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TRENDS AND CHALLENGES RELATED TO THE USE OF AI IN PUBLIC SERVICES FROM A CUSTOMER PERSPECTIVE: A NARRATIVE SYSTEMATIC LITERATURE REVIEW

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Purpose: The use of AI in public services is becoming increasingly common and brings many benefits. However, it is associated with various types of problems. One of them is social acceptance of services implemented with the participation of AI. Even the best technological solutions will not bring benefits if customers do not trust them or are unable to use them. The aim of the study is to identify factors that facilitate customer acceptance of public services implemented using AI and problems related to customer resistance to the use of AI technologies in these services.
Design/methodology/approach: This article is based on a narrative systematic literature review. Out of the 173 articles qualified for the study, through the selection and filtering process, 9 research articles that met the inclusion and exclusion criteria were finally qualified for the in-depth analysis. In order to achieve the study objective, a mixed research review method and qualitative synthesis were used.
Findings: Studies have shown that the acceptance of AI in public services depends on several key factors: trust in public institutions, transparency of AI services, privacy and data security, awareness of the usability and operation of AI, and the possibility of choosing service without AI. Acceptance of AI is higher in simple services and lower where individual approach and empathy are needed.
Research limitations/implications: The scope of this review was limited to the Web of Science database. The study covers publications from 2015 to 2025 and does not include review articles, retracted materials, or editorials.
Originality/value: This study, synthesizing different research perspectives, contributes to a better understanding of customer perceptions related to the use of AI in public services. The article identifies potential research gaps and directions for future research. It also proposes recommendations for public managers regarding the process of implementing artificial intelligence in public services.
Keywords: Artificial Intelligence, AI, public administration, public services, customer perception, improvement.
Category of the paper: literature review.

1. Introduction

Artificial intelligence (AI) is becoming one of the key tools for transforming the public sector. The literature indicates numerous examples of improving public services using AI tools that affect how citizens use services provided by public administration offices (Chen et al., 2019; Kachn et al., 2020; Delfos et al., 2022; Progoniuk, Husenko, 2022; Nicolás, Sampaio, 2024). Much attention in this regard is paid to the use of Chatbots (Van Noordt, Misuraca, 2019; Henman, 2020; Cortés-Cediel et al., 2023; Cruz Meléndez et al., 2024). Yigitcanlar et al. (2024), based on a review of grey literature, identified 262 actual AI implementations in 170 local governments around the world. It can therefore be stated that the transformation of public services focused on the use of AI is progressing dynamically, both in the sphere of scientific research and practical applications.

Although AI is developing dynamically and offers opportunities to improve the efficiency of public administration and service provision, significant barriers to its application can be identified, including concerns about bias, transparency, public acceptance and accountability (Caiza et al., 2024). The use of artificial intelligence in public services is therefore associated with a number of challenges faced by government and local government units.

Customer perception is one of the most frequently mentioned problems in the literature related to the implementation of AI solutions in public services. Articles presenting empirical research related to the implementation of AI tools in public services often indicate ethical concerns (Fatima et al., 2021; Alshahrani et al., 2022), problems with customer's lack of trust in AI (Gesk, Leyer, 2022), ensuring privacy and protection of personal data (Willems et al., 2023; El El Gharbaoui et al., 2024), and problems with stakeholder engagement (Berman et al., 2024). They are therefore largely related to how customers perceive the use of AI in public services and how smart services will affect their satisfaction.

Empirical studies on customer perceptions related to the use of AI in public services are scattered and heterogenous. The analysis of the Web of Science database showed that several review articles cover different aspects of the use of AI in public services. Of the 17 reviews identified in the WoS database, those that did not refer to public services directly implemented by the government and local government institutions, i.e.: education, libraries, health care, urban transport, etc. Systematic literature reviews in the area of AI in public services have been conducted, among others, in the areas of digitalization, accountability and accounting (Agostino et al., 2022), the impact of AI on public sector employment (Reis et al., 2021), corruption (Adam, Fazekas, 2021) and smart cities (Das, 2024; Alsabt et al., 2024). AI-powered IoT solutions (Ma et al., 2020) and problems related to interpreting black box models (Hassija et al., 2024) were also considered in the area of smart public services. De Sousa et al. (2019) point to a growing trend of interest in AI in the public sector, with India and the US being the most active countries. Madan and Ashok (2023) identified five AI-related tensions that affect

the creation of public value as a result of the dissemination of AI. In turn, Caisa et al. (2024) present a comprehensive review of the literature on the impact of artificial intelligence on decision-making processes in public administration. The authors' main conclusions indicate that the use of AI can: contribute to increased efficiency and precision in administrative decision-making, pose a challenge related to algorithmic biases, generate a lack of transparency and accountability for possible errors or abuses, pose a threat to privacy and data security, and generate the need to introduce appropriate regulations and standards in the area of AI.

