Tackling civic participation challenges with emerging technologies

Beyond the hype

OECD Public Governance Policy Papers No. 72

OECD
BETTER POLICIES FOR BETTER LIVES

Funded by the European Union

This work was approved and declassified by the Public Governance Committee on April 9, 2025 and prepared for publication by the Secretariat.

This document was produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Note by the Republic of Türkiye

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Union

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Please cite this publication as: OECD (2025), Tackling civic participation challenges with emerging technologies, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/2cb37a30-en.

Photo credits: Cover © DavideAngelini/Shutterstock.com.

Abstract

This paper offers a comprehensive examination of the role emerging digital technologies can play in improving citizen participation. It looks, in particular, at the opportunities offered by artificial intelligence, blockchain, and virtual reality. It assesses how these tools can be used to tackle specific challenges in citizen participation, while acknowledging the inherent complexities and risks. The paper presents adaptable and replicable solutions that could inspire public authorities across the OECD and beyond. It finds that AI, blockchain and virtual reality technologies can be used to i) reduce barriers to participation, ii) increase capacities in government, and iii) ultimately empower citizens with more intelligible and accountable participatory processes. The paper concludes with a way forward outlining key actions for governments to effectively use emerging technologies to, ultimately, improve citizen participation and deliberation.

Acknowledgements

The OECD Secretariat wishes to express its gratitude and acknowledge all the institutions and individuals that have contributed to this publication. This policy paper was prepared by the OECD Innovative Digital and Open Governance Division, under the OECD Public Governance Directorate (GOV) and the leadership of Elsa Pilichowski. It was developed under the overall supervision of Carlos Santiso, Head of the Innovative Digital and Open Governance Division and David Goessmann, Acting Head of the Open Governance, Public Communications and Civic Space Unit. This policy paper was drafted by Mauricio Mejia, Paulina Boéchat and Eloise Gabadou. Bruno Monteiro coordinated the project and provided strategic comments throughout the document.

This paper is prepared by the OECD as a deliverable of the project “Improving civic participation with emerging technologies” (23PT04) that Portugal, the Netherlands and Spain, funded by the European Commission under the Technical Support Instrument (TSI). The OECD Secretariat would like to address special thanks to Jorge Lagarto, Beatriz Silva, Patrícia Paralta and Elsa Belo from LabX within Agencia para a Modernizacao Administrativa (AMA) in Portugal, M. Concepcion Martinez Tejedor, Mercedes de la Fuente Torre, Pablo Blanco Fins and Marta Sánchez di Malta from LIP within Instituto Nacional de Aministración Pública (INAP) in Spain, and Giulietta Marani, Corné Snoeij and Nitesh Bharosa from Digicampus in the Netherlands. These partners are giving decisive guidance and steering to the project activities, sharing critical knowledge, and co-ordinating the interactions with public officials and key stakeholders in their countries. Throughout the drafting process they provided indispensable inputs and insights, gave support to the data collection and draft review, and hosted activities for the research phase (such as the systemic mapping workshops). Nicole Donkers and Katiuska Tarquis-Marin from the European Commission – DG REFORM consistently provided guidance and support.

The authors would like to extend a special acknowledgement to all experts that provided insights and accepted to be interviewed: Niccolo Testi, Rebecca Marconi, Maria Pia Junquera Temprano, Luis Rodriguez, Aviv Ovadya, Naiara Goia, Ione Ardaiz, Felix Carros, Logan Duff-Meadwell, Robert Bjarnason, Colin Megill, Adriana Groh, Thiago Peixoto, Antaraa Vasudev, Atharva Joshi, Geci Karuri-Sebina, Yasmin Shapurjee, Colombina Schaeffer, Wietse Van Ransbeeck, Winston NG, and the members of the OECD Innovative Citizen Participation Network.

The authors would also like to thank OECD colleagues that provided support and comments: Bruno Monteiro, Jack Orlik, Simone Parazzoli, Joaquin Collao, Deniz Devrim, Giulia Cibrario, Ollin Pérez-Raynaud, Angela Hanson, David Winickoff, Daniel Tekla, Joanne Caddy, and Gillian Dorner.

Table of contents

Abstract 2

Acknowledgements 3

Executive summary 6

1 Introduction 9
- Emerging technologies and their interaction with the public sector 10
- Beyond the Hype: introducing the opportunities of AI, blockchain and virtual realities for the public sector 11

2 Citizen Participation and deliberation face challenges 14
- Main challenges to ensure that participatory and deliberative processes are impactful 15

3 The role of emerging technologies in tackling citizen participation challenges 20
- Emerging technologies are redefining the civic tech field 20

4 Unlocking the potential of emerging technologies for citizen participation and deliberation 31
- AI can create amplify existing threats and create new divides 32
- Blockchain can create additional security risks 32
- Virtual and augmented realities are inaccessible for a large part of the population 33
- A way forward to unlock the potential of emerging digital technologies for participation 33
- Involving the public in the design, development, regulation and governance of emerging technologies 35

Conclusion and way forward 37

References 40

Annex A. OECD Framework for Anticipatory Governance of Emerging Technologies 51

FIGURES

Figure 3.1. Pol.is visualisation of major opinion trends after a consultation 23
Figure 3.2. Panoramic AI used to bridge Citizen Assemblies 25
Figure 3.3. CoHeSIVE as an interface to co-desing public spaces 29

TABLES

Table 1.1. Different approaches and definitions to understand digital and emerging technologies 10
Table 2.1. Mapping of challenges 16
Table 3.1. Civic Tech – timeline of development 21
Table 3.2. Pol.is (or other deliberative technologies) can help address existing challenges 24
Table 3.3. Generative AI can help address existing challenges 25
Table 3.4. Blockchain can help address existing challenges 27
Table 3.5. Virtual reality can help address existing challenges 29
Table 4.1. Areas of action for governments, the participation ecosystem and civic technologists 34
Table 4.2. Opportunities of emerging technologies to address existing challenges of citizen participation and deliberation 37

Executive summary

This paper explores how emerging digital technologies—such as artificial intelligence, blockchain, and virtual reality— can improve citizen participation and deliberation. It builds on an assessment of existing gaps and barriers in participatory and deliberative processes that draws upon OECD analysis, recent case studies and interviews with diverse stakeholders including public authorities, civil society organisations, academia and civic technologists. It then analyses the potential of emerging technologies to address and solve these challenges. It offers a particular focus on the experience of the Netherlands, Portugal and Spain.

It leverages extensive OECD work in open government, citizen participation, CivicTech and GovTech, digital government and public sector innovation. In particular, it builds on previous publications including the OECD Deliberative Toolbox, the OECD Guidelines for Citizen Participation Processes, and the forthcoming paper "New Frontiers of Citizen Participation in Policy Making", as well as in-depth research on digital technologies and its interaction with the public sector. The paper contributes to the global discussion on democracy in the digital age, in particular to the OECD Reinforcing Democracy Initiative and its Action Plan on Transforming Public Governance for Digital Democracy. This paper is part of a collaboration with Portugal, the Netherlands and Spain with the support of the European Commission under the Technical Support Instrument (TSI) on "Improving civic participation with emerging technologies" (23PT04). The paper "Partners in participation: Key insights from innovation ecosystems for civic participation and emerging technologies in Portugal, the Netherlands and Spain" provides additional evidence and more in-depth analysis of the field and actors at the country level.

Key findings

This paper explores the potential of emerging technologies, moving beyond traditional applications such as participation platforms, tools leveraging data, data analytics, and online peer-to-peer collaboration. While acknowledging the foundational work in these first-generation technologies, it focuses on the next wave of innovation. Specifically, the paper examines the opportunities of technologies powered by advancements in artificial intelligence, cryptography, and virtual reality.

It takes a pragmatic approach to explore the benefits of emerging technologies by looking at how these technologies can solve or address existing challenges faced both by governments and citizens in the cycle of a participatory process, from design to the implementation of its results.

This paper looks at the following challenges:

1. Evidence shows that a significant proportion (44% on average across OECD) of citizens tend not to **trust** their governments, nor that the government would adopt the opinions expressed in a public consultation (44.6% on OECD average).
2. **Impact** of participation can be hindered by lack of feedback and accountability.
3. **Institutional challenges** and disconnection with decision-making processes remain a barrier to impact.

4. Participatory processes are not always **inclusive** nor accessible.
5. **Poorly designed** processes can create barriers to participation.
6. **Isolation** from the broader society can hinder legitimacy and impact.
7. Participatory and deliberative process can be vulnerable to **undue influence**.
8. Public authorities usually lack adapted **capacities and resources.**

Building on case studies and desk research, the paper finds eight areas of opportunity for emerging technologies to help address existing challenges. 1) Blockchain technologies can **increase trust** in participatory processes by enabling secure and resilient electronic voting. 2) AI-powered technologies can help increase the **impact** of participatory processes by helping governments analyse and make sense of large amounts of inputs. 3) AI moderation can **expand the reach** of deliberation by enabling massive online conversations. 4) Generative AI can **lower the barriers to participate** by helping the public navigate complex or technical language and provide assistance to participants. 5) VR/AR can increase **empathy and lower barriers** of participation by enabling simulated scenarios and connecting with real-life evidence. 6) Virtual and augmented realities can **improve the design of participatory processes** by creating immersive and dynamic experiences for participants. 7) AI and Gen AI can augment the impact of participatory and deliberative processes by **connecting small group processes with the broader public,** thus enhancing legitimacy and societal engagement on the addressed policy issue**.** 8) Blockchain can **shield participatory processes from vulnerabilities** or security risks, mainly through authentication applications.

Among these technologies, **AI stands out as the most promising for immediate and further study.** Blockchain has yet to demonstrate substantial real-world impact in the context of participation, and despite its potential to create immersive and engaging platforms for participatory experiences, virtual reality remains in an exploratory phase with limited practical applications to date.

The paper also highlights risks governments might face when deploying emerging technologies in participatory and deliberative processes, for example, mistrust in the processes, threats to civic space, inequalities of access and use, online toxic environments, privacy threats, and increased environmental impact. It also suggests actions and guardrails governments can put in place to mitigate such risks.

Key recommendations

This paper suggests a list of actions for governments, the participation ecosystem (civil society organisations, designers, evaluators, researchers, facilitators, innovators, etc.) and civic technologists to ensure emerging technologies have a positive impact on participatory and deliberative processes:

- Ensure transparency, accountability and contestability of emerging technologies used in participatory and deliberative processes. For example, by designing dedicated guidelines, tools and promoting and enabling scrutiny thanks to open source, open code, and documentation through standards or registries.
- Promote inclusion and equality in the use and access of emerging technologies by providing an in-person or analogue alternative to all participatory processes and investing in digital skills both in government and across society.
- Enable experimentation and innovation in participation by supporting research and development in and outside government and promoting uses of emerging technologies in participatory and deliberative processes.
- Protect human rights and civic freedoms as inherent to the development and deployment of emerging technologies in participatory or deliberative mechanisms by establishing complaint mechanisms, elaborating ethical guidelines and guardrails for the use of emerging technologies in citizen participation.

- Nurture innovation and participation ecosystems by committing to open source as an enabler of greater transparency and effective collaboration, and by building communities of practice or networks to support learning, peer-to-peer support and collaboration.
- Provide adequate support to develop, adopt and scale emerging technologies by investing in developing the right skills and capabilities in the public sector, ensuring sustainable funding mechanisms or supporting digital public infrastructures.
- Involve the public in the design, development, deployment, regulation, and governance of emerging technologies so as to build trust and promote the development of technology in line with democratic principles.

1 Introduction

OECD countries have been experiencing a gradual erosion of public trust. On average, across OECD countries, only 39% of people have high or moderately high trust in their national governments[1].

Nevertheless, OECD data also shows that countries can act to improve citizens' trust by creating regular and meaningful opportunities for citizens to be part of policy and decision making. OECD data shows that perceptions of having a say in government actions influence trust more than socio-economic and demographic characteristics do (OECD, 2024[1]). In 2024, on average, among those who reported having a say in what the government does, 69% report high or moderately high trust in the national government, in contrast to only 22% among those who feel they do not have a say, representing the largest trust gap.

Many governments, in particular at the local level, are exploring mechanisms such as participatory budgeting, consultation, direct mechanisms such as referenda or petitions and deliberative processes. The OECD has collected almost 800 deliberative cases from 34 countries, with 96% of those situated within OECD members. For example, France, Spain, the Netherlands, and the United Kingdom have organised citizen assemblies on climate issues at the national level, and the European Union used these mechanisms to gather citizens across the Union to deliberate on future-looking issues such as virtual worlds and energetical transition.

Governments are increasingly adopting digital technologies to transform the way they interact with the public, both in formal channels (public consultations, participatory budgeting, etc.) as well as informal channels such as social media. Cities like Barcelona (Spain), the Hague (Netherlands), or Valongo (Portugal) have deployed digital tools to enable citizens to suggest ideas and vote in consultations. Emerging technologies can open a new range of opportunities for citizen participation. For example, AI and virtual reality can improve the reach and effectiveness of participatory and deliberative processes, addressing challenges such as inclusion and the provision of information. However, emerging technologies also pose new risks that need to be accounted for and addressed to ensure they can deliver their full potential. Although emerging technologies can provide an exciting and experimental prospect to solve participation challenges, the approach adopted aims to navigate this subject without succumbing to techno-solutionism nor to techno-pessimism. The paper does not advocate technology as a silver bullet to the challenges of participation or deliberation, neither will it discount technology's potential to innovate and usher in new approaches and tools to address well-established barriers and hurdles.

The content and findings of this paper are based on desk research, a comprehensive literature review, and interviews with leading professionals in the field of emerging technologies and participation from public administration, private sector, academia, and international organizations. Its purpose is to support public authorities across the OECD in improving citizen participation with emerging technologies by exploring (i) the potential benefits, (ii) challenges and (iii) outlining key actions for governments to effectively leverage emerging technologies, with the ultimate goal of improving citizen participation.

[1] OECD Trust Survey (2024)

Emerging technologies and their interaction with the public sector

The OECD has undertaken significant work on digital technologies and its use in the public sector. This research builds upon existing work published by the OECD on the matter, including Blockchains Unchained: Blockchain Technology and its Use in the Public Sector (Berryhill, Bourgery and Hanson, 2018[1]), State of the Art in the Use of Emerging Technologies in the Public Sector (Ubaldi et al., 2019[2]), the Uncertain Promise of Blockchain for Government (Lindman et al., 2020[3]), the OECD Framework for Anticipatory Governance of Emerging Technologies (OECD, 2024[4]) and the work done by the OECD's Observatory for Public Sector Innovation in particular Hello, World: Artificial Intelligence and its use in the Public Sector (Berryhill et al., 2019[5]).

