The technological promise of digital governance: procurement as a case study of 'policy irresistibility'

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ABSTRACT

This Chapter takes a governance perspective to reflect on the process of horizon scanning and experimentation with digital technologies. The Chapter stresses how aspirations of digital transformation can drive policy agendas and make them vulnerable to technological hype, despite technological immaturity and in the face of evidence of the difficulty of rolling out such transformation programmes—eg regarding the still ongoing wave of transition to e-procurement. Delivering on procurement's goals of integrity, efficiency and transparency requires facing challenges derived from the information intensity and complexity of procurement governance. Digital technologies promise to bring solutions to such informational burden and thus augment decisionmakers' ability to deal with that complexity and with related uncertainty. The allure of the potential benefits of deploying digital technologies generates 'policy irresistibility' that can capture decision-making by policymakers overly exposed to the promise of technological fixes to recalcitrant governance challenges. This can in turn result in excessive experimentation with digital technologies for procurement governance in the name of transformation. The Chapter largely focuses on the EU policy framework, but the insights derived from this analysis are easily exportable. The arguments in this Chapter are further explored at http://ssrn.com/abstract=4232973.

KEYWORDS

Public procurement, information intensity, information complexity, policymaking, digital technologies, artificial intelligence, machine learning, blockchain, distributed ledger technology, smart contracts, robotic process automation, hype, garbage can, policy entrepreneurship, policy capture, excessive experimentation.

JEL CODES

D73, H57, K23, K24, K49, O33.

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1. The Promise of Digital Procurement Transformation

As part of the broader transition towards digital government and a new model of public digital governance,[1] policymakers are seeking to embed digital technologies in the management of procurement processes: ie digitalising public procurement. These digitalisation efforts build on earlier attempts to incorporate electronic communications and platforms into procurement governance (e-procurement).[2] At EU level uptake has consistently remained low,[3] despite policy orientations dating back to 1996,[4] e-procurement being a key feature of a 2004 Directive,[5] and the advantages related to the adoption of new means of communication being pushed by the European Commission in repeated policies.[6] Accelerating the pace of adoption of e-procurement required a legal mandate for Member States to fully transition by 2018.[7] The transition to e-procurement has thus been very slow. In fact, at the time of writing in 2022, it is not yet complete in many Member States, especially at regional or local level.[8] This is not unique to the EU.

[1] The concept and terminology are contested. See eg Patrick Dunleavy, 'Governance and state organization in the digital era' in Chrisanthi Avgerou et al (eds) *The Oxford Handbook of Information and Communication Technologies* (OUP 2009) 404 (hereafter Dunleavy, 'Digital era governance'); *cfr* Evrim Tan and Joep Crompvoets, *The new digital era governance. How new digital technologies are shaping public governance* (Wageningen Academic 2022).

[2] This dynamic is shared with the transition from e-government to digital government; Barbara Ubaldi et al, 'State of the art in the use of emerging technologies in the public sector' (2019) OECD Working Papers on Public Governance, No. 31 < https://doi.org/10.1787/932780bc-en > accessed 7 September 2022 (hereafter Ubaldi et al, 'Emerging technologies in the public sector').

[3] PWC, 'e-Procurement Uptake. Final Report' (2015) < https://ec.europa.eu/docsroom/documents/10050/ > accessed 12 September 2022; European Parliament, 'Systems and e-Procurement - Improving Access and Transparency of Public Procurement' (Briefing) PE 618.990 (2018) < https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/618990/IPOL_BRI(2018)618990_EN.pdf > accessed 7 September 2022.

[4] European Commission, 'Green Paper on Public Procurement in the European Union: Exploring the Way Forward' (Communication) COM (96) 583 final.

[5] Timothy Millett, 'Electronic Procurement: Modernising the Public-Private Interface' (2007) 2 European Public Private Partnership Law Review 244.

[6] European Commission, 'Action plan for the implementation of the legal framework for electronic public procurement' (Communication) COM (2004) 841 final; European Commission, 'Green Paper on expanding the use of e-Procurement in the EU' (Communication) COM (2010) 571 final; European Commission, 'A strategy for e-procurement' (Communication) COM (2012) 179 final; European Commission, 'End-to-end e-procurement to modernise public administration' (Communication) COM (2013) 453 final. See also PWC, 'e-Procurement Golden Book of Good Practice. Final Report' (2013) < https://ec.europa.eu/docsroom/documents/15443/ > accessed 7 September 2022. For discussion, see Sangeeta Khorana, Kirsten Ferguson-Boucher, and William A Kerr, 'Governance Issues in the EU's e-Procurement Framework' (2015) 53 Journal of Common Market Studies 292.

[7] Petra Ferk and Bostjan Ferk, 'Article 22 – Rules applicable to communication' in Roberto Caranta and Albert Sanchez-Graells (eds), *European Public Procurement. Commentary on Directive 2014/24/EU* (Edward Elgar 2021) 236, 240-241.

