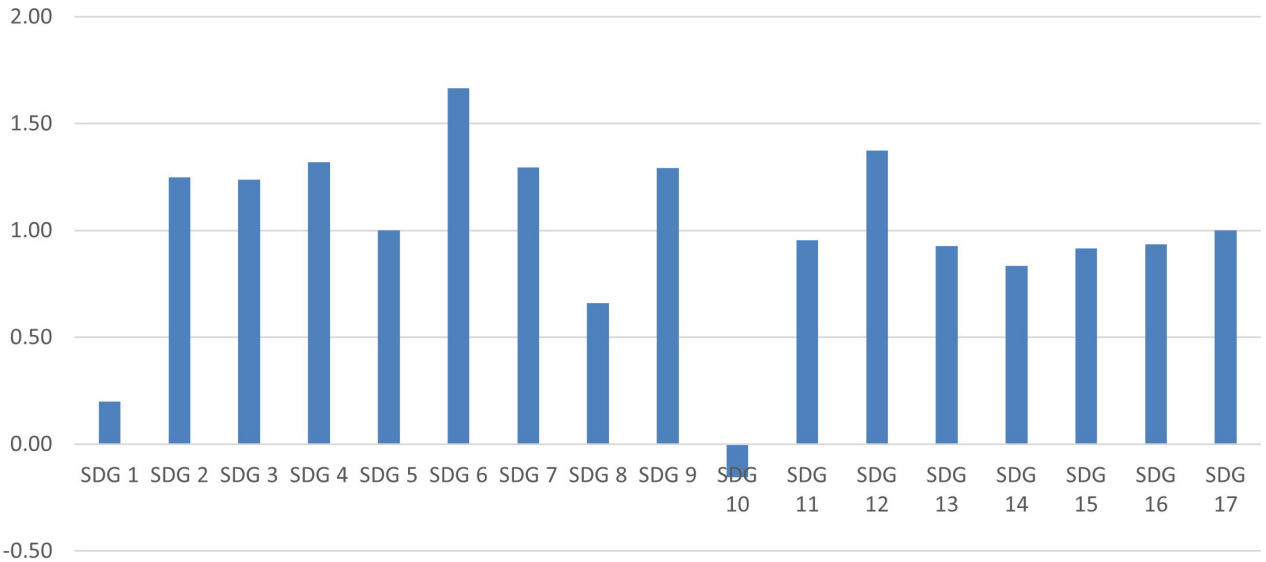

Figure 5. Average impact of AI in government across the SDGs. Source: The Authors.