Table 1. Different approaches and definitions to understand digital and emerging technologies

Scope	Definition
Technology	"The knowledge, concepts, experimental processes, tangible and intangible artefacts and wider socio-technical systems that are required to recognise technical problems and to conceptualise, formulate, research, develop, test, apply, diffuse and maintain effective solutions to those problems as they change through time". Nightingale (2014)
Digital technology	"Information and communication technologies (ICTs), including the Internet, mobile technologies and devices, as well as data analytics used to improve the generation, collection, exchange, aggregation, combination, analysis, access, searchability and presentation of digital content, including for the development of services and apps." OECD (2014)
Emerging technology	"Emerging technologies, from synthetic biology and neurotechnology to AI, immersive and quantum technologies, are characterised by rapid development and uncertainty in trajectory and impact". OECD (2024) "Those technologies of recent adoption, or currently under development, offer disruption to the current operating models of government and allow for innovative solutions for public policy and service delivery, and to the socio-economic context overall."Ubaldi et al (2019) "Emerging technologies have the potential to reshape industries, economies, and societal structures, presenting both opportunities and challenges for organizations of all sizes and types". World Economic Forum (2024)

Source: Author's own elaboration

From a legal and regulatory perspective, emerging technologies represent a challenge for the discipline as they are rapidly changing and uncertain in their development development (Rodriguez, Green and Lubomira Kubica, 2021[6]). Existing legal concepts and tools such as copyright, intellectual property, liability, privacy – must (re)adapt. They may also alter the legal practice itself by introducing new processes (e.g. smart contracts based on blockchain) or by improving them (e.g. the automation of tedious tasks or the use of natural language processing (NLP) to enhance research or drafting). For example, the increased use of generative artificial intelligence (Gen AI) to create content such as images, music and video is challenging the existing legal tools that protect intellectual property.

From an access and usage perspective, emerging technologies are technologies that have not yet been widely used or experienced by the majority or have not yet reached everyday life ((Pink et al., 2020[7])). Technology in general follows this logic: the closer one gets to expert communities, the more concrete is the understanding; the farther away, the more abstract. This is especially specific to emerging technologies as they are characterised by their uncertainty in development and applications, a necessity for deep technical understanding and the speculation around them ((Moore, 2014[8])). For example, virtual and augmented realities have been part of popular culture mainly through science fiction but remain still far from the everyday life.

From an economic perspective, emerging technologies can be at the origin of new markets, by introducing innovative solutions or replace existing markets by presenting alternatives to established products and services. Emerging technologies can impact the labour market by creating new jobs, while transforming others through task automation, generating demand for new skills and introducing skill gaps, provoking wage disparities, and changing the overall work environment. Moreover, emerging technologies can alter

the economy by bringing radical innovation (e.g. quantum computing) known as product innovation, or old technologies that are used in new contexts, known as position innovation (e.g. AI as search engines) ((Tidd and Bessant, 2005[9])).

From an innovation perspective, emerging technologies are based on fields of expertise that are still developing, distinguishing them from "mature technologies" which are well established technologies and "zombie technologies", technologies that have a robust knowledge base but are no longer actively supported or developed (e.g. fax machines). Emerging technologies are therefore characterised by experimentation and evolving expertise, occupying a dynamic space where innovation and uncertainty intersect. They represent a breakthrough in terms of computational capabilities (storage capacity, processing power), engineering (algorithmic sophistication, new interfaces), data science (data handling and treatment), or scientific knowledge (material science and manufacturing processes). Technologies can be considered as emerging even when they have existed for an extended time, if their development and scale of adoption face a substantial increase in society and the economy. For example, in recent years AI has shifted from mostly existing in a niche space of experimentation and deployment to massive adoption in everyday activities of governments, businesses, and individuals.

From a political perspective, emerging technologies are those whose potential applications and limitations have not yet been widely explored or discussed in the public domain. This means that the public is still building an opinion and defining the red lines and guardrails to adopt to avoid negative or abusive uses of such technology. Emerging technologies might have been present in the popular culture or collective imagination but are not yet embedded or translated into normative practices, such as policies or politics ((Godhe and Goode, 2018[10])). For example, the emergence of AI technologies is prompting governments to discuss the limits or ethical red lines, for example on the uses of AI for security purposes in the public space.

Beyond the Hype: introducing the opportunities of AI, blockchain and virtual realities for the public sector

Building on previous OECD work, case studies and desk research, **this paper identified three emerging technologies with real opportunities to improve how governments work and deliver: artificial intelligence, blockchain and virtual realities.** This section briefly reviews the use of artificial intelligence, blockchain and virtual realities by governments as context for subsequent sections that explore the specific opportunities for their application in addressing the existing challenges of citizen participation and deliberation.

Artificial intelligence (AI)

The OECD has adopted the following definition: "*an AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment*."[2]

The promise of AI for governments is high and can be clustered around three main potential transformations (OECD, 2024[11]):

[2] The OECD published further guidance on the definition of AI which can help the reader understand AI systems and its components: https://oecd.ai/en/wonk/definition

- **Productivity enhancement**: AI can streamline internal government operations and improve the effectiveness of public policies. It can automate repetitive administrative tasks, allowing public officials to focus on more complex and strategic functions.
- **Responsiveness and inclusivity**: AI can help governments design and deliver more proactive and personalised public services, making them more responsive to citizens' needs.
- **Accountability and oversight**: AI can bolster government accountability by enhancing the capacity for oversight and red-flagging potential fraud risks.

Blockchain

The OECD (2022[12]) defines blockchain as "*all types of Blockchain technologies and distributed ledger technologies (DLT), including the protocol, network, and application layers. DLT is a combination of technologies that together create a digital, shared and self-updating ledger of verified transactions or information among parties in a network based on innovative database technologies, including blockchain technologies. DLT uses various types of multi-party consensus mechanisms to validate and record transactions and has various governance systems, ranging from "centralised" models through to instances where there may be no control by a central authority(ies) (also known as "decentralised").*"[3]

The original promise of blockchain is to enable a secure transfer directly between parties. In other words, blockchain provides a technical infrastructure for decentralised, transparent and auditable transactions without an intermediary (Lindman et al., 2020[13]). Most use cases by the public sector correspond to ensuring integrity of data records (e.g. in case of electronic voting, public tender, citizen records), eliminate dependency upon a third-party organisation which may not be trustworthy (Ubaldi et al., 2019[14]), or in the cybersecurity field. Despite hundreds of pilots, there have been few government success stories related to blockchain implementation. Scepticism and cynicism are on the rise as this technology appears to be entering the proverbial "trough of disillusionment" common among emerging technologies as they inch towards maturity and a fuller understanding. The Illinois Blockchain Initiative reported more than 200 public sector blockchain initiatives by 2017 which most of them were inactive in 2020 (Lindman et al., 2020[13]).

Virtual and augmented realities

Recent reports by the OECD[4] and European Commission[5] provide a policy-centred perspective to understand the diversity of immersive technologies which can be understood as part of a continuum between fully real to fully virtual:

- **Virtual reality** (VR) completely replaces a user's surroundings with a digital environment using a head-mounted display (HMD) with two near-eye displays, one for each eye creating a fully immersive 3D environment (DigitalCatapult, 2024[15]).
- **Augmented reality** (AR) creates an immersive experience for users by blending the real with the virtual. AR seamlessly blends the digital and physical worlds by allowing a user to overlay digital objects in a physical space. For example, the famous videogame Pokémon Go (DigitalCatapult, 2024[15])

[3] For additional definition on blockchain for a public sector perspective, the reader can consult (Ubaldi et al., 2019[14]) and the OECD Blockchain Primer: https://cdn.gihub.org/umbraco/media/2431/oecd-blockchain-primer.pdf

[4] 2024 Digital Economy Outlook's chapter on VR: https://www.oecd-ilibrary.org/sites/a1689dc5-en/1/3/5/index.html?itemId=/content/publication/a1689dc5-en&_csp_=5cbbea11094afe4b75c96b4a3ec0bcd2&itemIGO=oecd&itemContentType=book#sect-75

[5] Report on Next Generation Virtual Worlds https://publications.jrc.ec.europa.eu/repository/handle/JRC133757

- **Extended realities (XR)** offer an umbrella term that covers all forms of virtual, augmented and mixed reality technologies as well as all the different degrees of immersion and interaction offered to the user to engage with virtual contents (Hupont Torres et al., 2024[16])
- **Virtual worlds (metaverse)**: immersive environments based on augmented reality (AR), virtual reality (VR), mixed reality (MR) and other extended reality (XR) technologies that enhance the realism of virtual experiences, blurring the lines between the physical and digital worlds. The term metaverse is broad, not well-defined and overused. The term, which came from science fiction, is a future-oriented concept that has spread to video game developers and academia. (OECD, 2024[17]). With an estimated global growth of EUR 800 billion by 2030 and a potential 860 000 new jobs created by 2025 in the European Union, virtual worlds are set to transform all sectors alike from industry, business and public sectors (Hupont Torres et al., 2024[16]) .

Uses of VR/AR technologies by the public sector are still scarce and mostly on pilot or experimentation levels. In the majority of cases, governments are using immersive technologies to provide an advanced delivery channel (an additional way of providing online access) for public services, and to transform it into a personalised experience tailored to an individual pattern and behaviour.

2 Citizen Participation and deliberation face challenges

Citizen participation refers to the efforts by public institutions to hear the views, perspectives, and inputs from citizens and stakeholders. Participation allows citizens and stakeholders to influence the activities and decisions of public authorities at different stages of the policy cycle, and at all levels of government. The OECD Recommendation of the Council on Open Government (OECD, 2017[18]) distinguishes among three levels of participation, which differ according to the level of involvement:

- **Information**: an initial level of participation characterised by a one-way relationship in which the government produces and delivers information to citizens and stakeholders. It covers both on-demand provision of information and "proactive" measures by the government to disseminate information.
- **Consultation**: a more advanced level of participation that entails a two-way relationship in which citizens and stakeholders provide feedback to the government and vice-versa. It is based on the prior definition of the issue for which views are being sought and requires the provision of relevant information, in addition to feedback on the outcomes of the process.
- **Engagement**: when citizens and stakeholders are given the opportunity and the necessary resources (e.g. information, data, and digital tools) to collaborate during all phases of the policy-cycle and in the service design and delivery. It acknowledges equal standing for citizens in setting the agenda, proposing project or policy options and shaping the dialogue – although the responsibility for the final decision or policy formulation in many cases rests with public authorities.

Governments can involve the public through different mechanisms, spanning from consultations to representative deliberative processes[6]. The OECD Guidelines for Citizen Participation Processes (2022[19]) provide detailed guidance and cases for eight different methods that governments can use to involve citizens in policy making:

- **Access to information and data**: Publishing information proactively and providing information reactively.
- **Open meetings and townhall meetings**: Gathering the public in face-to-face meetings with public authorities, in order to provide information and openly discuss topics of interest.
- **Public consultations**: A two-way relationship in which participants provide feedback to a public institution (such as comments, perceptions, information, advice, experiences, and ideas).
- **Open innovation** (crowdsourcing, hackathons, and public challenges): Tapping into the collective intelligence to co-create solutions to specific public problems via crowdsourcing, hackathons, or public challenges.

[6] To consult additional OECD resources on the benefits of citizen participation and deliberation, as well as guidance for governments: https://www.oecd.org/en/topics/sub-issues/open-government-and-citizen-participation/innovative-public-participation.html

- **Citizen science:** Involving citizens in one or many stages of a scientific (or evidence-based) investigation, including the identification of research questions, collection of data and evidence, conducting observations, analysing data, and using the resulting knowledge.
- **Civic monitoring**: Involving citizens in the monitoring and evaluation of public decisions, policies, and services. Civic monitoring can be considered as a social accountability mechanism.
- **Participatory budgeting**: Mechanisms that allow citizens and stakeholders to influence budgetary public decisions through the direct allocation of public resources to priorities or projects or by being involved in public deliberations.
- **Representative deliberative processes**: A randomly selected group of people who are broadly representative of a community spending significant time learning and collaborating through facilitated deliberation to form collective recommendations for policy makers.

Main challenges to ensure that participatory and deliberative processes are impactful

Participation and deliberation face a series of challenges to ensure a positive contribution to democracy and trust. These challenges are not new nor emerging, having been identified by the OECD, practitioners and scholars. For example, Edelenbos (1999[20]) discusses challenges of process design and process management, pondering on how participation should be included in the policy cycle and how the process should be managed to produce the most effective outcomes. Kurkela et al (2024[21]) point out the relevance of building a culture of participation through trust and citizen empowerment, while Abas (2023[22]) stresses the lack of financial resources, low efficiency, language barriers and lack of adequate skills.

Building on evidence collected through interviews with the Netherlands, Portugal and Spain as well as the work with pilot projects throughout the European Union[7], **the OECD identified eight clusters compiling the most pressing challenges[8] faced by both civil servants and citizens when designing and implementing participatory processes**. These challenges unfold in distinct ways depending on the specific context and affect differently the actors involved (e.g. governments, citizens, specific groups, practitioners). Following sections will demonstrate how governments can make use of emerging technologies to address these challenges.

[7] For more information on the collaboration between the OECD and the European Commission's Directorate General for Regional and Urban Policies: https://www.oecd.org/en/publications/engaging-citizens-in-cohesion-policy_486e5a88-en.html

[8] These challenges were collected through a variety of sources, such as desk research and literature review, and evidence from implementing 11 pilots in the European Union. They then underwent a round of validation with the Expert Panel assembled for this specific project and the OECD Innovative Citizen Participation Network (ICPN).

Table 2. Mapping of challenges

Category of challenge	Concrete challenges faced by both public authorities and participants
Trust	• Low levels of public trust, in particular, not feeling that participation will have an impact. • Lack of confidence in citizens' skills and abilities to make informed decisions on policies.
Impact	• Difficulty to evaluate the impact of participation. • Low levels of accountability after a participatory process. • Inconsistent feedback loop. • Low levels of impact on decision making. • Challenges in making sense of inputs received, such as analysing large volumes and understanding trends and conflicting interests.
Institutional	• Lack of awareness or incentives in public administration • Low levels of institutionalization. • Disconnection from representative institutions and decision-making processes
Inclusion	• Exclusion of usually underrepresented or marginalized groups. • Process not accessible for individuals with special needs. • Technical and complex language.
Design	• Unappealing processes • Multiplicity, opacity, and complexity of participatory processes. • Gaining and maintaining participants' interest.
Isolation	• Gap between process (and its outcomes) and the wider public
Integrity	• Vulnerability to undue influence or policy capture by interest groups.
Resources	• Lack of resources, be they human or financial. • Limited capacities and skills to organise (government officials) and to participate (citizens)

Author own's elaboration

1. A significant portion of citizens do not trust their governments nor the outcomes of a participatory process.

The OECD defines trust as "a person's belief that another person or institution will act consistently with their expectation of positive behaviour" (OECD, 2024[23]). According to the 2024 Trust Survey, only 39% of citizens trust their national government and less than 40% are convinced that a majority view against a national policy would be enough to nudge governments to review its implementation.