[8] Petra Ferk, 'Can the Implementation of Full E-Procurement into Real Life Address the Real Challenges of EU Public Procurement?' (2016) 11 European Procurement & Public Private Partnership Law Review 327; Marina Borodina and Mari-Ann Simovart, 'A qualitative step from e-communication to e-procurement: the Estonian e-procurement model' (2017) 2 Ius Publicum 6 < http://www.ius-publicum.com/repository/uploads/09_05_2022_22_14_06_Simovart_Borodina_2017_IUSPUB1.pdf > accessed 7 September 2022.

The difficulties in rolling out e-procurement relate to general issues in the delivery of public sector reform programmes,[9] such as difficulties in project management, insufficient or defective needs assessments and preparatory work, (dis)continuity and (in)sufficiency of funding, technological debt and shortages in technical skills, other issues related to legacy (proprietary) systems, organisational resistance to change, and so on.[10] This recent experience should offer a cautionary tale about the challenges and difficulties of rolling out an ambitious programme of technological change in the realm of procurement governance (and more generally).[11] This should serve to moderate expectations and regulate the importance and priority of digital transformation in policymaking agendas.

However, the accelerating uptake in digital transformation across the public sector, especially in the aftermath of the covid-19 pandemic,[12] is seen to open the possibility of a more decisive approach to digitalisation *this time around*. This places procurement digitalisation rather high on the policy agenda. By contrast, there are already early indications that progress will be slow and patchy, especially past initial stages of exploration and piloting.[13] The likely pace of adoption of digital technologies is not the focus of this Chapter, though. The analysis will rather concentrate on the governance risks resulting from the current impetus and urgency in promoting procurement digitalisation—or rather digital procurement *transformation*.

The motivating observation is that, given the *transformative potential* attributed to digital technologies and the hype surrounding digital procurement transformation in the private sector (with common claims that 'Procurement practices will never be the same and supply chain operations will transform in ways we never imagined'[14])—public buying organisations are rather keen to engage in horizon scanning and experimentation, even if they are not necessarily ready to undertake digital transformation processes, or there are no clear plans for full rollout.[15] This puts organisations at risk of capture—either by internal policy entrepreneurs, external providers, or both—and translates into a risk of diversion of resources that could be put to better use elsewhere.[16] The normative goal of this Chapter is thus to highlight this governance risk, and to point at ways of countervailing it, to be explored in later Chapters in this Part III.

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[9] Jane E Fountain, *Building the Virtual State: Informational Technology and Institutional Change* (Brookings Institution 2001).

[10] Idah Mohungoo, Irwin Brown and Salah Kabanda, 'A Systematic Review of Implementation Challenges in Public E-Procurement' in Marie Hattingh et al (eds), *Responsible Design, Implementation and Use of Information and Communication Technology* (Springer 2020) 46.

[11] This is of course a well understood phenomenon. See eg National Audit Office, 'The challenges in implementing digital change' (2021) < https://www.nao.org.uk/insights/the-challenges-in-implementing-digital-change/ > accessed 7 September 2022.

[12] As discussed in Chapter 1.

[13] European Commission, 'AI Watch, European Landscape on the Use of Artificial Intelligence by the Public Sector' < https://data.europa.eu/doi/10.2760/39336 > accessed 5 September 2022 (hereafter 'AI Watch Landscape').

[14] Girish Mutagi, 'Digital transformation: Next Gen procurement and supply chain' (*IBM Supply Chain and Blockchain Blog*, 25 April 2018) < https://www.ibm.com/blogs/blockchain/2018/04/digital-transformation-next-gen-procurement-and-supply-chain/ > accessed 12 September 2022.

[15] Albert Sanchez-Graells and Michael Lewis, 'Digital technologies, hype, and public sector capability' (*howtocrackanut.com*, 13 July 2022) < https://www.howtocrackanut.com/blog/2022/7/13/digital-technologies-hype-and-public-sector-capability > accessed 12 September 2022.

[16] Albert Sanchez-Graells, 'Data-Driven Procurement Governance: Two Well-Known Elephant Tales' (2019) 24 Communications Law 157 (hereafter Sanchez-Graells, 'Data-Driven Procurement Governance').

1.1 Digital Procurement Governance as Transformation

The transition to e-procurement seeks to achieve several relevant policy goals:

> Countries are harnessing digital technologies to achieve better outcomes and deliver public services more effectively and efficiently … E-procurement systems can significantly enhance visibility about how public money is spent, help fight corruption and increase the efficiency of public procurement. They save money and time by reducing administrative burdens and potential mistakes that might arise during public procurement cycles.[17]

From that perspective, embedding electronic communication technologies in procurement governance is seen as a (partial) solution to some of its most recalcitrant challenges: corruption, inefficiency, and the waste of public money. Technology already has a long track record of being seen as a way of facilitating the achievement of the regulatory goals of procurement, which are discussed in Section 2. However, the transition to e-procurement was largely conceived as an opportunity to 'go paperless', while continuing to administer the same procurement processes of the analogue world (a 'lift and shift' policy intervention). This may partly explain limited motivation to overcome the challenges in its delivery, especially if the expected benefits were considered rather marginal.

E-procurement is generally considered a pragmatic pre-requisite for procurement digitalisation and the boundary between e-procurement and digital procurement is not always clear. It would be possible to conceptualise digitalisation as part of the process of developing sophisticated e-procurement systems and, in that regard, digitalisation could be seen as simply complementary of, or a stretch of e-procurement programmes, capable of making a gradual and additive (non-transformative) contribution to governance.

