

Artificial intelligence and public governance models in socioeconomic welfare: some insights from Slovenia

Eva MURKO¹, Matej BABŠEK², Aleksander ARISTOVNIK³

Abstract: This paper investigates the adoption of artificial intelligence (AI) in public governance and its impact on socioeconomic welfare, focusing on Slovenian Social Work Centres (SWCs). The objectives are to assess how AI applications align with governance models such as (Neo)Weberian Bureaucracy, New Public Management (NPM), and Good Governance, and to evaluate their effectiveness in promoting socioeconomic welfare. Furthermore, the study aims to identify opportunities and risks associated with AI in public governance and to provide policy recommendations for the ethical and effective integration of AI. A mixed-methods approach is adopted, comprising a comprehensive literature review to develop a theoretical framework, a cross-tabulation analysis of the European Commission's dataset of 686 AI use cases in 27 EU Member States, and a case study of AI implementation in Slovenian SWCs. This includes the analysis of administrative data from 2018–2022 on the e-Welfare platform and analysis of reports from Slovenian oversight bodies such as the Court of Audit, the Administrative Inspection, and the Human Rights Ombudsman. The results show that AI significantly improves administrative efficiency, particularly in the areas of resource management, cost-effectiveness, and service quality, which closely align with NPM principles. However, challenges remain in terms of transparency and accountability, as AI systems are often not transparent, making oversight difficult and jeopardising public trust, especially in the area of social welfare. The study concludes that while AI has significant potential to improve public governance, appropriate regulation and human oversight are essential to mitigate risks and ensure compliance with governance principles. The study provides valuable insights into the role of AI in administrative efficiency and is therefore relevant to policymakers, public officials, and researchers aiming to leverage AI's benefits while ensuring ethical governance and equitable socioeconomic outcomes.

¹ Young Researcher, University of Ljubljana, Faculty of Public Administration, Gosarjeva ulica 5, 1000 Ljubljana, Slovenia and University of Rijeka, Faculty of Economics and Business, Ulica Ivana Filipovića 4, 51 000 Rijeka, Croatia, e-mail: eva.murko@fu.uni-lj.si. ORCID: 0000-0002-2868-3726

² Research Assistant PhD, University of Ljubljana, Faculty of Public Administration, Gosarjeva ulica 5, 1000 Ljubljana, Slovenia, e-mail: matej.babsek@fu.uni-lj.si. ORCID: 0000-0002-4103-1503.

³ Professor PhD, University of Ljubljana, Faculty of Public Administration, Gosarjeva ulica 5, 1000 Ljubljana, Slovenia, e-mail: aleksander.aristovnik@fu.uni-lj.si. ORCID: 0000-0003-1345-9649.

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Introduction

Socioeconomic development is highly influenced by the strategic and effective role of public governance in controlling and managing growth. Governance can be broadly defined as the customs and institutions through which authority is exercised in a nation (Kaufmann et al., 2000). Building on the foundational theory of Douglass North, who was instrumental in shaping the understanding of institutions and their impact on socioeconomic development (North, 1990), numerous international studies have demonstrated a positive relationship between the quality of institutions and economic development (Dellepiane-Avellaneda, 2010). There is a widespread view among growth and development economists that 'good governance' is essential for sustainable development (Knack, 2003). On the other hand, progress in information and communication technology (ICT) is recognised for its significant potential to promote the economic and social development of countries (Adam, 2020).

Digitalisation has been an integral part of public administration since its inception, which has led to the development of concepts such as e-government and digital government (Todorovski & Vintar, 2021). Extensive research in various disciplines shows the impact of ICT on administrative practise and socioeconomic development (Barcevičius et al., 2019). Artificial intelligence (AI) is also becoming increasingly important in the public administration by improving various administrative functions and contributing to improvements in several areas (Ahn & Chen, 2020; Wirtz et al., 2019). AI research in the public administration is predominantly theoretical, leaving a gap in detailed studies on the application of AI (Wirtz et al., 2019). There is also a need for a greater diversity of possible governance frameworks, and future research should aim to explore alternative modes of governance to better understand the impact of AI use on public governance (Zuiderwijk et al. 2021). This article therefore fills this gap by examining the actual impact of AI on governance and socioeconomic outcomes.