There is a strong sense that public authorities are not properly taking into account the inputs received or are implementing participatory processes as a box to be ticked or as a communication exercise (Slaev et al., 2019[24]) (Ianniello, Iacuzzi and Brusati, 2019[25]). On average across OECD countries, only 32% of citizens find it likely that the government would adopt the opinions expressed in a public consultation (OECD, 2024[23]). Participatory processes that are not followed up, or are perceived as pointless by citizens, can hinder trust in government and reinforce the perception that participation has no influence, creating frustration and deterring meaningful participation by citizens in the future (Gilman, 2022[26]).

2. Impact of participation can be hindered by lack of feedback and accountability.

Measuring the impact of participatory and deliberative processes is a long-standing issue reflected by public authorities, academics and practitioners (Abas et al., 2023[22]) (Ayano, 2021[27]) (Font, Pasadas del Amo and Smith, 2016[28]). The impact of a participatory and deliberative process can be understood in three levels: i) on decision-making, ii) on participants and iii) on society at large. Impact on participants can be deemed subjective, as it influences participants' behaviour, changing their perception and behaviour (for example, reducing polarisation), and possibly having a positive impact on inter-personal and public trust. For these benefits to be extended to society, then governments need make participation a habit and ensure voices are heard (OECD, 2022[19]) (OECD, 2024[23]). Impact can be hindered if public authorities do not close the feedback loop, which means communicating back to participants and the broader public on the results of the process. Lack of feedback and clear accountability mechanisms can reinforce the perception that participation does not generate impact on policies and cause discourage among citizens to participate in future occasions (OECD, 2022[19]).

3. Institutional challenges and disconnection from decision-making remain a barrier to impact.

Interviews with the Netherlands, Portugal and Spain, as well as evidence from other countries including Brazil (2022[29]), Romania (2023[30]), and Czechia (2023[31]) point to important institutional challenges as a barrier to ensure participation delivers impact. Namely, low levels of institutionalisation and political will among elected representatives and policymakers. Institutionalisation refers to establishing a legal or cultural form of commitment to go beyond one-off processes and embed participatory and deliberative mechanisms into existing decision-making structures such as local councils, governments, or Parliaments (OECD, 2021[32]). This helps ensure their continuity regardless of political change, builds a culture of participation and deliberation in and out of government, and increases the opportunities for citizens to participate in public decision and policymaking. There are different ways to institutionalise participatory processes, including through legislation, by embedding them in administrative or policy processes, or by establishing permanent mechanisms.

4. Participatory processes are not always inclusive nor accessible

According to the Perceptions of Democracy Survey run in 34 countries, most minorities groups, women and low-income individuals perceive higher barriers to access representative institutions and are more sceptical about governmental institutional performance (International IDEA, 2024[33]). Participatory and deliberative practices aim at enriching and complementing traditional representative spaces such as elected assemblies by offering spaces for usually underrepresented voices to have a say. Participatory and deliberative mechanisms need to be accessible and provide enabling conditions for all who wish to participate, nevertheless, lack of inclusion remains an important challenge. People can be excluded for a variety of reasons due to social, physical, economic, or cultural factors (Gilman, 2022[26]).

Steps can be taken to ensure that deliberative processes foster accessibility and inclusion for example by remunerating participants or covering for basic costs such as transportation to attend, daycare services, or translation (OECD, 2020[34]).

5. Poorly designed processes can create barriers to participation.

Participatory processes should be designed to ensure equal standing for all participants, reach the expected outcomes and provide participants with a positive experience. Their design should not only produce process and outcome satisfaction, but also attract and maintain the attention of the public (Abas et al., 2023[22]) (Kurkela et al., 2024[21]). For example, avoiding the dominance of certain participants or groups, be it because they are more vocal, informed or aligned with public authorities' objectives is an

important point of contention to observe and counter to ensure and not discourage the engagement of all participants (Escobar, 2012[35]). In this sense, an adequate use of dialogue, enabling a safe, respectful, and open environment, where participants can not only voice their views and opinions, but also feel comfortable to advocate for them is essential to ensure engagement throughout the process (Escobar, 2012[35]).

Governments have many methodological supports to use as blueprints for the design of their participatory processes including the OECD Guidelines[9], the Council of Europe's Code of Good Practice[10] or the European Commission's corporate guidance[11] on citizen participation.

6. Isolation from the broader society can hinder legitimacy and impact.

A recurrent challenge for participatory and deliberative processes is isolation from the wider public. The connection with the broader public enables increased awareness about the process and its outcomes and supports greater legitimacy for the whole process. It is vital to involve the wider community in the conversation to increase uptake of the results, especially when those will impact the community beyond the process' participants (OECD, 2024[36]). Public communication throughout the process can help bridge the process and the broad public as well build legitimacy for the process' outcomes (OECD, 2021[32]). Alternatively, using different forms of participation in combination can support expanding the reach and diversity of voices, for example, the Forum against Fakes in Germany combined a deliberative process with online consultations.

7. Participatory and deliberative process can be vulnerable to undue influence.

Integrity is understood as "consistent alignment of, and adherence to, shared ethical values, principles and norms for upholding and prioritising the public interest over private interests in the public sector" (OECD, 2017[18]). Participatory processes can be victim of undue influence by malicious actors (including foreign organisations) or by private interests through lobbying. Lobbying and other influence activities are understood as actions aimed at promoting the interests of other influence actors with reference to public decision-making and electoral processes (OECD, 2024[37]). Lobby frameworks are especially relevant since they can increase transparency in this field, by clearly revealing, who is lobbying, for what purposes and how are they are conducting their lobbying efforts (OECD, 2024[38]). This not only allows for governments to be transparent about the activities of lobbyists and public officials, but also to understand which interests are vying for representation in policymaking (OECD, 2024[38]).

The more open and often not institutionalised nature of citizen participation processes entails the risk that their results amplify the opinions and positions of single, organised and better resourced interests in the understanding of policymakers. While representative deliberative processes are designed to reflect the composition and the interests of the society as a whole (OECD, 2020[34]), governments should strive to design accessible and transparent participatory processes to provide a level playing field to all groups and interests.

---

[9] OECD's Guidelines on Citizen Participation Processes: https://www.oecd.org/gov/open-government/oecd-guidelines-for-citizen-participation-processes-f765caf6-en.htm

[10] Council of Europe's Code of Good Practice for Civil Participation in the Decision-Making Process: https://www.coe.int/en/web/ingo/civil-participation

[11] European Commission's corporate guidance on citizen engagement: https://citizens.ec.europa.eu/document/download/ebc24405-4220-4273-9284-6ef84aa15344_sk?filename=Corporate%20Guidance%20on%20Citizen%20Engagement.pdf

8. Public authorities often lack adequate capacities and resources

Designing and implementing a participatory process requires dedicated resources to be successfully implemented and result in useful outputs for decision makers. The necessary resources vary depending on the design and implementation of the process. Some elements that will influence the amount and type of resources needed can include: the scope of the process (timeframe, number of participants), the method used, the type of recruitment, the tools, and some logistical considerations such as venues and facilitation. Resources can be human, financial, and/or technical (OECD, 2022[19]).

For example, it can take, on average, 8-12 months to set up, run and follow up on a Citizens' Assembly, as well as the costs associated with selecting venues, experts, staff, materials, remuneration or expense coverage of participants, among others can require a budget commitment spanning several thousand euros (DemocracyNext, 2023[39]). Additionally, involving the public requires specific sets of skills and infrastructures to properly engage with citizens and process the inputs receive. Public officials need skills in facilitation, empathy, active listening, and capacity to summarise large number of inputs received (Ianniello, Iacuzzi and Brusati, 2019[25]) (Kurkela et al., 2024[21]).

3 The role of emerging technologies in tackling citizen participation challenges

The idea of deploying digital technologies to improve democratic governance and institutions is hardly new, even dating back to the 1970s (Schrock, 2019[40]). Digital technologies are contributing to expanding the opportunities of citizen participation by supporting existing in-person mechanisms and enabling new forms and channels of interaction between citizens and governments. Technology is regularly used by public authorities at all levels of government to collect and analyse citizen inputs, to inform them about participation opportunities, to provide learning materials, online voting and follow-up on the implementation of the results of participatory and deliberative processes (García and Al., 2023[41]). For instance, numerous local governments in the Netherlands, Spain, Portugal regularly use digital tools to involve citizens in participatory processes such as participatory budgeting or urban planning (see Box 0.1). The OECD defines this trend as Civic Tech, meaning "the use of digital technologies to reinforce democracy by enabling the public to be informed, participate in decision and policymaking, and increase governments' responsiveness and accountability" (OECD, forthcoming[42]).

The benefits of digital technologies for citizen participation can be clustered around (OECD, forthcoming[43]) (Nesta, 2021[44]):

- **Scope**: technology can help reach out to a larger number of individuals, in broader geographical spaces.
- **Interaction**: technology can innovate in how the public participates, by for example enabling asynchronous participation or non-textual forms of interaction.
- **Efficiency**: technology can help public authorities design and implement participatory processes, and better manage inputs received.
- **Impact**: technology can augment and amplify the results of participatory or deliberative processes beyond a small group of participants.

Emerging technologies are redefining the civic tech field

The emergence of technologies provides the opportunity to reflect on the original promise and set the right expectations for the new generation of technology. This reassessment can build upon previous experiences where digital tools prove the most effective, as well as expand to new horizons offered by emerging technologies. As part of this technological process, the OECD identified four phases of the Civic Tech development since its inception in the 2000s (Knight Foundation, 2013[45]; Mabi, 2017[46]; Rumbul, 2019[47]; Political Watch, 2022[48]; Modekurty et al., 2019[49]) and finds that emerging technologies are bringing civic technologies to a new dimension.

Table 3. Civic Tech – timeline of development

Phase	Key trends	Key dates
2004 – 2008 Inception	New phase of e-Government with interest in using ICTs not only for internal operations but also for citizen-facing projects. Precursory Civic Tech initiatives, mostly developed by civil society actors, with a more pronounced focus on transparency and monitoring. Civic Tech based on open data, visualization tools, and georeferencing technologies.	**2004:** TheyWorkForYou (UK parliamentary monitoring website) – mySociety; publication of OECD report "Promise and Problems of E-Democracy" (OECD, 2004[50]) **2006:** OpenCongress (US monitoring tool) - the Sunlight Foundation **2007:** Change.org (online petition platform) **2008:** Ushahidi (Kenyan crowdsourcing platform) **2008:** Washington DC hosts the first open government data hackathon, leading to the creation of 47 apps
2009 – 2015 Growth	Amplification of a government culture shift developing in relation to the open government movement. Creation of a global community around Civic Tech, through conferences and networks. Steady rise in Civic Tech launches, with a stronger focus on participation and representation. Civic Tech based on online forums, mobile applications, wikis, surveys, and data analysis.	**2009:** Launch of Ciudadanía Inteligente (Chile) **2009:** Open Government directive by the Obama administration **2009:** Launch of Code for America **2012**: g0v civic hacking movement (Asia) **2012:** Launch of Code for All **2013:** People's Assembly (Estonia) **2014:** Launch of Pol.is and its first case study (Chinese Taipei) **2015:** launch of TICTeC, one of the leading Civic Tech conferences **2015:** peak year for project launches according to the Civic Tech Field Guide's timeline: Consul (Spain), Make.org, CitizenLab, LabHacker (Brazil), etc.
2016 – 2022 Consolidation	Maturing of the Civic Tech field: slowing down in project launches, replication of successful tools, structuring of private sector, calls from the field to reflect on the impact of initiatives. Further institutionalisation of Civic Tech, with initiatives originating from civil society or private actors now integrated by governments and Civic Tech ecosystem working more closely with institutions. Context in which public perception of technology has become more negative.	**2016:** launch of participation platform Decidim in Barcelona **2016:** participatory drafting of the constitution of Mexico City (Change.org) with 280 000 online participants. **2016:** Civic Tech Hackathon organized by the French Presidency during the OGP Summit **2017:** government technology company OpenGov acquires Open Town Hall; OECD Recommendation of the Council on Open Government (OECD, 2017[18]) **2019:** All OECD countries have a dedicated entity to lead and co-ordinate digital government, and 88% have "open by default" requirements for government data (2020[51]). **2019:** Launch of ACTE (industry trade group for digital participation platforms in Europe) **2020:** online WirvsVirus hackathon in Germany, with over 28 000 participants in 48 hours **2021 – 2022**: Conference on the Future of Europe uses automatic translation
2023 - A Fourth Age of Civic Tech	Post Covid-19 pandemic, which accelerated the digitalization of many public services and interactions with government. Emerging technologies, including artificial intelligence, blockchain, virtual realities renew interest in the civic tech ecosystem.	**2023:** The "Civic Tech Field Guide" reaches 8000 projects **2023**: Brazil launches its federal platform for participation based on Decidim **2023:** Citizens.is experiments with ChatGPT-4 in Iceland **2023-24**: Adoption of AI tools by civic tech actors (Make.org, Bluenove, GoVocal) **2024**: French Citizen Convention on End-of-Life experiments with GenAI

Source: Author's own elaboration based on (Knight Foundation, 2013[45]; Mabi, 2017[46]; Rumbul, 2019[47]; Political Watch, 2022[48]). (Modekurty et al., 2019[49])

To assess the promise of emerging technologies for the civic tech field and for democracy, the OECD suggests a pragmatic approach by looking at how emerging technologies could help solve the main challenges faced by participatory and deliberative processes previously described in section "Citizen Participation and deliberation face challenges".

Box 1. Good practices in Netherlands, Portugal and Spain

In the **Netherlands** - The OpenStad platform is an open-source tool that allows cities to promote community engagement through online voting, consultation, and participatory budgeting. Recently, the city of Enschede piloted a new version which is embedded in the official government website to integrate participation in the usual channels of communication of the government.

In **Spain** – Initially developed by the Municipality of Barcelona, Decidim is an open-source and highly customizable software. It allows governments, organizations, and communities to tailor their digital platform for participation to adapt it to their own context when facilitating consultations, debates, budget planning, and collaborative proposals.

In **Portugal** - Participa.gov is a digital platform deployed by the National government to allow citizens submit ideas, share opinions, and take part in decision-making processes.

Source*: OECD, Observatory for Public Sector Innovation – Case Study Library (2024), https://oecd-opsi.org/innovations*

Artificial intelligence can help augment participation and amplify deliberation

Artificial intelligence systems (AI) introduce new and significant opportunities to support citizen participation. AI can help governments increase the efficiency and scope of their participatory efforts, while supporting citizens in reaching consensus in large online conversations while maintaining the quality of exchanges. Nevertheless, the use of AI tools should aim at supporting human capacities on both the citizens and government sides, and not at replacing humans (Acemoglu and Johnson, 2023[52]). In other words, automated or predictive decision-making enabled by AI systems should not replace citizen participation efforts. Finally, policymakers and practitioners should focus on using AI tools to enable high quality large-scale participatory processes, instead of adopting such tools to uniquely improve the efficiency of information processing.

