AI-enabled co-creation for evidence-based policymaking, A conceptual model

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Abstract. This study focuses on developing and validating the key parameters of Artificial Intelligence (AI) -enabled co-creation integrated into evidence-based policymaking. We critically analyzed prior research to ensure a participatory, data-driven, and iterative policymaking process. We identified essential parameters shaping AI-enabled co-creation processes in public sector organizations (PSOs), including legal conformance, sustainability, and ethics. The parameters were validated and refined through a workshop with experts from academia and technology organizations, contributing to the development of a conceptual model structured around four interconnected co-creation phases: 1) co-commissioning; 2) co-designing; 3) co-delivering; and 4) co-assessing. Our study contributes to both theory and practice. Concerning theory, it positions AI-enabled co-creation as a core institutionalized process within evidence-based policymaking rather than a standalone participatory practice. It also introduces a key conceptual distinction between digital co-creation, where digital tools facilitate participatory processes, and digital public service co-creation, where digital solutions are the co-creation outcomes. Concerning practice, the study provides a structured framework for integrating co-creation into policymaking, aligning AI-enabled mechanisms with four identified policy co-creation phases. The framework offers policymakers and public administrators actionable guidance on designing adaptive, stakeholder-driven, AI-supported policy solutions

Keywords. Co-creation, Evidence-based policymaking, Artificial Intelligence, Public sector.
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1. Introduction

Several European policy declarations, such as the (Tallinn Declaration, 2017), place users' needs at the center of service design, and encourage the use of digital tools to strengthen the users' participation. In addition, the (Berlin Declaration, 2020) urges policymakers to draw from the lessons learned during the COVID-19 pandemic to achieve a sustainable digital transformation that serves citizens, businesses, and society. These declarations highlight the need for sustainable, ethical, and digital co-creation in policymaking, i.e. creating rules, regulations, and guidelines to address specific issues or achieve defined objectives by governments or other institutions. The increased availability of data, research, and a growing public focus on results have expanded policymakers' ability to assess whether public investments achieve their intended outcomes and to make informed choices. When policymaking is rooted in systematic, evidence-based approaches that leverage available data and research for decision-making, it is referred to as evidence-based policymaking (Evidence-Based Policymaking Collaborative, 2016).

According to (Head, 2010a), reliable knowledge is the key instrument for advising decision-makers, taking decisions, and developing policies, and four key principles to support this approach are: 1) compiling rigorous evidence about what works, including costs and benefits; 2) monitoring and evaluating policy effectiveness; 3)

using evidence to refine and improve programs; and 4) fostering innovation through experimentation with new approaches. Head (2010a) also notes that integrating evidence into policymaking is a complex and multifaceted process that requires ongoing improvements, and closer integration with research is often "disappointing" (p. 78), i.e. the "hopes of large and rapid improvements in policies and programs [...] have not materialized as readily as anticipated" (p.80). He, therefore, suggested that there are four enabling factors that must be included in any evidence-based policymaking process: high-quality information, professionals skilled in data analysis and policy evaluation, political and organizational incentives for using evidence-based analysis and advice, and mutual understanding between policy professionals, researchers and decision-makers.

(Fedorowicz & Aron, 2021) suggest that evidence-based policymaking can be strengthened by increasing the production of evidence, enhancing its use, and applying equity and justice to both evidence generation and decision-making processes. This emphasis on evidence-based policymaking aligns strongly with the concept of co-creation, i.e. shifting the focus of public service reform away from internal efficiency to creating value for citizens and service (Osborne et al., 2016). Co-creation research highlights its benefits for fostering citizen engagement and improving service delivery (Ansell & Torfing, 2021; Eseonu, 2022; Scognamiglio et al., 2023), but the knowledge of the enabling factors that contribute to successful co-creation processes and outcomes within PSOs is limited. Additionally, the role of co-creation within evidence-based policymaking remains underexplored.

At the same time, the increasing integration of digital tools, particularly AI, into co-creation processes introduces further complexities. While AI has the potential to enhance decision-making, stakeholder collaboration, and service delivery, it also raises transparency, fairness, data privacy, and other ethical concerns. These issues are often overlooked, leading to the erosion of public trust, reinforcing societal inequalities, and other risks. To address these challenges, there is a critical need to explore how ethical governance can be embedded within co-creation frameworks. Furthermore, ethical co-creation should not only deliver immediate value but also contribute to long-term societal, economic, and environmental objectives. However, research on co-creation for sustainable policymaking is underdeveloped. There is limited investigation into processes that generate enduring outcomes and their alignment with sustainability objectives and limited research on how AI-enabled co-creation can be systematically embedded into the policymaking cycle by PSOs. Additionally, the absence of standardized guidelines and legal frameworks further complicates realizing ethical and sustainable co-creation.

This study has two objectives to address this gap: to identify and define the key parameters of AI-enabled co-creation for evidence-based policymaking; and to develop a conceptual model that integrates AI-driven co-creation with policymaking processes. To this end, we carried out a critical analysis of previous research to identify and define the key parameters of AI-enabled co-creation in evidence-based policymaking. We also organized an expert workshop involving academic and technology professionals to validate the parameters uncovered by the research analysis and develop the conceptual model of AI-enabled co-creation for evidence-based policymaking.

This work makes some important contributions. First, it advances the understanding of AI-enabled co-creation in evidence-based policymaking by proposing an integrated policymaking process that aligns AI-driven co-creation mechanisms with four interconnected policymaking phases. Second, it highlights AI's role in enhancing evidence collection, stakeholder engagement, and decision-making responsiveness in each phase. Also, the findings emphasize the importance of distinguishing between digital co-creation and the co-creation of digital public services in PSOs, addressing the challenges of integrating AI into these processes and achieving effective outcomes. Third, the study provides a structured framework for policymakers and administrators to design adaptive, user-centered, and data-driven public policies, strengthening participation, trust, and effectiveness of such policies.