The adoption of AI in governments harbours numerous promising opportunities, in particular the improvement of internal efficiency, decision-making processes, and interaction between citizens and government (Samoili et al., 2020; Medaglia et al., 2023; Murko & Žabkar, 2024). The AI-driven productivity gains identified by Acemoglu and Restrepo (2018) as a result of automation and task complementarity include cost reductions through the automation of routine tasks and the increase in worker productivity through specialisation in non-automated tasks. This microeconomic efficiency translates into macroeconomic benefits such as higher

GDP and productivity, leading to more employment, higher wages, and better public services, which form the basis for social development (Acemoglu, 2024).

The aim of this study is to shed light on the role of AI-supported public governance in improving socioeconomic welfare. The study has several objectives: Assessing the compliance of AI applications with different governance models — (Neo)Weberian Bureaucracy, New Public Management (NPM) and Good Governance — and evaluating their effectiveness in promoting socioeconomic welfare. Furthermore, the research aims to identify both the opportunities and risks associated with the use of AI in public governance and to provide policy recommendations for the ethical and effective integration of AI. The introduction of AI in government offers unique opportunities, but also poses significant risks and challenges (Dwivedi et al., 2021) that could threaten public governance, as further elaborated in this paper.

The governance of many public processes takes the form of administrative procedures, including social procedures, and is heavily regulated by law in Central and Eastern European (CEE) countries, often leading to inflexibility (Kovač, 2022). While social procedures are part of the broader socioeconomic administrative framework, they illustrate the need to find a balance between strict compliance with regulations and adaptability to changing demands such as digitalisation and AI adoption (Babšek & Kovač, 2023). These processes aim to protect substantive and procedural rights, which is a growing concern in Slovenia (Kogovšek Šalamon, 2019). The shift towards less formal social processes often harbours risks, especially for vulnerable groups. Simplifications could have a negative impact on the rights of parties in the name of efficiency. In this context, the AI-powered e-Welfare platform in Slovenia, launched in 2011, aimed to streamline social transfers and improve service delivery by integrating databases and later using automated decision making (ADM) and machine learning to increase productivity (Babšek & Kovač, 2023; European Commission, 2021). While AI promises greater efficiency in public administration and social services, it is important that it is aligned with the principles of public governance and the constitutional guarantees of the rule of law and the welfare state in order to protect the rights of parties and maximise socioeconomic benefits. Based on the above theoretical assumptions, the following research questions were formulated in this study:

1. To what extent is the application of AI technology in public administration aligned with the core principles of public governance?
2. In what ways does the deployment of AI in public governance affect broader socioeconomic welfare outcomes?

Answering these questions is important for policy makers and welfare officials to understand this context – which principles can be enhanced by AI and which problems can be addressed with AI, and on the other hand, which principles cannot be supported or even jeopardised by AI – in order to further influence socioeconomic welfare.

The remainder of the paper is structured as follows: The next section presents the literature review, followed by an explanation of the materials and methods used in

the study. This is followed by a section summarising the results of the analysis, with a subsequent discussion. The final section concludes the paper by summarising the key findings, limitations of the study, and implications.

1. Theoretical background

Relevant literature emphasises the changing role of institutions and technology in shaping governance, which is increasingly seen as a key factor in socioeconomic development (Dellepiane-Avellaneda, 2010). Public institutions are central to governance strategies, and their effectiveness depends on adaptability, transparency and integrity. Governance has gained prominence in academic and policy debates as it is essential for aligning economies and societies towards common development goals. United Nations General Assembly Resolution 66/288 emphasises that good governance, democracy and the rule of law are essential for sustainable development (Castro & Lopes, 2022). Acemoglu et al. (2003, 2005) argue that strong institutional frameworks promote economic growth and social progress, while Charron et al. (2014) show that regions with high quality governance achieve better socioeconomic outcomes. This research challenges the view that decentralisation alone improves governance and argues that the quality of governance, including administrative competence and institutional integrity, is more crucial for development.

Three dominant models crystallise in the discourse on public governance: Weberian bureaucracy, New Public Management (NPM) and Good or New Public Governance (GG/NPG). Weberian bureaucracy emphasises hierarchical, rule-based governance with a focus on accountability and procedural standardisation (Weber, 1946; Pollitt & Bouckaert, 2011). NPM introduces private sector management techniques such as efficiency, performance measurement, and public-private partnerships into the public sector (Hood, 1991). In contrast, GG/NPG favours transparency, inclusivity, and citizen participation and promotes a collaborative governance approach that involves social networks in decision-making (OECD, 2004; Peters, 2012). These governance models often coexist in modern systems through a process known as "layering" or "sedimentation" (Olsen, 2010), whereby traditional, administrative, and participatory elements merge into hybrid governance frameworks.