The conducted analysis indicates the need to collect and systematize the existing body of empirical research that relates to how users of public services react to the use of artificial intelligence tools in these services. Therefore, this study aims to identify factors that facilitate customer acceptance of AI-based public services and problems related to customer resistance to the use of AI technologies in these services through a narrative systematic literature review. The analysis of existing studies will allow for a better understanding of the problems and barriers resulting from customer resistance to the use of AI solutions in public services, which may limit its effective implementation. The following sections of the publication discuss the theoretical framework necessary for the discussion of this topic. Then, the methodological aspects of the study, including data collection and analysis procedures, are presented. Finally, the results of the review are presented and an agenda for future research is proposed.

2. Theoretical framework

2.1. Artificial intelligence

Artificial intelligence is a term that was first used by J. McCarthy in the 1950s (McCarthy, 2007). It can be understood as a kind of philosophy of machines that are supposed to think, behave and act in the same or similar way as humans (Dhamija, Bag, 2020). Currently, artificial intelligence is one of the most dynamically developing areas of technology, discussed in the context of various spheres of human activity (Thayyib et al., 2023; Lawelai et al., 2023; Knani et al., 2022; Vasishta et al., 2024; Bawack et al., 2022). Moreover, the term covers a wide range of issues, from machine learning algorithms to ethics and the impact of AI on society. In the service sector, artificial intelligence can have various applications. Many analyses indicate that its implementation improves the efficiency of service processes and the quality of customer service (Kumar et al., 2024; Kulal et al., 2024). Examples of intelligent tools used to improve customer service quality include chatbots and virtual assistants (Misischia et al., 2022), e-commerce recommendation systems (Necula, 2023), and algorithms that optimize logistics processes (Chen et al., 2024). In banking and finance, AI helps detect fraud and manage risk (Aziz, Andriansyah, 2023), and in the hotel industry and tourism, it enables the creation of

unique customer profiles and the provision of personalized recommendations and dynamic price adjustments (Das et al., 2024).

2.2. Characteristics and classification of public services

Public services are basic services provided by government and local government bodies or entities authorized by them. Their purpose is to satisfy the basic needs of citizens and to ensure social well-being. Public services can be defined as public goods that have a specific value regardless of the number of recipients and in relation to which it is impossible to exclude anyone from using them (Lissowski, 2017). Public services therefore play a key role in the functioning of the state and ensuring the well-being of its citizens. Public services in the literature on the subject are classified differently by different authors. Due to the scope of services provided, the most frequently cited classification of public services in Poland is the division into: (1) administrative services, which are directly related to the performance of administrative activities, e.g. issuing certificates, concessions, administrative decisions, documents, (2) social services, which are aimed at meeting social needs, e.g. health care, education, culture, social assistance and care, and (3) technical services, which are related to transport, energy, water management, waste management (Kożuch, B., Kożuch, A., 2011). Diepart et al. (2016) divided public services into the following categories: health, education, public administration, social affairs and security. In turn, depending on the method of provision, public services can be divided into general, which are provided without a specific request and concern all or most citizens, and specific, which are explicitly requested by citizens and affect only one or a few citizens (Halaris et al., 2007). Taking this division into account, it can be stated that technical and social services can be classified as general services because they are addressed to the general public (e.g. providing educational services or water to residents in a given area) and administrative services can be treated as specific (e.g. issuing a building permit at the request of the client).

3. Methods

This study conducted a narrative systematic review of the literature (Mishra, V., Mishra, M.P., 2023). To achieve the study objective, the mixed research review method (Grant, Booth, 2009) was used due to the fact that the initial literature review indicated the use of both quantitative and qualitative research in relation to the analysed issue. The process of conducting a systematic literature review was designed based on the guidelines proposed by Synder (2019) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology (Moher et al., 2009).

