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SYSTEMATIC REVIEW

REVISED Artificial Intelligence use cases adopted by people and their impact on achieving sustainable development goals: a systematic review

[version 2; peer review: 1 approved, 2 approved with reservations]

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Abstract

Individuals are increasingly integrating Artificial Intelligence (AI) into their lives, adopting various use cases in healthcare, education, urban mobility, and more. AI has the potential to enhance efficiency, well-being, and societal progress, but it also has negative potential associated with ethical challenges, privacy concerns, and social inequality. A significant research gap remains in understanding the impacts of AI use cases adopted by people on SDG achievement. This study addresses that gap through a systematic analysis of whether AI adoption by people supports or hinders progress toward the SDGs. Using the PRISMA framework, we conducted a systematic review of 131 studies. The results show that the overall impact of AI use cases adopted by individuals on the SDGs is moderately positive. These use cases significantly contribute to areas such as healthcare, innovation, and sustainable urban development, yet their effects remain complex and context dependent. While individually adopted AI fosters efficiency and well-being in many domains, concerns about job displacement, biased decision-making, and misinformation highlight the need for responsible deployment. The study emphasizes the importance of ethical AI governance, equitable access, and AI literacy to ensure its positive contribution to sustainable development. Future research should not only empirically evaluate the real-world impacts of AI applications adopted by people from a sustainability perspective but also explore and develop strategies to mitigate negative impacts on progress toward the SDGs while maximizing their positive

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Any reports and responses or comments on the article can be found at the end of the article.

contributions. This research contributes to the evolving discourse on AI adoption by people and its implications for sustainable development.

Keywords
Artificial Intelligence, Sustainable Development Goals, People

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REVISED **Amendments from Version 1**

We revised the manuscript in response to both reviewers to improve conceptual clarity and methodological transparency.

First, we clarified what we mean by *individual-level AI adoption*. We now define this as AI use cases that individuals voluntarily choose based on personal preferences and perceived benefits, in contrast to AI systems deployed at wider organizational or city levels (Introduction; Methods).

Second, we refined and justified our SDG-linkage approach, with particular attention to SDG 9. We now explain that when the narratives around individual-level AI use cases focused on innovation-related or innovation-enabling contributions (for example, enabling access to digitally mediated services or supporting technological upgrading through novel digital tools), we linked those use cases to SDG 9. We also clarified when and why a use case was linked to multiple SDGs (Methods).

Third, we expanded the explanation of the search strategy and screening process. We clarified why we used a broad search string to maximize recall and how precision was ensured through predefined inclusion/exclusion criteria applied at title/abstract screening and full-text eligibility stages (Methods).

Fourth, we strengthened the limitations discussion by noting that restricting searches to Web of Science and ScienceDirect may limit coverage of relevant studies indexed elsewhere (e.g., IEEE Xplore or Google Scholar), and that single-reviewer screening may introduce selection bias. We also clarified mitigation steps for the latter, including systematic application of predefined criteria across stages and team discussion to resolve ambiguous cases consistently (Methods; Limitations/Discussion).

Finally, we clarified how AI use cases were extracted and labeled across heterogeneous terminology (Methods) and incorporated suggested references to strengthen the methodological positioning and the discussion of responsible and ethical AI (Methods; Discussion).

Any further responses from the reviewers can be found at the end of the article

Introduction

Artificial Intelligence (AI) applications have become increasingly prevalent, with people adopting a wide range of use cases that enhance various aspects of daily life, from personalized healthcare (Al-Besher & Kumar, 2022; König, 2023; Yigitcanlar *et al.*, 2024) and education (Choung *et al.*, 2023; Si, 2022; Yeh *et al.*, 2021) to smart home technologies (Choi & Drumwright, 2021; Das *et al.*, 2023; Maninger & Shank, 2022) and urban mobility solutions (Gesk & Leyer, 2022; Kleizen *et al.*, 2023; Oleksy *et al.*, 2023). AI use cases have the potential to positively impact people's lives by improving quality of life, enhancing time and cost efficiency, and contributing to broader societal advancements, thereby supporting the achievement of the United Nations' Sustainable Development Goals (SDGs) (Ametepey *et al.*, 2024; Goralski & Tan, 2020; Gosselink *et al.*, 2024). However, alongside these positive potentials, the adoption of AI also poses challenges, including ethical dilemmas, data privacy concerns, and risks of reinforcing social inequalities (Ingram, 2021; Lainjo, 2024; Sartori & Theodorou, 2022; Si, 2022; Vinuesa *et al.*, 2020).

AI use cases span a wide range of applications, bringing diverse impacts that can be both positive and negative (Kinder *et al.*, 2023; Lainjo, 2024; Ranga, 2024; Sætra, 2021; Si, 2022). On the positive side, AI has enhanced learning experiences through personalized education platforms (Das *et al.*, 2023; Murthy *et al.*, 2024), improved healthcare through accurate diagnostics (Robinson, 2020; Yeh *et al.*, 2021) and predictive modelling (Ozmen Garibay *et al.*, 2023), and optimized urban living with smarter traffic (Al-Besher & Kumar, 2022; Moravec *et al.*, 2024) and resource management systems (Yigitcanlar *et al.*, 2023). On the flip side, some use cases have raised concerns, such as job displacement caused by automation (Albarrán Lozano *et al.*, 2021; Liang & Lee, 2017), the amplification of biases in AI-driven decision-making (Langer *et al.*, 2023; Sartori & Theodorou, 2022), and significant environmental costs due to the energy demands of large-scale AI operations (Spelda & Stritecky, 2020). These varied outcomes underscore the importance of examining each AI use case individually to understand its unique implications and to implement it responsibly.