Digitalisation has become an essential tool for the development and transformation of public governance. The role of ICT in government is widely recognised, and e-government has emerged as a key strategy to improve efficiency, transparency, and service delivery (Adam, 2020; Srivastava & Teo, 2006). Although extensive research has been conducted on the development and adoption of e-government, fewer studies have examined its long-term impact on socioeconomic development (Skiftenes Flak et al., 2009; Srivastava, 2011). Nevertheless, existing literature shows that e-government can improve service delivery, reduce corruption, and increase government transparency (Bertot et al., 2010; Shim & Eom, 2008; Von Haldenwang, 2004). These developments point to the increasing importance of integrating digital tools into government structures. One of the most important technological advances impacting government today is AI. The introduction of AI

into public governance promises to improve decision-making and operational efficiency. In Slovenia, for example, SWCs have introduced algorithm-based decision-making systems known as e-Welfare (slov. e-Sociala), which automate administrative decisions and streamline the delivery of social services (Babšek & Kovač, 2023). AI technologies are designed to perceive and analyse their environment, react to problems, and adapt to specific goals (Dwivedi et al., 2021). However, there are still concerns about the bias, transparency, and fairness of algorithms. In this context, Ranchordas (2022) argues that incorporating principles of good governance into AI-supported decision-making systems, such as accountability and transparency, could help mitigate these risks. Coglianesi (2021) also emphasises the need for governance models that embed ethical considerations into AI systems to ensure that AI improves governance while protecting citizens' rights. The integration of AI into governance also requires a reassessment of how governance models can deal with such disruptive technologies. Sun & Medaglia (2019) cite common challenges associated with AI adoption, including cross-organisational data integration, resistance to technological change, and concerns about job displacement. While AI has the potential to improve governance, it also harbours risks such as reduced transparency and the reinforcement of biases (Dwivedi et al., 2021). This raises critical questions about how to reconcile AI with the principles of public governance and whether it can be effectively integrated without undermining fundamental democratic values (Medaglia et al., 2023).

The role of welfare policy in governance is also an important subject of investigation, especially in the CEE countries, taking into account the specific socioeconomic, political and historical determinants of this area. In this context, Androniceanu et al. (2022), for example, call for an increase in public spending on social protection systems in order to reduce inequalities and improve living standards. In their work, they emphasise the importance of designing and implementing effective social policies to ensure equitable social outcomes in all regions. Similarly, Žofčínová (2017) examines the challenges faced by Slovakian territorial self-governments in the provision of social services, particularly for older people, and argues for reforms to address the demographic pressures of an ageing population. In the Croatian context, Kekez (2018) argues in favour of fully integrating both neo-Weberian and GG/NPG principles in the design of social policy. As Morawski and Akarsu (2024) emphasise, when analysing these systems in general, it is important to bear in mind that benefit systems in CEE countries are generally more complex than those in Western Europe, with a greater emphasis on means-tested benefits and specific, rather universal instruments for beneficiaries.

As AI and digitalisation become an integral part of governance, maintaining public trust and institutional integrity is crucial. Governance models must evolve to balance efficiency with ethical considerations such as transparency, accountability and inclusivity. Future research should investigate how AI-driven governance interacts with traditional principles and their socioeconomic impacts (Aristovnik et al., 2023; Androniceanu, 2024; Androniceanu, 2023; Lazaroiu et al., 2022). Elsayed et al. (2021) emphasise the need for accountability mechanisms in ADM processes to

reconcile AI with democratic governance. As governance evolves, transparency, accountability and inclusivity must take centre stage to ensure that AI contributes positively to socioeconomic development. The balance between innovation and ethical governance requires a robust institutional framework and continuous research.

2. Method

In this study, a mixed-methods approach was used to comprehensively answer the research questions regarding the relationship between public governance models, the application of AI technology and its impact on socioeconomic welfare. The methodological process was divided into three distinct but complementary steps: a literature review, a cross-tabulation analysis of a comprehensive database of AI use cases, and an analysis of the social procedures of SWCs. Each methodological step is designed to capture different dimensions of the research gap and provide a holistic understanding of the topic.