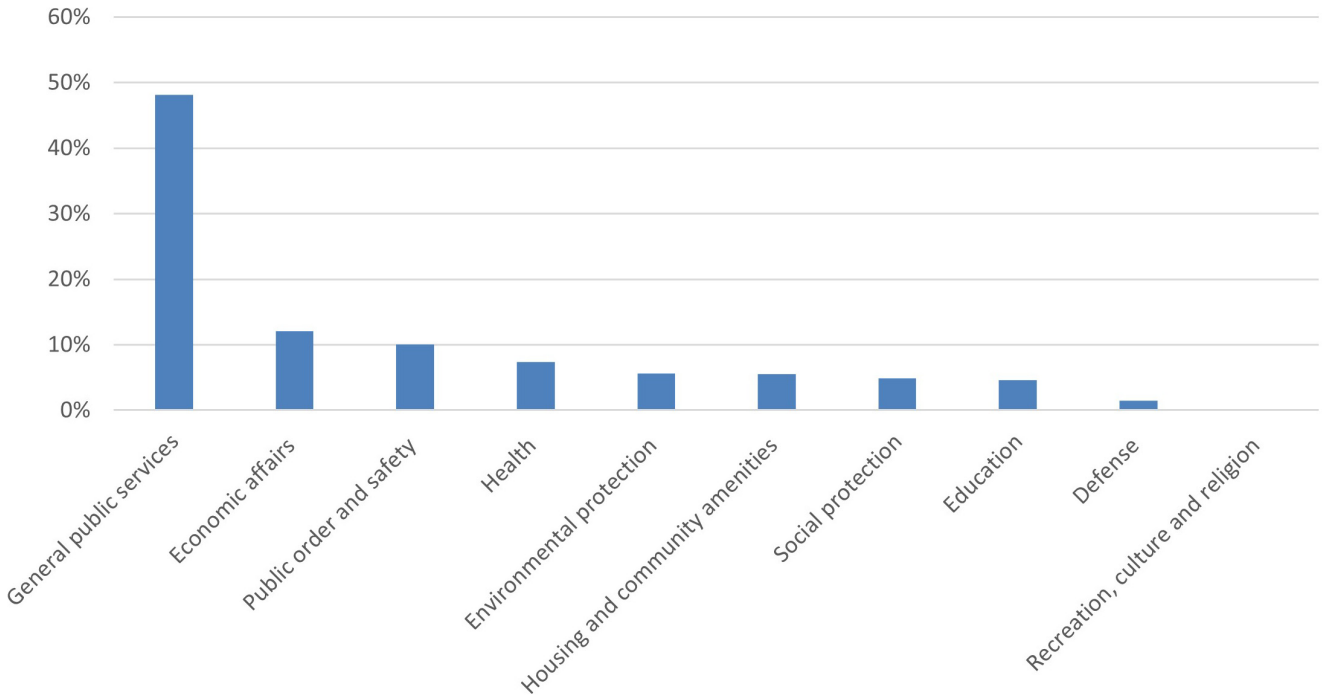

Figure 6. Percentage of government functions mentioned. Source: The Authors.

that AI use in the Housing and Community Amenities and Economic Affairs government functions yields the most positive impact on the SDGs, while its use in Health and Recreation, Culture, and Religion showed minimal impact, and we observed no measurable impact in Defense (see Figure 7).

Using AI in the Housing and Community Amenities government function achieved the highest overall average impact (1.63) on the SDGs, highlighting its significant contribution goals like SDG 3 (Good Health and Well-being), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action). This underscores AI's capacity to enhance citizens' well-being, improve urban planning, optimize resource management, and support environmental sustainability. Moreover, leveraging AI in Economic Affairs demonstrated a significant impact across multiple SDGs. These include SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production), highlighting AI's potential to enhance efficiency in economic planning and production. AI in Education aligns prominently with SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions).

AI usage in Environmental Protection demonstrated a moderate impact on the SDGs. For example, SDG 13 (Climate Action) recorded an impact score of 0.77, while SDG 14 (Life Below Water) and SDG 15 (Life on Land) each showed an average impact of 1.0. The low average impact is mainly attributed to the resource-intensive nature of AI operations and their environmental consequences. Other functions, such as Public Order and Safety and Health, also demonstrated moderate impact, suggesting untapped potential in these areas. Recreation, Culture, and Religion recorded an average impact of 1.00 only for one SDG (SDG16 Peace, Justice, and Strong Institutions). This suggests limited AI integration in cultural and recreational sectors, pointing to a potential area for further exploration.

The most mentioned government function, General Public Services, recorded a very low average impact of 0.2 and demonstrated negative impacts on SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities). Similarly, at the lower end, the impact of AI in Social Protection was negative for multiple SDGs, including SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities and Communities) and SDG 16 (Peace, Justice, and Strong Institutions) suggesting an urgent need for greater focus on leveraging AI to address inequalities and improve welfare systems. Meanwhile, in Defense, AI showed an average impact of 0.0 for SDG 16 (Peace, Justice, and Strong Institutions), as the positive and negative outcomes were balanced.

Discussion

The concentration of AI research in high-income nations underscores the unequal global distribution of AI knowledge and applications, potentially reinforcing existing inequalities. A bibliometric analysis by Niu *et al.* (2016) of AI research patterns from 1990 to 2014 identified a similar disparity, with AI research heavily concentrated in the USA, Western Europe, and East Asia. Notably, the United States and the Chinese Academy of Sciences led in single-country and collaborative publications. This persistent imbalance raises significant concerns about the