The main area of opportunity relies on AI's ability to make sense of large amounts of information. Governments usually face the challenge of analysing large amounts of qualitative inputs received in online or in person consultations. For example, in 2019, the French Government organised a national consultation on government priorities (Grand Débat) that gathered 1.9 million submissions through an online platform (French Government, 2019[53]). The ability of AI systems, and in particular of natural language processing (NLPs) models, to make sense of large amounts of textual inputs contributes to analysing and summarising citizen input. Concretely, AI systems can map or predict trends, cluster opinions and ideas (Arana-Catania et al., 2021[54]) (Berditchevskaia and Baeck, 2020[55]), detect outliers (Schneider and Sanders, 2023[56]), help navigate sentiments or divergences around a sensitive issue or rank content based on participants' preferences. AI can help public officials and civil servants understand and visualise citizens' priorities and opinions on the issues at stake, support them in translating large amounts of inputs into actionable recommendations that are representative of the participants' views and enable faster summary of deliberations or consultations.

Recent studies show the potential of AI to support consensus-making among large groups of people. In the United Kingdom, researchers trained a large language model (LLM) called the Habermas Machine to facilitate divisive discussions on topics like migration and climate change. This AI moderation model helped generate more agreeable and inclusive statements, leading to broadly accepted outcomes without disregarding minority viewpoints (Tessler et al., 2024[57]). AI-enhanced deliberation could help scale deliberative democracy by facilitating large online conversations or supporting human facilitators in finding common ground on complex issues. The combination of LLM capacities to summarise and process large

amount of information in different languages and build consensus could also enable transnational or multilingual deliberations, setting the path for regional or global deliberations (Miller, 2024[58]).

1. *Case study: Deliberative technologies like Pol.is can help understand citizens' voice and scale deliberation*

How does Pol.is work?

Pol.is is an AI-powered open-source software designed as a "system for gathering, analysing and understanding what large groups of people think in their own words, enabled by advanced statistics and machine learning" (The Computational Democracy Project, 2024[59]). Pol.is – as other tools like Remesh or Cortico – is part of a relatively new field of deliberative technologies which focuses on tools that facilitate inputs collection, reactions and responses to given questions or statements. Participants contribute to discussions by responding to prompt questions through short text statements, or comments, which are then sent out semi-randomly to other participants to vote on by clicking agree, disagree or pass. It uses an algorithm that clusters opinions and identifies "consensus and divisive statements", becoming a useful tool to reach consensus on controversial policy issues.

Figure 1. Pol.is visualisation of major opinion trends after a consultation

Source: https://compdemocracy.org/Case-studies

Actors

Pol.is is maintained by the Computational Democracy Project, a nonprofit organisation based in the United States and has been implemented by several public authorities in countries like Austria, Germany, the United States, and Uruguay. In 2023, the Finnish Future Fund Sitra experimented with Pol.is to conduct a national-wide consultation process on citizens' policy priorities and opinions (Sitra, 2023[60]). Different public authorities in the Netherlands including the Province of South Holland, the Municipality of Groningen and the Ministry of the Interior in partnership with research organisations such as Tilburg University have an ongoing a pilot to experiment with the use of pol.is at the national level as a way to better involve citizens in the digital era.

Table 4. Pol.is (or other deliberative technologies) can help address existing challenges

Type of challenge	Concrete difficulties faced by the participatory ecosystem	Possible solution using an emerging technology
Impact	• Challenges related to the analysis of inputs received.	• Cluster mapping can help policymakers visualise citizens' inputs, map opinions on complex topics, supporting uptake of citizen participation outcomes.
Isolation	• Gap between process (and its outcomes) and the wider public	• AI can amplify the impact of a Citizen Assembly by combining small in-person and massive online deliberations.
Resources	• Insufficient time and resources in government	• AI can scale deliberation by multiplying small, representative groups with the help of AI moderation • AI can help governments summarise and address inputs more efficiently

Source: Author's own elaboration

2. Case study: Panoramic AI can connect Citizens Assemblies to the broader public

How does Panoramic AI work?

PanoramicAI[12] is an online platform powered with generative artificial intelligence (GenAI) to make complex subjects accessible to everyone. The objective of PanoramicAI is to make the results of a deliberative process, including the learning materials, hearings, as well as deliberation of the members, accessible to a wider audience, in an easy and interactive manner. Built as a search engine format, the tool allows users to ask questions to which it answers in a bullet-point style synthesis, citing all the original sources. Panoramic uses artificial intelligence (RAG model, which means Retrieval-Augmented Generation) to first understand the intent of the request, then identify the pertinent information in a large database, to finally generate an answer from the information collected adapting it to the initial query. Panoramic guides the user by providing suggested questions or topics to explore. For example, it invites users to start the conversation by asking for more information about the deliberative process, to select one of the main topics of the Assembly, or to ask any of the following questions: "What are the conclusions of the Citizens' Convention?" or "How were religious arguments included in the deliberations?". Panoramic provides the original source for each answer and invites the user to further explore the different resources.

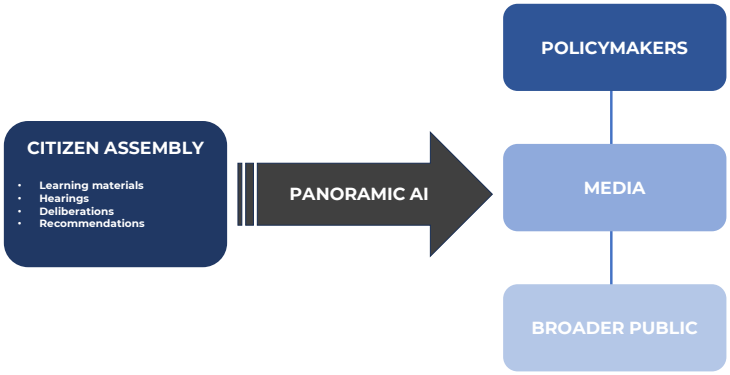
Actors

This tool was developed by a civic tech company (Make.org) and implemented in the context of the Citizen Convention on the End of Life organised by the French Economic, Social and Environmental Council (CESE)13.

[12] Accessible here: https://panoramic.make.org/about

[13] The Citizens' Convention on the End of Life gathered 184 randomly selected citizens to debate and deliberate on whether the French framework on end-of-life support was functioning or if it should be amended. More information can be accesses here: https://airtable.com/appP4czQlAU1My2M3/shrX048tmQLl8yzdc/tblrttW98WGpdnX3Y/viwX5ZutDDGdDMEep?blocks=hide

Figure 2. Panoramic AI used to bridge Citizen Assemblies



Source: Author's own elaboration

Table 5. Generative AI can help address existing challenges

Type of challenge	Concrete difficulties faced by the participatory ecosystem	Possible solution using an emerging technology
Impact	• Challenges related to the analysis of inputs received. • Low levels of impact	• It can support uptake of recommendations by the media, civil servants, and public authorities • It can make the results of the process (recommendations and deliberations) easy to navigate.
Isolation	• Gap between process (and its outcomes) and the wider public	• GenAI can connect Citizen Assemblies with the broader public by making its content more accessible, appealing, and easy to re-use.
Inclusion	• Technical and complex language.	• GenAI builds on original sources and helps the public navigate technical language whilst keeping links to original sources to facilitate fact checking and avoid oversimplification.

Source: Author's own elaboration

Box 2. Additional examples of AI being used to improve citizen participation

GoVocal - Using AI to make better use of citizens' inputs in online consultations

Municipalities across Europe like Leuven (Belgium), Linz (Austria) and Cambridge (United Kingdom) are using the online platform developed by the civic tech startup GoVocal to consult their residents. Recently, GoVocal started integrating machine-learning technologies to help civil servants process thousands of contributions and use these insights efficiently in decision-making. Concretely, civil servants with access to the back-office can use a dashboard where inputs received in a participatory process are classified and organised by clusters to visualise emerging topics, summarise trends, and group similar contributions by theme, demographic trait or location. The use of the AI sense-making tool allowed the project team to save 50% of the time required to properly process and summarise the inputs provided by the community.

Source: GoVocal (2024), case studies, https://www.govocal.com/case-studies

Blockchain and other distributed technologies can support online voting and shield participation from undue influence

Several characteristics of blockchain technology offer potential benefits for citizen participation (Ubaldi et al., 2019[14]).

- **Disintermediation**: A central intermediary or governing institution has traditionally been required to establish trust and mitigate risk among a set of independent parties that seek to enter into a transaction or agreement with each other. While these centralised bodies have effectively fulfilled their function throughout large parts of human history, they have at times grown opaque, complacent, inefficient and costly to run.
- **Resilience**: If properly designed, blockchain offers the promise of stronger resilience against cyberattacks and IT system frauds than centralised systems, thanks to its decentralised nature which prevents single point of failure that is common to centralised databases. As information is replicated simultaneously and kept in sync on all users of the network, if part of the network becomes faulty, there will always be another part that ensures continued availability of the system.
- **Immutable**: The association of cryptography, consensus protocols and collective/decentralised bookkeeping in principle guarantees that transactions are recorded irreversibly and permanently. In other words, there can only be one single version of the data/information that is visible to all participants in the network, although there is yet no way of authenticating the veracity of data/information protected in the blockchain.

The primary use case of blockchain for democratic processes is electronic voting. The possible benefits are increased security and resilience for distance voting as a way to create trust in the process and its outcome. This is particularly relevant to support voting elements in non-electoral processes (such a participatory budget or a petition) where authentication is less strict than electoral ballots. For example, doubts about the authenticity of petition signatures have been used by politicians to undermine demands from citizens (Peixoto and Steinberg, 2019[61]). Blockchain-based solutions could support distance voting with solutions to i) cast a vote, ii) audit the votes, or iii) enable voter registration or authentication (Park,

Specter and Narula, 2020[62]). Blockchain technologies might be more beneficial for authentication purposes (digital identity[14]) to be used in online voting, but as of now, cases remain anecdotical and further experimentation and research should be undertaken to clarify the clear added value for blockchain technologies to be widely deployed in democratic processes.

Case study: Vochain and other blockchain tools can support secure non-electoral voting

How does Vochain work?

Vochain is a digital ballot protocol using blockchain's decentralized technology (Tendermint) to enable "open source, decentralized, verifiable, tamper-proof & anonymous voting" (Vocdoni, 2021[63]). Vochain enables anonymity and vote security thanks to a cryptography protocol called zero-knowledge proof which allows the ballot organiser to check that a vote is from someone in the census but without revealing its identity (Vocdoni, 2021[63]).

Vochain was used in a non-binding local referendum in Bellpuig (Spain) where citizens were asked about the future of the town's funeral services. In total, 1095 residents (31.67% of eligible voters) cast their vote using Vochain as the voting protocol (Vocdoni, 2021[63]). This voting protocol is embedded in the digital democracy platform Decidim as a secure online voting module and was tested during an internal election at the Extraordinary Assembly of the Decidim Association (Haarseim, 2023[64]). It has also been used by civil society in Belarus in 2024 to counter censorship and surveillance from the Government. Another blockchain-based voting system, Voatz, was used in the Mexican Federal Elections in June 2024, for expatriate voters who signed up for remote voting.

Actors

This technology was developed by Vocdoni (a private company) and has been deployed by different organisations from public authorities such as the Bellpuig Council, private organisations like the FC Barcelona, by civil society in Belarus, and by non-for-profit associations such as Decidim.

Table 6. Blockchain can help address existing challenges

Type of challenge	Concrete difficulties faced by the participatory ecosystem	Possible solution using an emerging technology
Trust	• Low levels of trust	• Blockchain can provide a secure and resilient digital voting system, supporting public trust in participatory processes with voting mechanisms
Integrity	• Vulnerability to undue influence or policy capture by interest groups	• Blockchain can provide a resilient voting system to protect from malicious actors whilst providing a secure authentication system to avoid manipulation of results by automated machines (bots) or organised campaigns.

Source: Author's own elaboration

[14] For more information on digital identity, please refer to OECD's G20 Collection of Digital Identity Practices: https://www.oecd-ilibrary.org/fr/governance/g20-collection-of-digital-identity-practices_75223806-en

Box 3. Additional examples of Blockchain being used to improve citizen participation

Groningen municipality in the Netherlands

Blockchain technology has been implemented in the municipality through (at least) six pilots from 2016 to 2019, including a proof of concept for a digital vote-counting system during local/national elections.

Legislative citizen bills in Brazil

Mudamos is a mobile application leveraging blockchain technology that enables Brazil's citizens to participate in lawmaking by proposing their own bills and signing onto one another's proposals using verified electronic signatures.

Source: GovLab (X), Mudamos: the citizen initiative app, https://congress.crowd.law/files/mudamos-case-study.pdf

Virtual and augmented realities can improve the design, accessibility and experience of participatory and deliberative processes

Virtual and augmented realities (VR/AR) are most often associated with the entertainment industry where it has achieved modest success. Virtual and augmented realities could also represent potential benefits when applied in the context of citizen participation:

- **Developing empathy:** VR allows people to develop empathy, improve attitudes and increase prosocial behaviours than less immersive tasks such as watching a video (OECD, 2024[17]). In the context of participation, it could be used to bring real-life evidence into the decision-making process. For example, participants could experience the difficulties of people with disabilities to use public transport and reflect this experience into the design of public spaces. Developing empathy or understanding the standpoint of minorities can be positive in participatory processes to develop more inclusive policies and services that take into account the voices of usually underrepresented populations.
- **Training and learning**: A recent report by the European Commission concluded that education could become more effective and inclusive using VR/AR as it can enhance the educational experience with immersive interactive experiences, visualisations, and different kinds of communication (Hupont Torres et al., 2024[16]). In the context of a deliberative process, VR/AR could be used to improve the learning stage, which could be of particular benefit for topics that require imagination or empathy such as climate change or urban design, whilst decreasing costs related to travel for in-person learning.
- **Digital twins:** VR digital twins are used to model complex systems, often in urban planning, architectural design, manufacturing and training. In the context of participatory and deliberative processes, digital twins could increase citizens' experience by enabling immersive visualisations of cities/communities for a specific short-term check, to more long-term visualisation and simulation of complex policy decisions modelling possible consequences of certain policy choices.

3. Case study: CoHeSIVE enables participatory design through immersive technologies

How does CoHeSIVE work?