The first step of the research was to define the research objective and questions. The PICO method was used to correctly formulate the research questions. The result is presented in Figure 1.

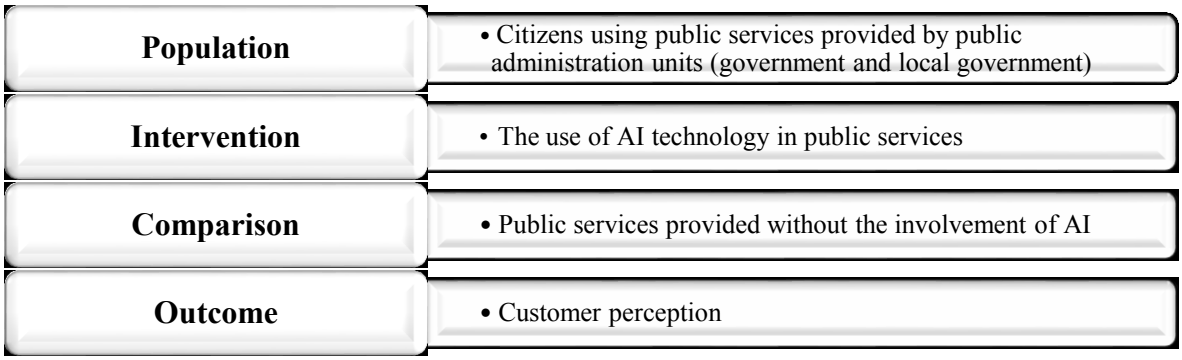

Figure 1. PICO Model.

Source: own work.

The PICO model presented in Figure 1 allowed for the formulation of two research questions:

RQ1: What factors influence positive customer perceptions related to the use of AI technology in public services compared to services implemented without the participation of AI in public administration units?

RQ2: What factors influence the negative customer perception related to the use of AI technologies in public services compared to services implemented without the participation of AI in public administration units?

In order to achieve the aim presented in the introduction and answer the research questions, a literature search strategy was developed in the next step. The Web of Science database was selected for the study because it presents high-quality and influential scientific articles. It was decided to use two general keywords in the search criteria: "public services" and "artificial intelligence". The search criteria included all publications excluding review articles, retracted materials and editorials. Studies were limited to the 2015-2025 period, with no restrictions on the language of the publication. The inclusion criteria included: quantitative, qualitative or mixed empirical studies on customer perceptions related to the use of AI technologies in public services in central or local government units. The exclusion criteria included: works on the digitization of public services that do not discuss AI, studies not focused on the application of AI in services provided directly in government and local government administration, such as smart cities, medicine, universities, police, healthcare, macro-level studies on legal regulations, policies and guidelines regarding AI.

4. Results

4.1. Descriptive analysis of publications included in the review

The article selection process began with an analysis of the publication set for duplicates that were not found. In the next step, titles, abstracts and keywords were analysed and articles were selected in accordance with the adopted inclusion and exclusion criteria. In the next step, data relevant to the achievement of the research objective and the research questions were extracted. The procedure is presented in Figure 2.