However, the European Commission conceptualises procurement digitalisation as 'rethinking the procurement process with digital technologies in mind. This goes beyond simply moving to electronic tools; it rethinks various pre-award and post-award phases … It also allows for the integration of data-based approaches at various stages'.[18] From that perspective, procurement digitalisation emerges as a policy vision that sees it as a potential catalyst for further and extensive public sector *transformation*:

> New technologies provide the possibility to rethink fundamentally the way public procurement, and relevant parts of public administrations, are organised. There is a unique chance to reshape the relevant systems and achieve a digital transformation.[19]

This more ambitious (but nebulous) strategic view of the digitalisation of procurement as *transformative* has much in common with the emergence of GovTech as a market and policy area where the development of technological solutions to support the operation of government (either in the delivery of public services or the operation of government itself)[20]

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[17] OECD, 'Government at a Glance 2021' (2021) 166.

[18] European Commission, 'Digital Procurement' < https://single-market-economy.ec.europa.eu/single-market/public-procurement/digital-procurement_en > accessed 7 September 2022.

[19] European Commission, 'Making Public Procurement work in and for Europe' (Communication) COM (2017) 572 final, 11-12. See also the UK's Digital, Data and Technology Profession, 'The Digital, Data and Technology Playbook' (2022) < https://www.gov.uk/government/publications/the-digital-data-and-technology-playbook/the-digital-data-and-technology-playbook > accessed 6 September 2022.

[20] Marissa Hoekstra et al, *The Digital Single Market and the digitalisation of the public sector. GovTech and other innovations in public procurement* (Publication for the committee on Internal Market and Consumer Protection (IMCO), European Parliament, 2022) (hereafter Hoekstra et al, 'GovTech and procurement').

is seen as a potential governance revolution.[21] This changes the policymaking narrative,[22] and perhaps activates higher levels of policy engagement than conceptualising the transition to (advanced or sophisticated) e-procurement as a technical back-office issue. There is a clear trend of technocentrism in emerging approaches to the governance of the public sector, and public procurement in particular. This creates a regulatory environment where technology-based policy entrepreneurship can be rather successful, and where the public sector is highly exposed to capture by technology firms. This is the main preoccupation of this Chapter.

1.2 Exploring the Governance Risks of Seeking Transformation

There is no question that digital technologies can positively impact the functioning of public procurement and facilitate higher levels of achievement of its multiple regulatory goals. However, whether digital technologies can be truly *transformative* remains to be seen,[23] and some of the high expectations implicit in some policy visions may easily prove to be excessive. Not all digital technologies are suitable for deployment as a tool of procurement governance. And even those that are suitable require significant adaptive changes to enable their deployment, some of which may be very difficult, costly, or simply undeliverable in practical terms. More importantly, even where they can be deployed, digital technologies cannot create a perfect or unproblematic model of procurement governance—not least, because the technologies themselves can create new governance risks.[24] However, these constraints and limitations are not always recognised in policy visions for digital procurement, which can result in a large gap between broad high-level strategies and the operational delivery of such transformation and digitalisation programmes.

Against this background of potentially excessive expectations capable of eschewing policymaking processes, this Chapter focuses on the links between the goals and challenges of procurement regulation and the promises of their digital governance. The Chapter maps the ways in which digital technologies *could* improve procurement governance if the technology could reliably perform the function its developers aspire to. The Chapter then reflects on how that abstract potential is susceptible to capture decision-making in a setting of 'organized anarchy', as conceptualised in garbage can theory, with high levels of policy entrepreneurship and heightened market incentives for policy capture. The Chapter concludes by stressing the need to reassess the true potential of digital technologies and, more importantly, the required enabling mechanisms, likely roadblocks, and new risks, to draw a feasibility boundary for their deployment in the governance of public procurement.

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[21] Tanya Filer, 'Thinking about GovTech. A Brief Guide for Policymakers' (2020) Bennett Institute for Public Policy < https://www.bennettinstitute.cam.ac.uk/publications/thinking-about-govtech-brief-guide-policymakers/ > accessed 7 September 2022; World Bank, 'GovTech: The New Frontier in Digital Government Transformation' (2020) < https://documents.worldbank.org/curated/en/898571612344883836/GovTech-The-New-Frontier-in-Digital-Government-Transformation > accessed 8 September 2022.

[22] Elizabeth A Shanahan, Michael D Jones and Mark K McBeth, 'Policy Narratives and Policy Processes' (2011) 39 Policy Studies Journal 535; Caroline Schlaufer et al,' The Narrative Policy Framework: A Traveler's Guide to Policy Stories' (2022) 63 Politische Vierteljahresschrift 249.

[23] *Cfr* Juan Carlos Barahona and Andrey M Elizondo, 'The Disruptive Innovation Theory Applied to National Implementations of E-procurement' (2012) 10 Electronic Journal of e-Government 107.

