Artificial Intelligence & public sector innovation in a data-driven society: Shaping Digital Europe 2040

Gianluca Misuraca*

*Former Senior Scientist, European Commission, JRC Seville
Research Fellow at the eGovernance and Public Administration Department of the Danube University Krems, Austria

The views expressed are those of the author and may not in any circumstances be regarded as stating an official position of the European Commission
Outline

1. Envisioning Digital Europe 2030 (10 years ago!)

2. Exploring Digital Government transformation in the EU: a journey between evidence and hope

3. Governance in the age of AI: the need for future-proof policy & institutional re-design in a global landscape

4. Back to the future: shaping Digital Europe 2040

5. Policy implications, future research and open issues
1. Envisioning Digital Europe 2030!
The “new” role of JRC in the new Commission
Navigating through Innovation & Foresight
Envisioning Digital Europe 2030 (in 2010)

Source: Misuraca et al., 2010
European Commission’s JRC-IPTS
OpenGov is 'the new normal'... and it is about behavioural and societal changes. But we are still only halfway through the open battle for open government.

Paradigm shifts?
Future of Government 2030+
A Citizen Centric Perspective on New Government Models

DIY Democracy  Private Algocracy  Super Collaborative Gov  Over-regulatocracy

Source: Vesnic-Alujevic, L., et al., 2019
But the question remains open on how ICT-enabled innovation can transform governance and policy-making?

“Prediction is very difficult, especially if it is about the future”

(Niels Bohr, 1885-1962)
2. Exploring Digital Government Transformation in the EU
Background: 10 (more) years of eGov in (declar)ation

- 2017 Tallinn Declaration on user-centric eGovernment
- 2018 Vienna Conference on Digital & eGovernment
- 2019 Helsinki Conference on Human-centric Digital Government
- The 2020 Digital Strategy for Europe, with a crucial role for AI adoption in government & the public sector
- The forthcoming Digital Europe Programme… in the emerging “Pandemic society”…
Exploring Digital Government transformation

JRC Exploratory Research 2018-2020

- To better understand how innovation in the public sector, enabled by ICTs, can transform governance systems, in terms of new approaches to use data for policy design & service delivery, to better address systemic problems.

*The DigiGov research has been conducted by the JRC Digital Economy Unit in Seville with scientific and technical support of the Consortium composed by PPMI, Open Evidence, Politecnico di Milano, RAND Europe and Martel Innovate.

In search of innovation between evidence and hope

- **Limited robust empirical evidence** on the effects of digital government transformation, especially on less measurable impacts such as inclusion, legitimacy and participation.

Unveiling the path to Digital Government

Evolution or revolution?
• From ‘simple’ to ‘complex’ forms of governing
• Different stages of readiness / levels of maturity
• Focus on service delivery & risk of 'mirroring effect'
• Techno-optimism & the trough of disillusionment

Re-imagining government

Governance & Service Transformation
• Digitization is only a part of it (often just the starting point)
• Permeating all aspects of governing and service delivering
• Complexity and multi-linearity of change
• Utopia & dystopia of digital innovation
Assessing Digital Government transformation

- A conceptual framework for understanding how ICT-enabled innovation can transform government and policy design.
- Empirical case studies and experiments to illustrate possible impacts of the digital transformation in different contexts and phases of the policy-cycle.

Understanding innovation antecedents & change strategies

• The need to reframe public sector innovation to achieve Digital Government Transformation
Engaging with experts and stakeholders

- Scientific validation of findings through stakeholder engagement, expert consultation and peer review at international level

https://publications.jrc.ec.europa.eu/repository/handle/JRC121494
Building evidence through experimental case studies

- Tvarkau Vilnių, LT
  Citizens engagement

- Body Worn cameras for policing in UK, NL & FI

- Sustainable behaviour & literacy in the city of Trento & Ferrara, IT

- Privacy & trust in digital public services (DE & ES)

<table>
<thead>
<tr>
<th>Country</th>
<th>Level of trust:</th>
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<tbody>
<tr>
<td>Spain</td>
<td>• 19% in national government</td>
</tr>
<tr>
<td></td>
<td>• 36% in regional/local authorities</td>
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<tr>
<td></td>
<td>• 37% in public administration</td>
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<tr>
<td>Germany</td>
<td>• 54% in national government</td>
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<tr>
<td></td>
<td>• 78% in regional/local authorities</td>
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<td></td>
<td>• 71% in public administration</td>
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Main findings & Lessons learned

1. There are limits of automation and of immediate productivity
2. Importance of investments to keep service up and running
3. Reframing of organisational processes crucial to move beyond pilots
4. Strategic importance and twofold nature of legitimacy and trust
5. Greater focus is needed on adoption, considering the digital divide
6. Realism about engagement, open governance and co-production
7. Importance of non-monetary effects and embracing complexity
3. Governance in the age of AI
The paradigm shift we were waiting for?

