Introducing AI-Enhanced Democracy: Context, Challenges, and Research Framework

Ilaria Mariani, Jennifer Edmond, George Manias, and Maria Panou

Abstract This chapter serves as the introduction to this study on AI and democracy. It introduces the central themes and motivations of this book, examining the opportunities and challenges AI presents for democratic processes—ranging from civic participation and public deliberation to policy-making and institutional trust. Emphasizing methodological approaches such as research-through-design and triangulation of theoretical and empirical knowledge, this chapter outlines the structure of the book and its aim to bridge theory and real-world experimentation. The chapter situates the work within a broader European research ecosystem, grounded in the contributions of four Horizon Europe projects (ORBIS, AI4GOV, ITHACA, and KT4D), and reflects on how these initiatives collectively inform a practice-based, interdisciplinary investigation of AI-enhanced democracy.

Keywords Context of reference · Methodology · Background · Expected audience · Aim

I. Mariani (✉)
Department of Design, Politecnico di Milano, Milan, Italy
e-mail: ilaria1.mariani@polimi.it

J. Edmond
Trinity College Dublin, Dublin, Ireland
e-mail: edmondj@tcd.ie

G. Manias
University of Piraeus, Piraeus, Greece
e-mail: gmanias@unipi.gr

M. Panou
Hellenic Institute of Transport of the Centre for Research and Technology Hellas, Thessaloniki, Greece
e-mail: mpanou@certh.gr

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1 Opportunities and Challenges in AI and Democracy

The intersection of Artificial Intelligence (AI) and democracy presents a setting rich with both opportunities and challenges. This book sparks from fundamental questions that features the current discourses on the topic: How can AI participate in citizen–government relations? In what ways can it be harnessed to improve democratic governance, and what are the implications of its growing influence in policy-making processes?

AI technologies hold the promise of enhancing transparency, fostering more meaningful citizen engagement, and supporting data-informed decision-making in democratic governance at various scales. As discussed in literature (Duberry 2022b, 2022a), AI plays a dual role of empowering and disrupting democratic processes, with civic tech initiatives enabling citizen participation while raising critical concerns about surveillance, bias, and accountability. At the same time, they raise indeed significant and well-known concerns about the concentration of power, the reinforcement of existing biases and polarizations, and the erosion of institutional accountability.

There is a widening gap between citizens and political institutions, alongside an ongoing erosion of trust in democratic systems, which highlight the urgent need for innovative and scalable models of civic engagement (Åström et al. 2017; Fung 2015; Sieber et al. 2024). Central to these concerns is the question of how AI might influence the trust citizens place in democratic institutions—whether it acts as a bridge to greater civic inclusion or as a barrier, eroding confidence in public processes. These complex dynamics and tensions define the perimeter of this book and highlight why the relationship between AI and democracy is both urgent and inherently complex. The topic spans a wide array of domains, from algorithmic decision-making in public services, to AI's role in moderating online discourse, to the application of predictive analytics in policy and legislative processes and planning. Moreover, the discourse unfolds at the intersection of multiple disciplines—computer science, political theory, ethics, public administration, design, and sociology—making it a deeply interdisciplinary field of investigation (Duberry 2022b; Zuiderwijk et al. 2021). As a consequence, addressing the implications of AI for democracy requires a plurality of perspectives and collaborative methods. This book answers that need by bringing together insights from technologists and designers, policymakers, civil society actors, and citizens. It is both an exploration of how AI can be used in service of democratic ideals, and a critical reflection on how those ideals must, in turn, shape the development and governance of AI.

The relationship between technology and democracy has undergone significant transformations over the past decades, shaped by successive waves of innovation and the shifting expectations placed on digital tools to enhance political life. In the 1990s and early 2000s, early efforts focused on digitizing participation through online voting, opinion polls, discussion forums, and virtual town hall meetings—technologies that mirrored existing democratic practices in a digital format. As digital infrastructures matured, more sophisticated approaches and tools—such as online

platforms, simulation environments, and serious games emerged—entered the loop, aiming not only to gather citizen input but to actively involve people in collaborative decision-making and eventually policy-making (Simonofski et al. 2017, 2021). Today, the adoption of AI in governance reflects a continuation of these technological evolutions, although marking a shift toward a qualitatively different mode of public participation and policy innovation (Sousa et al. 2019), with AI-enabled tools increasingly reshaping the quality of citizen contributions to public discourse, entering the policy cycle itself to introduce new forms of agenda-setting, decision-making, and even evaluation (Kankanhalli et al. 2017; Zuiderwijk and Hinnant 2019).