[24] Eg in the way they empower new 'insiders' that have a technological knowledge advantage. This is discussed in Albert Sanchez-Graells, 'Procurement Corruption and Artificial Intelligence: between the potential of enabling data architectures and the constraints of due process requirements' in Sope Williams-Elegbe and Jessica Tillipman (eds), *Routledge Handbook of Public Procurement Corruption* (Routledge forthcoming) XXX.

Such feasibility boundary should then inform a readjustment of policy priorities and inform and modulate experimentation with digital technologies in procurement governance.

2. Procurement Governance: Goals and Challenges

To understand the key challenges of procurement governance as a policy area, we need to first look at the goals of public procurement. This could be a more complex exercise than may at first seem, as the goals of procurement regulation remain contested.[25] The discussion will be kept functional and high-level here. There is a rather undisputed core of goals,[26] which primarily relate to the need to ensure probity in the expenditure of public funds by preventing corruption in the award and administration of public contracts.[27] This usually entails a related transparency goal as an anti-corruption tool.[28] A more disputed,[29] but still broadly accepted, set of goals concerns the use of market-based competitive mechanisms to generate value for money (or efficiency) in the expenditure of public funds.[30] This competition goal has an anti-protectionist element, to the extent that procurement markets need to be (internationally) open, which also facilitates the prevention of corruption.[31] A final set of goals concerns the instrumentalization of public procurement for policy delivery.[32] This can relate to the leveraging of procurement in relation to social, environmental or innovation goals—as well as the instrumentalization of procurement as a regulatory tool (eg in relation to digital technologies themselves, as discussed in Part II). These goals are more disputed, especially in relation to the unavoidable trade-offs between the 'core' goals of integrity, transparency and competition, and the 'horizontal' goals of innovation, environmental or social protection—or now the promotion of trustworthy artificial intelligence (AI).

Without seeking to address (again) the issue of procurement goals from a normative perspective,[33] suffice it to establish here that achieving (to any degree) any of the above procurement goals requires addressing two primary challenges: gathering relevant information, which can be very voluminous and originate in a broad array of disparate sources, and dealing with complexity and uncertainty in that information, which can lead to risk management.

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[25] For discussion, see Steven L Schooner, 'Desiderata: Objectives for a System of Government Contract Law' (2002) 11 Public Procurement Law Review 103; Steven L Schooner, Daniel I Gordon and Jessica Lynn Wherry, 'Public Procurement Systems: Unpacking Stakeholder Aspirations and Expectations' (2008) GWU Legal Studies Research Paper No. 1133234 < https://ssrn.com/abstract=1133234 > accessed 6 September 2022.

[26] Stephane de La Rosa and Patricia Valcarcel Fernandez (eds), *Principles of Public Contracts in Europe* (Bruylant 2022).

[27] This is clearly stressed in Art 9 of the United Nations Convention Against Corruption (hereinafter UNCAC).

[28] Monika Bauhr et al, 'Lights on the shadows of public procurement: Transparency as an antidote to corruption' (2020) 33 Governance 495.

[29] Sue Arrowsmith, 'The Purpose of the EU Procurement Directives: Ends, Means and the Implications for National Regulatory Space for Commercial and Horizontal Procurement Policies' [2012] Cambridge Yearbook of European Legal Studies 1; Peter Kunzlik, 'Neoliberalism and the European Public Procurement Regime' [2013] Cambridge Yearbook of European Legal Studies 283.

[30] Albert Sanchez-Graells, 'Competition and Procurement Regulation: A Goal, a Principle, a Requirement, or All of the Above?' in Carina Risvig Hamer et al (eds), *Into the northern lights – In memory of Steen Treumer* (Ex Tuto Publishing, 2022) XXX.

[31] Art 9(1) UNCAC.

[32] Sue Arrowsmith, 'Horizontal policies in public procurement: a taxonomy' (2010) 10 Journal of Public Procurement 149.

[33] Albert Sanchez-Graells, *Public Procurement and the EU Competition Rules* (2nd edn, Hart 2015) 101-114.

This applies to each of the putative goals of procurement. Ensuring integrity requires significant volumes of information of a varying nature, ranging from information on the decision-making process (eg which information did the public buyer take into account and was that information properly and objectively evaluated), to transactional information (eg were payments under a contract correct or excessive, did they respond to the proper implementation of the contract or were they made despite deficiencies in contract execution or compliance, etc) or relational information (eg which personal and financial relationships exist, if any, between those involved in the decision to award the contract and those owning or managing participating companies). Promoting competition to drive efficiency also requires both disseminating and collating large volumes of information, and best procurement practice should be based in extensive (and costly) market research and intelligence activities to enable the public buyer to identify potential solutions for its needs in a way that maximises value for money—as well as horizontal goals of eg innovation or green procurement, which are also largely information based. Moreover, ensuring value for money in the delivery of public contracts also requires gathering and analysing large volumes of information, some of which may require periodic or constant monitoring. Some or all of this information can be made transparent to foster a range of governance goals and public participation, although such disclosure adds additional layers of complexity and value judgement (eg in deciding which information to protect as commercially sensitive and which information to disclose in the public domain, with intermediate possibilities to release information on a need to know basis also possible). All this information tends to be complex and to require careful analysis (especially as the complexity of the procurement itself increases), and is always incomplete, which generates the unavoidable need to manage uncertainty and, where appropriate, deploy risk management strategies.