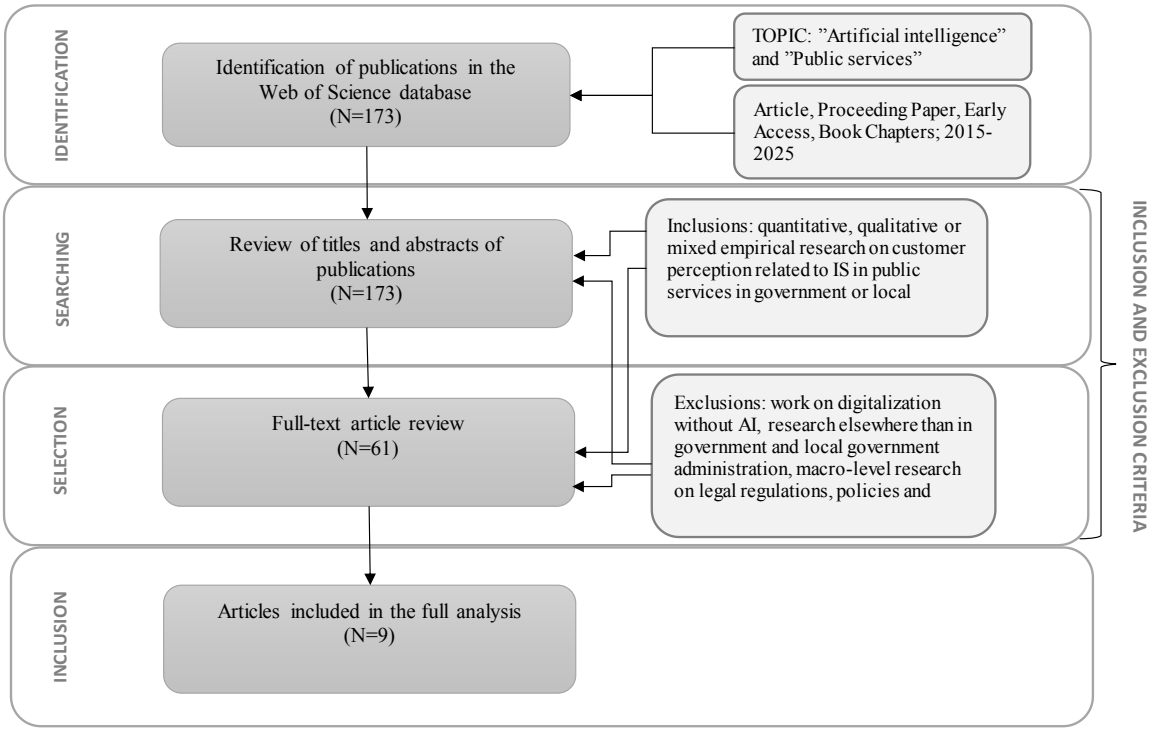

Figure 2. Flowchart presenting the research selection process.

Source: own work.

As a result of the first stage of the search, 173 publications were identified. Figure 3 presents the quantitative distribution of publications and their citations by date of issue.

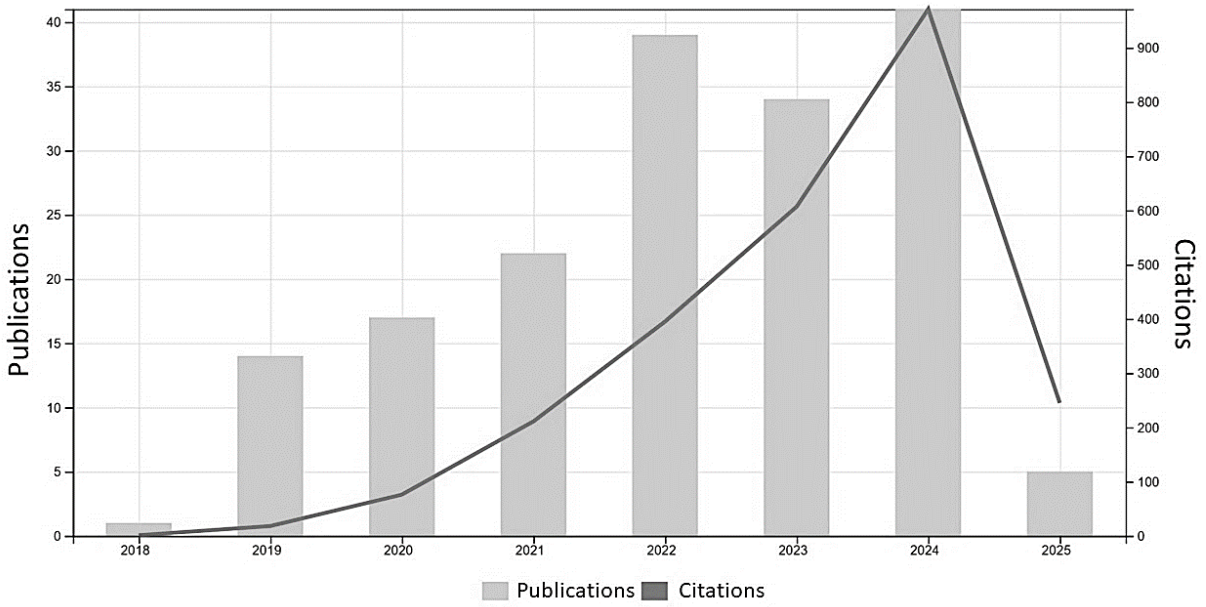

Figure 3. Quantitative distribution of publications and citations by date of issue.
Source: Web of Sience.