At various stages of the democratic processes, the integration of AI-based tools is enhancing civic participation (Androutsopoulou et al. 2019) and collective decision-making (Ansell and Gash 2018; Bataineh and Abu-Shanab 2016; Borge et al. 2022; Esau et al. 2017), expanding the possibilities for more inclusive and far-reaching public deliberation. AI can be used to scale participatory processes by enabling large-scale public consultations, analyzing massive datasets from citizen input, and facilitating inclusive dialogue across diverse communities. For instance, AI-powered platforms can support deliberative democracy by clustering arguments, surfacing underrepresented perspectives, and managing complex discussions that would otherwise be overwhelming for human moderators (Anastasiou et al. 2025). In election cycles, AI has the capacity to engage voters through chatbots, personalize campaign messaging, and assess public sentiment in real time (Aoki 2020; Sousa et al. 2019). Public administrations are using AI to predict service demand, detect patterns in civic complaints, and improve the targeting of social programs (Kuziemski and Misuraca 2020).

These applications suggest that AI, when guided by democratic values, can not only improve the efficiency of governance but also bring citizens closer to decision-making processes. Through data analytics, governments can identify emerging social needs, anticipate crises, and engage in evidence-based policymaking. AI can contribute to the quality of democratic conversation by offering tools for fact-checking, visualizing complex issues, and promoting informed public debate (Romberg and Escher 2024). In contexts of low engagement, such as rural or marginalized communities, AI-supported platforms—if designed inclusively—can support reducing participation barriers related to language, mobility, or literacy (Magnini et al. 2000). These examples show how AI can serve as a means to renew and revitalize democratic life, particularly in times of institutional fatigue and citizen disengagement.

As a counterpart, however, they introduce complexities in scaling such practices while maintaining the depth and quality of discourse (Manosevitch 2014; Farina et al. 2013). A major challenge lies in the fact that AI technologies are often developed in environments removed from public oversight, guided more by market incentives than democratic deliberation. Moreover, the logic of algorithmic optimization—maximizing engagement, speed, and personalization—does not align with the slower, contested processes of democratic reasoning (Buhmann and Fieseler 2023).

Social media platforms, for instance, have leveraged AI to maximize user engagement but have inadvertently fostered echo chambers, polarization, and the spread of disinformation (Cath et al. 2018; Skaržauskienė and Mačiulienė 2020). AI systems used in political campaigns can micro-target voters in ways that bypass public deliberation, undermining the transparency and fairness of electoral processes. Therefore, the same tools that can empower citizens can also be used to manipulate, surveil, and exclude them.

These risks are particularly salient when it comes to the datafication of democracy (Redden 2018). As governance becomes more data-driven, it raises questions about who controls the data, how it is used, and to what end, with warnings related to how data is often portrayed as objective and neutral, and other simplifications. Data is shaped by social biases, political priorities, and economic structures. As a consequence, the use of AI in public policy may reinforce existing inequalities if datasets are incomplete, unrepresentative, or historically biased (Galais et al. 2021). Moreover, access to data and computational power is unequally distributed, concentrating influence among a small number of actors—typically ranging from private technology firms or powerful governments. This asymmetry threatens the democratic principle of equal participation, as only a few entities can fully leverage the data that shapes public life.

Another issue concerns algorithmic governance—the increasing reliance on automated systems to make or inform political decisions. While algorithms can assist in managing complexity, their deployment in welfare allocation, predictive policing, or immigration control raises concerns about fairness and legitimacy (Goodman and Flaxman 2017; Voegtlin and Scherer 2017). The opacity of algorithmic processes—the well-known black-box problem—undermines the democratic requirement that decisions be explainable and contestable (Coussement et al. 2024; Siachos and Karacapilidis 2024). This undermines the democratic requirement that decisions be explainable and contestable. While democracy can be framed as an attempt to collectively define which problems matter and how they should be addressed, algorithms, by contrast, are designed to optimize pre-set objectives, rather than engaging in value-based deliberation or responding to competing interpretations of the common good.