Limitations or failures in achieving the goals of procurement can usually be traced back to information and complexity issues. Corruption and inefficiency can thrive where oversight is ineffective due to a lack of information, or a significant lag between the implementation of public contracts and their audit, or because of the interposition of complex networks of intermediaries. Competition can be impaired where there is insufficient dissemination or collection of information, where the information is not correctly verified or processed, or where complexity exceeds the capacity of the public buyer to understand or evaluate information. The same applies to horizontal goals. Resources can also be wasted where the complexity of the procurement system itself prevents desirable outcomes, or where an incorrect interpretation or application of the rules results in eg tender cancellations. It is thus clear that procurement is an information-intensive activity and that most of the costs it generates, including opportunity costs and regulatory failure costs, are information costs.

It is thus no surprise that procurement procedures are conceived of as an information revelation mechanism. It is also no surprise that calls to boost the integrity and efficiency of procurement, as well as its effectiveness in delivering horizontal policy goals, tend to highlight the importance of increasing the size of the procurement workforce, and to boost skills development through professionalisation programmes[34]—to tackle both aspects of

[34] Eg Commission Recommendation (EU) 2017/1805 of 3 October 2017 on the professionalisation of public procurement — Building an architecture for the professionalisation of public procurement [2017] OJ L 259/28; see also module four of European Commission, 'ProcurCompEU. European Competency Framework for Public Procurement Professionals (2020) < https://ec.europa.eu/info/sites/default/files/procurcompeu-ecf_for_pp_en.pdf > accessed 8 September 2022.

information intensity and complexity. The information dependency, complexity and resource intensity of procurement governance are thus the core areas of focus of any programme of procurement reform or improvement.

Problematised in this way, the primary functional challenges in procurement governance directly map onto the promises of improved performance by digital technologies, which are meant to be able to gather and process volumes of information that far exceed human capabilities (big data), and to identify data patterns and other insights that are too complex for human analysis. In abstract terms, thus, digital technologies could: reduce the burden of gathering, disseminating and analysing data, and boost the visibility of public sector activities to (near) real time; guarantee the veracity and integrity of the underlying information; distil complexity into actionable policy and operational insights, including in areas of uncertainty through the prediction of future events or the plotting of future trends; and boost the productivity of the public sector by freeing up the workforce from menial, repetitive, and non-value added tasks, as well as avoiding mistakes.

It is this abstract possibility to address the challenges of information intensity and complexity that fuels the ambitious policy visions of transformation discussed in Section 1.1. Problematically, this same abstract potential to contribute to the goals of procurement governance can translate into hype and policy irresistibility, which can in turn underpin an excessive diversion of policy resources towards experimentation with technologies with no real, or commensurate, likelihood of generating governance or operational gains.[35] Excessive experimentation can also result from too keen an embrace of emerging calls for 'mission-led' governance approaches.[36] Such excessive experimentation could result from skewed or captured (techno-optimistic) decision-making. This evidences a governance problem in itself, which echoes the broader issue of regulatory pacing discussed in Part II: how to guide the process of adoption of digital technologies in a way that avoids such risk of excessive experimentation, without impairing the (transformative) long-term potential of some of those digital technologies?

To start to answer this question, it is useful to explore in more detail what the abstract promises of digital technologies in relation to procurement governance are, to then proceed to understand how those abstract promises can trigger an excessive mobilisation of policymaking resources. The following two sections focus on technologies capable of reducing the burden of information intensity and information complexity, respectively.

3. Digital Technologies and Procurement Information Intensity

As mentioned above, one of the primary challenges in procurement governance concerns the collection and exchange of large volumes of information. Deploying digital technologies to tackle this information intensity presupposes the existence of adequate sources of such information, as well as a series of characteristics of that information (such as its machine readability). For the purposes of assessing the technologies' abstract potential, let us assume that such enabling data architecture is in place—which is a big assumption, though, as discussed in Chapter 7, Section XX. In abstract terms, digital technologies could reduce the information burden associated with procurement governance, both in terms of gathering, cross-checking, and exchanging information, and in terms of ensuring its veracity and

[35] Sanchez-Graells, 'Data-Driven Procurement Governance' (n 16).

[36] See eg Mariana Mazzucatto, *Mission Economy. A moonshot guide to changing capitalism* (Allen Lane 2021).

integrity. Different digital technologies, and combinations thereof, could facilitate these outcomes. The following is a highly stylised and non-exhaustive overview of the technologies and potential applications that takes their potential functionalities and advantages at face value.[37] It does not provide a critical assessment of their likely potential contribution to procurement governance, which will be carried out in detail in Chapter 7. The purpose of this overview is to highlight the characteristics that can make these technologies so difficult to resist from a policymaking perspective.