Codesigning Healthy Public Spaces via Immersive Virtual Environments (CoHeSIVE) is a methodology for urban co-design using an Immersive Virtual Environment (IVE) technology. CoHeSIVE helps "citizens and designers participate together in an urban design discussion to understand individuals' preferences for

new, not yet existing design scenarios and corresponding design implication" (Evers et al., 2023[65]) . CoHeSIVE creates an immersive virtual environment where users can modify it in real time by using a Head-Mounted Display (HDM), resembling goggles, and a gaming engine. Users can move around and interact with the space and its objects as they would in the real life. Immersive environments and digital twins provide users with an infinite canvas for urban imagination and creativity.

Figure 3. CoHeSIVE as an interface to co-desing public spaces

Simulated environment from eye-level perspective with user interface to select among options a) or b)

Source: (Evers et al., 2023[65])

Actors

This technology was developed by a consortium of research institutions (Eindhoven University of Technology, Wageningen University, Utrecht University and TMC Utrecht) and piloted for a research project on the Municipality of Eindhoven in the Netherlands. The pilot consisted of a simulation of a future station plaza of downtown Eindhoven.

Table 7. Virtual reality can help address existing challenges

Type of challenge	Concrete difficulties faced by the participatory ecosystem	Possible solution using an emerging technology
Design	• Unappealing processes • Difficulty to engage	• A virtual interactive canvas can enable dynamic processes supporting design and tangible proposals in urban settings. • It can increase empathy and build new forms of evidence by creating virtual scenarios to experience specific situations or places - helping citizens connect with different realities. • Helps participants deal with trade-offs or to select among different suggested scenarios.
Inclusion	• Technical and complex language.	• VR/AR can empower participants in processes where technical knowledge is required to better articulate ideas and suggestions by enabling more visual ideas and creative exercises.

Source: Author's own elaboration

Box 4. Additional examples of VR/AR being used to improve citizen participation

Citiverses – ITU

The International Telecommunication Union (ITU) launched the CitiVerse Initiative - a virtual environment that integrates real-world cities into digital spaces, helping local and regional governments visualise traffic, mobility planning, energy management, and pollution control. The objective is to make cities more inclusive and sustainable by enabling new forms of citizen participation.

Metaverse Seoul (Korea)

Metaverse Seoul is a Metaverse platform where citizens can access a wide array of administrative services as avatars that represent them in a three-dimensional virtual space. Citizens can navigate the 3D virtual space of Metaverse Seoul to access Seoul's wide range of administrative services, including economy, culture and tourism, education, and participate in city administration. Virtual spaces have been built into the platform as a participatory space where all citizens can get together and interact in an enjoyable environment.

Source: (Seoul Metropolitan Government, n.d.[66])

4 Unlocking the potential of emerging technologies for citizen participation and deliberation

Emerging technologies offer valuable opportunities to improve civic participation by addressing current challenges. However, the use of emerging technologies in democratic processes entails significant challenges and risks. Through its work on digital government and public sector innovation, the OECD has mapped a series of challenges governments face when developing and deploying digital technologies or GovTech[15] solutions in the public sector.

- **Digital maturity challenges:** countries' digital transformation maturity is dependent on many factors including digital literacy and skills, a data-driven public sector, among others. Adoption of emerging technologies can be hindered by low or unequal levels of digital maturity.
- **Governance and administrative challenges**: Digital technologies are often deployed by different departments and public agencies in an uncoordinated manner, which prevents the ecosystem from having a clear point of contact and hampers government's capacity to adopt a whole-of-government approach. Red tape or ill-adapted administrative processes like procurement can become a barrier to the deployment of emerging technologies.
- **Sustainability and funding challenges:** Learnings from the civic tech ecosystem point towards a funding and sustainability challenge. Emerging technologies require adequate business models and adapted sources of funding to invest in R&D, human resources, development, and impact measurement (Knight Foundation and Rita Allen Foundation, 2017[67]; Zhang et al., 2021[68]; International Republican Institute, 2023[69]).

When participatory and deliberative process are organised online or have a digital component, a new set of challenges can compound existing barriers. Among the most recurrent risks described in the literature and highlighted by public authorities in the Netherlands, Portugal and Spain:

- **Mistrust of digital technologies:** Digital technologies usually suffer from a lack of transparency and explainability which creates black boxes that are difficult to navigate for both governments and the public alike. Opacity and complexity can decrease trust in digital tools, and when these are used in democratic spaces, it can in turn affect trust in the participatory process and its outcomes.
- **Digital threats to civic space and human rights:** some governments have misused or abused digital technologies for surveillance or even to silence groups and digital opposition, thereby undermining online civic space (OECD, 2022[70]). The use of technology for surveillance purposes, content moderation, or predictive policing can threaten human rights and civic freedoms such as right to peaceful assembly and freedom of expression.

[15] OECD GovTech Policy Framework: https://www.oecd-ilibrary.org/governance/enabling-digital-innovation-in-government_6bb7d90b-en#:~:text=Innovation%20in%20Government-,The%20OECD%20GovTech%20Policy%20Framework,innovative%2C%20and%20cost%2Deffective.

- **Digital inequalities:** digital technologies can create new inequalities due to uneven access to and use of digital technologies. Factors such as limited access to high-speed internet, digital literacy, and affordable devices often exclude marginalized groups from engaging fully in online civic activities. This digital divide leads to unequal participation, reinforcing existing societal disparities and limiting the reach of participatory and deliberative processes.
- **Online harms:** Digital spaces can be impacted by the amplification of polarised positions in public debate, including through mis- and disinformation - often further amplified by algorithms. In addition, online hate and harassment can lead to the unequal weight of voices in democratic processes, often impacting women and minority communities.
- **Environmental impact:** digital technologies have environmental downsides, as data centers produce e-waste, consume large amounts of water and electricity, and rely on unsustainably mined minerals. This leads to resource strain and greenhouse gas emissions, impacting efforts to reduce global warming (UNEP, 2024[71]). This trend is particularly true for artificial intelligence and blockchain.

AI can create amplify existing threats and create new divides

While the potential of AI is promising, there are important risks to take into consideration such as language divides, opacity of algorithmic decision-making and biases, among others. Currently, AI systems are mainly trained in English, Spanish, and Mandarin, other languages being underrepresented (Peixoto, Canuto and Jordan, 2024[72]). In the context of participation, this means that inputs submitted in other languages than the main languages might not be processed and valued in the same way creating new democratic inequalities (Romberg and Escher, 2024[73]). In addition, as AI systems evolve, a new set of skills and infrastructures might be needed to harness its full potential, exacerbating an already visible digital divide in terms of access, skills, and usages.

To address the language divide, the government of Iceland partnered with OpenAI to train the Large Language Model GPT-4 in Icelandic in order to preserve the Icelandic language (Government of Iceland, 2023[74]). Similarly, the University of Turku (Finland) partnered in 2023 with the company SiloAI to build the Poro model, a family of multilingual open-source Large Language Models (LLMs) for all European official languages (University of Turku, 2023[75]).

Historical and social biases can be unconsciously encoded into AI systems due to data inequalities. This can result in a persistence and crystallization of the exclusion of marginalized groups (Chander, 2020[76]). AI moderation can affect the quality and depth of deliberation as the models might be trained to discourage diverse preferences, silencing minority views. AI could also compromise the creativity in language and reflection, focusing rather on efficiency and agreement (Peixoto, Canuto and Jordan, 2024[72]).

AI-generated content can pollute online debate and digital participatory processes (astroturfing) by amplifying specific interests and distort policymakers' understanding of citizens' preferences and opinions on a given policy issue (Kreps, 2024[77]; García-Orosa, 2021[78]).

Blockchain can create additional security risks

Some of the given benefits of blockchain can create additional risks and challenges for participatory practices. For some scholars, blockchain technologies are more vulnerable than paper ballots and can create additional and more critical security problems (Peixoto and Steinberg, 2019[61]). MIT researchers claim that blockchain-based voting would increase the risk of undetectable, nation-scale election failure and online voting may have little to no effect on turnout in practice, and it may even increase disenfranchisement (Park, Specter and Narula, 2020[62]). More importantly, given the current state of digital

security, public trust on a blockchain-enabled voting is not a given. In addition, blockchain transactions are pseudonymous, which is useful when protecting personal information, but can make it easier for ill-intentioned actors to engage in unwanted activities, such as cybercrimes or electoral interference. Moreover, blockchain, in general, remains an opaque technology for the wider public which means that both its mechanisms and implications for citizen participation are hard to grasp.

Virtual and augmented realities are inaccessible for a large part of the population

The OECD (2024[17]) mapped five major downsides and risks for virtual and augmented realities. Privacy can be at risk, particularly around the tracking of body movements and the significant amount of data collection which also facilitates the generation and potential sharing of highly detailed user profiles. Other major risks relate to behavior, social interactions, and mental health impact of such technologies in particular in children, young people and cases of addiction or overuse. VR/AR technologies remain largely inaccessible for the majority of the population both in terms of the technical interface (headsets, applications) as well as to knowledge and capabilities of usage. The democratization of these technologies would require large investments both in access to infrastructure and software as well in leveraging digital skills.

A way forward to unlock the potential of emerging digital technologies for participation

Governments can play multiple roles in translating technological progress into public sector applications that deliver public value.

- **Government as a convener**, through the adoption of an overarching strategy that showcases high-level political commitment.
- **Government as financier**, typically through the provision of direct or indirect funds to support the research, development and adoption of emerging technologies.
- **Government as direct user and co-developer**, together with public sector organisations, can act through innovative procurement practices, or as a proactive co-developer through public-private partnerships, and other forms of collaboration, to build tailored solutions.
- **Government as a regulator**, as the diversity of challenges raised by the digital transformation calls for a reassessment of existing policy frameworks, holistic approaches to ensure policy coherence and international regulatory co-operation.

Public authorities can put in place guardrails to mitigate the risks associated with emerging technologies and ensure they have a positive impact on citizen participation. Table 4.1 summarises a suggested list of actions based on existing guidance by the OECD[16] in particular the OECD Framework for Anticipatory Governance of Emerging Technologies (2024[4])[17]. These actions focus only on the intersection of emerging technologies and citizen participation, governments should implement additional guardrails when developing and deploying technology including legislation and regulatory frameworks (such as the European Union's AI Act or General Data Protection Regulation).

[16]OECD Recommendation on Digital Government Strategies (2014), OECD Recommendation on Artificial Intelligence (2019), OECD Recommendation of the Council on Blockchain and Other Distributed Ledger Technologies (2022)
[17] (see 4Annex A for more information)

Table 8. Areas of action for governments, the participation ecosystem and civic technologists

Guardrails	Concrete actions	Examples
Ensure transparency, accountability and contestability of emerging technologies used in participatory and deliberative processes	• **Designing dedicated guidelines, and tools** to steer the ethical and responsible development and use of technology. • **Promoting and enabling scrutiny** thanks to open source, open code, documentation, standards or registries.	• **Canada's** Algorithmic Impact Assessment tool • **Netherlands** Algorithm Register • The **European** Declaration on Digital Rights and Principles for the Digital Decade • **France** 's National Action Plan for Open-Source Software and Digital Commons adopted in 2021.
Promote inclusion and equality in the use and access of emerging technologies	• **Providing an in-person or analogue alternative** to all participatory processes • **Investing in digital skills** both in government and across society.	• **Portugal**'s participatory budgeting includes online and in-person mechanisms.
Enable experimentation of emerging technologies in participatory settings	• **Support research and development** in and outside government. • **Promote uses of emerging technologies in participatory and deliberative processes**	• **France** set up a partnership with universities and Make.org to launch "Democratic Commons" a global research program to build AI in service of democracy • Basque country authorities in **Spain** are partnering with MIT Lab and DemocracyNext to explore tech-enhanced deliberation • Innovation Labs can promote experimentation and collaboration among stakeholders, for example Arantzazulab (**Spain**) is experimenting with AI and deliberative processes.
Protect human rights and civic freedoms as inherent to the development and deployment of emerging technologies in participatory or deliberative processes	• **Addressing potential risks to civic freedoms** in legislations, policies and strategies • **Establishing complaint mechanisms** in the event of a discriminatory outcome of automated decision making • **Elaborating ethical guidelines and guardrails for the use** of emerging technologies in participation developed in collaboration with CSOs. • **Build partnerships and protect the digital rights ecosystem**	• The **European Union's** Declaration on digital rights and principles define citizens' rights in the digital space and develop a framework for Member States • The **OECD G7** Toolkit for Artificial Intelligence in the Public Sector translates principles for safe, secure, and trustworthy AI into actionable policies. • The **United Kingdom's** Ethics, Transparency and Accountability Framework for Automated Decision-Making making is designed to help departments with safe, sustainable and ethical use of automated or algorithmic decision-making
Nurture the innovation and participation ecosystems	• **Commitment to open source** enables effective collaboration and adaptation of tools to different contexts. • **Building communities of practice or networks** can support learning, peer-to-peer support and collaboration. • **Facilitating dedicated spaces such as innovation labs to promote collaboration** among civil servants, and between civil servants and outside innovators	• **Spain's** success with Decidim and Consul demonstrates the potential of open-source tools. • The Network of Participative Municipalities (RAP) in **Portugal**, supports knowledge sharing and gives an annual award for Good Participation Practices, while the VNG in the **Netherlands** manages aspects of digital participation technologies that are too complex for individual municipalities, such as maintaining the codebase for open-source tools. • The **European Commission** launched the Virtual and Augmented Reality Industrial coalition bringing together industry and policy makers
Build the right conditions for the development, adoption and scale of emerging technologies	• **Invest in developing the right skills** and capabilities in the public sector • **Sustainable funding mechanisms** connected to clear strategic goals can ensure that continue to be supported and developed. • **Adopt agile procurement environments** adapted to the specificities of emerging technologies. • **Support digital public infrastructure** and interoperability to scale public solutions.	• Innovation labs such as **Portugal's** LabX and **Spain's** HazLab support capacity building in government. • Programmes such as General Interest Entrepreneurs in **France** allows technical profiles to work in government • In **Germany** the Prototype Fund, a joint initiative between the **government** and Open Knowledge Germany, offers funding and training to grantees. • **Spain** developed the public large language model MarIA, tailored in the Spanish language, to support the development of Spanish digital economy

		• GovStack, a multi-stakeholder initiative led by **Estonia** supports the development and maintenance of digital publics goods

Source: Author's own elaboration

Box 5. Examples of guardrails to mitigate risks of emerging technologies

Digital inclusion in Portugal

The Portuguese government has launched the project "Eu Sou Digital" (I am digital) to promote digital literacy by connecting volunteers with beneficiaries to teach them how to navigate the internet, use email, access social media, and understand privacy.

An Algorithm Register in the Netherlands

To address the lack of transparency and auditability of AI, the government of **the Netherlands** launched in 2022 an Algorithm Register to provide information about the algorithms used by the Dutch Government and guidance to object an algorithm-based decision.

Increased oversight of AI in the Spanish public sector

Spain adopted an ambitious strategy to deploy an ethical and public vision of AI. In addition to a National Strategy, the Spanish Government established a dedicated Agency to implement the EU AI regulations and supervise high-risk AI systems. Moreover, the Spanish government is developing an AI language model trained in Spanish and co-official languages, resulting from a public-private collaboration.