The remainder of the paper is structured as follows. Section 2 outlines the theoretical background and concepts underpinning the identification of the conceptual model's key parameters. Section 3 provides information on the research design and methods. Section 4 presents the identification and validation of the key parameters and the development of the conceptual model. Section 5 concludes with the main findings, limitations and research plans.

2. Background and concepts

The public sector is facing an increasing demand for citizens-centered services and policies (Wiktorska-Święcka, 2018), aligned with their specific needs and circumstances (Bovaird & Loeffler, 2012). A shift is becoming visible, policy-making and public service delivery can no longer be seen as unilateral processes (Needham, 2008), and the government should no longer be seen as the sole public service and public value provider (Brandsen et al., 2018). The dominant view of citizens as passive consumers of public sector outcomes has been replaced by a view of citizens as co-creators (Osborne, 2018; Voorberg et al., 2017). This clearly outlines the growing need to allow citizens to actively participate in defining appropriate public services, shaping policy-making processes and influencing their outcomes. As mentioned above, four enabling factors to be included in evidence-based policy-making are high-quality information, skilled professionals, political and organizational incentives, and the mutual understanding between the stakeholders involved (Head, 2010). Co-creation can support this by considering misdirected stakeholder involvement, exclusion of the key actors, and reduced authority among public officials

(Edelmann & Virkar, 2023). Ethical data governance, stakeholder coordination, and transparent accountability are essential to preventing excessive personalization, information overload, and unclear decision-making. Failure to address these issues may undermine future engagement (Edelmann & Mureddu, 2023). Strong political and managerial leadership is crucial to fostering citizen-centric, co-creative governance (Meijer, 2016; Osborne, 2006).

This section addresses the first objective, to identify and define the key parameters underpinning AI-enabled evidence-based policymaking in the context of co-creation. Parameters, a term common in mathematics, computer programming and AI, are the variables in a model, system or function to help define the expected behavior and performance. They can be adjusted, e.g., during a training process to minimize prediction errors. These parameters and the sections covering them are public sector co-creation (Section 2.1), co-creation processes and outcomes (Section 2.2), and five sections on public sector co-creation and: digital tools (Section 2.3), AI (Section 2.4), evidence-based policymaking (Section 2.5), sustainability (Section 2.6), and ethics (Section 2.7).

2.1. Public sector co-creation

The co-creation paradigm is becoming increasingly popular. It aims to transform the public sector from an authority and service provider into an arena for engaging citizens and public and private actors and mobilizing experiences, resources and ideas of a plurality for the design and production of public services and public policy (Osborne, 2018; Ostrom et al., 1978). Co-creation enhances public value by improving service quality, expanding participation, refining information accuracy, and increasing citizen satisfaction (Cordella et al., 2018). It can be structured into several phases, e.g. co-design, co-delivery, and co-evaluation or co-assessment, each having specific characteristics and operational mechanisms (Linders, 2012)(Jaspers & Steen, 2021). Other models introduce four phases: co-commissioning, co-designing, co-delivering and co-assessment (Loeffler & Bovaird, 2019). The co-design phase engages stakeholders in the creation and development of policies or services, including their perspectives in shaping the outcomes. The co-delivery phase fosters greater acceptance of public policies and services by involving stakeholders in their implementation (Sicilia et al., 2016). Lastly, the co-evaluation phase focuses on assessing the effectiveness of services post-delivery or policies/initiatives after the implementation, providing valuable insights for self-learning and adaptation. These phases aim to ensure user-centric experiences, increase trust in public administrations and enhance communication between service providers and users, enabling administrations to gather stakeholder data but also increase service users' willingness to accept and use the service. However, the sustainability of co-creation depends on ensuring adequate financial resources and institutional capacities, which are essential for ensuring continuous stakeholder engagement and their meaningful integration into decision-making (Misuraca et al., 2020; Rodriguez Müller et al., 2021a).

2.2. Co-creation processes and outcomes

A co-creation process allows "two or more public and private actors [to] solve a shared problem, challenge, or task through a constructive exchange of different kinds of knowledge, resources, competences, and ideas that enhance the production of public value […], or services, either through a continuous improvement of outputs or outcomes or through innovative step-changes that transform the understanding of the problem or task at hand and lead to new ways of solving it" (Torfing, et al 2019, p. 802). According to Torfing et al. (2019), co-creation is a process. It can also be seen as an outcome. Co-creation thus leads to the creation of effects that endure, even after the co-creation activity itself has come to an end (Jaspers & Steen, 2021), contributes to the development of collaborative practices in an organization, as well as user acceptance of public services and technologies. Edelmann and Steen (2023) show that according to the stakeholders, the co-creation of digital public services involves identifying technology needs and gaps, supporting innovation, capacity-building, and dissemination. Stakeholders point out that ensuring the sustainability of co-creation requires organizational change regarding technical support arrangements, organizational processes and developing expertise. At the same time, the relationship with external stakeholders must be developed and sustained, and all stakeholders must engage in continuous learning. It is also important to consider the technical or financial risks of co-creation, to address any bias appearing during the co-creation process and in the outcomes achieved (Edelmann & Virkar, 2023; Jacobs et al., 2018).