As a result, these developments echo past reflection on how technologies are not neutral instruments, but socio-technical constructs whose design, affordances, and implementation can unevenly distribute power and reshape engagement (Coiera 2007). AI systems embody the values, assumptions, and intentions of their designers and the broader sociotechnical systems in which they are deployed. Therefore, an ethical approach to AI and its governance requires to go beyond technical fixes like bias detection or transparency tools. It requires a pluralistic and inclusive approach that integrates cultural diversity, protects human rights, and ensures meaningful public participation (Herrmann 2023; Leslie et al. 2021; Prabhakaran et al. 2022). Thus, the increasing presence of AI systems in democratic settings demands a renewed and critical inquiry into their impact on participation, representation, and power (Risse 2023).

2 Open Challenges

The rapid integration of AI into democratic governance evidently carries significant transformative potential. Yet, this integration extends beyond mere technological adoption—it represents a profound socio-political shift, as the design, deployment, and governance of AI systems directly influence citizen participation, representation, and power distribution within democratic societies (Duberry 2022b; Zuiderwijk et al. 2021). As AI increasingly mediates interactions between citizens and democratic institutions, reshapes public deliberation, and informs policy decisions, it becomes critically important to understand how democratic values are upheld, challenged, or transformed. Several critical challenges remain open and require urgent attention.

Firstly, AI introduces a complex ethical landscape, particularly concerning data privacy and the potential misuse of personal information collected via platforms and deliberative processes (Bright and Margetts 2016; Buhmann and Fieseler 2023). Increased data collection and algorithmic analysis heighten concerns over digital surveillance, manipulation, and the risk of amplifying existing societal inequalities (Redden 2018; Bécue et al. 2021; Lee et al. 2021; Kyriazis et al. 2020). These issues threaten to fundamentally alter the delivery of essential public services, undermine data protection legislation and disrupt democratic processes, complicating the assurance of fairness and equity. Hence, the collection and incorporation of citizens' information in policies demands a robust framework for data privacy and security to prevent unauthorised access or disclosure of confidential details, something current regulatory approaches often inadequately address (Goodman and Flaxman 2017; Biran et al. 2022). The latter will result in improved ways for the aggregation of data (e.g., citizens' signals, data from IoTs, and complaints) from divergent sources by preserving in parallel data privacy, integrity and ownership. Ethical guidelines frequently neglect the direct impacts of AI technologies on civic participation and democracy, especially regarding how data biases and embedded perspectives shape technological development (Fernández-Martínez et al. 2018; Prabhakaran et al. 2022). In the context of ML and AI in general, this could be caused due to erroneous data on which a model has been trained, to implicit bias that can be introduced by the AI engineers themselves due to wrong assumptions, or due to other factors that can result in 'unfair' outcomes (Birhane et al. 2022; Holroyd et al. 2017). Additionally, important cultural dimensions—such as societal beliefs, languages, norms, creativity, historical contexts, and collective identities—remain largely overlooked in present regulatory frameworks (Duberry 2022b; Kan and others 2024; Leslie et al. 2021).

Secondly, substantial disparities in access to digital technologies persist, posing risks of excluding certain populations and further intensifying existing inequalities. Beyond the challenges posed by AI systems themselves, structural inequalities in digital access and literacy also limit the democratic potential of AI (Delgado et al. 2021; Sætra 2023; Sieber et al. 2024). The digital divide—rooted in disparities of infrastructure, education, income, and geography—means that not all citizens can participate equally in AI-mediated public life. Those without reliable access to digital