3.1 Automation of Information Retrieval, Cross-Checking, and Exchange

Robotic process automation (RPA), or software robotics, is a technology that facilitates the automation of repetitive, information intensive, back-office processes based on clearly defined rules that do not require complex logic[38]—such as establishing matches with specific terms or codes, or checking whether values exceed a specified threshold. RPA can replace manual tasks such as gathering, cross-checking, or exporting information with software 'bots' that automatically conduct them.[39] RPA could thus reduce some information costs in different stages of the procurement process,[40] either to the benefit of potential tenderers, or the procuring entity. RPA could for example facilitate a certain degree of customisation in the search for contract opportunities where potential tenderers would not rely on a direct examination of the portals where tender notices are published, but RPA software would allow them to create a system of alerts that would filter relevant opportunities for them and bring them to their attention through automated messaging. This could reduce the burden of identifying contract opportunities and could generate more competition. Similarly, there are several sub-processes within a procurement that require rules-based verification, such as screening economic operators against debarment or qualification databases or checking specific aspects of their tenders against pre-established values. The possibility of automation could not only reduce the information burden within procurement procedures for the benefit of the contracting authority, but also allow for the use of more open procedures in situations where other types of procedure are currently used as a way of ensuring that the public buyer has the capacity to screen tenderers or evaluate their tenders—which could also generate a positive effect in terms of competition for the contract. Moreover, automation could facilitate the retrieval of information from more sources than are currently used for procurement governance purposes, such as general sources of information on the internet (eg software could be used to gather information from press releases or other sources of publicly-available information to screen for any signs of concern over a tenderer's track record, compliance or other policies). RPA could be deployed to process invoices.[41] RPA could also reduce the burden of information reporting and exchange, such as by automating the creation of specific reports, such as debriefing reports collating the results of other automated checks, and their publication or exchange in near real time. Where connected to machine learning (ML) or other

[37] This is labelled as 'applications in theory' eg in Deloitte, 'Study on up-take of emerging technologies in public procurement. Final report' (2020) < https://ec.europa.eu/docsroom/documents/40102 > accessed 7 September 2022 (hereafter Deloitte, 'Emerging technologies in public procurement'); and in World Bank, 'Disruptive Technologies in Public Procurement' (2021) < http://documents.worldbank.org/curated/en/522181612428427520/Disruptive-Technologies-in-Public-Procurement> accessed 8 September 2022 (hereafter, WB, 'Disruptive technologies').

[38] WB, 'Disruptive technologies' (n 37) 17-18.

[39] Deloitte, 'Emerging technologies in public procurement' (n 37) 19.

[40] WB, 'Disruptive technologies' (n 37) 41.

[41] Deloitte, 'Emerging technologies in public procurement' (n 37) 20.

forms of AI, RPA can automatically generate decision proposals, or even fully automate decision-making.[42]

A cursory overview of RPA shows that it holds the abstract promise of automating burdensome and low value-added tasks, which would reduce the cost and time required to complete procurement (sub)processes, as well as potentially freeing up resources that could be redeployed to more value-added tasks. RPA can also reduce error risks and contribute to consistency and reliability in the carrying out of the automated tasks. The advantages of RPA would be potentially larger where existing procurement processes involve the use of many disparate sources of information, or where the same piece of information is used multiple times to verify different aspects of the tenderer or tender. Another abstract potential advantage of RPA is the possibility of speeding up and (endlessly) repeating the automated checks. This generates the additional potential advantage of information update and visibility in (near) real time. This can be particularly helpful in the monitoring of evolving aspects of a procurement process, as well as in ensuring that decisions are adopted based on current information. It can also facilitate early interventions where the relevant automated checks relate to modifiable or evolving parts of a procurement process, or to market dynamics.

Internet of things (IoT) refers to technology that automates the collection of information via sensors, as well as facilitating remote interactions by and with the connected things/sensors. They can be as simple as barcode scanners, or range to more complex sensors designed to capture or measure specific conditions in an environment. IoT implementations could substitute traditional information gathering mechanisms and accelerate the transmission of that information to also provide (near) real time visibility.[43] There could be several implementations in procurement governance, primarily in relation to contract performance, such as gathering information on the demand of specific goods or services. Where combined with RPA or ML, IoT implementations could replace some inspections and checks, as well as trigger automated procurement processes (eg to restock supplies when a pre-determined availability threshold is reached, or to facilitate the execution of 'on demand' or 'pay as you go' contract modalities (which can be particularly relevant in models of procurement of anything as a service (XaaS))).[44]

A cursory overview of IoT implementations also shows that, much like RPA, it has the potential to reduce the burden, speed up, and reduce the risk of errors in the retrieval and exchange of information. Both technologies can interoperate between themselves, and both can also interoperate with different elements of AI and ML in forms of intelligent automation. Such intelligent automation would reduce the burden in relation to more complicated (but still rules-based) decisions, along the lines described in Section 4.

[42] The automation of procurement decision-making requires detailed analysis, undertaken in Chapter XX, section XX.

[43] WB, 'Disruptive technologies' (n 37) 55.

[44] Deloitte, 'Emerging technologies in public procurement' (n 37) 21.