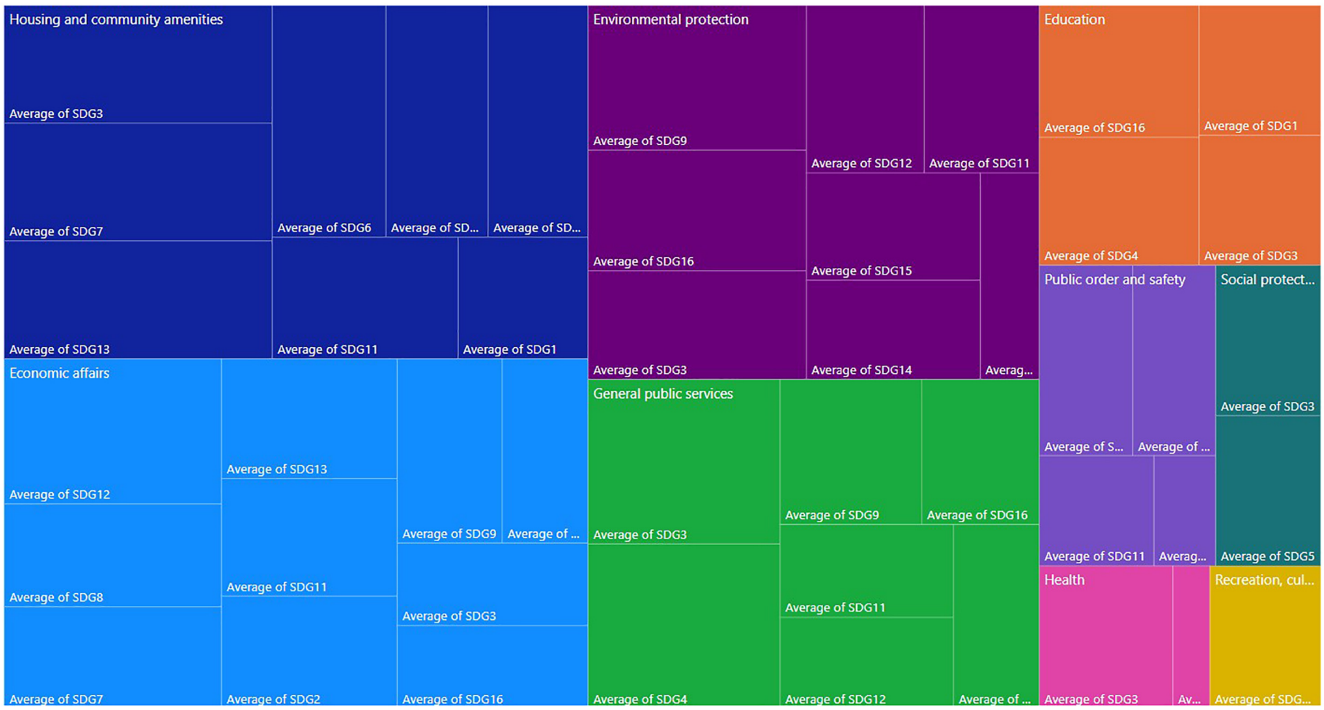

Figure 7. Average AI impact on SDGs categorized by government functions. Source: The Authors.

ability of low- and middle-income countries to harness AI's transformative potential, particularly in advancing sustainable development. Addressing this inequality requires dedicated efforts to foster collaboration, build capacity, and ensure equitable access to AI resources on a global scale.

We observed further disparities in the adoption of specific AI technologies. Out of the 15 categories, two—Chatbots and Virtual Assistants, and Machine Learning and Predictive Analytics—collectively accounted for 42% of mentions in the literature. These findings indicate that while certain AI technologies received significant attention, others remain underexplored, potentially due to being in earlier stages of development or differences in readiness, resource availability, or perceived utility across government sectors.

We categorized nearly 25% of the AI factors analyzed (318 out of 1,307) as not applicable (NA) without a score, highlighting a significant gap in measurable impacts. None of the studies reviewed provided unequivocally positive conclusions, instead emphasizing potential positive impacts using terms like "reduce," "improve," or "increase." 15% of AI factors were associated with negative outcomes. Furthermore, only 23% of AI factors explicitly referenced a specific country or a context, highlighting the limited availability of localized insights. This underscores an urgent need for empirical, context-specific research to validate claims and guide AI's application in government.

Reflecting on the research question—does AI adoption by governments hinder or support the achievement of the SDGs?—our findings suggest that AI adoption generally facilitates SDG progress, though its impact varies significantly across goals. AI in government has the potential to play a pivotal role in advancing SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), and SDG 12 (Responsible Consumption and Production). It also contributes to SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 2 (Zero Hunger). Additionally, AI in government can moderately support SDG 5 (Gender Equality), SDG 11 (Sustainable Cities and Communities), and SDG 17 (Partnerships for the Goals).

However, some goals showed minimal or even negative impacts. For instance, SDG 1 (No Poverty) exhibited a very low average impact, and SDG 10 (Reduced Inequalities) stood out as the only SDG with a slightly negative average impact of -0.15. These disparities in the impacts of AI across SDGs highlight the need for deliberate intervention to ensure balanced progress. As governments have a unique mandate to prioritize societal needs, this makes it essential to leverage AI not only to achieve specific technological advancements but also to promote inclusivity, equity, and long-term sustainability.