The first research step consisted of a comprehensive literature review of the sources available in the Scopus, Web of Science, and Google Scholar databases to identify and synthesise the defining principles of (neo)Weberian bureaucracy, New Public Management (NPM) and Good/New Public Governance (GG/NPG) models from the most frequently cited academic documents. This included a critical evaluation and extraction of the principles as defined by various scholars in the field and provided a framework for analysing the impact of AI applications within these governance paradigms (Aristovnik et al., 2022).

The second phase analysed the European Commission's database (2021), which documents 686 AI use cases in the public sector in 27 EU Member States and other European countries. This extensive database covers more than 25 different categories of AI applications and provides a comprehensive and complex data set for the analysis. Cross-tabulation was used to analyse the relationships between different characteristics and qualities of AI use cases and the theoretical principles of selected public governance models. This method uses two or more dimensional tables to capture the frequency of certain characteristics (Gray et al., 1997). It is well suited to the study of nominal or categorical data and thus to analysing the diverse and complex data set provided by the European Commission on AI use cases in the public sector. The second step in this phase was conducted to determine the frequency and nature of the impact of AI on public services and administration (Murko & Žabkar, 2024). The selected results of this analysis were synthesised with theoretical implications derived from a limited literature review to understand how AI can enhance or challenge the principles of (neo)Weberian bureaucracy, New Public Management (NPM) and Good/New Public Governance (GG/NPG).

The third methodological approach consisted in analysing the characteristics of the social procedures of the Slovenian SWC in deciding on social rights, which served as a case study. For this purpose, various data from publicly available Slovenian databases and sources were analysed. This case study included the following: (i)

secondary analysis of administrative statistics on social procedures conducted by the SWCs administered by the Ministry of Public Administration of the Republic of Slovenia (available in September 2024 for the years 2018–2022), (ii) content analysis of the Supervisory Report of the Court of Audit of the Republic of Slovenia (2021), which refers to the information system of the SWCs for the decision on social rights, (iii) content analysis of the Annual Report of the Human Rights Ombudsman of the Republic of Slovenia for the year 2023 (2024) in the part related to the powers of SWCs in deciding on social rights, and (iv) content analysis of the available reports of the Administrative Inspection on the work of SWCs in the implementation of social administrative procedures for the years 2019 and 2021 (Ministry of Public Administration of the Republic of Slovenia, 2019, 2021).

The period of publicly available and analysed data on the work of SWCs from 2018 to 2023 follows the significant reorganisation of SWCs in Slovenia, which aimed to streamline and digitalise social procedures. Although the e-Welfare platform was introduced in 2011, the informational calculation represents a decisive step forward in the use of AI in social procedures. This AI-driven calculation was a central pillar of the reorganisation strategy, which was originally planned for 2018 but was delayed and only fully implemented in the first half of 2021. According to Babšek et al. (2020), the reorganisation aimed to improve the efficiency and uniformity of social procedures, making it an ideal context for studying the impact of digitalisation and AI integration. By analysing administrative data, complemented by the analysis of reports from various oversight bodies on the work of the SWC, over the entire six-year period, this approach provided both quantitative and qualitative insights into the effectiveness and challenges of AI-driven welfare systems. This mixed-methods approach enabled a comprehensive examination of the role of AI in public governance. It provided a multifaceted perspective on the potential benefits and challenges of integrating AI into socioeconomic development and offered valuable insights for theory, policy makers, and civil servants.

3. Results

The first part of the results from the literature review is presented in Table 1, which lists the theoretical implications of the most common governance models. Core principles such as hierarchy, rule of law, efficiency, accountability and transparency are fundamental to the integration of AI into public administration. These principles ensure that AI applications are aligned with government objectives while ensuring public trust and compliance with legal and ethical standards.