2.3. Public sector co-creation and digital tools

As analog public services remain widely used, non-digital co-creation tools continue to play a significant role, particularly in the early stages of service and policy design. These tools are especially prevalent for ideation and collaboration (Borum et al., 2014; Inie & Dalsgaard, 2017), leveraging interviews, surveys, focus groups, and meetings (Peters et al., 2021). However, PSOs increasingly adopt digital tools to deliver public services and broaden user engagement in co-creation processes (Edelmann & Pereira, 2024). The digitalization of PSOs offers a potential solution to co-creation, even when users are vulnerable or hard to reach (Jalonen et al., 2021). Digital tools have become integral to co-creation, enabling online debates, collaboration, and crowdsourcing, supporting new digital public services and informing policy-making (Edelmann & Mergel, 2021). These initiatives utilize forums, collaborative websites, SMS, mobile applications, online surveys, and other tools (Rodriguez Müller et al., 2021b). Moreover, digital technologies empower users to create, edit, and evaluate content (Kaplan & Haenlein, 2010), and facilitate interactions, facilitating the sharing of information, opinions, and interests (Khan et al., 2014). Within the

public sector, digital tools foster innovative approaches to processes that deliver public value (Lember, 2017). Their dynamic nature enables citizens to contribute data, participate in creating new products and services, and address resource constraints (Randma-Liiv & Vooglaid, 2019). Enhancing motivation to participate, encouraging contributions, and promoting shared decision-making add value for public stakeholders (Brandsen et al., 2018; Lember et al., 2019). However, digital tools do not deliver effective participation or collaboration alone (Kreijns et al., 2003). Power imbalances, knowledge gaps, digital literacy disparities and other social and organizational barriers hinder co-creation in PSOs (Ståhlbröst & Holst, 2017). Poor channels, inaccessible interfaces, unstructured data, etc. limit engagement (Mejlgade Lab, 2017; Popescul et al., 2024). Ethical concerns over privacy call for user-centered approaches to building trust (Edelmann & Mureddu, 2023). Digitalization may also reduce transparency in administrative processes, replacing human interactions with automated systems, and marginalizing citizens by treating them as data points rather than individuals with needs and rights (European Union, 2024).

2.4. Public sector co-creation and Artificial Intelligence

The use of AI enables public service innovation and citizen involvement in the co-creation process. As Misuraca et al. (2020) highlight, AI-supported co-creation can lead to cost savings, improved service quality, higher user satisfaction, greater inclusivity, and broader societal benefits. Key enablers such as leadership, financial resources, stakeholder engagement, and digital infrastructure (Edelmann & Mureddu, 2023) align with AI's capabilities to enhance public service co-creation. Numerous cases confirm AI's role in enabling co-creation across boundaries, fostering interaction between service providers and service users (Ali et al., 2022; Manser Payne et al., 2021; Rizun et al., 2023). (Rizun et al., 2025) also revealed a disproportionate and fragmented development of AI-supported co-creation, particularly in text analytics (TA) which is predominantly used in the co-design phase. This is due to the effectiveness of TA techniques such as content analysis and pattern recognition, along with question-answering systems that enhance consultation and ideation (Cortés-Cediel et al., 2023; Rodriguez Müller et al., 2021b). TA applications in the co-evaluation phase remain limited, primarily focused on sentiment analysis and feedback prioritization, facing the challenges of explainability, domain adaptation, and human oversight (Ojo et al., 2024). The co-delivery phase, hindered by underdeveloped theoretical and legal frameworks, lack of governmental accountability, and low awareness among practitioners, exhibits the least AI applications (Linders, 2012). Addressing these disparities is crucial for AI to support all co-creation phases, enabling a more holistic and effective public service model. However, challenges regarding data quality, sensitivity, completeness, and accessibility remain. While most studies focus on technical issues, ethical concerns such as bias mitigation, accountability, and transparency remain underexplored. This highlights the urgent need for best practices and regulatory frameworks to ensure that AI-enabled co-creation aligns with ethical principles, fostering trust, security, and governance (European Commission, 2021; van Noordt et al., 2023).

2.5. Public sector co-creation and evidence-based policymaking

Evidence-based policy promotes rigorous analysis of service and policy options to improve decision-making quality (Head, 2010b). While traditional decision-making features "bargaining, entrenched commitments, and the interplay of diverse stakeholder values and interests" (p.77), evidence-based policymaking incorporates "rigorous research evidence into public policy debates and internal public sector processes" (Head, 2010a). Integrating evidence into policymaking requires systematic mechanisms to enhance its effectiveness. In the public sector, evidence-based policymaking relies on two forms of evidence: 1) factual, statistical, and scientific data that assess whether policies and initiatives function effectively; and 2) contextual insights that evaluate how policies work across social groups and environments (Sanderson, 2002). Four evidence-based policymaking principles are: 1) compiling evidence on what works, costs and benefits; 2) monitoring and evaluating policy effectiveness; 3) using evidence to refine and improve programs; and 4) fostering innovation and experimentation in policymaking (Head, 2010). Strengthening evidence-based policymaking requires enhancing evidence production, improving research finding applications, and bringing equity to evidence generation and policy design (Fedorowicz & Aron, 2021). The emphasis on evidence-driven decision-making aligns with co-creation, i.e. stakeholders contributing information, experiences, and expertise collaboratively. In AI-enabled co-creation, citizens design, deliver, and evaluate public initiatives, connecting policymakers and society. Such co-creation serves two roles: 1) generating evidence that reflects real-world policy impact and stakeholder needs; and 2) leveraging AI-powered analytics to support responsive, data-informed governance (BPC Policy Center, 2019). At the co-design stage, co-creation integrates stakeholder perspectives, ensuring that an understanding of societal needs informs policy formulation. AI amplifies this process by analyzing large-scale datasets, forecasting policy impacts, and identifying challenges, allowing to tailor solutions to evidence-based insights**.** During co-delivery, collaboration between governments, organizations, and citizens enables real-time policy adaptation. AI-driven decision support systems help PSOs respond to evolving conditions and stakeholder feedback. During co-evaluation, co-creation fosters a learning cycle, where stakeholder input and AI-powered analytics enhance policy assessment, ensuring that policies remain relevant, responsive, and aligned with evolving priorities (Gertler et al., 2016). Embedding AI in co-creation allows policymakers access to context-specific, real-time insights that support transparent, accountable, and adaptive governance (Mahmoud et al., 2023). AI-driven analytics refines decision-making, justifies policy actions, identifies unintended consequences, and ensures inclusivity (Flores et al., 2022; Ojo & Rizun, 2021). Thus, AI-enabled co-creation enables evidence-

based policymaking, stakeholder engagement and institutional capacity for data-driven decision-making.