Table 2: Top 15 technologies of 2025

1. Artificial intelligence
2. Internet of Things/Smart Things
3. Robotics/Automation
4. Cybersecurity
5. Big data/analytics
6. Energy storage/Batteries
7. Blockchain
8. 5G
9. Cloud
10. FinTech
11. Battery-less/energy harvesting
12. Augmented/mixed reality
13. Voice assistants/VPA
14. 3D printing
15. Virtual reality

Source: IDATE DigiWorld
The EU policy agenda for Human-centric AI

- "Building Trust in Human-Centric Artificial Intelligence" COM (8.04.2018) & AI Declaration (10.4.2018)
- "Maximising the benefits for AI in Europe" COM (25.4.2018) & Coordinated Action Plan "AI Made in Europe" (07.12.2018) establishing the Al-Watch
- High Level Expert Group on AI - Ethics Guidelines & Policy & Investment Recommendations for Trustworthy AI
- 2020 Strategy on Shaping Europe’s digital future
  - White paper on AI – A European approach to excellence & trust COM(2020) 65 final, 19/02/2020
  - A European Strategy for Data COM(2020) 66 final, 19/02/2020
AI Watch – the Knowledge Service to monitor the Development, Uptake and Impact of AI for Europe

https://ec.europa.eu/knowledge4policy/ai-watch_en
Conceptualising AI-enabled innovation in the public sector

- Focus on adoption & use of AI applications
- Functional view of AI use:
  - Perception, Reasoning & Action
- AI typology derived from collected cases
Mapping AI use in public services in the EU

- **230 cases** (EU27 + CH, NO & UK)
Key findings: AI use & purpose

- General Public Services (33%), Health (18%) and Economic Affairs (17%) have most active AI use in our sample.
- Most AI cases (57%) are found in national administrations. 30% of cases are implemented at local/city level.
- Technologies used most are Chatbots, Predictive Analytics, Computer Vision, Expert Rules-based Systems.
- AI often enables incremental change with less significant organisational reforms or deep changes in work practices.
- Challenges remain in moving from data analysis to end-user adoption: still unclear if pilot solutions are mainstream.

Support service provision and engagement (38%):
Chatbots, matching services

Enforcement (20%):
Detecting fraud, prioritizing targets, ensuring compliance to regulation

Internal Management (20%):
Human resource management, procurement processes, ICT management

Regulatory research and monitoring (17%):
Decision support and analysis tools for policy making, gaining insights

Adjudication (5%):
Granting of formal benefits and rights to citizens
National AI strategies focus on public sector

Stimulating awareness and knowledge sharing
- Awareness campaigns
- Organising and hosting meetings
- Participating in and promoting events

Strengthening data management for AI
- Enhancing data quality
- Improving accessibility to public data
- Access to private sector data

Building internal capacity
- Generalist AI training
- Specialist AI Training
- New positions, institutions or departments

Learning by doing
- Pilots, experiments and flagship projects
- Regulatory sandboxes for AI
- Sharing practices/cross-sector cooperation

Ethical and legal framework
- Development of an ethical framework
- Reform of data sharing laws
- Possibility of a specific AI law

Funding and procurement
- Funding for AI projects in the public sector
- Stimulating GovTech & incubators
- Revising procurement processes
There are differences in the depth and scope of policy actions taken.

It is still unclear to which degree these actions contribute to AI adoption.

Clear focus on data access and quality.

Large degree of initiatives aim to stimulate or facilitate adoption.

Dedicated funding or legal reforms are less prevalent.
Towards a methodology to assess impact of AI

- Public value perspective & focus on AI adoption & effective implementation
- Addressing barriers which may prevent AI exploitation in the public sector’s context
- Looking at potential benefits but also unintentional and unexpected risks/side effects
- Comparing ex-ante and ex-post impacts of AI use

Source: Misuraca, G, & van Noordt, C., 2020, JRC AI Watch – AI in public services
Key take-aways & implication for policy

1. High level of heterogeneity of AI use across EU and unclear public value created
2. Search for “best practices”: learn from success stories and replicate / scale out
3. Ensure the path to institutionalise AI into mainstream services: beyond “ever-piloting”
4. Little evidence of what works and what is actually threatening services quality
5. Varying scope and depth of strategies to develop and adopt AI for the public sector
6. Dual role of public sector in the governance “with and of /by” AI
7. Innovative Public Procurement & GovTech crucial for adopting AI solutions
4. Back to the future: Shaping Digital Europe 2040
Back to the future... *again*
“Super AI” will realise the singularity dream?