Table 1. Selected public governance models and corresponding principles

	Weberian public administration	New public management (NPM)	Neo-Weberian State	Good governance, New public governance (GG/NPG)
Main principles	<ul style="list-style-type: none"> - accountability through hierarchy - rule of law - equality before the law - objectivity - functional specialisation 	<ul style="list-style-type: none"> - efficiency - effectiveness - economy - deregulation - competitiveness - performance measurement - decentralisation - cost reduction - entrepreneurship 	<ul style="list-style-type: none"> - rule of law - reliability - openness - accountability - inter-institutional networks and partnerships - results-orientation 	<ul style="list-style-type: none"> - participation - transparency - responsiveness - equity - efficiency - effectiveness - accountability - equality - credibility

Source: Aristovnik et al., 2022; Bach & Bordogna, 2011; Bevir, 2011; Hood, 1991; Lampropoulou & Oikonomou, 2018; OECD, 2004; Peters, 2012; Pollitt & Bouckaert, 2011; Weber, 1946

These theoretical insights are further refined by a cross-tabulation analysis of the European Commission's database (2021), which provides a deeper understanding of the different AI solutions implemented in the EU public sector. Although the case studies represent only a small part of the overall AI applications, the insights gained are comprehensively presented in the AI Watch Policy Report (Tangi et al., 2022). Table 2 shows the three main dimensions of improvement through the use of AI — improved public service, administrative efficiency and open government — which have been categorised in detail by the European Commission (2021). The analysis shows that the NPM model is mainly used to improve public services and administrative efficiency, with a focus on cost-effectiveness and process optimisation. In contrast, the GG/NPG model emphasises open government initiatives and citizen-centric services, with a focus on transparency. The combination of these governance models underlines their importance in optimising the various aspects of AI adoption in public administration. In addition, this table shows the number of cases in which AI improvements were observed in the three selected dimensions. The marked lines in the table highlight the areas with the most frequent improvements. In general, improvements in the category of improved public services were observed in 363 out of 686 cases. The research found that the main benefit of AI in these services was improved responsiveness, efficiency, and cost-effectiveness, which represented 283 cases (41%). This was followed by 154 cases (22%) where the quality of services was improved and 118 cases (17%) where services were more user-centred. From an internal perspective, administrative

efficiency was increased in 322 cases. Better resource management was improved in 193 cases (28%), improved process and system quality in 168 cases (24%), and responsiveness of the authorities in 140 cases (21%). In addition, the study found improvements in the open government functions of these applications in 82 of the 686 cases. The most notable improvement was the increase in transparency in the public sector category, which was found in 78 cases (12%).

**Table 2. Taxonomy of AI use cases by the European Commission
with recorded service improvements**

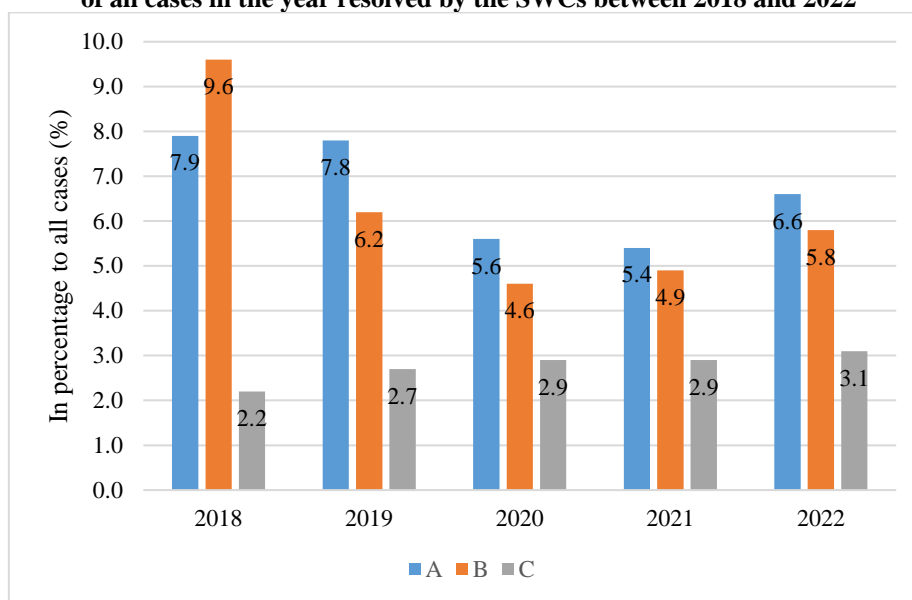
Category	Features	Predominant public gov. model	No. of cases
Improved public service in 363 cases / 686	Personalised services	NPM	36
	Public (citizen)-centric services	GG/NPG	118
	Improved quality of public information and services	NPM	154
	More responsive, efficient, and cost-effective public services	NPM	283
	New services or channels	NPM	26
Improved administrative efficiency in 322 cases / 686	Cost-reduction	NPM	18
	Responsiveness of government operation	GG/NPG	140
	Improved management of public resources	NPM	193
	Improved quality of processes and systems	NPM	168
	Better collaboration and communication	GG/NPG	18
	Reduced or eliminated risk of corruption and abuse of the law by public servants	(Neo)Weberian	16
	Enabled greater fairness, honesty, equality	(Neo)Weberian	9
Improved open government capabilities in 82 cases / 686	Increased transparency of public sector operations	GG/NPG	78
	Greater public participation in government actions and policymaking	GG/NPG	17
	Improved public control and influence on government actions and policies	GG/NPG	3