2.6. Public sector co-creation and sustainability

The expanding use of AI in PSOs has created opportunities to redefine interactions among public administrations, citizens, and stakeholders, contributing significantly to sustainability goals and fostering better governance. Sustainability is about supporting, maintaining, and preserving what is valuable (Türke, 2012). It endures over time, supported by collaborations, flexible processes, and citizens' involvement in co-creation, which collectively lead to valuable and lasting outcomes (Jaspers & Steen, 2019). The collaborative nature of co-creation fosters long-term value creation, responsiveness to diverse social needs, and enduring societal benefits; it aligns with sustainability (Thomsen, 2013). These principles resonate with the UN 2030 Agenda and the Sustainable Development Goals (SDGs), which emphasize stakeholder engagement, inclusiveness, and resource efficiency as essential pathways to sustainable development (United Nations, 2015). Facilitated by co-creation, evidence-based policymaking enhances sustainability by aligning immediate actions with long-term goals and addressing diverse needs through reliable data and ethical practices (Edelmann et al., 2023; Edelmann & Voigt, 2024). AI can support these efforts but needs an ethical focus to ensure transparency, accountability, inclusiveness, and building trust among the stakeholders (Edelmann & Virkar, 2023; Rizun et al., 2025).

2.7. Public sector co-creation and ethics

Organizations increasingly emphasize a shift from collaborative knowledge to co-creation, as the latter bridges the research-practice gap and increases stakeholder empowerment (Mahmoud et al., 2023). Co-creation should involve the end-users from beginning to end; this will impact the implementation and acceptance of the service by the end-users and increase trust in the provider (PSO). Such collaboration should be not only equitable but also ethical. Relevant frameworks include the Good Practice Principles for Data Ethics in the Public Sector, emphasizing the trustworthy use of data in digital government (OECD, 2021), OECD Principles for Managing Ethics in the Public Service to improve effective public sector governance (OECD, 2016), OECD recommendations aimed at anti-corruption and public sector integrity (OECD, 2022), or the Australian framework for professional conduct and public interest (NSW Public Service Commission, 2022). The European Court of Auditors found out that EU institutions have adequate ethical frameworks but there is no common EU ethical framework to govern the work of the Member States and their representatives. In 2019, the European High-Level Expert Group on AI presented the Ethics Guidelines for Trustworthy AI, highlighting that trustworthy AI should be lawful, ethical, and robust (European Commission, 2019). Whilst public participation is a legal right in Europe, and there are guidelines for conducting such participation, the same cannot be said for co-creation (Banisar et al., 2011; European Environment Agency, 2023; Giannelos et al., 2024; Pevkur et al., 2018).

2.8. Research gap

The analysis of existing literature documented in previous sections uncovered a broad spectrum of studies that: 1) explore the role of co-creation in public service delivery, emphasizing its potential for fostering citizen engagement and improving policy outcomes, and 2) investigate the integration of digital tools, particularly AI, in co-creation, highlighting its capacity to enhance decision-making, collaboration, and efficiency in policymaking. Conceptual insights derived from sections 2.1 to 2.7 are synthesized in Table 1.

Tab. 1 – Conceptual insights on AI-enabled co-creation for evidence-based policymaking

Label	Insight	Section
CI1	Co-creation should be understood as an iterative phase-based process relying on collaboration, feedback loops, and adaptation, generating tangible public value, such as improved service quality, strengthened trust, and greater inclusivity.	2.1
CI2	A comprehensive understanding of co-creation as both a process and an outcome is essential for effective public sector innovation and meaningful stakeholder engagement.	2.2
CI3	The intertwined social, organizational, financial, and technical challenges underscore the need for a systematic approach to integrating digital tools into co-creation processes.	2.3
CI4	Establishing a rigorous legal and regulatory framework that addresses potential risks, ensures that AI applications align with ethical principles and standards, and facilitates a seamless transition to effective AI-enabled public sector co-creation is essential.	2.4
CI5	Co-creation facilitates evidence-based policymaking, leveraging AI's transformative potential to enhance informed decision-making and stakeholder collaboration.	2.5
CI6	Achieving sustainability requires recognizing the continuity of the co-creation processes and outcomes, which address immediate challenges while fostering long-term societal benefits.	2.6
CI7	Whilst co-creation is often regulated by the regional, national and supranational legal frameworks, a dedicated ethical framework to guide co-creation practices is needed.	2.7

However, this analysis also revealed a significant gap in understanding how AI-enabled co-creation operates within PSOs and how it contributes to evidence-based policymaking. While co-creation has gained recognition in public service innovation, its role as a structured, integrating mechanism for participatory, data-informed, and adaptive policymaking remains underexplored. Despite the increased emphasis on evidence-based policymaking, where rigorous research, data availability, and systematic evaluation guide decision-making, the link between AI-driven co-creation and its impact on policy formulation, implementation, and evaluation remains unclear. Additionally, policy initiatives such as the Tallinn Declaration (2017) and the Berlin Declaration (2020) emphasize the importance of user-centered service design, participatory governance, and digital transformation in policymaking. However, existing research lacks a clear framework on how co-creation can systematically shape policies, ensuring that such policies are informed by diverse stakeholder inputs, AI-driven insights, and sustainability considerations.

3. Research design

To address the research gap uncovered in Section 2 and defined in Section. 2.8, this study explores the role of AI-enabled co-creation in PSOs to contribute to evidence-based policymaking. Its objectives are:

O1. To identify and define the key parameters of AI-enabled co-creation for evidence-based policymaking
O2. To develop a conceptual model that integrates these parameters, contributing to a structured framework for understanding co-creation as both a process and an outcome in evidence-based policymaking

The study adopted four steps to meet these objectives.