infrastructures risk marginalization within AI-supported democratic processes, reinforcing divides rather than bridging them (Savaget et al. 2019). Moreover, even where access exists, digital literacy remains uneven, affecting individuals' ability to critically engage with AI systems, understand their rights, or advocate for fairer designs (Wilson 2022). This exclusion is not merely a technical issue but a political one: it determines who has a voice in shaping the future of democracy. Decisions informed by biased or unreliable AI systems can further entrench unjust societal structures, erode public trust, and result in flawed policymaking. Bias and discrimination continue to significantly impact public service delivery worldwide, influencing the access, quality, and outcomes experienced by diverse populations (Maragno et al. 2023; Romberg and Escher 2024). Ethical principles commonly cited in the AI debate, such as fairness and diversity, often lack specificity and practical guidance. Consequently, socially vulnerable groups—already at heightened risk from biased AI systems—remain inadequately represented and potentially excluded from digital civic engagement. Addressing representation and inclusivity thus demands innovative, participatory approaches to AI system design and implementation (Corbett et al. 2023; Zhang et al. 2023). Active and direct engagement of diverse communities can help mitigate risks such as algorithmically induced polarization and echo chambers, fostering more pluralistic and inclusive discourse (Landemore 2022).

Thirdly, the issue of data understandability emerges as a distinct yet closely related discourse to the push for explainable AI (XAI) (Coussement et al. 2024; Holzinger 2018; Nannini et al. 2024). Data understandability goes beyond simply opening the AI 'black box' to reveal algorithmic functioning. It involves ensuring citizens, policymakers, and civil society stakeholders possess meaningful comprehension of both AI outputs and the underlying data and decision-making processes (Ehsan et al. 2022; Karacapilidis et al. 2023). Transparency alone is insufficient if stakeholders cannot genuinely interpret and engage with AI-produced information. Without effective strategies to enhance data comprehension, efforts towards transparency may fail to build genuine trust or informed participation in democratic governance (Anastasiou et al. 2025; Mariani et al. 2025).

3 Background of This Book. Cluster Projects on AI, Big Data, and Democracy

This book directly engages with these open challenges, positioning itself within a broader ecosystem of inquiry and experimentation. It originates from the AI, Big Data & Democracy Task Force, a collaborative cluster initiative composed of four Horizon Europe-funded projects—ORBIS, AI4GOV, ITHACA, and KT4D—brought together to support the European Commission's vision of 'Europe in a changing world—inclusive, innovative and reflective societies'. ORBIS is funded under the call 'The future of democracy and civic participation', while AI4GOV,

ITHACA, and KT4D are part of the call 'Artificial intelligence, big data and democracy'. This diverse and complementary funding landscape reflects the Task Force's interdisciplinary ambition and wide-ranging scope.

This book draws upon the unique insights and innovations generated by the four projects of the Task Force on AI, Big Data, and Democracy, which began their activities in 2023. Across its chapter, each project independently contributes to this volume serving as a distinct case study, offering their focus and lens on addressing the complex and evolving relationship between AI and democracy. Together, they reveal complementary dimensions of democratic transformation in the age of AI, despite their diverse thematic priorities and methodological approaches.

ORBIS emphasizes scalable models for deliberative democracy; AI4GOV addresses the ethical, regulatory, and accountability dimensions of AI in public services; ITHACA centers on inclusive civic participation, particularly for vulnerable and marginalized communities; and KT4D explores cultural and epistemological dimensions often neglected in current regulatory frameworks. Collectively, these projects provide a strong foundation for this book's reflections and proposals, offering valuable insights into the domain and a shared understanding that AI is not merely a technical tool but a socio-technical force capable of reshaping democratic practices in fundamental ways (Table 1).

4 Research Methodology

The foundational knowledge presented in this book is rooted in a rich and evolving scientific discourse that spans multiple academic and applied fields. Understanding the complex interplay between AI and democracy requires a truly interdisciplinary approach, drawing from a broad spectrum of expertise. Key contributing disciplines include computer science, particularly in the areas of artificial intelligence, data science, and human–computer interaction, which provide the technical backbone for developing and understanding AI systems. Political science and democratic theory offer critical insights into governance, participation, and power dynamics, while public sector innovation and management contributes perspectives on institutional processes, digital government, and service delivery aiming at addressing fragmentation in citizen-policy dialogue and designing scalable socio-technical solutions. Ethics and philosophy of technology explore the normative implications of AI, including fairness, accountability, transparency, and human rights, extending the reflection on data protection, algorithmic accountability, and the governance of emerging technologies. Meanwhile, sociology and media studies help unpack how technologies shape and are shaped by social behavior, cultural norms, and communication practices. Design research, information science, and science and technology studies (STS) contribute approaches and methodologies for participatory design, user experience, and socio-technical system analysis, contributing in the translation of democratic values into user-centered experiences, ensuring that the solutions developed are responsive to the real needs of diverse civic contexts. History, cultural studies