Most studies about AI and people focus on its sector-specific applications, while others explore people's perceptions, attitudes, acceptance of AI, or its impact on various aspects of human life. However, there is a significant gap in understanding the diverse use cases of AI adopted at the individual level and their impacts on the Sustainable Development Goals (SDGs). Some studies have evaluated the overall impact of AI on the Sustainable Development Goals (SDGs), considering AI as a monolithic entity (Ametepey *et al.*, 2024; Vinuesa *et al.*, 2020). Others have examined selected case studies of AI applications, demonstrating how these specific applications of AI impact the SDGs (Goralski & Tan, 2020). This paper addresses this gap by systematically analysing academic literature, cataloguing AI use cases adopted by people, and evaluating their diverse impacts on achieving the SDGs. The individual use cases of AI are highly

diverse, leading to varying impacts on the Sustainable Development Goals (SDGs) in terms of which goals they affect, whether the effects are positive or negative, and the extent of their influence. Hence, a systematic analysis, like the one undertaken in this study, is crucial to understanding their potential to drive progress or introduce challenges.

In this study, individual-level AI adoption refers to AI use cases that individuals voluntarily choose to use based on personal preferences and perceived benefits (e.g., voice assistants, AI learning tools, or health and well-being apps). In contrast, wider deployment of AI systems such as at the city-level happen through institutional processes (e.g., AI-enabled traffic management, surveillance systems etc.), where opportunities for public participation may be limited and individuals may be subject to these systems without actively choosing to adopt them (Levy *et al.*, 2021; Warne *et al.*, 2021). This study examines how people's own AI usage choices, rather than passive exposure to institutionally deployed systems, may support or hinder progress toward the SDGs.

Method

We conducted a systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol. The PRISMA protocol ensures transparency and consistency, making it easy for the reader to understand the selection process and improving the quality of the systematic review (Knobloch *et al.*, 2011), and 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 and SD, provided by Elsevier, is the world's leading database of peer-reviewed, full-text scientific, technical, and health literature. We searched both databases using titles and abstracts, with the search terms ((“people” OR “citizens” OR “residents”) AND (“artificial intelligence” OR “AI”)). The search string was intentionally broad to maximize recall and reduce the risk of omitting relevant studies, with precision ensured through subsequent application of predefined inclusion and exclusion criteria during title and abstract, and full-text screening.

Furthermore, we defined the scope of the studies of interest in alignment with our research aim, following Moher *et al.* (2009)'s guidelines. In practice, many eligible studies came from literature on people's perceptions, attitudes, trust, acceptance, and adoption of AI, because these papers often contain information on AI use cases adoptable at the individual-level.

Inclusion criteria

1. We included studies when they contained information on at least one AI use case adopted, or adoptable, at the individual level, meaning an application that individuals can voluntarily choose to use. We identified most eligible studies in research that examines people's perceptions of, attitudes toward, trust in, acceptance of, and adoption of AI, but we did not require any particular study focus for inclusion.

2. Only research articles written in English were included.

3. Only research conducted between the years 2015 and 2024 were included.

Exclusion criteria

1. Articles that focused solely on the computational aspects and techniques of AI applications were excluded.

2. Articles that focused exclusively on AI use cases adopted at a broader level (e.g., by a city or organization) without including any content on those that can be adopted at the individual level were also excluded.

3. Studies that had no content on use cases of AI that could be adopted at the individual level were excluded.

(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 resulting sample from the previous phase, applying the same criteria checks to the full texts. Finally, in the (d) inclusion phase, we analysed the remaining included studies. One researcher performed the screening and eligibility assessments, applying the inclusion and exclusion criteria at each phase.

To reduce potential selection bias, the criteria were applied systematically across the title and abstract screening and full-text eligibility stages. In addition, cases that were ambiguous or difficult to classify were discussed within the research team to ensure consistent interpretation of the criteria and to reach consensus on the final inclusion or exclusion of studies. 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 in March 2024 returned 9149 results. We retained 9122 studies after removing the duplicates. Using the inclusion and exclusion criteria, we conducted a filtering of these articles by reading through the title, abstract, and keywords of each one, resulting in 178 articles qualifying for a full-text review. After thoroughly reviewing the full texts and considering only articles that met the inclusion and exclusion criteria, 47 studies were excluded. Ultimately, after excluding also the duplicate results, 131 papers were selected for the final analysis. Refer to the data availability section for the complete list of included articles.

The analysis: We analysed the selected articles, and the analyses were recorded and organised in a tabular format (on an Excel worksheet), and the following steps were followed:

- **Indexing the papers:** We documented the title of each paper and assigned it an index number to refer to it (without using the full title, author's name, etc.) in the tabular analysis.