3.2 Information Verification and Integrity

Blockchain or, more generally, Distributed Ledger Technology (DLT),[45] is a system of electronic records that

> enables a network of independent participants to establish a consensus around the authoritative ordering of cryptographically-validated ('signed') transactions. These records are made persistent by replicating the data across multiple nodes, and tamper-evident by linking them by cryptographic hashes. The shared result of the reconciliation/consensus process - the 'ledger' - serves as the authoritative version for these records.[46]

In other words, DLT allows for new approaches to the storage and exchange of information where 'instead of having one centralised database on which records are stored, this data is stored in a decentralised manner across all of the nodes of the … network'.[47] DLT is thus an information management technology that can facilitate the decentralisation of information verification by ensuring the permanence and tamper-proofness of the records without requiring the intervention of any one given entity, such as the public buyer.[48] It can also facilitate the creation of a trusted, secure and transparent data backbone[49]—and, in that function, it functionally overlaps with open procurement data efforts.[50] Depending on their specific configuration, DLT systems could ensure the provenance and integrity of information and, in some situations, its veracity (eg where provenance from an authoritative source is established,[51] or where the information is itself automatically generated in the process of its inclusion on the DLT, which could be facilitated by an interconnection with IoT or other types of oracle). This could reduce the need to supply the same information for verification on multiple occasions, and thus underpin the implementation of the 'once only principle'. DLT could also facilitate the cross-border exchange of procurement-relevant information.[52] It could prevent or evidence any tampering with such information, as well as help identify the origin of any such information security breach. This is particularly important in relation to the confidentiality of procurement information, as well as eg the numerous rules limiting the possibilities to alter or amend tenders. It could also prevent instances of corruption where tenders are modified post-submission, or records are otherwise tampered with.[53]

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[45] Michel Rauchs et al, 'Distributed Ledger Technology Systems. A Conceptual Framework' (2018) < https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2018-10-26-conceptualising-dlt-systems.pdf > accessed 7 September 2022 (hereafter Rauchs et al, 'DLT conceptual framework'); Ubaldi et al, 'Emerging technologies in the public sector' (n 2) 13-17.

[46] Rauchs et al, 'DLT conceptual framework' (n 45) 24, references omitted.

[47] Deloitte, 'Emerging technologies in public procurement' (n 37) 8.

[48] However, it should already be stressed that the likelihood of the public sector implementing a fully decentralised, ie permissionless, form of DLT is very low; Sanchez-Graells, 'Data-Driven Procurement Governance (n 16) 163.

[49] Deloitte, 'Emerging technologies in public procurement' (n 37) 8.

[50] Open data is discussed in detail in Chapter 7, Section XX.

[51] WB, 'Disruptive technologies' (n 37) 51.

[52] Pedro Telles, 'Existing and Potential Use Cases for Blockchain in Public Procurement' (2022) < https://ssrn.com/abstract=4168144 > accessed 8 September 2022; Ramanathan Somasundaram and S M Quamrul Hasan, 'Regional: Development of a Global e-Government Procurement Architecture using Blockchain Technology' (2018) Asian Development Bank Technical Assistance Consultant's Report < https://www.adb.org/sites/default/files/project-documents/47192/47192-001-tacr-en_5.pdf > accessed 8 September 2022.

[53] Deloitte, 'Emerging technologies in public procurement' (n 37) 9; Sope Williams-Elegbe, 'Public Procurement, Corruption and Blockchain Technology: A Preliminary (Legal) Inquiry' (2018) Inaugural Lecture at Stellenbosch University <

Moreover, DLT can operate as an infrastructure layer over which to deploy smart contracts, which are another technology for rules-based automation that could complement or substitute some RPA processes. Smart contracts deployed on a DLT architecture could fully automate (most parts of) the procurement process.[54] Smart contracts could thus, in addition to reducing the administrative burden of carrying out a procurement process, also reduce or exclude the exercise of discretion in procurement, which could have significant anticorruption benefits.[55]

A cursory overview of DLT and smart contracts shows the potential they could have in further reducing information handling and verification costs, as well as additional potential benefits in terms of ensuring the objectivity (and automaticity) of procurement procedures.

4. Digital Technologies and Procurement Information Complexity

In addition to the potential advantages in relation to the information intensity of procurement procedures, digital technologies could also facilitate the analysis of complex procurement information, as well as support the management of uncertainty, including through the deployment of risk management systems.

ML is a form of AI that involves 'the use and development of computer systems that are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyse and draw inferences from patterns in data'.[56] ML applications can rely on two main forms of development (supervised and unsupervised ML) and be descriptive, predictive, or prescriptive. Functionally, ML can solve classification and prediction problems based on amounts of information (big data) not processable by humans.[57] ML can be deployed for category and spend management,[58] which could support efficiency analysis. ML could also be used to develop synthetic sources of information based on complex and unstructured procurement (and other) information. This could be used to eg create reference prices to benchmark the efficiency of procurement procedures; generate (measurable) quality benchmarks; produce predictions of procurement needs or outcomes; or support systems of red flags for a number of procedural or relational aspects of procurement implementation and oversight. For example, from an anticorruption perspective, there are projects seeking to develop new measures to assess risks of conflict of interest and other

https://www.sun.ac.za/english/Documents/newsclips/InauguralLecture_ProfSopeWilliamsElegbe_23Oct2018.pdf > accessed 8 September 2022.