After reviewing the titles and abstracts of the identified articles and taking into account the inclusion and exclusion criteria, 61 papers were qualified for full-text analysis. Four texts were excluded from this group because their full content was not available. The full texts of the articles were analysed to ensure that they met all the study criteria. Nine publications were qualified for the final analysis.

4.2. Findings of the qualitative synthesis

All of the articles that qualified for analysis were published in the years 2021-2024. Seven research projects were based on quantitative research addressed to large groups of respondents. The main tool used for their implementation was a survey questionnaire, and the obtained data were analysed using statistical methods. In the case of the other two articles, qualitative research methods were used to achieve the research objectives, and interviews were conducted with respondents.

The analysis of the empirical research results presented in Table 1 allowed us to identify several important factors that may influence how customers using public services perceive the use of artificial intelligence in the implementation of these services. First, a positive or negative reaction to the use of AI in public services is determined by trust in the government. Schmager et al. (2024) argue that a high level of trust in the government fostered a positive attitude towards the implementation of AI in public services. This trust was based on the belief that the government acts in the best interests of citizens. They also emphasized that the key factors for responsible and effective implementation of AI in public services are ensuring transparency and human participation in decision-making processes.

Table 1.
Context of research in the area of customer perceptions of the use of AI in public services

Author	Country	Purpose/research questions/hypotheses	Method	Number of respondents
El El Gharbaoui et al. (2024)	Morocco	The aim of the study is to identify the impact of AI chatbot implementation on citizen satisfaction in the public sector in Morocco, with particular emphasis on the moderating variable of trust in AI chatbots.	Quantitative	N=157
Horvath et al. (2023)	United Kingdom	H1 – Greater human involvement increases the acceptance of AI in decision-making and the related perception of its fairness; H2 – Greater human involvement mitigates the negative impact of some AI characteristics, such as inaccuracy, high cost, or data sharing.	Quantitative	N=2143
König (2023)	Germany	The aim of the study is to identify whether citizens' conceptions of democracy are related to their views on AI in government and politics.	Quantitative	N=1115
Kim et al. (2023)	South Korea	The aim of the study is to identify the influence of six functional factors, namely usability, ease of use, service reliability, service quality, responsiveness and security, on the continued use of AI-based public services through the mediating effect of user satisfaction.	Quantitative	N=350
Willems et al. (2023)	Austria	1. How do perceived usability, data sharing requirements, and citizens' general privacy concerns affect their willingness to use AI-based public services? 2. Do citizens act on privacy concerns in specific contexts?	Quantitative	N=1048
Chatterjee et al. (2022)	India	RQ1. How can the use of AI-enabled services by various government departments promote citizen satisfaction? RQ2. Can the deep and broad assimilation of AI-enabled government services affect the operational and strategic public services provided to citizens? RQ3. Are there any moderating effects of risk factors that may affect the quality of AI-enabled services and public values?	Quantitative	N=315
Gesk, Leyer (2022)	Australia	RQ1. Is AI accepted for (specific and generic) services in the public sector? RQ2. Why is AI accepted or rejected in this context?	Quantitative	N=395
Schmager et al. (2024)	Norway	The aim of the study is to obtain citizens' opinions on the use of AI in public services based on a designed social service prototype.	Qualitative	N=20
Drobotowicz et al. (2021)	Finland	The aim of this study was to determine what requirements citizens have for trustworthy AI services in the public sector.	Qualitative	N=21

Source: Own work based on literature analysis.

The transparency of AI services is also highlighted by Dobrotowicz et al. (2021), who claim that customers of public services expect explanations regarding how AI systems work and how data is used. Therefore, it is indicated that there is a need to provide mechanisms for controlling personal data, because customers want to know who and how processed their data (Drobotowicz et al., 2021; Willems et al., 2023).