- **Content Extraction:** We manually reviewed the articles to extract and list the AI use cases that can be adopted at the individual level. We excluded AI use cases adopted exclusively at broader levels, such as organizational or city-level implementations. For example, the excluded use cases included city-wide smart traffic management systems, predictive maintenance in industrial operations, and large-scale climate modelling for environmental monitoring. When multiple studies discussed the same AI use case, we recorded it separately for each source. We made this deliberate choice because researchers often attribute different sustainability impacts to the same use case depending on context and implementation specificities. Recording use cases at the study level therefore allowed us to capture the different impact narratives. Given the heterogeneous terminology used across studies, we did not impose a formal classification scheme. Where feasible, we used consistent labels when studies described identical individual-level use cases.

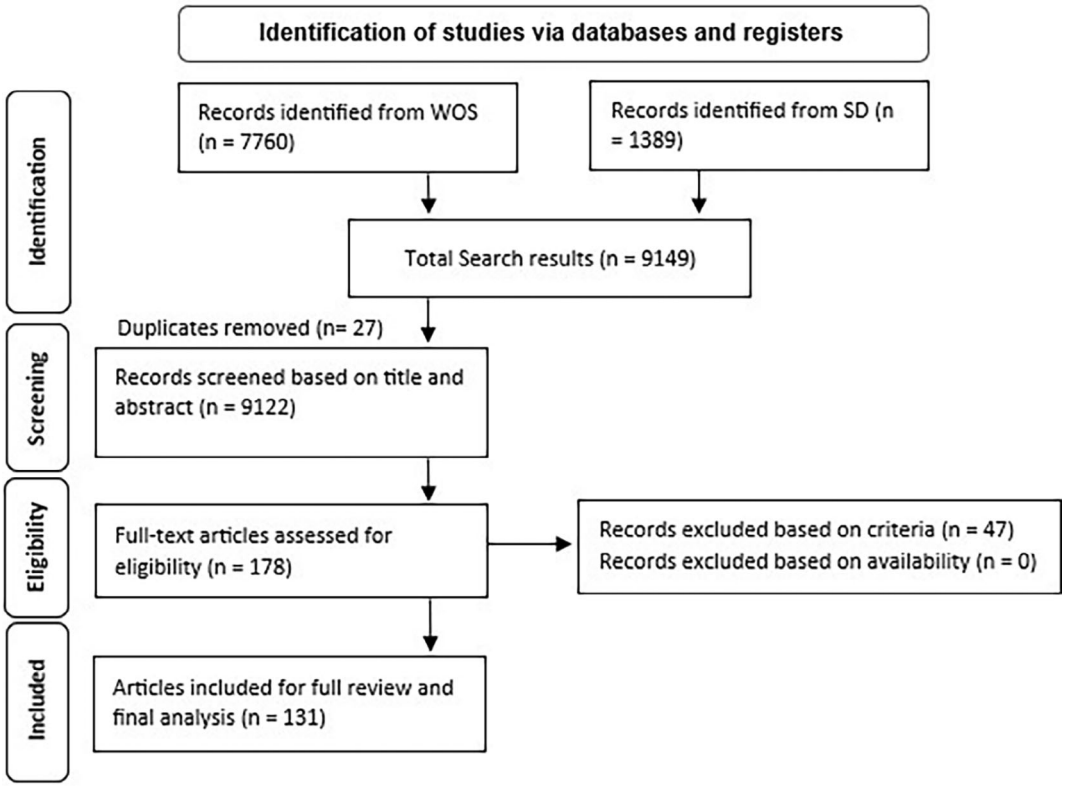


Figure 1. PRISMA flow chart (Adapted from Moher *et al.*, 2009).

- **SDG Correlation:** We linked each AI use case to one or more SDGs based on the the description and narrative in the source articles regarding whether and how it could contribute directly or indirectly to these sustainable development goals. PRISMA-based reviews from other fields have also mapped evidence to the SDGs (Raman *et al.*, 2024). We primarily linked each use case to the SDG for which the connection was most evident. In most cases, this linkage was straightforward because certain SDGs are closely associated with specific domains such as health, education, agriculture, etc., and several AI use cases clearly contributed to these domains. In some cases, we linked the use cases to multiple SDGs when the narrative supported more than one clear contribution. We inferred potential direct linkages to SDGs based on the characteristics and/or described impacts of the AI use cases, even when the source articles did not explicitly reference any SDG. We assigned SDG 9 when the article narrative emphasized innovation-related or innovation-enabling contributions of an individual-level AI use case (e.g., enabling access to digitally mediated services or supporting technological upgrading through novel digital tools), either as a primary linkage or alongside a domain-specific SDG when both connections were evident.

- **Impact Scoring:** Subsequently, one of the numerical score values mentioned below was assigned to each linked SDG per AI application based on the paper's content and narrative:

    - +3, if the authors inferred that the AI use case contributes tremendously positively towards the specific SDG.
    - +2, if the authors inferred that the AI use case contributes moderately positively towards the specific SDG.
    - +1, if authors inferred that the AI use case contributes slightly positively towards the specific SDG.
    - 0, if the authors mentioned the AI use case but did not infer that it contributes positively or negatively towards any SDGs.
    - -1 if the authors inferred that the AI use case contributes moderately negatively towards the specific SDG.
    - -2 if the authors inferred that the AI use case contributes negatively towards the specific SDG.
    - -3 if the authors inferred that the AI use case contributes very negatively towards the specific SDG.