While our findings identified SDG 16 (Peace, Justice, and Strong Institutions) and SDG 11 (Sustainable Cities and Communities) as the most frequently mentioned SDGs, their average impacts remain relatively moderate. This contrast suggests that while these goals are central to AI in government research, the impact of AI applications in these areas appears limited. On the other hand, SDG 6 (Clean Water and Sanitation), SDG 4 (Quality Education), and SDG 12 (Responsible Consumption and Production) showed the highest average impacts, despite being

less frequently discussed in literature. This discrepancy indicates that AI applications in these sectors might be more transformative and effective when implemented.

Moreover, using AI across different government functions had a varied impact on achieving the SDGs. While AI usage in Housing and Community Amenities and Economic Affairs demonstrated strong support for goals like SDG 3 (Good Health and Well-being), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action), its integration into General Public Services and Social Protection showed limited or even negative impacts, particularly on SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities). These disparities highlight AI's potential to drive transformative changes in areas like urban planning and resource management but also underscore the need for more deliberate strategies to address inequalities and enhance welfare systems.

Overall, the extent to which AI supports or hinders the SDGs depends on its application, the government function, and the targeted goals. Our findings reveal both the transformative potential of AI and the urgent need for deliberate strategies to address disparities, especially for governments to align AI applications with broader societal goals. This research contributes to the growing discourse on AI in government and how their adoption of AI affects sustainable development.

Limitation

This study has several limitations. First, our approach treats SDGs as singular entities, limiting granularity; future research should analyze AI's effects at the SDG indicator level. Second, the study reflects a language bias, as AI research is limited to English-language sources. Additionally, the database selection (WOS, ScienceDirect) may have excluded relevant studies from IEEE Xplore or Google Scholar. Lastly, the single-reviewer screening process introduces potential selection bias.

Ethics and consent

No ethics and consent were required.

Data availability

Zenodo repository: "Mapping AI's role in supporting or hindering the achievement of SDGs: A systematic review for AI in government" https://doi.org/10.5281/zenodo.14999967. (Karam, 2025)

This project contains following underlying data:

-AIinGovernment_Coding.xlsx- Contains the list of all included studies along with coding of AI factors for each paper, including government functions, AI applications, and SDG associations

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0) (https://creativecommons.org/licenses/by/4.0/).

Reporting guidelines

Zenodo Repository: PRISMA checklist for "Mapping AI's role in supporting or hindering the achievement of SDGs: A systematic review for AI in government". https://doi.org/10.5281/zenodo.14999967. (Karam, 2025)

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Version 1

Reviewer Report 06 February 2026

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✓ **Derrick Mirindi**
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Frederic Mirindi
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This manuscript investigates the implications of AI for achieving the SDGs.
1. Change in the abstract from "Artificial Intelligence (AI)" to "artificial intelligence"
2. Provide a reference to this sentence:
"Lastly, we categorized the identified AI factors using the United Nations' Classification of the Functions of Government (COFOG)."
3. Change the title: "Geographical context of ai in government research" to "Geographical context of AI in government research"
4. It is important to include in this manuscript the "Conclusions" after the "Discussion" section.

Are the rationale for, and objectives of, the Systematic Review clearly stated?
Yes

Are sufficient details of the methods and analysis provided to allow replication by others?
Yes

Is the statistical analysis and its interpretation appropriate?
Yes

Are the conclusions drawn adequately supported by the results presented in the review?
No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: This is a very good paper for publication. However, minors change are

required.

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 10 May 2025

https://doi.org/10.21956/openreseurope.21304.r53135

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This review aims to provide constructive feedback on the submitted systematic literature review (SLR) article concerning artificial intelligence (AI) and its role in advancing Sustainable Development Goals (SDGs). While the study presents a relevant and timely topic, several critical improvements are needed to enhance the manuscript's clarity, methodological robustness, and scholarly contribution.

Abstract
The abstract currently provides general and vague conclusions. It is recommended that the authors revise this section to explicitly mention the specific outcomes of the study. For instance, what were the key findings in relation to AI's contribution to specific SDGs? Without clearly articulated outcomes, the abstract fails to effectively communicate the study's value.