First, existing literature was critically analyzed to identify and define the key parameters of AI-enabled co-creation for evidence-based policymaking. The outcome is documented in Section 2 and synthesized in the form of seven conceptual insights in Table 1. In turn, these insights will serve as the foundation for defining the key parameters of an AI-enabled co-creation model in Section 4.1.

Second, a workshop involving experts from academia and technology organizations was organized to validate the literature-based parameters; the results are documented in Section 4.2. To help develop the conceptual model for AI-enabled co-creation for evidence-based policymaking, the results are also documented in Section 4.3. The workshop formula was selected to enable small group discussions, guided by a moderator, to gather experts' views on the parameters, the model, and any additional perspectives (Gottesdiener, 2002). The workshop formula is also commonly used in co-creation to reflect a democratic decision-making process (Andersen & Jæger, 1999). Specifically, the workshop was organized online in January 2025, bringing together nine experts from academia and technology organizations. Experts were invited from diverse fields, including public administration, academia, and technology organizations (see Table 2), ensuring a comprehensive, interdisciplinary perspective. A detailed presentation was provided to establish a shared understanding of the parameters and the model among participants. The parameters were based on the systematic literature review and (Rizun et al., 2025).

Third, to facilitate iterative discussions on the model and assess its applicability to real-world scenarios, workshop participants were asked to complete a structured questionnaire via Google Forms, designed based on the workshop presentation. The questionnaire comprised one closed and eight open-ended questions, designed to validate the key parameters of the conceptual model and gather expert insights. It began with a closed question to assess the experts' agreement with Edelmann and Virkar's (2023) definition of sustainability. Next, evidence-based policy was explored based on the outcomes by Head (2010). The experts were asked whether these outcomes fully captured the scope of evidence-based policymaking and invited to propose additional outcomes. Ethics in public sector co-creation was another focal point, with participants identifying the key ethical frameworks applicable to public administration. The questionnaire then addressed digital co-creation, asking respondents to highlight significant issues, suggest appropriate communication channels, identify key stakeholders, and propose potential funding sources for co-creation activities. The role of AI in public sector co-creation was another area of inquiry. Experts were asked to specify functions and processes that could be delegated to AI and to outline perceived challenges and risks associated with AI integration in co-creation efforts.

Fourth, from the workshop, the discussion protocol, memo notes, and expert survey responses were analyzed using thematic analysis (Naeem et al., 2023), a process for deriving conceptual models from qualitative research findings. The insights gathered from the workshop and questionnaire, serving as validation instruments, contributed to refining the model by incorporating experts' perspectives on its key parameters. The thematic analysis followed two stages. First, validating and refining the key parameters that form the foundation of the conceptual model. Second, developing the model by systematically mapping AI-enabled co-creation phases and their mechanisms onto the evidence-based policymaking process and integrating this process with the identified key parameters.

Tab. 2 – Profiles of the workshop participants

ID	Organization	Area of expertise	Years of expertise
E1	academia	Computational analysis, artificial intelligence, policy analysis, public service co-creation	23
E2	academia	Digital government, digital inclusion, sustainable development	20
E3	academia	e-Governance, in particular organizational change and digital transformation in public sector organizations, new ways of working, engagement practices, sustainability	25
E4	academia	New information/computation paradigms, trustworthy software infrastructures, citizen-centered digital services	25
E5	academia	Data modeling ontologies, e-governance, public administration, information systems interoperability	15
E6	academia	Computational linguistics, NLP, ML for text mining, responsible AI, disinformation, propaganda detection	30
E7	academia	Business administration, business process management, linguistics	10
E8	academia	Computer science, decision support systems, data mining, business process management	25
E9	academia	Education internationalization, project management, implementation of international projects	20

4. Results

This section addresses the second objective to develop a conceptual model that integrates identified parameters of AI-enabled co-creation for evidence-based policymaking, contributing to a structured framework that conceptualizes co-creation as both a process and an outcome in this context.

4.1 Conceptual model parameters

Based on the conceptual insights from the literature review (Section 2), five parameters of co-creation for evidence-based policymaking in PSOs were identified, providing the foundation for the conceptual model.

The first is the structure of the public policy and service creation process, represented as a continuous iteration of commissioning, designing, delivering, and evaluating (CI1). Adopting a "co-" approach – co-commissioning, co-designing, co-delivering, and co-evaluating – enriches this process by fostering collaboration, shared expertise, and leveraging diverse perspectives to enhance the quality and legitimacy of public decision-making.

The second parameter is the co-creation impact, emphasizing the tangible and structural effects of the process. Beyond being a key enabler and guiding principle, co-creation drives measurable public sector outcomes (CI2) by shaping overarching institutional and specific co-creation-related results. These include: 1) social impact by addressing the needs of diverse groups, including the vulnerable, by tailoring policies and services to their specific needs; 2) innovation by encouraging creative solutions that incorporate diverse stakeholder insights and leverage advanced technologies like AI; 3) efficiency by streamlining resource allocation and policymaking through participatory and data-informed processes; and 4) organizational transformation by facilitating cultural and structural changes within PSOs to adapt to dynamic societal needs.

The third parameter represents the enablers of evidence-based policymaking – leadership, financial support, stakeholder engagement, and technologies like AI (CI3), essential for operationalizing co-creation. While leadership, financial support, and stakeholder engagement provide the necessary governance, resources, and collaborative mechanisms, AI enhances the process by enabling predictive modeling, trend analysis, and improved stakeholder communication. Together, these enablers ensure that the co-creation process is structured and adaptive, empowering PSOs to address complex policy challenges.