The scoring was conducted relatively, meaning that each score was assigned in comparison to other factors rather than as an absolute measure. In cases where the same AI use cases were mentioned in multiple articles, we assigned impact scores separately for each instance based on the content narrative of the respective paper. The calculated impact score averages provide insights into how AI use cases adopted by people contribute to each SDG.

- **Implementation status:** The authors documented for each article, if the information was present in the body of the article, whether the AI use case has already been implemented in any context or if it is presented as a potential or hypothetical application.

- **Checking whether the narrative on AI's impact is a hypothesis, based on academic literature or empirical data:** The authors analysed each article to check whether the narratives regarding the impacts of the AI use cases are hypothetical, or derived from existing scientific literature or empirical data.

- **Aggregation of the analyses:** We consolidated the extracted data to identify recurring trends, and patterns regarding AI use cases adopted by people and their association with the Sustainable Development Goals (SDGs). This process involved categorizing AI use cases by their levels of adoption, implementation status, and connections to specific SDGs. Furthermore, to quantify the overall impact of AI use cases on the SDGs, we aggregated the individual impact scores assigned during the analysis phase. For each SDG, the average impact score was calculated by summing the scores of all use cases linked to that SDG and dividing by the total number of valid scores, excluding any "NA" values. The "NA" scores were assigned to denote use cases with a clear connection to an SDG but lacking sufficient information on their impact. Similarly, an overall average impact score was calculated to represent the collective influence of AI use cases on all SDGs. This approach provided a structured assessment of how AI use cases adopted by people contribute to sustainable development goals individually and collectively. We used Excel to extract, organize, and analyse 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.

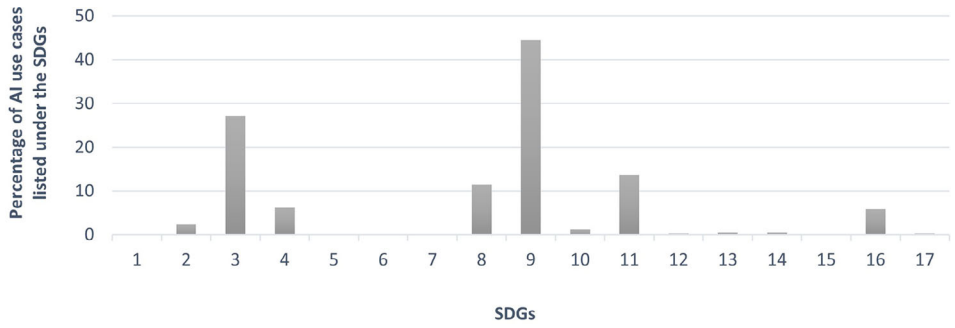


Figure 2. Percentages of AI use cases adopted by people categorised under each SDG (Source: The authors).

Findings

Linking the AI use cases to SDGs

We analysed what fraction of the identified AI use cases were linked to each of the Sustainable Development Goals (SDGs). As shown in Figure 2, the AI use cases we identified as being adopted by people are unevenly distributed across the Sustainable Development Goals (SDGs), based on which SDGs the use cases have a direct impact on.

- A significant number of use cases were directly linked to SDG 3 (Good Health and Well-Being: 27.2%), SDG 4 (Quality Education: 6.1%), SDG 8 (Decent Work and Economic Growth: 11.4%), SDG 9 (Industry, Innovation, and Infrastructure: 44.4%), SDG 11 (Sustainable Cities and Communities: 13.7%), and SDG 16 (Peace, Justice, and Strong Institutions: 5.8%).

- Only a limited number of AI use cases had a direct impact on the achievement of SDG 2 (Zero Hunger: 2.3%), SDG 10 (Reduced Inequalities: 1.2%), SDG 12 (Responsible Consumption and Production: 0.3%), SDG 13 (Climate Action: 0.6%), SDG 14 (Life Below Water: 0.6%), and SDG 17 (Partnerships for the Goals: 0.3%).

- None of the AI use cases discussed were directly associated with SDG 1 (No Poverty: 0%), SDG 5 (Gender Equality: 0%), SDG 6 (Clean Water and Sanitation: 0%), SDG 7 (Affordable and Clean Energy: 0%), or SDG 15 (Life on Land: 0%).

The impact assessment of the AI use cases across the SDGs

Based on the scientific literature we analysed, the overall **average impact of AI use cases adopted by people on the SDGs is 1.02**, indicating that AI use cases adopted by individuals contribute slightly positively to the SDGs. However, we observed that the articles lacked information regarding the impacts of a considerable number of AI use cases (221 out of 342, 64.2%) mentioned within them, in general and in relation to the Sustainable Development Goals (SDGs). These studies focus on other aspects such as acceptance levels or people's perceptions of the AI use cases. For the remaining use cases, we derived impact scores for each AI use case mentioned in the selected articles by analysing their content.