Table 1 Description of the 4 HEU projects, with challenges and opportunities

Project	Consortium	Description	Challenges	Opportunities
ORBIS (GA: 101,094,765; https://orbis-project.eu/; https://cordis.europa.eu/project/id/101094765)	Coordinator: Politecnico di Milano Participants: 13 Partners: 2	Democracy is in need of reshaping, with an emphasis on participation, engagement, transparency, responsiveness, accountability and effectiveness. The current state of solutions is fragmented, and produces scattered contents that often lead to dysfunctional argumentation **Objective**. ORBIS responds to the lack of dialogue between citizenship and policy making institutions by providing (1) a theoretically sound and highly pragmatic socio-technical solution to enable the transition to a more inclusive, transparent and trustful Deliberative Democracy in Europe; (2) exploring models of digitally-enhanced democracy for scaling participation	Complex ethical landscape of using AI in democratic processes, particularly concerning data privacy and the potential misuse of personal information Disparities in access to technology, which could limit participation and exacerbate existing inequalities	Leveraging AI tools to facilitate broader and more effective participation across diverse communities, enhancing the democratic process Using digital platforms to scale up the reach of deliberative democracy to involve larger populations in meaningful ways Utilising advanced data analytics to gain deeper insights into public opinion, improving the responsiveness and relevance of policy-making Employing AI to break down barriers to participation for marginalised or underserved groups, ensuring a more inclusive democratic process Developing new models of democracy that blend traditional deliberative methods with cutting-edge technology, potentially transforming how democracy is practised

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Table 1 (continued)

Project	Consortium	Description	Challenges	Opportunities
AI4GOV (GA: 101,094,905; https://ai4gov-project.eu/; https://cordis.europa.eu/project/id/101094905)	Coordinator: Maggioli Participants: 13	The AI4GOV introduces a holistic approach and different regulatory, data governmental, and technological frameworks that include (i) a thorough analysis and understanding of bias and ethics, (ii) methods to mitigate ethics issues on several levels of the AI chain, and (iii) a proactive accounting for bias including awareness, description of bias and finally an explanation of the AI based decision **Objective**. AI4GOV substantially helps public authorities, legal organizations, and other policy actors to factor legal and ethical hazards caused by potential misuse of AI and Big Data in their policies, services, and respective processes. The ethical and human rights challenges are initially reviewed as well as mitigation strategies are proposed to analyze and research how a regulatory framework might be designed and deployed to address these challenges	AI systems could exaggerate digital surveillance and data manipulation, reflect, and reinforce some of the deepest societal inequalities, fundamentally alter the delivery of public and essential services, undermine data protection legislation, and disrupt policy making processes Data security and privacy increases the complexity of the systems and paves the way for the implementation of robust data protection measures Decisions informed by biased or unreliable AI systems can result in major implications and consequences, including reinforcing unfair systems, losing public trust, and making poorly informed decisions Bias and discrimination in public services remain critical issues globally, influencing access, quality, and outcomes for diverse populations	Deploying AI-enabled trustworthy systems that perform predictive analytics and optimise resource allocation in a sustainable and fair way Develop AI-driven toolkits that make government services more accessible to citizens, improving inclusivity and equal access Leverage the potential of emerging technologies (e.g., blockchain, homomorphic encryption) towards improving the accountability, integrity, and confidentiality of the data Increase awareness among the public/citizens and empower them with deeper knowledge and understanding on AI. Develop new digital skills and enhance the trust on the utilization of novel tools Provision of improved privacy and security mechanisms, as well as transparency on the policy making procedures through the utilization of blockchain and decentralized approaches Unpack the main dimensions of trusted and fair AI and incorporate them into a robust and comprehensive framework that ensures lawful, ethical, inclusive, and transparent AI governance. This framework will act as a blueprint and clear guidelines, processes, and specifications to the end-users