Source: EuSouDigital; Building a Resilient Community in Valongo (democracy-technologies.org); How Cascais includes elderly people in digital participation (Government of the Netherlands, 2022[79])

Involving the public in the design, development, regulation and governance of emerging technologies

The relationship between participation and technology is a two-way street. This paper focuses on the ways in which technology can be leveraged to reinforce, scale, and complement citizen participation, this final section focuses on the role that participation can play in the development and regulation of emerging technologies.

Participation in science and technology is not new and is known as PEST processes (Public Engagement and Participation in Science and Technology). The OECD considers stakeholder engagement as a pillar of its Framework for Anticipatory Governance of Emerging Technologies (2024[4]) as it can "enrich the understanding of issues by contributing missing knowledge, opening problem framings, and illuminating key values at stake". Citizens and stakeholders can be involved at different stages:

- **Design and development:** participatory, or deliberative mechanisms can be employed in technological design in ways that are accessible to the larger public and do not require expertise. Citizen and stakeholder participation in technology development is particularly relevant to address value-based debates prior to the deployment and adoption of tools. For instance, citizens can have a say on the features of a specific technology through open prototyping or can contribute to the development of AI models, as the French model PIAF, which is based on a collaborative effort to build a French LLM model that grasps the diversity of accents.

- **Regulation**: the public can be actively involved in defining collective rules and norms or the red lines not to be crossed. For example, in 2021, a Citizen Assembly provided recommendations on genome editing and in 2024 to define the Belgian vision for AI (see Box 2).
- **Governance**: participation could be used as a method to collectively decide on how to govern technology. For example, the global governance architecture for the internet (ICANN) is based on a multi-stakeholder process where public authorities and non-governmental actors have an equal voice (ICANN, 2025[80]).
- **Digital commons:** Governments can choose to collaborate with non-government stakeholders through digital commons. Digital commons are "a subset of the commons, where the resources are data, information, culture, and knowledge which are created and/or maintained online. They are shared in ways that avoid their enclosure and allow everyone to access and build upon them" (Dulong de Rosnay and Stalder, 2020[81]) which contributes to their quality and sustainability. Key components of the digital commons include open content, open standards and guidelines, open data, open software, and open hardware and physical infrastructure (Gill, Baeck and Whittington, 2022[82]). For instance, mapping platform Open Street Map is a crowdsourcing digital common on which other applications are built, such as monitoring platform Ushahidi or Humanitarian Open Street Map.

Box 6. Involving citizens to improve regulation and governance of emerging technologies

EU Panel on Virtual Worlds

In 2023, the European Citizens' Panel on Virtual Worlds brought together randomly-selected citizens from all 27 member states to come up with actions needed to create attractive and fair European virtual worlds. The recommendations are reflected in the EU roadmap on Web 4.0 and virtual worlds.

Citizens' Panel on AI in Belgium

In 2024, 60 randomly selected citizens met in Brussels to deliberate over 3 weekends on the role the Europe Union could play in shaping AI. The conclusions were presented to Belgian and European representatives, including the Belgian Prime Minister and the vice-president of the European Commission. In total, 9 key messages formed what the members of the panel called the "citizens' view of artificial intelligence within the EU" (e.g. "Learn to handle AI", "AI and the environment", or "Global agreements: the EU takes the initiative").

Source: (OECD, 2023[83])

Conclusion and way forward

As documented by Schrock (2019[40]), some scholars have questioned the ability of digital technologies to truly change the power dynamics between citizens and governments. The limits stem in part from the fact that digital solutions are systemic and embedded in specific social and political contexts, and technology only plays a small part in reaching the desired outcomes. The impact of technology is closely linked to the institutional features and the surrounding political process more than the technology deployed (Mellon, Peixoto and Sjoberg, 2022[84]). This paper contributes to the global discussion on democracy in the digital age, in particular by providing evidence on how emerging technologies are reshaping the civic tech field and by identifying the areas of opportunity brought by AI, blockchain and VR/AR to improve citizen participation and deliberation. It suggests policy insights and actionable recommendations for governments to mitigate the existing and foreseeable risks of such technologies.

Emerging technologies can be useful to address certain challenges, in particular those related to impact (i.e. helping process large number of inputs), inclusion (i.e. translation and complex language), process design (i.e. interactive settings), isolation (i.e. bridge between processes and society), and resources (i.e. scaling deliberative processes). These opportunities are summarised in Table 4.2. Nevertheless, emerging technologies alone will not solve challenges related to lack of institutionalisation, low political will, or low levels of trust. Those require a combination of multiple factors that go beyond the use of technology whether emergent or not. Moreover, tech-enhanced participation and low-tech, in person engagement formats should not be seen as mutually exclusive, but combined in meaningful and complementary ways to accommodate the needs of different publics.

Table 9. Opportunities of emerging technologies to address existing challenges of citizen participation and deliberation

Emerging technology	Type of challenge	Concrete difficulties faced by the participatory ecosystem	Possible solution using an emerging technology
Artificial intelligence	**Impact**	Challenges related to the analysis of inputs received. Low levels of trust	1) **Cluster mapping** can help policymakers visualise citizens' inputs, map opinions on complex topics, supporting uptake of citizen participation outcomes. 2) It can support **uptake of recommendations** by the media, civil servants, and public authorities 3) It can make recommendations and deliberations easy to navigate.
	Isolation	Gap between process (and its outcomes) and the wider public	4) AI can **amplify the impact of a Citizen Assembly** by combining small in-person and massive online deliberations. 5) GenAI can **connect Citizen Assemblies with the broader public** by making its content more accessible, appealing, and easy to re-use.

	Resources	Insufficient time and resources in government	6) AI can **scale deliberation** by multiplying small, representative groups with the help of AI moderation 7) AI can **help governments summarise** and address inputs more efficiently
	Inclusion	Technical and complex language.	8) GenAI builds on original sources and helps the public **navigate technical language** whilst keeping links to original sources to facilitate fact checking and avoid oversimplification.
Blockchain	**Trust**	Low levels of trust	9) Blockchain can provide a **secure and resilient digital voting system**, supporting public trust in participatory processes with voting mechanisms
	Integrity	Vulnerability to undue influence or policy capture by interest groups	10) Blockchain can provide a secure authentication system to **avoid manipulation of results** by automated machines (bots) or organised campaigns.
Virtual and Augmented realities	**Design**	Unappealing processes Difficulty to engage	11) A virtual interactive canvas can enable **dynamic processes** supporting design and tangible proposals in urban settings. 12) It can **increase empathy and build new forms of evidence** by creating virtual scenarios to experience specific situations or places - helping citizens connect with different realities. 13) **Help participants deal with trade-offs** or to select among different suggested scenarios.
	Inclusion	Technical and complex language.	14) VR/AR can **empower participants in processes where technical knowledge is required** to better articulate ideas and suggestions by enabling more visual ideas and creative exercises.

Source: Author's own elaboration

Building on the OECD paper *Exploring New Frontiers of Citizen Participation in the Policy Cycle* (2024[85]), case studies, and interviews with experts[18], emerging technologies (AI, VR/AR and Blockchain) can be beneficial for citizen participation by supporting three lines of action:

- 1) **Emerging technologies can help lower barriers** to make citizen participation more inclusive by reducing language and knowledge barriers, making participation more interactive and appealing, and expanding the opportunities for participation. Improving the accessibility of citizen participation processes means providing a broader and more diverse public with the opportunities and the tools to meaningfully engage in collective decisions with qualitative contributions. For example, artificial intelligence can lower barriers by supporting automatic translation and by helping participants navigate technical or jargon language, allowing citizens to participate in their native language and to better understand the policy issues at stake. In addition, AI moderation can enable massive online conversations creating opportunities for more people to participate in deliberative and participatory processes while preserving the quality of the discussions. Virtual realities can create interactive and more engaging settings helping citizens better articulate their ideas and suggestions.
- 2) **Emerging technologies can raise capacities** among civil servants to deliver meaningful participation by supporting the back-office of participatory and deliberative processes. Artificial intelligence has demonstrated its potential to support governments in processing large amounts of

[18] See full list of interviewees in the Acknowledgments section of this paper.

inputs received in consultation and deliberative processes and AI-powered moderation which complemented with human skills can multiply public sector's capacities to run deliberative processes.

- 3) **Emerging technologies can increase accountability** and further demonstrate the impact of participation by enabling new channels to access information and communicate results, amplifying the results of processes to the broader public and the media, and shielding processes from undue influence. Chatbots and GenAI can help issue targeted communication on processes and their outcomes and support public scrutiny on the follow-up and implementation of citizens' inputs. Blockchain technologies can reduce intermediaries, ensure processes documentation and enable safer voting mechanisms that are transparent and accountable.

Emerging technologies such as artificial intelligence (AI), blockchain, and virtual reality offer significant benefits to help address existing challenges in citizen participation and deliberation. However, their adoption should be approached with caution and guided by the principle that these tools must address existing challenges rather than introduce new ones. Blockchain, while often lauded for its potential to secure and decentralize participation, has yet to demonstrate substantial real-world impact in the context of participation. Similarly, virtual reality, despite its potential to create immersive and engaging platforms for participatory experiences, remains in an exploratory phase with limited practical applications to date.

AI stands out as a particularly promising tool for strengthening democracy due to its potential to enhance the citizen-government relationship. This technology has already shown tangible benefits in improving democratic processes by facilitating more efficient analysis of large datasets, enabling more personalised citizen participation, and supporting informed decision-making. AI can transform how citizens access and use public information, how governments listen and communicate with their populations, and how individuals engage and interact with public authorities. Building on the insights of this paper and the forthcoming OECD Flagship Report on Governing with AI, the OECD will further explore the potential of AI to support democratic processes in a dedicated Policy Paper, as part of a collaboration with the the Bertelsmann Stiftung. Nevertheless, it is crucial that AI be implemented ethically and responsibly, with careful attention to issues such as privacy, transparency, bias, the protection of civic space, and accountability.

Governments can deploy different guardrails to mitigate the associated risks and ensure that emerging technologies positively impact participatory and deliberative processes. Considering the guardrails at the intersection between emerging technologies and citizen participation, public authorities should commit to ensuring transparency, accountability, and contestability by designing dedicated guidelines, tools, and standards that promote open-source and scrutiny. Inclusion and equality are highlighted through the provision of analogue alternatives and investments in digital skills for governments and society at large. The paper proposes experimentation and innovation by supporting research and development both within and outside governments and encouraging the use of emerging technologies in participatory processes. It stresses the need to protect human rights and civic freedoms by establishing complaint mechanisms and ethical guidelines to guide the deployment of these technologies. Collaboration and innovation ecosystems should be nurtured by committing to open-source practices and building networks to foster learning and peer-to-peer support. Additionally, governments are urged to provide adequate resources for the development, adoption, and scaling of emerging technologies through skill-building, sustainable funding, and investments in digital public infrastructure. Finally, the public must be actively involved in the design, regulation, and governance of emerging technologies, including before deployment, to build trust and ensure their democratic development.

References

Abas, A. et al. (2023), “A systematic literature review on public participation in decision-making for local authority planning: A decade of progress and challenges”, *Environmental Development*, Vol. 46, pp. 1-13, https://doi.org/10.1016/j.envdev.2023.100853. [22]

Acemoglu, D. and S. Johnson (2023), *Rebalancing AI*, https://www.imf.org/en/Publications/fandd/issues/2023/12/Rebalancing-AI-Acemoglu-Johnson. [52]

Arana-Catania, M. et al. (2021), “Citizen participation and machine learning for a better democracy”, *Digital Government: Research and Practice*, Vol. 2/3, pp. 1-22. [54]

Ayano, T. (2021), “A survey of methods for evaluating mini-publics”, *Asia-Pacific Journal of Regional Science*, Vol. 5/1, pp. 1-19, https://doi.org/10.1007/s41685-020-00183-3. [27]

Bakhanova, E. et al. (2023), “Gamification Framework for Participatory Modeling: A Proposal”, *Group Decision and Negotiation*, Vol. 32, pp. 1167-1182, https://link.springer.com/article/10.1007/s10726-023-09838-w. [106]

Berditchevskaia, A. and P. Baeck (2020), *The Future of Minds and Machines: How artificial intelligence can enhance collective intelligence*. [55]

Berryhill, J., T. Bourgery and A. Hanson (2018), “Blockchains Unchained: Blockchain Technology and its Use in the Public Sector”*, OECD Working Papers on Public Governance*, No. 28, OECD Publishing, Paris, https://doi.org/10.1787/3c32c429-en. [1]

Berryhill, J. et al. (2019), *Hello, World: Artificial Intelligence and its use in the Public Sector*, OECD Publishing. [5]

Black, A. et al. (2014), *Civic Innovation Beyond Civic Technology*, https://www.newamerica.org/oti/blog/civic-innovation-beyond-civic-technology/. [120]

Boswell, J. (2021), “Seeing Like a Citizen: How Being a Participant in a Seeing Like a Citizen: How Being a Participant in a Citizens Assembly Changed Everything I thought I Knew about Deliberative Mini-Publics”, *Journal of Deliberative Democracy*, Vol. 17/2, pp. 1-12, https://doi.org/DOI: https://doi.org/10.16997/jdd.975. [103]

Burmaoglu, S., O. Sartenaer and A. Porter (2019), “Conceptual definition of technology emergence: A long journey from philosophy of science to science policy”, *Technology in Society*, Vol. 59. [91]

Cabrera, V. (2022), *Observatório das Eleições*, https://observatoriodaseleicoes.com.br/2022/09/22/cresce-a-confianca-na-contagem-dos-votos-em-2022-bolsonaristas-confiam-em-menor-proporcao/. [102]

Candy, S. and J. Dunagan (2017), "Designing an experiential scenario: The People Who Vanished", *Futures*, Vol. 86, https://doi.org/10.1016/j.futures.2016.05.006. [141]

Cardullo, P. (ed.) (2019), *What is Civic Tech? Defining a Practice of Technical Pluralism*, Bingley: Emerald Publishing Limited. [40]

Carson, L. and S. Elstub (2019), *Carson, L., & Elstub, S. (2019). Comparing Participatory and Deliberative Democracy*, https://www.newdemocracy.com.au/wp-content/uploads/2019/04/RD-Note-Comparing-Participatory-and-Deliberative-Democracy.pdf. [112]

Chander, S. (2020), *Data Racism: a New Frontier*, https://www.enar-eu.org/Data-racism-a-new-frontier/. [76]

Chatwin, M. (2020), "Improving Monitoring and Evaluation in the Civic Tech Ecosystem: Applying Contribution Analysis to Digital Transformation", *JeDEM - eJournal of eDemocracy and Open Government*, Vol. 12(2), pp. 216-241, https://doi.org/10.29379/jedem.v12i2. [126]