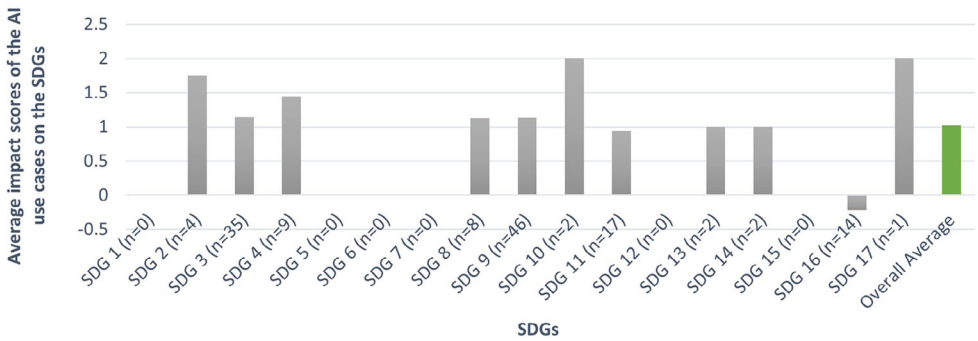


Figure 3. Average impacts of the AI use cases adopted by individuals across the SDGs (n = the number of AI use cases linked to the respective SDG for which we assigned impact scores) (Source: The authors).

Only 4 use cases were framed with hypothetical impacts, offering speculative discussions without evidence or reference. In contrast, 117 use cases provided insights on their impacts supported by references to existing scientific literature.

As shown in Figure 3, the most notable average impact scores of AI use cases adopted by people across the SDGs were as follows:

- **SDG 2 (Zero Hunger):** Among the 8 use cases, only 4 were assigned impact scores due to a lack of information, resulting in an **average impact score of 1.75**, which showcases AI's potential in advancing agriculture through precision farming and resource optimization.

- **SDG 3 (Good Health and Well-Being):** Of the 93 use cases, only 35 were assigned impact scores, resulting in an **average score of 1.14**, which highlights AI's potential to advance healthcare through improved diagnostics, personalized medicine and fitness plans.

- **SDG 4 (Quality Education):** Out of 21 use cases, 9 were given impact scores, resulting in an **average score of 1.44**, reflecting the positive impact of use cases of AI in facilitating personalized learning and efficient education management.

- **SDG 8 (Decent Work and Economic Growth):** Of the 39 use cases, only 8 were assigned impact scores, with an **average score of 1.13**, suggesting that the adoption of AI by individuals for work boosts economic growth and work efficiency. However, challenges such as job displacement remain a concern.

- **SDG 9 (Industry, Innovation, and Infrastructure):** Of the 152 use cases, 46 were assigned impact scores, with an **average score of 1.13**, indicating AI's potential in enhancing innovation.

- **SDG 11 (Sustainable Cities and Communities):** Among the 47 use cases, 17 are assessed for impact, resulting in an **average score of 0.94**, showcasing AI's potential in making cities sustainable through use cases such as navigation support, well-being monitoring, etc.

- **SDG 16 (Peace, Justice, and Strong Institutions):** Out of 20 use cases, 14 report impact scores, with a **negative average score of -0.21**, reflecting concerns about the potential misuse of AI, through use cases such as misinformation, and deceptive chatbots.

However, the variability across SDGs and the negative impact observed for SDG 16 underscore the complexity of AI's role in achieving sustainable development.

Implementation status of the AI use cases

The implementation status of the AI use cases reveals that the majority—306 use cases (89.5%)—are already adopted by people in real-world scenarios, showcasing AI's widespread integration into daily life and various sectors. In contrast, 22 use cases (6.4%) lacked information about their implementation status, and 14 use cases (4.1%) were hypothetical, discussed without evidence of real-world application. Examples of hypothetical AI use cases include AI for hairdressing services, and AI algorithms for detecting romance fraud patterns. In some articles, hypothetical scenarios were created to ask questions or collect data on how people might behave in imagined situations involving these AI use cases. For instance, an imaginary scenario with AI in fitness coaching was used to gauge perceptions of feasibility and trust in such technologies. Even though some use cases of AI already exist in real life, they were categorized as hypothetical when the articles analysed did not provide evidence of their real-world implementation or relied on speculative contexts.

Discussion

By systematically analysing AI use cases adopted by people, identified across 131 research articles, this study demonstrates the widespread integration of AI into people's lives and its potential to drive sustainable development. However, it also reveals several challenges and gaps that warrant attention.

The analysis confirms AI's capacity to contribute positively to multiple SDGs when applied thoughtfully and equitably. Notably, use cases related to SDG 3 (Good Health and Well-Being) were the most frequently mentioned, showcasing AI's potential in enhancing diagnostics, personalizing treatments and fitness plans, and providing mental health support. Following this, AI use cases associated with SDG 9 (Industry, Innovation, and Infrastructure) highlighted their positive potential through use cases such as intelligent homes, and content generation. Similarly, AI's positive impact on SDG

11 (Sustainable Cities and Communities) is evident through applications like navigation systems and disaster response support. Use cases such as personalized education platforms and efficient educational management systems linked to SDG 4 (Quality Education) highlight the positive potential of AI to enhance access to learning and improve overall efficiency in education. The high average impact scores for SDG 2 (Zero Hunger) further demonstrate AI's potential in advancing precision agriculture and improving food security.