Source: Author's contribution based on Aristovnik et al., 2022; European Commission, 2021

The insights gained from analysing public governance models and AI use cases in the EU were complemented by a Slovenian SWC case study. A secondary analysis of administrative statistics on decision-making on social rights from public funds covered the years 2018-2022, i.e. a period after the reorganisation of social work centres (Babšek et al., 2020). This reorganisation was intended to improve the efficiency and coherence of social procedures. As can be seen in Figure 1, the

percentage of cases settled after the legal deadline and the backlog of pending cases decreased after the reorganisation in 2018. It is surprising that there was an increase in unresolved cases and backlog in 2022. The reason for this could lie in the post-pandemic period, when SWCs started to work more intensively with people on the ground again, but the provision of human resources for this did not follow (Babšek & Kovač, 2023), which translated into less time for processing applications for social benefits.

Figure 1. Characteristics of social administrative cases as a percentage of all cases in the year resolved by the SWCs between 2018 and 2022



Note: A - the percentage of administrative cases closed after exceeding the statutory time limits in relation to all cases; B - pending cases as a percentage of all cases; C - appeals as a percentage of all cases

Source: Author's contribution based on administrative statistics from the Ministry of Public Administration of the Republic of Slovenia, 2024

In addition, a trend towards an increase in complaints in social proceedings can be observed in the years analysed, which may indicate dwindling user confidence in the work of SWCs. Considering the increasing use of AI in social decision-making, this suggests a positive role of AI in the legal integrity of benefit decisions, while strongly emphasising the importance of public trust, transparency and human oversight in the use of AI solutions in the social welfare.

The analysis in Table 3 shows both the opportunities and risks associated with the introduction of AI in social procedures, as identified by Slovenian supervisory bodies such as the Court of Audit, the Administrative Inspection of the Ministry of Public Administration and the Human Rights Ombudsman.

Table 3. Opportunities and risks of using AI for social procedures according to reports by the Slovenian supervisory authorities

Opportunities	Risks
Court of Audit of the RS	
<ul style="list-style-type: none"> - AI automates data retrieval, reduces employee workload and improves decision-making efficiency. - Pre-prepared documents standardise processes, improve consistency and reduce human error. - AI solutions provide better access to external databases and improve the accuracy of decision-making. • AI support costs are minimal compared to the total value of managed rights, promoting financial efficiency. 	<ul style="list-style-type: none"> - Frequent system interruptions put a strain on staff and increase the risk of errors. - Pre-prepared documents often contain legal errors, which leads to incorrect decisions. - Handling of sensitive personal data raises concerns about information security. - Inadequate financial forecasts when introducing AI led to unforeseen costs.
Administrative Inspection, Ministry of Public Administration of the RS	
<ul style="list-style-type: none"> - AI can streamline document management and decision-making and reduce time delays. - Secure access to databases ensures better control over sensitive data and compliance with regulations. - Automated retrieval and processing increase consistency of decisions across SWCs. - Automated systems minimise human error when processing applications and issuing decisions. 	<ul style="list-style-type: none"> - Frequent system errors and inefficiencies in updating information delay service delivery. - Inadequate staff training leads to improper use and non-compliance with procedural guidelines. - AI systems cannot account for all procedural variations, leading to non-compliance. - Heavy reliance on automated systems can lead to the necessary human oversight being overlooked for critical processes.
Human Rights Ombudsman of the RS	
<ul style="list-style-type: none"> - AI-powered data management enables greater transparency and accountability in service delivery. - AI-powered automation reduces manual errors and frees up time for more complex tasks. - Data-driven AI insights help to allocate social work resources more effectively. - Predictive AI can identify people at risk and enable earlier interventions. 	<ul style="list-style-type: none"> - System failures can lead to delays in case processing and affect the provision of services. - The processing of sensitive personal data by AI systems harbours significant risks of data breaches. - AI tools can reinforce bias, leading to unfair decisions in social welfare cases. - Over-reliance on AI could exclude people with limited access to technology.