Courant, D. (2021), "Citizens' Assemblies for Referendums and Constitutional Reforms: Is There an "Irish Model" for Deliberative Democracy?", *Frontiers in Political Science*, Vol. 2, pp. 1-20, https://doi.org/doi: 10.3389/fpos.2020.591983. [97]

Cuaou, C. (2019), *Applying artificial intelligence to citizen participation: the Youth4Climate case study*, https://www.citizenlab.co/blog/civic-engagement/youth-for-climate-case-study/ (accessed on 23 May 2024). [128]

Dabo, A. and E. Pouyé (2022), *Assessing Civic Tech That Works to Build #TheAfricaWeWant*: Citizen-led tech for impact that can help African governments deliver better services*, European Democracy Hub, https://www.bosch-stiftung.de/sites/default/files/publ. [124]

David, N., J. McNutt and J. Justice (2018), *Smart Cities, Transparency, Civic Technology and Reinventing Government*. [135]

DemocracyNext (2023), *DemocracyNext: Assembling an Assembly Guide*, https://assemblyguide.demnext.org/. [39]

DigitalCatapult (2024), *Everything you need to know about immersive technology*, https://www.digicatapult.org.uk/expertise/blogs/post/everything-to-know-about-immersive-technology/. [15]

Dulong de Rosnay, M. and A. Stalder (2020), "Digital commons", *Internet Policy Review*, Vol. 9/4, https://doi.org/10.14763/2020.4.1530. [81]

Edelenbos, J. (1999), "Design and Management of Participatory Public Policy Making", *Public Management an International Journal of Research and Theory*, Vol. 1/4, pp. 569-576, https://doi.org/10.1080/14719039900000027. [20]

Escobar, O. (2012), *Public Dialogue and Deliberation: A communication perspective for public engagement practitioners*, Edinburgh Beltane Open Minds, http://creativecommons.org/licenses/by-nc/3.0/. [35]

EU Comission Joint Research Center (2021), *Participatory and Deliberative Democracy*. [110]

European Commission (2023), *Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions On Defence Of Democracy*. [94]

Evers, S. et al. (2023), "Designing healthy public spaces: A participatory approach through immersive virtual reality", https://doi.org/10.5194/agile-giss-4-24-2023. [65]

Font, J., S. Pasadas del Amo and G. Smith (2016), "Tracing the Impact of Proposals from Participatory Processes: Methodological Challenges and Substantive Lessons", *Journal of Public Deliberation*, Vol. 12/1, https://www.publicdeliberation.net/jpd/vol12/iss1/art3. [28]

French Government (2019), *Grand Débat*, https://granddebat.fr/. [53]

Fung, A. (2015), "Putting the Public Back into Governance: The Challenges of Citizen Participation and Its Future", *Public Administration Review*, Vol. 75/4, pp. 513-522, https://www.jstor.org/stable/24757808. [98]

García, D. and E. Al. (2023), *Democracy Technologies in Europe: Online Participation, Deliberation and Voting*, Innovation in Politics Institute, https://www.idea.int/publications/catalogue/democracy-technologies-europe. [41]

García-Orosa, B. (2021), "Disinformation, social media, bots, and astroturfing: the fourth wave of digital democracy", *Profesional de la información*, Vol. 30/6, https://doi.org/10.3145/epi.2021.nov.03. [78]

Gill, I., P. Baeck and A. Whittington (2022), "Designing the Collective Intelligence Commons", *The Centre for Collective Intelligence Design/Agence Française de Développement Group*. [82]

Gilman, M. (2022), "Beyond Window Dressing: Public Participation for Marginalized Communities in the Datafied Society", *Fordham Law Review*, Vol. 91/2, pp. 503-555, https://ir.lawnet.fordham.edu/flr/vol91/iss2/7. [26]

Godhe, M. and L. Goode (2018), "Critical Future Studies – A Thematic Introduction", *Culture Unbound*, Vol. 10/2, pp. 151–162. [10]

Government of Brazil (2024), *Progresso do Plano Clima*, https://brasilparticipativo.presidencia.gov.br/processes/planoclima/. [138]

Government of Iceland (2023), *Head Start for Icelandic*, https://www.government.is/diplomatic-missions/embassy-article/2023/03/14/Head-start-for-Icelandic/ (accessed on 23 May 2024). [74]

Government of the Netherlands (2022), *The Algorithm Register of the Dutch Government*, https://algoritmes.overheid.nl/en (accessed on 23 May 2024). [79]

Haarseim, T. (2023), *Decidim Partners with Vocdoni to Offer Blockchain Voting*, https://democracy-technologies.org/voting/blockchain-voting-decidim-vocdoni/. [64]

Hupont Torres, I. et al. (2024), *Next Generation Virtual Worlds: Societal, Technological, Economic and Policy Challenges for the EU*, https://doi.org/10.2760/51579. [16]

Ianniello, M., S. Iacuzzi and L. Brusati (2019), "Obstacles and solutions on the ladder of citizen participation: a systematic review", *Public Management*, Vol. 21/1, pp. 21-46, https://doi.org/10.1080/14719037.2018.1438499. [25]

ICANN (2025), *About the ICANN Community*, https://www.icann.org/en/community (accessed on 30 January 2025). [80]

International IDEA (2024), *PERCEPTIONS OF DEMOCRACY: A Survey about How People Assess Democracy around the World*, International IDEA, https://doi.org/10.31752/idea.2024.24. [33]

International Republican Institute (2023), *Sustaining and Scaling Civic and Government Technology: A White Paper on Challenges, Best Practices and Recommendations*, https://www.iri.org/resources/sustaining-and-scaling-civic-and-government-technology/. [69]

IPU (2019), *Artificial Intelligence (AI) in parliaments*, https://www.ipu.org/innovation-tracker/story/artificial-intelligence-innovation-in-parliaments. [139]

Kimaid, L. (2024), *Artificial Intelligence-Driven Archibot: Transforming Access to European Union Parliament Archives*, https://library.bussola-tech.co/p/artificial-intelligence-archibot-eu-parliament. [114]

Klein, M. and N. Majdoubi (2024), "The medium is the message: toxicity declines in structured vs unstructured online deliberations", *World Wide Web*, Vol. 27/31, pp. 1-30, https://doi.org/10.1007/s11280-024-01269-0. [142]

Knight Foundation (2013), *The Emergence of Civic Tech: Investments in a Growing Field*, https://www.slideshare.net/knightfoundation/knight-civictech. [45]

Knight Foundation and Rita Allen Foundation (2017), *Scaling Civic Tech: Paths to a Sustainable Future*, https://knightfoundation.org/features/civictechbiz/ (accessed on 17 August 2023). [67]

Kreps, S. (2024), "The potential impact of emerging technologies on democratic representation: Evidence from a field experiment.", *New Media & Society*, Vol. 26/12, pp. 6918-6937, https://doi.org/10.1177/14614448231160526. [77]

Kurkela, K. et al. (2024), "Citizen participation as an organisational challenge in local government", *International Journal of Public Sector Management*, Vol. 37/1, pp. 124-140, https://doi.org/10.1108/IJPSM-08-2022-0179. [21]

Landemore, H. (2022), "Landemore, H. (2022). Can AI bring deliberative democracy to the masses?", *HAI Weekley Seminar*, pp. 1-35. [130]

Lindman, J. et al. (2020), "The uncertain promise of blockchain for government", *OECD Working Papers on Public Governance*, No. 43, OECD Publishing, Paris, https://doi.org/10.1787/d031cd67-en. [13]

Lindman, J. et al. (2020), "The uncertain promise of blockchain for government", *OECD Working Papers on Public Governance*, No. 43, OECD Publishing, Paris, https://doi.org/10.1787/d031cd67-en. [3]

Mabi, C. (2017), "Citoyen hackeur: Enjeux politiques des Civic Tech", *La Vie des Idées*, https://laviedesidees.fr/Citoyen-hackeur (accessed on 17 August 2023). [46]

Make.org (2024), *Convention citoyenne sur la fin de vie : le CESE avec Make.org propose au grand public et aux parlementaires de mieux s'approprier les débats des citoyens grâce à l'intelligence artificielle*, https://about.make.org/post/convention-citoyenne-sur-la-fin-de-vie-le-cese-avec-make-org-propose-au-grand-public-et-aux-parlementaires-de-mieux-sapproprier-les-debats-des-citoyens-grace-a-lintelligence-artificielle (accessed on 23 May 2024). [129]

Make.org (2024), *Make.org Blog*, https://about.make.org/articles-en/forum-against-fakes-a-broad-online-citizen-participation-to-support-the-work-of-a-new-citizens-panel-in-germany-on-how-to-tackle-misinformation. [107]

Mejia Galvan, M. (2023), *Citizens are shaping EU's main investment policy*, https://medium.com/participo/citizens-are-shaping-eus-main-investment-policy-1271d9fcaed3. [111]

Mellon, J., T. Peixoto and F. Sjoberg (2022), "The Haves and the Have Nots: Civic Technologies and the Pathways to Government Responsiveness", *World Bank Working Papers*. [84]

Miller, C. (2024), *Reclaiming Technology for Democracy*. [58]

Mochtak, M., C. Lesschaeve and J. Glaurdic (2021), "Voting and winning: perceptions of electoral integrity in consolidating democracies", *Democratization*, Vol. 28/8, pp. 1423-1441, https://doi.org/DOI: 10.1080/13510347.2021.1918111. [99]

Modekurty, S. et al. (2019), "A Timeline of Civic Tech Tells a Data-Driven Story of the Field", *Civic TechCivic Techde*, https://civictech.guide/a-timeline-of-civic-tech-tells-a-data-driven-story-of-the-field/. [49]

Moldes, C. (2018), *Chat bot lets Russians detained at protests request legal assistance*, https://globalvoices.org/2018/09/25/chat-bot-lets-russians-detained-at-protests-request-legal-assistance/. [113]

Moore, G. (2014), *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers*, Harper Business Essentials, https://www.harpercollins.com/products/crossing-the-chasm-3rd-edition-geoffrey-a-moore?variant=32130444066850. [8]

Mozilla Foundation (2024), *Election Manipulation in Brazil's 2022 General Elections: The Role of WhatsApp and Telegram on the Attacks Against Electoral Integrity and the Threats to Democracy*, https://doi.org/Creative Commons Attribution 4.0 International license. [101]

Municipality of Barcelona (2023), *Foro Joven BCN*, https://ajuntament.barcelona.cat/joves/es/canal/forum-jove-bcn. [137]

Nesta (2021), *Collective crisis intelligence for frontline humanitarian response*, https://media.nesta.org.uk/documents/Nesta_Collective_crisis_intelligence_for_frontline_humanitarian_response_Final.pdf. [44]

New America (2023), *Public Interest Technology*, https://www.newamerica.org/pit/about/. [123]

Nightingale, P. (2014), "What is Technology? Six Definitions and Two Pathologies", *SWPS 2014-2019*. [90]

OECD (2024), *Anti-Corruption and Integrity Outlook 2024*, OECD Publishing, Paris, https://doi.org/10.1787/968587cd-en. [38]

OECD (2024), *Exploring New Frontiers of Citizen Participation in the Policy Cycle*, https://www.oecd.org/content/dam/oecd/en/about/programmes/reinforcing-democracy-initiative/Exploring-New-Frontiers-of-Citizen-Participation-Discussion-Paper.pdf. [85]

OECD (2024), *Facts not Fakes: Tackling Disinformation, Strengthening Information Integrity*, OECD Publishing, Paris, https://doi.org/10.1787/d909ff7a-en. [146]

OECD (2024), "Framework for Anticipatory Governance of Emerging Technologies", *OECD Science, Technology and Industry Policy Papers*, No. 165, OECD Publishing, Paris, https://doi.org/10.1787/0248ead5-en. [4]

OECD (2024), "Governing with Artificial Intelligence: Are governments ready?", *OECD Artificial Intelligence Papers*, https://doi.org/10.1787/26324bc2-en. [11]

OECD (2024), *OECD Digital Economy Outlook 2024 (Volume 1): Embracing the Technology Frontier*, OECD Publishing, Paris, https://doi.org/10.1787/a1689dc5-en. [17]

OECD (2024), "OECD Survey on Drivers of Trust in Public Institutions - 2024 Results", in *OECD Survey on Drivers of Trust in Public Institutions - 2024 Results*, OECD Publishing, Paris, https://www.oecd.org/en/publications/oecd-survey-on-drivers-of-trust-in-public-institutions-2024-results_9a20554b-en.html. [23]

OECD (2024), *Promoting Public Deliberation in the Basque Country in Spain*. [36]

OECD (2024), *Recommendation of the Council on Transparency and Integrity in Lobbying and Influence*, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0379. [37]

OECD (2023), *OECD Deliberative Democracy Database*, https://airtable.com/appP4czQlAU1My2M3/shrX048tmQLl8yzdc/tblrttW98WGpdnX3Y/viwX5ZutDDGdDMEep?blocks=hide. [83]

OECD (2023), *OECD Public Governance Reviews: Czech Republic: Towards a More Modern and Effective Public Administration*, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/41fd9e5c-en. [31]

OECD (2023), *Open Government for Stronger Democracies: A Global Assessment*, OECD Publishing, https://doi.org/10.1787/5478db5b-en. [145]

OECD (2023), *Open Government Review of Romania*, https://doi.org/10.1787/ff20b2d4-en. [30]

OECD (2022), "Building Trust and Reinforcing Democracy", in *Building Trust and Reinforcing Democracy: Preparing the Ground for Government Action*, OECD Publishing, Paris, https://www.oecd.org/en/publications/building-trust-and-reinforcing-democracy_76972a4a-en.html. [86]

OECD (2022), *Building Trust to Reinforce Democracy: Main Findings from the 2021 OECD Survey on Drivers of Trust in Public Institutions*, Building Trust in Public Institutions, OECD Publishing, Paris, https://doi.org/10.1787/b407f99c-en. [153]

OECD (2022), *Guidelines for Citizen Participation Processes*. [116]

OECD (2022), *OECD Guidelines for Citizen Participation Processes*, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/f765caf6-en. [19]

OECD (2022), *OECD Guidelines for Citizen Participation Processes*, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/f765caf6-en. [155]

OECD (2022), *Open Government Review of Brazil : Towards an Integrated Open Government Agenda*, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/3f9009d4-en. [29]

OECD (2022), *Open Government Review of Brazil : Towards an Integrated Open Government Agenda*, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/3f9009d4-en. [151]

OECD (2022), *Recommendation of the Council on Blockchain and Other Distributed Ledger Technologies*. [12]

OECD (2022), *The Protection and Promotion of Civic Space: Strengthening Alignment with International Standards and Guidance*, https://www.oecd.org/en/publications/the-protection-and-promotion-of-civic-space_d234e975-en.html. [70]