Introduction
The introduction touches upon important themes but requires a clearer delineation of the study's scope. The statement, *"However, a significant research gap persists in examining how government adoption of AI specifically affects the achievement of these goals,"* is problematic because this particular gap cannot be addressed through a systematic literature review. Investigating the impact of government adoption of AI on SDGs would necessitate empirical or exploratory research methods.
Similarly, the assertion, *"Furthermore, Understanding this relationship is crucial because governments play a central role in driving, coordinating, and implementing SDG efforts,"* is beyond the investigative capacity of an SLR. Systematic literature reviews are more suited for synthesising literature, identifying tensions, and highlighting contradictory findings—not for establishing causal relationships.
Given this, it is strongly recommended that the problem statement and rationale for the SLR be clearly articulated. The introduction must focus on justifying the need for a systematic synthesis rather than proposing objectives that require primary data collection. Furthermore, the introduction should clearly state the research questions. The absence of research questions makes it difficult for the reader to assess the coherence and direction of the review.

Method

The methodology section needs more critical justification. The current claim that *"the procedures make it easy for the reader to understand the selection process"* is insufficient. A systematic review must be rigorous and transparent. One key concern is the exclusive reliance on the Web of Science (WOS) database. The authors should justify why Scopus and other databases were excluded, as relying solely on WOS may result in missing relevant literature.
Moreover, the keywords used do not appear to include specific terms related to SDGs. The rationale behind the selection of keywords must be explained, especially considering the central role SDGs play in the research aim. Inclusion and exclusion criteria must also be clearly justified beyond procedural ease; the criteria should align with the objectives and scope of the study.
The statement, *"Fourth, we assigned each AI Factor a numerical score to evaluate its impact on the linked SDGs based on the content and narrative of the articles,"* is particularly concerning. This approach requires more elaboration. A supplementary file should be included to explain how these scores were derived. More importantly, it is methodologically inappropriate to assign scores based on narrative interpretation alone. Ideally, such scoring should be grounded in empirical findings of the reviewed studies rather than subjective assessment.

Discussion
The discussion section includes several claims that require clarification and stronger evidence. For example, the sentence, *"The concentration of AI research in high-income nations underscores the unequal global distribution of AI knowledge and applications, potentially reinforcing existing inequalities,"* needs further substantiation. It is unclear whether this inequality is due to income, innovation ecosystems, or infrastructural capacity. Moreover, given that many AI systems are now affordable, the disparity in AI use may not be directly linked to national income.
The statement, *"this persistent imbalance raises significant concerns about the ability of low- and middle-income countries to harness AI's transformative potential, particularly in advancing sustainable development,"* oversimplifies the issue. Barriers in these countries often relate more to institutional and bureaucratic red tape than an inherent inability to leverage AI.
Another claim, *"ensure equitable access to AI resources on a global scale,"* is overly broad. AI is a form of digital technology, and ensuring equitable access requires nuanced policy, infrastructural, and governance frameworks. The discussion would benefit from a more grounded analysis of these factors.
The sentence, *"We observed further disparities in the adoption of specific AI technologies,"* also needs re-evaluation. The distinction between usage and adoption is crucial here. Moreover, the conclusion that some AI technologies are underexplored cannot be definitively drawn from an SLR without consideration of evolving research trajectories and publication biases.
The authors also write, *"Reflecting on the research question—"* but no such research question is clearly stated in the introduction, leading to a lack of alignment between the study's objectives and discussion.
Additionally, the claim, *"our findings suggest that AI adoption generally facilitates SDG progress, though its impact varies significantly across goals,"* should be more accurately framed as a synthesis of reviewed literature, not as original findings. Systematic reviews do not generate new findings but interpret existing ones.
The implications section is currently underdeveloped and should be expanded to address theoretical, practical, and policy implications more comprehensively.

Limitations
The limitations section needs significant improvement. Many methodological concerns raised above—such as database selection, keyword limitations, subjective scoring methods, and

overgeneralized conclusions—should be transparently discussed in this section.

Conclusion
While the topic addressed is both timely and important, the current manuscript requires substantial revisions to improve its academic rigour. Clarifying the study's objectives, research questions, methodology, and analytical claims will greatly enhance its contribution to the literature on AI and sustainable development.

Are the rationale for, and objectives of, the Systematic Review clearly stated?
Partly

Are sufficient details of the methods and analysis provided to allow replication by others?
Partly

Is the statistical analysis and its interpretation appropriate?
Not applicable

Are the conclusions drawn adequately supported by the results presented in the review?
No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Systematic Literature Review, Bibliometric Analysis, Technology & Business, Technological Advancements

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.