The level of acceptance of public services implemented using AI varies depending on the type of services. The use of AI raises more concerns in areas that require a high level of trust and privacy, e.g. in administrative decisions or medicine (Gesk, Leyer, 2022; Willems et al., 2023). Artificial intelligence is more accepted in simple and repetitive services (such as issuing an identity document, certificate, etc.). However, in the case of more complex situations, citizens prefer interaction with humans (Gesk, Leyer, 2022). This may be due, among other things, to the fact that customers want to be able to appeal to a human in the case of decisions made by AI (Drobotowicz et al., 2021). Some authors also argue that the presence of a human in service processes is important, especially in matters requiring empathy or contextual assessment (Schmager et al., 2024; Willems et al., 2023). Chatterjee et al. (2022) also argue that the acceptance of AI in the public service environment is facilitated by the visibility of the benefits of its use, such as speed of implementation or convenience. These conclusions are consistent with the results of Kim et al. (2023), according to which citizens' satisfaction with AI services contributes to the growth of public value if the systems are well designed and integrated with social needs. It is also worth mentioning that the broader and more comprehensive the implementation of AI, the greater the user satisfaction (Chatterjee et al., 2022).

Interesting research on the acceptance of AI in public services refers to the privacy paradox. Willems et al. (2023) indicate that customers declare concerns about the privacy and protection of their data in relations to the use of AI in public services. However, these concerns do not always translate into actual user behaviour. Studies have shown that despite these concerns, participants did not show significant sensitivity to the amount of personal data required by the application. The key factor influencing respondents' decision to use AI during service provision was in this case the perceived usefulness of the application.

The studies also show concerns among users of public services related to automation and the loss of human supervision. König (2023) indicates that people do not want administrative decisions to be made solely by algorithms. He indicates that while respondents showed moderate support for the use of AI in routine administrative tasks, the acceptance of the use of AI at higher decision-making levels, such as supporting or replacing politicians in decision-making, was much lower. In turn, Gesk and Leyer (2022) indicate that negative perceptions of AI are more often due to fears than to a lack of knowledge about the technology.

In summary, the results of the analysis indicate that the use of AI in public administration can help improve the quality of public services and increase customer satisfaction if certain conditions are met that ensure the acceptance of AI. These conditions include: fast and convenient service, transparency of AI-based systems and providing customers with the possibility of interaction with a human. Otherwise, lack of trust, privacy concerns and insufficient control over AI decisions can lead to customer dissatisfaction and lack of acceptance for AI. The level of trust in public institutions is also important.

5. Discussion

The aim of this study was to identify factors that facilitate customer acceptance of public services implemented using AI and to identify problems related to customer resistance to the use of AI technologies in these services. The conducted systematic review and analysis of the literature showed that there are several key factors that can influence both positive and negative customer perceptions related to the use of AI in public services. These include: trust in public institutions, transparency of AI services, privacy and data security, awareness of the usefulness and operation of AI, and the ability to choose service without AI. These factors can affect both positive (RQ1) and negative (RQ2) customer perceptions, depending on whether specific conditions contributing to the acceptance of AI services are met.

In order to increase the chances of a positive customer response to the use of AI in public services, offices should work on strengthening the general trust of citizens in their institution. It is good to implement AI in public services in stages, through evolution. A simplified proposal of the process of improving public services through the implementation of artificial intelligence tools is shown in Figure 4. This process is part of Deming's continuous improvement cycle, PDCA (Moen, Norman, 2006).

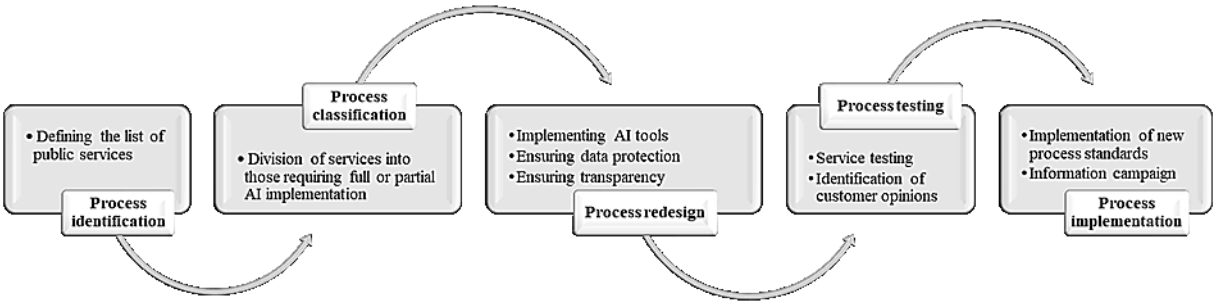

Figure 4. The process of improving public services through the implementation of AI tools.
Source: own work.