OECD (2022), *The Protection and Promotion of Civic Space: Strengthening Alignment with International Standards and Guidance*, OECD Publishing, Paris, https://doi.org/10.1787/d234e975-en. [154]

OECD (2021), "Eight ways to institutionalise deliberative democracy", *OECD Public Governance Policy Papers*, No. 12, OECD Publishing, Paris, https://doi.org/10.1787/4fcf1da5-en. [32]

OECD (2021), *Evaluation Guidelines for Representative Deliberative Processes*, OECD Publishing, Paris, https://doi.org/10.1787/10ccbfcb-en. [89]

OECD (2021), *OECD Database of Representative Deliberative Processes and Institutions*. [118]

OECD (2021), *OECD Report on Public Communication: The Global Context and the Way Forward*, OECD Publishing, Paris, https://doi.org/10.1787/22f8031c-en. [152]

OECD (2021), *Recommendation of the Council for Agile Regulatory Governance to Harness Innovation*, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0464#dates. [93]

OECD (2020), "Digital Government Index: 2019 results", *OECD Public Governance Policy Papers*, No. 03, OECD Publishing, Paris, https://doi.org/10.1787/4de9f5bb-en. [51]

OECD (2020), *Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave*, OECD Publishing, https://doi.org/10.1787/339306da-en. [144]

OECD (2020), *Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave*, OECD Publishing, Paris, https://doi.org/10.1787/339306da-en. [34]

OECD (2020), *OECD Public Integrity Handbook*, OECD Publishing, Paris, https://doi.org/10.1787/ac8ed8e8-en. [88]

OECD (2020), "The OECD Digital Government Policy Framework: Six dimensions of a Digital Government", *OECD Public Governance Policy Papers*, No. 02, OECD Publishing, Paris, https://doi.org/10.1787/f64fed2a-en. [140]

OECD (2019), *Institutions Guaranteeing Access to Information: OECD and MENA Region*, OECD Publishing, https://doi.org/10.1787/e6d58b52-en. [143]

OECD (2017), *Recommendation of the Council on Open Government*, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0438. [18]

OECD (2017), *Recommendation of the Council on Public Integrity*, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0435. [108]

OECD (2004), *Promise and Problems of E-Democracy: Challenges of Online Citizen Engagement*, OECD Publishing, Paris, https://doi.org/10.1787/9789264019492-en. [50]

OECD (forthcoming), *Civic Tech for Democracy*. [43]

OECD (forthcoming), *Getting Civic Tech Right for Democracy*. [42]

OECD (forthcoming), "Moving Transparency and Accountability Forward", *WPOG Working paper*. [87]

OEDC (n.d.), . [136]

Oladoyinbo, T. (2024), "The Effect of Data Information Security In Digital Voting and Electoral Processes", *IOSR Journal of Computer Engineering*, Vol. 26/2, pp. 11-16, http://www.iosrjournals.org. [100]

Open Government Partnership (2019), *Citizen Participation*, https://www.opengovpartnership.org/glossary/citizen-participation/. [109]

Paice, A. (2022), "Creating an online conversation between a nation and a mini-public: a case study on Polis & the Austrian Citizens' Climate Council", *Co-Intelligence Institute*, https://www.co-intelligence.institute/case-study-polis-c. [117]

Park, S., M. Specter and N. Narula (2020), "Going from bad to worse: from Internet voting to blockchain voting", *Journal of Cybersecurity*. [62]

Peixoto, T., O. Canuto and L. Jordan (2024), *AI and the Future of Government: Unexpected Effects and Critical Challenges*. [72]

Peixoto, T. and T. Steinberg (2019), "Citizen Engagement: Emerging Digital Technologies Create New Risks and Value", *World Bank*. [61]

Pink, S. et al. (2020), "Design anthropology for emerging technologies: Trust and sharing in autonomous driving futures", *Design Studies*, Vol. 69, https://doi.org/10.1016/j.destud.2020.04.002. [7]

Pogrebinschi, T. (2017), "Digital Innovation in Latin America: How Brazil, Colombia, Mexico and Peru have been experimenting with E-participation", *openDemocracy*, https://www.opendemocracy.net/en/democraciaabierta/digital-innovation-in-latin-am. [132]

Political Watch (2022), *Más de 10 años de CivicTech: Logros Alcanzados Y Propuestas Para La Próxima Década*. [48]

Porter, A. et al. (2002), "Measuring national 'emerging technology' capabilities", *Science and Public Policy*, Vol. 29, pp. 189-200, https://doi.org/10.3152/147154302781781001. [147]

Rodriguez, A., M. Green and M. Lubomira Kubica (2021), *Legal Challenges in the New Digital Age*. [6]

Romberg, J. and T. Escher (2024), "Making Sense of Citizens' Input through Artificial Intelligence: A Review of Methods for Computational Text Analysis to Support the Evaluation of Contributions in Public Participatio", *Digital Government: Research and Practice*, pp. 1-30, https://doi.org/10.1145/3603254. [73]

Rumbul, R. (2019), "The Third Age of Civic Tech", *mySociety*, https://web.archive.org/web/20201030184447/https://tictec.mysociety.org/2019/presentation/rebecca-mysociety. [47]

Rumbul, R. (2015), "Who benefits from Civic Technology? Demographics and public attitudes research into the users of civil technologies", *mySociety*, https://research.mysociety.org/media/outputs/demographics-report.pdf. [125]

Schneider, B. and N. Sanders (2023), *AI could shore up democracy - here's one way*, https://theconversation.com/ai-could-shore-up-democracy-heres-one-way-207278 (accessed on 23 May 2024). [56]

Seoul Metropolitan Government (n.d.), *Metaverse Seoul, the New Continent of Seoul*, https://english.seoul.go.kr/policy/smart-city/metaverse-blockchain/. [66]

Simon, J. et al. (2017), "Digital Democracy: the tools transforming political engagement", *Nesta*, https://media.nesta.org.uk/documents/digital_democracy.pdf. [121]

Simon, J. et al. (2017), "Digital Democracy: the tools transforming political engagement", *Nesta*, https://media.nesta.org.uk/documents/digital_democracy.pdf. [119]

Sitra (2023), *FAQ - What is the 'What do you think, Finland' experiment all about?*, https://www.sitra.fi/en/articles/faq-what-is-the-what-do-you-think-finland-experiment-all-about/. [60]

Slaev, A. et al. (2019), "Overcoming the failures of citizen participation: The relevance of the liberal approach in planning", *Planning Theory*, Vol. 18/4, pp. 448-469, https://doi.org/10.1177/1473095219848472. [24]

Stahl, B. (2011), "What Does the Future Hold? A Critical View of Emerging Information and Communication Technologies and Their Social Consequences", *IFIP Advances in Information and Communication Technology*, https://doi.org/10.1007/978-3-642-21364-9_5. [92]

Tabor, H. (2020), "Civic Engagement, Autism and Deliberative Democracy: Prioritizing the Inclusion of Marginalized Perspectives", *The American Journal of Bioethics*, Vol. 20/4, pp. 41-43, https://doi.org/10.1080/15265161.2020.1730620. [148]

Tambouris, E., A. Macintosh and F. Bannister (eds.) (2014), *Conceptualising Trust in E-Participation Contexts*, Springer, https://doi.org/10.1007/978-3-662-44914-1. [96]

Tessler, M. et al. (2024), "AI can help humans find common ground in democratic deliberation", *Science*, Vol. 386/6719, https://doi.org/10.1126/science.adq2852. [57]

The Computational Democracy Project (2024), *Pol.is*, https://compdemocracy.org/. [59]

The Guardian (2019), "'Transparency and fairness': Irish readers on why the Citizens' Assembly worked", *The Guardian*, https://www.theguardian.com/commentisfree/2019/jan/22/irish-readers-citizens-assembly-worked-brexit (accessed on 31 July 2024). [104]

The Open Source Initiative (2023), *The Open Source Definition*, https://opensource.org/osd/. [133]

Tidd, J. and J. Bessant (2005), *Managing Innovation: Integrating Technological, Market And Organizational Change*, John Wiley & Sons, https://www.wiley.com/en-us/Managing+Innovation%3A+Integrating+Technological%2C+Market+and+Organizational+Change%2C+7th+Edition-p-9781119713302. [9]

Tolosa City Council (2022), *Governance, Participation, and Transparency Ordinance*, https://udala.tolosa.eus/sites/default/files/BEHIN%20BETIKO%20ONARPENA%20PUBLIKAZIOA%20GAO_1.pdf. [127]

Tsai, L. et al. (2024), "Generative AI for Pro-Democracy Platforms", *An MIT Exploration of Generative AI*, https://doi.org/10.21428/e4baedd9.5aaf489a. [149]

U.S. Government (2021), *Key Findings and Recommendations from the Joint Report of the Department of Justice and the Department of Homeland Security on Foreign Interference Targeting Election Infrastructure or Political Organization, Campaign, or Candidate Infrastructure Related*, https://www.justice.gov/opa/press-release/file/1376761/dl. [95]

Ubaldi, B. et al. (2019), "State of the art in the use of emerging technologies in the public sector", *OECD Working Papers on Public Governance*, No. 31, OECD Publishing, Paris, https://doi.org/10.1787/932780bc-en. [2]

Ubaldi, B. et al. (2019), "State of the art in the use of emerging technologies in the public sector", *OECD Working Papers on Public Governance*. [14]

UNEP (2024), *AI has an environmental problem. Here's what the world can do about that*, https://www.unep.org/news-and-stories/story/ai-has-environmental-problem-heres-what-world-can-do-about. [71]

United Kingdom Government (2024), *A pro-innovation approach to AI regulation: government response*, https://www.gov.uk/government/consultations/ai-regulation-a-pro-innovation-approach-policy-proposals/outcome/a-pro-innovation-approach-to-ai-regulation-government-response#introduction. [131]

United Nations (2021), *on a Proposed UN Centralised Database of Open-Source Appropriate Technologies*, http://unctad.org/system/files/official-document/ecosoc_res_2021d30_Note_OpenSource_en.pdf. [134]

University of Turku (2023), *TurkuNLP*, https://turkunlp.org/ (accessed on 23 May 2024). [75]

Ville de Paris (2023), *L'Assemblée citoyenne de Paris en 8 questions*, https://cdn.paris.fr/paris/2023/05/03/faq-extracommunautaires-assemblee-citoyenne_vf-1-TC7g.pdf. [105]

Vocdoni (2021), *Introducing the Vocdoni Ballot Protocol*, https://blog.vocdoni.io/vocdoni-ballot-protocol. [63]

Welker, Y. (2023), *Generative AI holds great potential for those with disabilities - but it needs policy to shape it*, https://www.weforum.org/agenda/2023/11/generative-ai-holds-potential-disabilities/ (accessed on 24 May 2024). [115]

World Bank (2022), *CivicTech: Transparency, Engagement, and Collaboration for Better Governance*, https://doi.org/License: CC BY 3.0 IGO. [122]

Zerilli, J. et al. (2019), “Algorithmic Decision-Making and the Control Problem”, *Minds and Machines - Journal for Artificial Intelligence, Philosophy and Cognitive Science*, Vol. 29, pp. 555-578, https://doi.org/10.1007/s11023-019-09513-7. [150]

Zhang, W. et al. (2021), “A Review of Research on Civic Technology: Definitions, Theories, History and Insights.”, *ACM Comput. Surv.*, https://arxiv.org/pdf/2204.11461.pdf. [68]

Annexe A. OECD Framework for Anticipatory Governance of Emerging Technologies

This framework brings together existing OECD standards, policy tools, and good practices to propose a general approach to the governance of emerging technologies. Working with and building upon governance work on specific technological areas, the framework aims to address recurrent issues and policy questions.

This framework features five interconnected elements. The elements and their associated actions should be interdependent and interactional.

- **Guiding values:** technological development should be anchored in guiding values, both foundational (encompassing shared ethical, political, economic, and cultural ideals) and technology-specific (tailored to technology policy decisions). These values must be debated in particular technology contexts to ensure that technology governance aligns with human rights, democratic principles, sustainability, equity, inclusion, safety and public good. Ethical, social, and political dialogue can nurture and develop this values-based innovation culture. Integrating these values – and reflection upon them – throughout the entire process, from agenda-setting to deployment by innovators will help enable responsible and inclusive technological advancement.
- **Strategic intelligence**: recognizing the unpredictable nature of emerging technologies, policies should foster shared forms of strategic intelligence, involving the comprehensive analysis of technology's potential directions, economic stakes, and societal implications. Robust tools such as horizon scanning, advanced data analytics, forecasting and technology assessment should be employed to anticipate future challenges and inform governance strategies. This anticipatory approach aids in the informed development of strategic visions, plans, and roadmaps for emerging technologies.
- **Stakeholder engagement**: policies should prioritize the proactive engagement of stakeholders and the broader society in the policy-making cycle. Similarly, engaging diverse actors early in the technology development cycle enriches the understanding of issues, fosters trust, and aligns technological innovation with societal needs. Care is needed to balance the range of perspectives and ensure that vocal vested interests do not dominate the process. Tools for societal engagement, including capacity-building, communication, consultation and co-creation should be leveraged to ensure broad-based participation and alignment of science and co-design of technology strategies and governance.
- **Agile regulation**: given the fast pace and evolving nature of emerging technologies, governance systems must strive for agility and anticipation through adapting regulatory tools, fostering inter-agency co-operation, developing forward-looking governance frameworks, and ensuring responsiveness to stakeholder concerns. Experimentation and testing under regulatory supervision should be encouraged to foster innovation, reduce uncertainty, and ensure that governance systems remain relevant and effective. Policy makers should also explore the potential of non-binding governance approaches such as high-level principles, technical standards and codes of conduct.

- **International co-operation**: acknowledging the transboundary nature of technology, policies should promote international co-operation in the face of a shifting geopolitical landscape. Forward-looking dialogue in inclusive fora should be facilitated to coordinate approaches to emerging technology governance, share experiences, deepen understandings, and lay the groundwork for collective standard-setting. Promoting a multi-stakeholder, consensus-driven development of technical standards and principles ensures the interoperability of emerging technologies and the creation of markets for responsible technology products and services.

Each of these framework elements apply to specific emerging technology contexts. The stage of technological development and the nature of the concerns raised in a technology case will determine how exactly the elements are applied. For example, the application of the elements to a technology like quantum computing, where risks and benefits are more speculative and removed from the present moment, will necessarily look different to their application in more developed technologies like synthetic biology where industrialisation has begun. There already exist regulatory systems in health or biosafety, or of AI, with sets of governance principles and where regulation is in development so that governance may be more a question of filling gaps or coordination.

For more information: OECD (2024), Framework for Anticipatory Governance of Emerging Technologies, OECD Science, Technology and Industry Policy Papers, OECD Publishing, Paris, https://doi.org/10.1787/0248ead5-en