Even though our analysis showcases AI's potential to contribute positively to SDG 8 (Decent Work and Economic Growth) by improving cost efficiency and saving time, there are significant challenges associated with its adoption. One major concern is job displacement caused by automation, particularly in sectors reliant on routine tasks, highlighting the need for strategies to support workforce transitions and reskilling. Concerns about fairness and equity also emerge in relation to SDG 10 (Reduced Inequalities), as uneven access to AI technologies and the reinforcement of biases in decision-making systems risk exacerbating social disparities. Furthermore, AI's potential misuse for privacy violations and fabrication of data, negatively impact SDG 16 (Peace, Justice, and Strong Institutions), and raises ethical questions that call for robust AI governance frameworks. To fully harness AI's potential for advancing the Sustainable Development Goals (SDGs) and mitigate potential negative impacts, developers and policymakers must ensure that AI use cases are designed and implemented ethically and equitably (Satornino, Du, & Grewal, 2024). Promoting AI literacy is critical, empowering individuals to engage effectively with AI technologies, ensuring equal access, and preventing the widening of social disparities. Additionally, fostering trust in AI through increased explainability and human-centricity is essential for encouraging broader adoption of ethical AI and accelerating progress toward achieving the SDGs.

We compared our main findings with those from existing studies on similar topics. Firstly, studies by Ametepey *et al.* (2024) and Gosselink *et al.* (2024) also concluded that AI's overall contribution to the SDGs is positive. Secondly, consistent with the findings of Vinuesa *et al.* (2020), who analysed use case impacts at a more detailed SDG indicator level[1], we observed that AI generally has a positive influence on most SDGs, though it can have negative effects on a smaller fraction of SDGs or their indicators. Finally, researchers such as Lainjo (2024) and Si (2022) emphasize that AI's potential for sustainable development depends on addressing ethical challenges and mitigating biases—one of our key discussion points as well. This consistency across studies underscores AI's significant potential for progress, provided it is implemented ethically and responsibly.

A key limitation of this research arises from the inconsistencies in the depth and focus of academic literature on AI's contributions to sustainability. As a result, we primarily relied on qualitative data extracted from the articles to record the impacts of AI use cases on the SDGs. This over-reliance on qualitative narratives highlights the need for more empirical, data-driven studies that systematically evaluate AI's real-world impacts across diverse contexts and SDGs. Second, our analysis treated SDGs as singular entities, which limits the granularity of insights. A more detailed understanding can be achieved by analysing impacts on the 169 SDG indicators rather than focusing solely on the 17 overarching SDGs. Third, some articles discussed both the positive and negative potential impacts of AI use cases on the same SDG(s). In such cases, we accounted for the positive impacts when it was evident that the negatives could be mitigated through careful development and implementation. Fourth, our analysis is limited to research published in English, which may exclude relevant studies from non-English-speaking contexts. Additionally, this review is limited to studies indexed in Web of Science and ScienceDirect. Although these databases provide broad coverage of peer-reviewed literature across AI, social sciences, and sustainability research, relevant studies indexed exclusively in other databases such as IEEE Xplore or Google Scholar may not have been captured. Future research could extend this review by incorporating additional databases to further broaden coverage.

Future research should prioritize empirical evaluations of AI use cases to provide evidence-based insights into their real-world impacts on the SDGs. A more granular approach is also necessary, analysing impacts on the 169 SDG indicators rather than treating the 17 overarching SDGs as singular entities. Additionally, research should explore the contextual variability of AI's impacts, examining how they differ across regions, populations, and socio-economic settings, with particular attention to marginalised communities. Studies following the suggested format should be conducted separately for AI use cases adopted at the individual level and those implemented at broader levels. Finally, it could be beneficial to record negative and positive impacts separately, as the same AI use case may support or deter progress toward the same SDG(s) or SDG indicators, depending on varying conditions and contexts.

Ethic and consent

Ethical approval and consent were not required.

[1]The 17 SDGs are further subdivided into 169 SDG indicators.

Data availability

Underlying data

Zenodo: Artificial Intelligence use cases adopted by people and their impact on achieving Sustainable Development Goals. Doi: https://doi.org/10.5281/zenodo.15048897

The dataset (Palliyil, 2025) supporting this systematic review has been made available publicly on Zenodo and contains the following underlying data:

- Excel File – Provides a complete list of all studies included in the review, along with all AI use cases adopted at the individual level as mentioned in the studies, the relative magnitude of their impacts on the SDGs, and the source of each impact score—whether hypothetical, derived from empirical research, or adopted from existing literature.

Data is available under the terms of the Creative Commons Attribution 4.0 International

Reporting guidelines

- Zenodo: PRISMA checklist for "Artificial Intelligence use cases adopted by people and their impact on achieving Sustainable Development Goals" Doi: https://doi.org/10.5281/zenodo.15048897

Data is available under the terms of the Creative Commons Attribution 4.0 International Reporting guidelines.

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The authors have used AI tools, namely ChatGPT, to increase the readability of this proposal.

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Open Peer Review

Current Peer Review Status: ✔ ? ?

Version 2

Reviewer Report 27 February 2026

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✔ **Lóránt Dénes Dávid**
John von Neumann University, Kecskemét, Hungary

This article has been revised and corrected by the authors; I hereby recommend it for indexing. I could not find any problems in ethical or plagiarism cases.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: tourism, hospitality, geography, earth sciences, economics, environmentalism, regional studies and sciences, sustainable development, circlular economy, bioeconomy, multi-, trans- and interdisciplinary fields

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.