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Table 1 (continued)

Project	Consortium	Description	Challenges	Opportunities
ITHACA (GA: 101,094,364; https://www.ithaca-project.eu/; https://cordis.europa.eu/project/id/101094364)	Coordinator: Konnekt Able Technologies Participants: 10	ITHACA project promotes responsible artificial intelligence (AI) practices aligned with human rights and democratic principles. It assesses AI's potential to enhance citizens' participation in local governance and empower vulnerable groups **Objective**. ITHACA provides a data governance framework, policy recommendations for embedding ethical values in AI civic engagement platforms	Frequently mentioned principles for ethical and trustworthy AI are vague when it comes to diversity and fairness. Individuals from socially vulnerable groups, who are already at risk of discrimination through biases in AI and are less represented in online political discourses and civic participation are at risk of being left behind if their needs and requirements for civic engagement are not explicitly considered	As the opposite of exclusively perceiving AI as risk, in the ITHACA project, the positive potential of AI is considered and exploited to ensure accessibility and usefulness for all citizens, especially for those who have often been excluded from civic participation or who usually face barriers and obstacles. In ITHACA, including citizens from vulnerable groups and those, who face obstacles in civic participation, such as the disabled, elderly, citizens from the rural area or those with language barriers, in the conceptual and technical design processes of the platform and considering their ideas and concerns, will ensure hat civic engagement is more inclusive. In addition, to reach this goal, integrated tools and metrics for the compliance of ethical principles of AI, such as fairness-metrics or privacy-preserving-machine learning tools will be developed
KT4D (GA: 101,094,302; https://kt4democracy.eu/; https://cordis.europa.eu/project/id/101094302)	Coordinator: Trinity College Dublin Participants: 10 Partners: 1	The Knowledge Technologies for Democracy (KT4D) project is investigating how democracy and civic participation can be better facilitated in the face of rapidly changing knowledge technologies-such as Artificial Intelligence (AI) and Big Data **Objective**. KT4D aims at enabling actors across society to capitalise on the many benefits these technologies can bring in terms of community empowerment, social integration, individual agency, and improved trust in both institutions and technological instruments while identifying and mitigating potential ethical, legal and cultural risks	Ethical tools and guidelines for the development of technologies typically do not focus on the impact of technologies on civic participation and democracy, and the ways that data and perspectival bias influence the development of technology Current regulatory approaches often miss out important cultural dimensions such as beliefs, languages, norms, creativity, history and the collective sense of self	Utilising knowledge technologies to better facilitate democracy and civic participation Capitalising on benefits of knowledge technologies for democracies including community empowerment, social integration, individual agency, and improved trust in both institutions and technological instruments

and the digital humanities help us to understand the long term trends, and in particular how software and culture intersect. Additionally, linguistics brings specific knowledge from the analysis of communicative patterns and conflict dynamics, which can inform the design of AI-supported platforms that foster constructive, dialogue-based deliberation and prevent the escalation of conflict in participatory processes.

This book triangulates data and knowledge from multiple sources to offer a comprehensive and grounded exploration of the evolving relationship between AI and democracy. It draws not only on an extensive body of academic literature—covering both the technological foundations of AI and the democratic processes it increasingly influences—but also on the concrete experiences and findings of four projects.

From a methodological perspective, this book builds upon a multi-layered approach:

1. **Conceptual insights and literature analysis**. Each chapter maps a specific topic on the evolving landscape of AI and democracy through a critical review of existing literature, establishing a robust theoretical foundation.
2. **Empirical grounding through projects as a whole and eventually their specific use cases**. The initial conceptual insights are then mapped against the concrete project and their use cases, building upon first-hand knowledge to illustrate how the theoretical dimensions are addressed, tested, or challenged in real-world scenarios.
3. **Exploration of socio-technical solutions**. The book highlights the socio-technical approaches being considered or implemented across the projects to enhance democratic opportunities while mitigating the associated risks and challenges posed.