Deep neural networks are energy hungry and growing fast

2025 Will we have reached the capacity of the human brain?
Energy efficiency of a brain is 100,000x better than current hardware
Are expectations coupled with socio-political trends?

- Increasing policy debate on the impact of technology on our societies
  - Rising power of tech giants
  - Regulation of the digital sphere
  - Algorithmic governance in a global landscape

- Two main dimensions of concern emerge:

The role of the state vis-à-vis the market: who will govern?
The level of individual data protection
Scenarios for Digital Europe 2040: Thesis 1

Is digital geopolitics here to stay?

Digital sovereignty a new hot topic in European policy circles
• Digital & technological sovereignty increasingly cited at the highest level in EU policy debate

Data protection, competition, cybersecurity: facts or geopolitical rhetoric?
• Platforms dominance, 5G, the danger of exporting data and importing services, etc.

Regulatory and policy innovation as the new European way?
• GDPR very influential worldwide and to some extent a success, is this the future for a new European digital leadership?
Managing radical uncertainty

Precautionary principle

- Intervene and regulate to avoid unknown risks (influencing the debate about ethics of AI)

Limitation

- When negative side effects offset the risks avoided, precaution can be turned on its head: it is precautionary not to intervene (Cass Sunstein, 2005, The Law of Fear)

New governance innovation to balance precaution and cost-benefit approach
Scenarios for Digital Government Transformation 2040

Dimensions of Impact

Y. Digital Transformation landscape: Ranging from “regulated/interventionist” to “unregulated/hands off”

X. Digital Citizenry: Ranging from “passive” (no control to data subjects), to “active” (full data ownership & digital sovereignty)
A Scenario is a possible world... a world that does not have to be, but may yet come to pass...
5. Conclusions: policy implications, future research and open issues
Lessons learned: Defining the framework conditions for innovating governance models and policy design

Enable the technological conditions for data openness and sharing, anticipating risks and possible negative consequences

Manage the governance “with & of” ICTs to unleash institutional re-design through social innovation and citizens engagement

Harness data-powered intelligence for evidence-based policy-making and better understanding the impact of ICTs on society…
Policy recommendations

1. Governing the tension between platformisation and distributed networks
2. Enforcing new ‘modes of regulation’ for enabling ‘e-Government 4.0’
3. Developing ethical framework to minimise the risks of new technologies
4. Opening access to data, while protecting privacy and promoting interoperability
5. Building capacities to exploit predictive analytics and cognitive technologies
6. Creating a digital transformation culture within the public administration
7. Prioritising public value and aligning governance systems with SDGs
Future research

- Further empirical application of the conceptual framework for in-depth analysis of public sector innovation practices to promote their “scaling-deep/up and out”

- Experimental analysis / ‘sandboxing’ of Data spaces, Innovative Public Procurement and GovTech to stimulate adoption of innovation in public services and policy-design

- Studying the collateral (alleged) positive effects of COVID-19 and their capacity to effectively speed up the needed “reframing” for digital government transformation

- Exploring the potential for public value creation at local and regional level through a systematic review of innovative public services and their digital local ecosystems

- Assessing the impact of specific technologies (e.g. AI, Blockchain, IoT) gathering evidence to support existing efforts, such as the AI Watch and IPSO, or new ones like the Platform for regions, to increase policy coherence in Digital Governance landscape
Old policy-makers’ utopias…

In “Machiavelli and the Politics of Democratic Innovation” (2018), Christopher Holman highlights that the project of the Florentine scientist was

- “to think a system of institutions capable, through harnessing the creative energy of the people who constitute the society …. to provide a means for the actualization of that human desire that is detailed in The Prince. It is in this sense that the Republic is the regime in which all the people can, by means of their virtue, become princes”.
And new policy-makers’ dilemmas…

- In the same vein of Machiavelli’s vision of The Republic, “we can imagine a post-COVID-19 “Pandemic Democracy” (Lucas, 2020), where digital technologies empower the citizens, crafting new ways of engaging in politics and decision making. But as this new pandemic world will evolve and digital technologies will mediate our actions and automate deliberations, EU policymaking must be able to keep the pace”. (Misuraca, 2020 forthcoming)
Open Issues / possible research directions

1. **AI and Public Sector Innovation to enhance governance in the digital State:** a public value perspective to investigate the implications of cognitive and predictive technologies on public sector’s governance with, of and by algorithms.

2. **Combining the European Green Deal and the Digital Transformation to achieve the SDGs:** addressing the need to rethink the social contract and the role of cities and regions in promoting societal well-being in the digital age.

3. **Democratic Innovation & Digital Resilience in a Pandemic Society:** exploring the impact of data-driven policymaking, foresight, experimental and AI-assisted decision systems/dynamic simulation models, for engaging citizens and increase speed and effectiveness of policies and their social acceptance and adoption.
Thank you

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