It is proposed to start this process by identifying services in a given public institution and then classifying them in terms of the possibility of using AI. The argument in favour of such a solution is the level of acceptance of AI in public services found in studies, which varies depending on the type of service. Acceptance of AI in public services occurs faster in the case of simple, routine services. In more complex cases, AI should be only a tool supporting officials, not replacing them. This will allow for maintaining a balance between process efficiency and the needs of citizens. The next stage is the redesign of processes combined with the implementation of AI tools. It is important to design solutions at this stage that ensure the protection of personal data and the transparency of the process, especially in relation to the stages implemented using AI. It is also recommended that in the case of complex services requiring empathy or an individual approach, customers should be allowed to use an alternative path, without the participation of AI. The fourth step of the improvement process consists in

testing the designed public service and verifying its correctness, taking into the account the customer's opinion. It is worth using, for example, customer experience research methods (Ludwiczak, 2021) in this step. After the testing stage is completed and any corrective solutions have been introduced, the service can be implemented. The key action at this stage is a properly designed information campaign aimed at citizens. It should provide information on how AI solutions were used, what benefits customers gain from it, how their personal data and privacy are protected, and how they can appeal against possible erroneous AI decisions.

6. Conclusion

In view of the growing interest in the application of AI in public services (Figure 3), this study contributes to both the literature on the use of technological innovations in improving public services and the management practice of central and local government units. The analysis identified key factors influencing customer perceptions of AI use in public services. It supplements existing literature reviews, for example on the tensions related to AI in public value creation (Madan, Ashok, 2023) and addresses the need for ongoing research and dialogue on the ethical, social and practical implications of AI in government, aimed at ensuring responsible and inclusive adoption of AI-based public services (Caisa et al., 2024).

By synthesizing different research perspectives, it was possible to identify potential research gaps. It was noted that out of 173 articles qualified for analysis, only 9 directly referred to empirical research on customer perception related to the use of AI in public services. These studies were characterized by different methodological approaches and large geographical dispersion. There is also a lack of research on how customer perceptions of AI-supported public services evolve over the long term. Based on the conducted analysis, potential directions for future research can be identified, which may contribute to a better understanding of the conditions necessary for the effective and ethical implementation of AI in public administration. One such direction could involve identifying the factors that influence the use of AI in public services across different cultural contexts (through comparative international studies) or among various social groups (e.g., individuals at risk of social exclusion). It is also worth examining how public perceptions of AI in public services change over time.

In addition, based on the results obtained, recommendations can be formulated for public policy and the management practices of public institutions concerning the implementation of artificial intelligence in public services. As previously noted, the acceptance of AI in public services depends on various factors, including trust in institutions, transparency of operations, data protection, public awareness, and the ability to choose a traditional service path. Therefore, the state should introduce policies aimed at strengthening public trust in institutions and

ensuring the transparency of AI algorithms. It is also essential to develop appropriate legal frameworks regarding privacy and the accountability of AI systems. Citizens must be provided with clear regulations defining responsibility for decisions made by AI, along with accessible appeal mechanisms. Moreover, within the scope of the state's information and education policy, it is advisable to support initiatives that promote knowledge about AI and its applications in public services. From the perspective of managing public institutions, a phased and evolutionary approach to implementing AI is crucial. This should include pilot programs, testing phases, and thorough evaluations of the innovations introduced. In cases where services require it, citizens should have the option to choose between AI-based and traditional forms of service. Public offices must also ensure system transparency, data protection, and straightforward procedures for appealing decisions. The successful implementation of AI also requires the development of digital competencies among public sector employees and the execution of effective public information campaigns, which are key to enhancing both acceptance and understanding of AI in public services.

This study has some limitations. First, the scope of this systematic review was limited to the Web of Science database. Therefore, valuable empirical research results published in journals, conference proceedings, or books that are not indexed in this database may not have been included in the study. Second, the study covers publications from 2015 to 2025 and does not include review articles, retracted materials, or editorials. Another limitation concerns the selected keywords. In order to increase the chances of examining as many articles as possible, general and popular keywords that are commonly used in articles on the topic under study were deliberately selected. However, it is possible that the selected keywords may not cover the detailed aspects of the topic discussed. Since this study is based on qualitative analysis, quantitative data analysis is needed in future studies to confirm the obtained results.

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