Reviewer Report 16 February 2026

https://doi.org/10.21956/openreseurope.24974.r69577

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? **Mark A Camilleri**
University of Malta, Msida, Malta

The authors have already revised their manuscript after they have received the first round of reviewers' evaluations.

I believe that their manuscript still has a few weaknesses and shortcomings. I am recommending

the following revisions.

The introduction can include a small section that discusses about the novelty/orginality of this contribution.

The authors should include more recent references to articles published in 2025 and 2026. They should be drawn from high impact journals. I suggest they include the following ones:

Al-Raeei, M. (2025). [Reference 1]

Costa, A., Crupi, A., Cesaroni, F., & Abbate, T. (2025). [Reference 2].

Jerez-Jerez, M. J. (2025). [Reference 3]

Mancuso, I., Petruzzelli, A. M., Panniello, U., & Vaia, G. (2025). [Reference 4]

Varriale, V., Camilleri, M. A., Cammarano, A., Michelino, F., Müller, J., & Strazzullo, S. (2025). [Reference 5].

Wang, Q., Zhang, F., & Li, R. (2025).[Reference 6].

The methodology should better explain the inclusion and exclusion criteria that guided the researchers in their systematic review. The authors need to clarify how they reduced their systematic review of 9122 publications to just 131 items. This would improve the trustworthiness and rigour of this study.

The findings could have indicated the academic contributions that captured the highest citations in each SDG area.

The discussion presents a short discussion considering that the authors examined all SDGs. The authors need to identify (and elaborate on) the most important themes that emerged from their review.

This manuscript ought to include a managerial/practical implications section (with at least two paragraphs). The limitations and future research directions should also be presented in another (new) section.

I look forward to reading a revised version of this manuscript.

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4. Mancuso I, Petruzzelli A, Panniello U, Vaia G: The bright and dark sides of AI innovation for sustainable development: Understanding the paradoxical tension between value creation and value destruction. *Technovation*. 2025; **143**. Publisher Full Text
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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?
No

Are the conclusions drawn adequately supported by the results presented in the review?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Strategic Management, Sustainable Development, Circular Economy, Technology Adoption, Digital Transformation, Artificial Intelligence, Education Technology.

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.

Version 1

Reviewer Report 08 October 2025

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Sina Shaffiee Haghshenas
[1] University of Calabria, Rende, Italy

[2] University of Calabria, Rende, Italy

1- The claim of a “significant gap” at the individual level is central—what distinguishes “individual-level adoption” from organizational/city-level beyond examples?

2- Why restrict to people’s perceptions/attitudes and individual-level adoption but still include SDG 9? Justify inclusion criteria for SDG 9 links at individual level .

3- The search string ((“people” OR “citizens” OR “residents”) AND (“artificial intelligence” OR “AI”)) is broad; how do you ensure recall/precision and avoid selection bias?

4- Why exclude IEEE Xplore and Google Scholar given AI application prevalence?

5- One reviewer conducted screening/eligibility; how is reliability ensured? Use dual-screening on a random subset (e.g., 20%).

6- How were AI use cases identified and standardized across heterogeneous terminology?

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?
Partly

Are the conclusions drawn adequately supported by the results presented in the review?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Transportation Engineering, Road Safety, Smart cities, Sustainable Development, Risk Management, AI, Fuzzy logic, Decision making

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.

Author Response 03 Feb 2026

Vijay Gopal Vazhoth Palliyil

We thank the reviewer for the insightful comments and questions, which helped us strengthen the manuscript substantially. Below, we reproduce the reviewer’s comments/questions together with our corresponding responses. Within each response, we indicate the section(s) of the manuscript where we implemented the relevant changes.

1. The claim of a “significant gap” at the individual level is central—what distinguishes

"individual-level adoption" from organizational/city-level beyond examples?
We thank the reviewer for highlighting the need for a clearer conceptual distinction between individual-level and organizational or city-level AI adoption. In this study, *individual-level adoption* refers to AI use cases that individuals voluntarily choose to adopt based on personal preferences and perceived benefits (e.g., personal voice assistants or AI-based learning applications). In contrast, *organizational- or city-level adoption* involves AI systems deployed through institutional or infrastructural decisions typically made by experts or authorities, where individuals are rarely involved in the decision-making process and are often exposed to AI without a meaningful choice or ability to opt out (e.g., AI-enabled traffic management or city-wide surveillance systems). This distinction is central to our research aim, as we examine how **people's own AI use behaviours and choices**, rather than passive exposure to AI systems, contribute to or hinder progress toward the SDGs. We have clarified this conceptual distinction in the Introduction and Methods sections to make the scope and contribution of the study more explicit.

2- Why restrict to people's perceptions/attitudes and individual-level adoption but still include SDG 9? Justify inclusion criteria for SDG 9 links at individual level. We thank the reviewer for this point. Although SDG 9 is often associated with industry and large-scale infrastructure, it also explicitly addresses innovation and technological development, which can be analytically relevant at the individual level when examining AI use cases adopted by people. Accordingly, in this review we linked individual-level AI use cases to SDG 9 when the study narrative emphasised innovation-related or innovation-enabling contributions, such as enabling access to digitally mediated services or supporting technological upgrading and productivity through novel digital tools. More generally, we linked each use case to the SDG(s) that best matched the contribution described in the source article, assigning domain-specific SDGs (e.g., health or education) when the contribution was sectoral and assigning multiple SDGs when more than one clear linkage was described. We have clarified this SDG-assignment logic in the Methods section to make the treatment of SDG 9 at the individual level transparent.