The fourth parameter represents the core principles of co-creation for evidence-based policymaking – ethics (CI4), evidence-based decision-making (CI5), and sustainability (CI6), together ensuring that co-creation is participatory, impactful, and aligned with long-term goals. Ethics safeguards transparency, accountability, and inclusivity, fostering trust among stakeholders and reinforcing the integrity of the co-creation process within public sector governance. Sustainability underscores the continuity and adaptability of co-creation processes, ensuring their longevity and inclusiveness while driving the co-creation of sustainable policy outcomes that address immediate challenges and foster enduring societal benefits. Evidence-based decision-making ensures that co-creation is guided by reliable data and insights, strengthening the effectiveness and legitimacy of the process.

Finally, the fifth parameter makes sure that the entire co-creation framework for evidence-based policymaking in PSOs is underpinned by a strong legal and regulatory foundation (CI7) to ensure compliance, transparency, and accountability, particularly by responsibly integrating AI and other technologies. This foundation provides the structural integrity necessary for co-creation processes to produce meaningful results and flourish.

4.2 Validated conceptual model parameters

This section presents the results of expert validation of the parameters of AI-enabled co-creation for evidence-based policymaking proposed from the literature, allowing us to clarify, enrich and refine such parameters.

Core principle – Sustainability

Experts' insights enriched the definition of sustainability according to Edelmann & Virkar (2023), refining its applicability to AI-enabled public sector co-creation for evidence-based policymaking, leading to the following definition: "Taking into account that sustainability can be understood as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs, sustainability should not only be about environmental and social impact but be adaptable to different contexts, retaining its value over time, leading to new ways of working in organizations, and include any artifacts created for the long term. Thus, sustainable processes and outcomes are those that have long-term benefits, where technology and AI act as key enablers, supporting new ways of working, enhancing efficiency and innovation, and ensuring long-term impact. To achieve sustainability, sustainable outputs must be defined beforehand, while mitigating risks such as bias and discrimination in digital technologies is essential to uphold fairness, inclusivity, and ethical co-creation".

Core principle - Ethics

An ethical co-creation framework must provide core values, standards of conduct, and accountability mechanisms: 1) transparency, accountability, fairness, and inclusion should be binding for all public employees and stakeholders involved in public sector co-creation, regardless of role or contract type; 2) while core values remain universal, ethical guidelines must adapt to different sectors, ensuring academic integrity and fairness in higher education, open engagement and trust in public administration, and data privacy, security, and bias mitigation in AI-enabled co-creation; 3) ethical frameworks must integrate rules of engagement, oversight mechanisms, and evaluation tools to ensure compliance and assess long-term impact; 4) ethical considerations should address both intended and unintended consequences, ensuring that co-creation processes account for future implications and the needs of directly- and indirectly-affected stakeholders (McKenna & Bargh, 1999). Experts also highlighted that existing ethical guidelines from research, innovation and AI could contribute to the ethical framework for co-creation (Dainow & Brey, 2021; Shneiderman, 2020, 2022; Thiebes et al., 2021). For a higher education context, ethical frameworks must focus on academic integrity, respect for intellectual property, fairness, inclusion, social responsibility and equality, and fair treatment of students and staff. The consequences framework, focusing on possible future effects of any course of action with consideration of directly- or indirectly-affected stakeholders (Gebru et al., 2021; Hardebolle et al., 2023; Reijers et al., 2018) may be particularly useful.

Enabler – AI and public sector co-creation

AI serves as a critical enabler for public sector co-creation by enhancing efficiency, automating repetitive tasks, and supporting evidence-based decision-making. Experts highlighted AI's role in: 1) process optimization, i.e. automating, monitoring, controlling, and adapting routine tasks and workflows; 2) data-driven insights, i.e. collecting, processing, and analyzing data, including sentiment analysis and scenario modeling; 3) decision-support mechanisms, i.e. providing evidence-based recommendations and simulating policy impacts; and 4) operational execution, i.e. assisting in communication, coordination, and execution of standardized processes. However, challenges in AI adoption within co-creation persist. Experts raised concerns about: 1) data quality and bias, as AI systems may draw on outdated or low-quality datasets; 2) transparency, security, and privacy risks in AI-driven decision-making; 3) over-reliance on automation, potentially reducing human oversight and accountability; 4) regulatory gaps, with a lack of governance frameworks for AI-based public services; and 5) public skepticism including unfounded fears and ethical concerns regarding AI's role in policymaking.

Enabler – Digital co-creation vs. co-creation of digital public services

Importantly, experts emphasized the need to clearly distinguish between digital co-creation and co-creation of digital public services, which imply different technological applications, stakeholder involvements, and governance structures. Digital co-creation refers to the use of digital technologies to enable co-creation activities. The outcome can be digital or non-digital. Digital co-creation emphasizes collaborative processes empowered by digital platforms, including participatory decision-making, citizen engagement, and collaborative problem-solving (Edelmann & Mergel, 2021; Rodriguez Müller et al., 2021b). This form of co-creation leverages digital tools such as crowdsourcing platforms, online forums, sentiment analysis, and social media to facilitate citizen participation and

improve service responsiveness (Brandsen et al., 2018). Digital co-creation includes five components: 1) technology as an enabler, i.e. digital tools supporting communication, collaboration, and decision-making, but not "prescribing" the nature of co-created public services (Lember, 2017); 2) stakeholder focus, i.e. inclusivity and accessibility for a diverse range of stakeholders (Bovaird & Loeffler, 2012); 3) ethical and governance principles, i.e. the organizations responsible for digital co-creation must adhere to ethical guidelines, ensuring data privacy, security, fairness, explainability, and human oversight (Edelmann et al., 2023); 4) sustainability and fairness, i.e. digital co-creation must support transparent, trust-based, and balanced collaboration, ensure that any biases are mitigated and decision-making is inclusive and participatory; 5) hybrid integration, i.e. digital tools should support virtual or face-to-face co-creation or involve physical co-creation efforts.