Source: Author's contribution based on Court of Audit of the Republic of Slovenia, 2021; Ministry of Public Administration of the Republic of Slovenia, 2019, 2021; Human Rights Ombudsman of the Republic of Slovenia, 2024

The most frequently mentioned opportunities include more efficient decision-making, more standardised processing and improved access to data, which promotes transparency and financial efficiency. However, risks cited include frequent system errors, the possibility of amplifying bias, data security concerns and the risk of over-reliance on automation, which could lead to a neglect of critical human oversight in decision-making processes and compromise socioeconomic welfare outcomes. These findings show that while AI has the potential to improve decision-making and resource management, it also poses significant challenges when it comes to maintaining fairness, inclusivity, and human oversight - all critical components of public governance - and emphasise the importance of balancing the technological benefits with robust management of operational and ethical risks when deploying AI.

4. Discussion

The research findings presented in this paper highlight several advantages and disadvantages of AI in public governance. The benefits of AI are illustrated by international experience (European Commission, 2021) and the SWC case study. The results show that AI technologies in the EU have primarily contributed to more responsive, efficient, and cost-effective public services and improved administrative efficiency, in particular through better management of public resources. This is in line with the well-documented value creation potential of AI, such as increasing efficiency, boosting labour productivity, optimising resource allocation, fostering innovation, improving service delivery, and reducing waste (Dwivedi et al., 2019; Medaglia et al., 2023). While these outcomes can reduce costs and streamline services for governments, the question is whether these benefits will reach citizens, especially those who depend on welfare systems. Efficiency in public administration does not automatically lead to better welfare outcomes unless socioeconomic inequalities are also addressed. The parallels with New Public Management (NPM) are notable, as both AI and NPM are geared towards reducing costs and increasing productivity (Peters & Savoie, 1994; Peters et al., 2022). The administrative reforms driven by NPM, which were inspired by managerialism and aimed at downsizing the public sector, also raised concerns that the protective function of the welfare state could erode (Murko & Žabkar, 2024; Peters et al., 2022). While AI has the potential to improve governance, the question remains whether it can preserve the role of the welfare state in promoting equitable socioeconomic outcomes? The AI-induced productivity gains from automation and task complementarity identified by Acemoglu and Restrepo (2018), such as lower costs from the automation of routine tasks and higher worker productivity, are promising for future developments. These microeconomic efficiency gains could lead to broader macroeconomic benefits and thus drive socioeconomic development. However, policymakers must ensure that AI-driven improvements do not deepen existing socioeconomic divides by prioritising efficiency at the expense of inclusivity. To mitigate these risks, AI must

be embedded in a governance framework that balances efficiency with transparency, accountability, and social justice.

Substitution of workers by AI is a widespread fear; however, researchers claim that AI applications such as rule-based systems, speech recognition, machine translation, computer vision, machine learning, robotics, and natural language processing have the potential to free up valuable cognitive resources from public workers, who can then be assigned to higher value-added tasks (Eggers et al., 2017). This reallocation allows the government to focus scarce resources on tasks where human labour performs better than machines, such as problem-solving activities that require empathy, creativity, and innovation (Dwivedi et al., 2019), which is particularly beneficial for welfare systems.

The findings reveal a tension between the benefits of AI in promoting equality through objective data processing and the risks it poses to transparency and accountability. While increased transparency in public sector activities is positive, the complexity of AI systems, particularly machine learning and neural networks, is a cause for concern. The "black box" nature of AI makes it difficult for public administrators to explain or justify AI-driven decisions, which could undermine the transparency and accountability they are supposed to uphold (Dwivedi et al., 2019). Furthermore, while automated decision-making can increase fairness by reducing the subjectivity of public service providers (Busch & Henriksen, 2018), it also carries the risk of public servants moving away from accountability, leading to situations where decisions are dismissed with explanations such as "the computer says no". Slovenian oversight bodies such as the Court of Audit (2021) and the Human Rights Ombudsman (2024) have expressed similar concerns, pointing out that the complexity of AI can deter public officials from their accountability and transparency, which are essential to maintaining citizens' trust. The lack of clarity in AI-driven decision-making not only raises questions about ethical responsibility and legal liability, such as who is to blame if an AI decision harms a citizen, but also raises broader concerns about the political accountability of public governance (Dwivedi et al., 2019).