3- The search string (("people" OR "citizens" OR "residents") AND ("artificial intelligence" OR "AI")) is broad; how do you ensure recall/precision and avoid selection bias? We thank the reviewer for this question. We intentionally used a broad search string to maximize recall across disciplines in a field with heterogeneous terminology. We did not add multiple technique-specific terms (e.g., machine learning, deep learning) because doing so tends to retrieve a higher proportion of studies that focus on computational methods rather than on people's AI use and experiences. We ensured precision and minimized selection bias through predefined, multi-stage screening at the title/abstract and full-text levels. We included studies if they contained extractable information on at least one AI use case adopted (or adoptable) at the individual level, and we systematically excluded papers focused solely on computational methods or on organizational/city-level deployments without individual-level content. We resolved ambiguous cases through team discussion to ensure consistent application of the criteria. We have updated the Methods section to explicitly describe the rationale for the broad search string and the screening steps used to reduce selection bias.

4- Why exclude IEEE Xplore and Google Scholar given AI application prevalence? We

acknowledge the reviewer's point regarding IEEE Xplore and Google Scholar. We chose Web of Science and ScienceDirect because they provide broad, multidisciplinary coverage of peer-reviewed literature across AI, social sciences, and sustainability research, and they support a reproducible search process. We recognize that IEEE Xplore and Google Scholar could contain additional relevant studies, particularly conference proceedings and grey literature, and our database selection may therefore have missed some eligible papers. We have added this as a limitation in the manuscript and encourage future work to extend the review by incorporating additional databases.

5- One reviewer conducted screening/eligibility; how is reliability ensured? Use dual-screening on a random subset (e.g., 20%). We acknowledge that the screening and eligibility assessments were conducted by a single reviewer, which may introduce selection bias. To mitigate this risk, inclusion and exclusion criteria were clearly predefined and applied systematically across the title, abstract, and full-text screening stages, and ambiguous cases were discussed within the research team to reach consensus on study inclusion. We have clarified these procedures in the Methods section and acknowledge that future research could further enhance reliability by applying full or partial dual-screening approaches.

6- How were AI use cases identified and standardized across heterogeneous terminology? We thank the reviewer for this question. We manually identified and recorded AI use cases adopted (or adoptable) at the individual level from the full texts of the included articles, acknowledging the heterogeneous terminology used across studies. When the same use case appeared in multiple articles, we listed it separately for each study to capture contextual differences and how sustainability impacts were framed. To handle terminological variation, we standardized labels where feasible when studies clearly referred to the same use case; otherwise, we retained the source terminology. We assessed impacts study by study based on each article's narrative rather than aggregating impact scores across studies. We have clarified this in the Methods section, under the Content Extraction subsection.

Competing Interests: No competing interests were disclosed.

Reviewer Report 16 June 2025

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Lóránt Dénes Dávid
[1] John von Neumann University, Kecskemét, Hungary
[2] John von Neumann University, Kecskemét, Hungary

I have reviewed the article titled *"Artificial Intelligence Use Cases Adopted by People and Their Impact*

on Achieving Sustainable Development Goals: A Systematic Review."
This systematic review makes a significant and timely contribution to understanding the role of Artificial Intelligence (AI) in sustainable development from a people-centric perspective. The study stands out by focusing not just on algorithm-centric innovations but on the actual use cases adopted by individuals and their effects - a dimension that is frequently neglected in policy and implementation studies.
The paper's main strength lies in its comprehensive and rigorous application of the PRISMA framework to identify, select, and analyze 131 relevant studies. The resulting picture is a well-balanced view: while there are predominantly positive impacts - particularly related to health care, education, innovation, and sustainable cities - there are also important caveats stemming from biases, misinformation, and growing inequalities. This realistic view underscores the necessity for responsible and ethical governance alongside enhanced literacy and policy mechanisms.
Furthermore, I appreciate your forward-thinking conclusion, which emphasizes future research directions and policy responses to maximize the benefits while mitigating potential drawbacks.
Suggestions for improvement (with additional citations):
While the systematic review is exhaustive, I suggest adding more citations to enable readers to appreciate the depth and robustness of the study.
Recommended articles for citing:
(refer to 1,2 and 3)
Etc.

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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?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: tourism, hospitality, geography, earth sciences, economics, environmentalism, regional studies and sciences, sustainable development, circlular economy, bioeconomy, multi-, trans- and interdisciplinary fields

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.

Author Response 03 Feb 2026

Vijay Gopal Vazhoth Palliyil

We thank the reviewer for the positive assessment of our work and for the helpful suggested references. In response, we have incorporated the relevant recommended literature where it aligns directly with the focus of our review, to strengthen both (i) the contextual grounding of our discussion, particularly around the responsible and ethical development and use of AI, and (ii) the methodological positioning of our SDG-linkage procedure by referencing a prior PRISMA-based review that similarly map extracted study content to the SDGs.

Competing Interests: No competing interests were disclosed.