Co-creation of digital public services is an outcome-oriented process, where collaborative design, implementation, and refinement of digital solutions drive public sector service delivery and innovation (Linders, 2012). Unlike digital co-creation, where digital tools support participatory processes, the co-creation of digital public services focuses on building digital services. The process involves multi-sector collaborations, including partnerships between governments, private tech companies, and research institutions (Rodriguez Müller et al., 2021b). The services may include AI-powered administrative systems, digital identity verification, open data portals, smart governance platforms, etc. Key components of co-creating digital public services are: 1) technology as the core product, i.e. the results is the development of digital solutions, e.g. AI-driven services, digital governance platforms, and e-government applications (Torfing et al., 2019); 2) service innovation and scalability, i.e. developing new digital solutions that must be sustainable, adaptable, and accessible, ensuring long-term usability and cross-institutional integration (Wirtz et al., 2021); 3) regulatory and legal compliance, i.e. the development requires compliance with legal, ethical, and technical standards, ensuring security, transparency, and interoperability across PSOs (European Commission, 2021); 4) human oversight and trust-building, i.e. while AI-driven automation enhances service efficiency, the human intervention must remain central to validate AI-generated insights, prevent algorithmic biases, and ensure user trust in digital public services. Hence, by distinguishing between digital co-creation and co-creation of digital public services, our study underscores the diverse roles of digital technologies in public sector innovation. While digital co-creation helps engage citizens in service development in the broad sense, co-creation of digital public services focuses on the development and implementation of digital solutions.

Enabler – Co-creation channels of participation and communication

Effective co-creation requires context-sensitive, inclusive communication strategies that integrate traditional and digital channels to accommodate diverse engagement dynamics and stakeholder needs. Experts emphasized that no single channel is inherently superior; rather, the selection must be purpose-driven, contextually relevant, and aligned with accessibility principles. Traditional channels like public meetings, workshops, or printed materials foster deliberative engagement and trust-building in structured settings. Digital channels like social media, crowdsourcing platforms, or electronic coordination tools expand reach, facilitate real-time participation, and enhance analytical capabilities through AI-driven insights. Beyond communication modes, stakeholder composition is fundamental. Co-creation must intentionally engage a diverse ecosystem of citizens, policymakers, private sector actors, NGOs, technology firms, and academic institutions to ensure inclusive governance, equitable representation, and legitimacy. Prioritizing those most affected and investing in co-creation with them strengthens policy responsiveness, trust, and co-ownership of outcomes.

Enabler – Financial aspects of co-creation

Co-creation requires dedicated financial resources, but no additional financial burden should be placed on participants. A sustainable funding model should integrate multiple sources: 1) public funding – local, regional, and national governments should take the lead in financing co-creation initiatives; 2) private sector contributions – partnerships with businesses can provide funding, expertise, and technological support; and 3) international grants and foundations – funding from international organizations, NGOs, and philanthropic institutions can support long-term sustainability. Whilst the public sector should take the lead in implementing public sector co-creation, convincing them of the value and long-term benefits of such investments remains a critical challenge.

4.3 Conceptual model

Based on the workshop-produced insights, the process of AI-enabled co-creation for evidence-based policymaking was adapted from the process proposed by Head (2010) and operationalized to be iterative, participatory and co-created. Each co-creation phase was mapped onto specific evidence-based policy processes, demonstrating how stakeholder engagement, AI-driven analytics, and iterative policy refinement enhance transparency, inclusivity, and adaptability. Integrating AI into co-creation allowed PSOs to develop more informed, accountable, and citizen-centered policy decisions. Table 3 presents this integrated process, demonstrating how AI-enabled co-creation aligns with evidence-based policymaking across four phases: 1) co-commissioning vs. policy initiation; 2) co-designing vs. engaging, evidence-gathering, and policy planning; 3) co-delivery vs. policy delivery; and 4) co-assessment and co-evaluation vs. policy evaluation.

Tab. 3 – The process of AI-enabled co-creation for evidence-based policymaking

Co-creation vs. evidence-based policymaking	Co-creation phase	Evidence-based policy phase
Co-commissioning vs. policy initiation		
	Co-commissioning for early stakeholder involvement and addressing legal and ethical requirements	Identifying policy goals and challenges while aligning with stakeholder needs, assessing organizational readiness and addressing legal prerequisites
Co-designing vs. engaging, evidence gathering, policy planning		
Co-designing vs. engaging	Co-designing to facilitate meaningful participation and shared decision-making	Involving citizens, organizations, and experts in shaping the policy agenda through engagement activities
Co-designing vs. evidence gathering	Ensuring co-designed evidence, integrating diverse perspectives and experiences, and AI-driven analytics	Collecting qualitative and quantitative data to inform policy decisions
Co-designing vs. policy planning	Embedding co-design principles to iteratively shape responsive policies	Developing citizen-centric, sustainable, and inclusive solutions based on stakeholder input and evidence
Co-delivery vs. policy delivery		
	Embeds co-delivery for stakeholder involvement throughout the execution. AI-enabled communication channels enhance accessibility, helping build trust and securing buy-in	Implementing policies with mechanisms for tracking progress and adapting to unforeseen challenges
Co-assessment or co-evaluation vs. policy evaluation		
Co-assessment vs. options and appraisals	Enables co-assessment to ensure stakeholder-driven assessment and mitigate personal and political biases. The integration of AI-driven simulations and scenario modeling.	Assessing policy alternatives for feasibility, impact, and alignment with innovation, public trust, accountability, inclusivity and other outcomes
Co-assessment vs. decision and presentation	Co-creation fosters transparency by involving stakeholders in final decision-making. Digital platforms and explainable AI add credibility and broaden acceptance.	Selecting policy directions and ensuring transparent communication with stakeholders and accountability
Co-evaluation vs. evaluation and review	Institutionalizes co-evaluation to ensure continuous learning and adaptation. AI-driven analytics and engagement ensure adaptability and responsiveness.	Reviewing impact, integrating feedback, and refining policies iteratively

The conceptual model for AI-enabled co-creation for evidence-based policymaking is depicted in Figure 1. The model integrates the five parameters identified and validated throughout the study. It structures the policymaking process as an iteration of four integrated phases aligned with co-creation phases. The model also highlights critical enablers of evidence-based policymaking, including leadership, financial support, stakeholder engagement, and AI-driven tools, while reinforcing evidence-based decision-making, sustainability, ethics, and regulatory compliance as principles. Furthermore, it identifies co-creation outcomes as measurable public sector transformations encompassing social impact, innovation, efficiency, and organizational change.