The integration of AI into governmental operations offers numerous potential benefits, including improving the interaction between citizens and the administration. These include the provision of better and more inclusive services and greater citizen participation in public sector activities (Samoili et al., 2020; Medaglia et al., 2023; Wirtz & Müller, 2019). However, these improvements are not as easy to recognise as some would expect. Only a minority of the EU AI use cases analysed deal with greater public participation in government actions and policy decisions or show better cooperation and communication between government and citizens. In these cases, natural language processing technologies were predominantly used, and it is expected that further detailed analyses will show why the number of cases where participation or collaboration has been improved is so low. It is important to emphasise that AI technologies used in participatory processes should be designed to promote partnership, delegation, and citizen control strategies. Such an approach would provide truly meaningful opportunities for citizens to actively engage as co-

creators and co-implementers of public policy (Bryer & Alvandipour, 2021). This discrepancy between the potential of AI and its current application to improve citizen participation highlights the need for further research on the design of participatory AI systems that go beyond simple consultation.

Overall, the integration of AI into public governance presents a dual challenge: Maximising its benefits while managing significant ethical, operational, and accountability risks. The theoretical implications of NPM and modern governance frameworks emphasise the need for a balanced approach that ensures AI improves public services without undermining fundamental governance principles such as transparency, social equity, and accountability. The ongoing discourse on the regulation of AI needs to evolve and ensure that AI systems are deployed with a focus on sustainable and inclusive public service delivery.

5. Conclusion

This study provides valuable insights into the intersection of AI technologies and public governance models in the context of socioeconomic welfare and emphasises the interconnectedness of existing frameworks such as Weberian bureaucracy, NPM and GG/NPG. The results show that while AI-driven improvements in public administration are predominantly in line with NPM principles such as efficiency and cost-effectiveness, they also reflect core values of other governance models such as transparency and inclusiveness. This demonstrates the continued relevance of "traditional" governance principles, which are evolving and adapting with the introduction of new technologies such as AI. Importantly, the findings emphasise the need for an interdisciplinary approach when examining the impact of AI on social welfare, as governance, technology, and ethical considerations come together.

The originality of this study lies in the comparative analysis of AI use cases from the European Commission and an in-depth case study of welfare procedures in Slovenia, which provides a unique perspective on how AI is reshaping public administration within different governance frameworks. The study makes a twofold contribution to theory: first, it reinforces the notion that AI is not a substitute for existing governance models, but rather a complementary tool that reinforces key principles such as efficiency, objectivity, and transparency. Secondly, it highlights the challenges in maintaining accountability and human oversight, particularly in complex decision-making scenarios where full automation could lead to a loss of contextual nuance. These findings form the basis for future research on how AI can be more effectively integrated without jeopardising the core values of public governance. For policy makers and practitioners, the study has practical implications as it emphasises the importance of developing strong regulatory frameworks that balance the efficiency potential of AI with the need for transparency, accountability, and inclusivity. Given the risks of algorithmic opacity and the "black box" problem, policymakers must ensure that AI systems used in public administration are ethical, explainable, trustworthy, and verifiable. This will help maintain public trust and protect the rights of citizens, especially the rights of vulnerable populations. In addition, the study

encourages practitioners to consider AI as a supporting tool, rather than a replacement for human decision-makers, to ensure that complex legal and administrative tasks continue to require human interpretation and judgement.

The study has some limitations. The focus on AI use cases from the European Commission and a Slovenian SWC practise case study limits the generalisability of the results to other global contexts. The inclusion of case studies from other regions or sectors would enable a more comprehensive understanding of the role of AI in public governance worldwide. Future research should aim to include different geographical and institutional contexts to better understand how AI impacts different public governance models worldwide. To summarise, while AI offers significant opportunities to improve public governance, it also brings challenges that need to be carefully managed. The key to successfully integrating AI into public governance for the benefit of society and the economy lies in promoting a balanced approach—that capitalises on AI’s strengths in efficiency and objectivity while ensuring transparency, human oversight and ethical governance. As AI evolves, ongoing research and regulatory adjustments will be critical to ensure that these technologies serve public value creation and are compatible with fundamental human rights and the basic principles of good governance.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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