Through this triangulation, the book connects theory and practice, using the projects as living laboratories that exemplify how AI is being integrated into democratic systems across different contexts. This book specifically benefits from a consistent and dynamic experimental setting provided by the four projects—that serve as both its foundation and its testbed. These projects have granted the authors first-hand access to ongoing research, design processes, and experimentation in deliberative democracy and policy-making, offering privileged environments in which theoretical insights could be developed, tested, and refined. The direct involvement in these initiatives has not only deepened the empirical grounding of the book but has also enhanced the practical applicability of its findings, ensuring that conceptual frameworks are continuously informed by real-world challenges and solutions.

Crucially, each project brought distinct perspectives, stakeholder engagements, and empirical data, enabling a multifaceted exploration of AI and democracy. By synthesizing insights from these projects with critical perspectives from the literature, the book structures its discussion into a coherent framework that captures the complexity of emerging topics while examining how technologies can be designed or co-design to reinforce democratic principles. In so doing, this book bridges academic debates with real-world experimentation, offering both theoretical and actionable insights.

This work is further enriched by adopting a design-as-research approach—a direction promoted by scholars such as Cross (2006), Laurel (2003), and Schön (1983) to merges academic inquiry with practical, design-led experimentation, emphasizing iterative learning, reflection-in-action, and the situated knowledge that emerges through doing. By positioning design not just as an outcome but as a method of inquiry, the book bridges the gap between abstract theoretical models and their implementation in real policy and governance contexts.

This book is also deeply informed by the research-through-design paradigm (Findeli 1998; Jonas 2007; Koskinen et al. 2011), a methodological approach particularly well-suited to Research and Innovation Actions (RIAs) such as the four European projects contributing to this volume. Research-through-design frames the creation of knowledge as a process that unfolds through making, testing, and reflecting—within the context of real-world projects and practical experimentation. Rather than isolating theory from practice, this approach encourages their co-evolution, ensuring that both conceptual insights and applied strategies are deeply grounded in actual socio-technical contexts. In the case of this book, the research-through-design methodology has guided the development of new tools, processes, and frameworks for democratic engagement, shaped by iterative experimentation within ORBIS, AI4GOV, ITHACA, and KT4D. This has allowed the authors to explore how AI can support democratic processes not only in theory but also in actionable, implementable ways. By embedding design-led inquiry within live policy and civic settings, the approach ensures that proposed solutions are responsive to complexity, adaptable to diverse environments, and focused on improving digitally-enhanced participation frameworks in meaningful ways. By employing this comprehensive and integrative approach, the book offers a more dynamic and responsive understanding of how AI-supported democracy can engage citizens and transform deliberation, easing participation and supporting the shift of its outcomes towards operationalisation.

5 Aims and Impact

This book aims to meaningfully contribute to—and further stimulate—the ongoing debate among academics, policymakers, practitioners, and other key stakeholders engaged in the evolving intersection of AI and democracy. Rather than treating technological, social, ethical, and institutional dimensions in isolation, it weaves them together to form a coherent and actionable understanding of the field. It seeks to advance collective understanding of both the opportunities and the challenges posed by AI, fostering dialogue that spans regulatory, technological, social, and cultural dimensions of innovation. By offering a multidisciplinary and practice-oriented perspective, the book aspires to support the development of democratic systems that are not only more inclusive and transparent, but also resilient and adaptive in the face of rapid technological change. Through critical analysis, grounded case studies, and actionable insights, the book ultimately strives to inform future

policy, guide ethical innovation, and inspire new approaches to civic engagement and governance.

This book is intended for a diverse and interdisciplinary audience working at the intersection of AI, governance, and democratic innovation. It is particularly relevant for public administrators and policymakers engaged in the design and regulation of digital public services, as it offers concrete insights into how AI-enhanced tools can be aligned with democratic values such as inclusivity, transparency, and accountability. Designers, civic technologists, and AI developers will find approaches and actionable methodologies—ranging from data storytelling and explainability techniques to co-creation and prototyping practices—that support the implementation of human-centered and trustworthy AI systems. The book also targets researchers and students in public administration, political science, design studies, HCI, and STS, who will benefit from the combined theoretical and empirical contributions of four Horizon Europe projects (ORBIS, AI4GOV, ITHACA, KT4D). Additionally, civil society organizations and civic innovation labs will find useful models for engaging stakeholders and mitigating risks of exclusion and opacity in AI deployment. By integrating case studies, technical experimentation, and participatory methodologies, the book offers a robust foundation for anyone seeking to understand and shape the socio-technical architectures and practices of democratic AI.