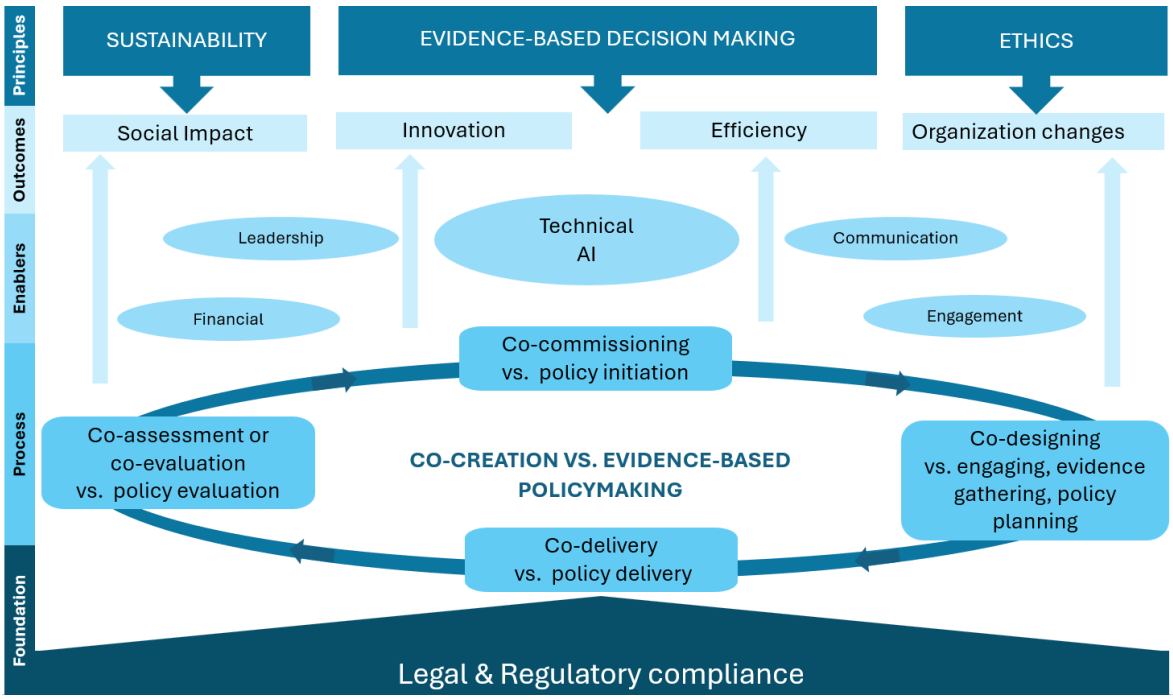

Fig. 1 – The conceptual model of AI-enabled co-creation for evidence-based policymaking

5. Conclusions

The main outcome of this study is the integration of AI-enabled co-creation and evidence-based policymaking within PSOs. The resulting conceptual model embeds co-creation into policy processes across four phases: 1) co-commissioning vs. policy initiation; 2) co-designing vs. engaging, evidence gathering, and policy planning; 3) co-delivery vs. policy delivery; and 4) co-assessment or co-evaluation vs. policy evaluation. The study makes theoretical, methodological, and practical contributions. The theoretical contribution is about advancing the understanding of co-creation as an integral component of evidence-based policymaking, embedding it in the structured and iterative policy process. The result highlights the interdisciplinary and multi-stakeholder nature of co-creation, emphasizing essential parameters such as sustainability, ethics, legal foundations, financial aspects, and digital governance required for its effective implementation in PSOs. The methodological contribution is about proposing a structured policymaking process, integrating AI-enabled co-creation across four interconnected phases, and making a distinction between digital co-creation (where digital tools enable participatory processes) and co-creation of digital public services (where digital solutions are the outcome of co-creation). The practical contribution is about providing a framework for integrating AI-enabled co-creation into policymaking processes, guiding policymakers and public managers in designing adaptive, user-centered, and data-driven public services.

The study has some limitations. First, while the conceptual model was validated through expert insights, further empirical research is needed to test its applicability across different PSO contexts and governance levels. Second, the dynamic nature of AI in co-creation processes presents ongoing challenges regarding ethical safeguards, regulatory compliance, and the evolving capabilities of AI-driven tools, which our model does not fully capture. Additionally, ethical concerns can go beyond AI, considering power dynamics and the risk of superficial participation. If not carefully managed, co-creation efforts may favor certain stakeholders.

Future research could explore strategies to prevent co-creation from becoming a symbolic exercise, ensuring genuine engagement and meaningful collaboration. Another challenge is the availability and quality of data. Similar to other domains, AI's effectiveness in co-creation depends on access to reliable and representative data; unfortunately, public sector data is often fragmented, biased, or difficult to access. Misinformation and security risks present ongoing challenges in digital co-creation. If not carefully monitored, AI tools can spread misinformation. Thus, strengthening security measures, improving misinformation detection, and building trust in AI-driven co-creation should be key priorities moving forward. Lastly, future research could further validate and refine the parameters of the conceptual model, conducting empirical testing and iterative evaluation to ensure its applicability and effectiveness in diverse public sector settings.

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