To address the multifaceted challenges and pressing needs emerging from both scientific debates and practical experimentation, this book spans across several foundational areas of inquiry that structure its content and shape its contributions. These areas are:

- **Contextualization of AI in and for democracy**. Explore the interplay between AI and democratic governance, highlighting how data-driven processes and AI-based tools are transforming the landscape of civic participation and policy-making, favouring societal impact.
- **Improving data understandability**. Introduce integrated approaches—combining narrative techniques, visual methods, and system design principles—to make complex data and AI outputs more comprehensible and actionable for citizens, policymakers, and civil society actors.
- **Embedding data ethics in democratic innovation**. Examine how ethical frameworks inform the responsible development and deployment of AI systems in public governance, with a particular focus on transparency, fairness, and accountability.
- **Advancing human-centered AI for democratic purposes**. Discuss how AI tools and platforms can be designed and implemented through co-creation and participatory processes that center human values, foster inclusivity, and support democratic deliberation.
- **Operationalizing inclusivity**. Present technologies and design strategies that enhance inclusion within AI-mediated democratic processes, including toolkits and frameworks—such as AI4GOV's Bias Detection Toolkit—that help identify and mitigate systemic biases.

Building upon these areas, the book is structured as follows, offering a comprehensive and interdisciplinary examination that spans from theory into practice.

- **This chapter** introduces the conceptual and methodological foundations of the volume, framing AI as both a driver of innovation and a source of democratic tension. It positions the inquiry within the broader European research context, outlining the contributions of four Horizon Europe projects and situating the book within the ongoing debates around algorithmic governance and participatory innovation—thus anchoring the volume in the first area: *contextualization of AI in and for democracy*.
- **Why AI and Democracy?** deepens this contextual analysis by mapping the state of the art in AI and democratic governance. It examines the promises and perils of digital participation tools and AI use in parliamentary settings, drawing on empirical insights from the ORBIS, KT4D, AI4GOV, and ITHACA projects. This chapter consolidates the foundational understanding of how data, civic technologies, and AI are reshaping democratic infrastructures.
- **Enhancing Data Understandability** addresses the challenge of *improving data understandability*, exploring how narrative approaches, interactive design, and AI-enhanced interfaces can make data more accessible and meaningful to citizens. It introduces cases that translate abstract data into actionable insights, reinforcing public trust and engagement.
- **Data ethics** then focuses on *embedding data ethics in democratic innovation*, investigating how ethical principles—such as explainability, privacy, and fairness—can be operationalized within AI systems, and within the design processes that create them. Through concrete examples and normative reflections, it shows how co-created governance models can align data practices with democratic values.
- **Human-Centered AI for Democracy** advances the discussion into the domain of *human-centered AI for democracy*, building on the framework proposed by Régis et al. (2024) to examine how participatory design and co-creation can embed democratic values into AI systems. Drawing on all four projects, it explores how human agency can be maintained through inclusive, value-driven approaches to AI development and deployment.
- **Inclusivity in AI-enhanced Democracy** tackles *operationalizing inclusivity*, presenting methods and tools—such as participatory capacity-building frameworks and bias mitigation toolkits—that aim to reduce exclusion and promote equity and human agency in AI design and governance.
- Finally, **Future Research Directions** builds on insights from the previous chapters and looks ahead to *future directions*, identifying key research and policy challenges such as hybrid human-AI governance, algorithmic accountability, and institutional adaptation.

Across its chapters, this book leverages first-hand knowledge and innovation, experimentation in real-world, explorative settings to bridge the gap between theoretical insight and practical application. This practice-oriented approach ensures

that the book speaks to a wide audience, aiming to equip both scholars and practitioners with actionable knowledge. Researchers will find a rich conceptual framework supported by grounded data, while policymakers, designers, and civic technologists will gain practical guidance on how to implement AI systems that are more engaged, inclusive, and responsive. In doing so, the book aspires to contribute meaningfully to the ongoing development of democratic innovation—showing how AI, when thoughtfully designed and ethically governed, can support and strengthen our democracies.

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