[54] WB, 'Disruptive technologies' (n 37) 48-49; Freya Sheer Hardwick, Raja Naeem Akram, and Konstantinos Markantonakis, 'Fair and Transparent Blockchain based Tendering Framework - A Step Towards Open Governance' (2018) < https://arxiv.org/pdf/1805.05844.pdf > accessed 8 September 2022; Sergi Nin Sanchez, 'The Implementation of Decentralised Ledger Technologies for Public Procurement: Blockchain-based Smart Public Contracts' (2019) 14 European Procurement & Public Private Partnership Law Review 180; Raquel Carvalho, 'Blockchain and Public Procurement' (2019) 6 European Journal of Comparative Law and Governance 187.

[55] Deloitte, 'Emerging technologies in public procurement' (n 37) 10.

[56] Oxford Languages Google Dictionary. This reflects the key elements of the seminar definition provided by Mitchell 'A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with experience E'; Tom M Mitchell, *Machine Learning* (McGraw-Hill 1997).

[57] Deloitte, 'Emerging technologies in public procurement' (n 37) 14.

[58] Deloitte, 'Emerging technologies in public procurement' (n 37) 15.

corrupt practices.[59] ML is also increasingly used to develop screens to detect anticompetitive practices in public procurement.[60]

ML could also be used for natural language processing (NLP)—that is 'the application of computational techniques to the analysis and synthesis of natural language and speech'[61]—to eg generate standardised procurement documents and draft contracts,[62] or develop decision-making assistants (chatbots) capable of providing (standard) advice or support currently given by specialist members of the procurement workforce, thus reducing the need to acquire specialist knowledge to navigate the complex system of rules and regulations applicable to a single procurement exercise. Chatbots could also be developed to allow tenderers to self-assess compliance with tender requirements before tender submission, thus reducing the scope for mistakes and the submission of non-compliant tenders.[63] Similar techniques could be used to extract and classify information from unstructured sources, and ML could also enable new approaches to procurement due diligence and evaluation based on a larger number of data points, as well as the embedding of forecasts or predictions into procurement evaluation processes.[64] This would allow for the automation of complex decisions that cannot be easily translated into strict rules to eg enable RPA or smart contract-based automation.[65] ML could also be used to develop recommender systems that facilitated a pre-screening of potential tenderers[66] or products and services, thus potentially reducing the cost and complexity of carrying out market research in preparation of procurement exercises. ML could also be used to develop systems of risk indicators, eg in relation to contract non-compliance, supply-chain issues, or other risks of non-performance, which could then inform the deployment of risk management systems.

A cursory overview of ML, including NLP, shows that it has the potential to bridge the complexity of the information relevant from a procurement governance perspective, and that it can augment decisionmakers' ability to deal with that complexity and with related uncertainty. This comes with the implicit advantage of automation, as all tasks carried out by ML would be automated. This could minimise the need for human decision-making, or even exclude it altogether.[67]

5. Factors Contributing to Hype and Policy Irresistibility

To recapitulate the superficial technological overview of the last two sections, in abstract terms, digital technologies have the theoretical potential to significantly reduce the burden of information intensity and complexity in procurement governance by a combination of automation and decision-making support implementations. These could generate significant

[59] Deloitte, 'Emerging technologies in public procurement' (n 37) 16. Albert Sanchez-Graells, IDB publication.
[60] Eg Manuel J Garcia Rodriguez et al, 'Collusion detection in public procurement auctions with machine learning algorithms' (2022) 133 Automation in Construction 104047. For discussion, see Albert Sanchez-Graells, '"Screening for Cartels" in Public Procurement: Cheating at Solitaire to Sell Fool's Gold?' (2019) 10(4) Journal of European Competition Law & Practice 199.
[61] Oxford Languages Google Dictionary.
[62] Deloitte, 'Emerging technologies in public procurement' (n 37) 17.
[63] Deloitte, 'Emerging technologies in public procurement' (n 37) 15.
[64] WB, 'Disruptive technologies' (n 37) 42.
[65] Deloitte, 'Emerging technologies in public procurement' (n 37) 18.
[66] Manuel J Garcia Rodriguez et al, 'Bidders Recommender for Public Procurement Auctions Using Machine Learning: Data Analysis, Algorithm, and Case Study with Tenders from Spain' (2020) Complexity 8858258.
[67] However, the automation of procurement decision-making requires detailed analysis; see Chapter XX, section XX.

gains in terms of boosting the integrity of the procedures, facilitating heightened competition for public contracts, and reducing the administrative costs of procurement procedures. Given the theoretical potential of digital technologies to reduce the information and complexity burdens of procurement, it is hardly surprising that the prospect of reaping the gains of the deployment of digital technologies generates significant hype and policy irresistibility. That is, an attractiveness that is likely to bring procurement digitalisation to the top of the policymaking agenda, even if its specific benefits and the requirements to unleash them are not very clear, or well understood—not least, because these technologies are immature.

This hype and policy irresistibility is fuelled not only by the direct mapping of the theoretical functionality of digital technologies onto the primary regulatory challenges in procurement governance, which can increase the appeal of technological fixes for governance challenges,[68] but also by additional governance characteristics such as: multi-level governance, an increased emphasis on embedding innovation in procurement processes, and a continued gap in the digital capability of the public sector. These characteristics directly connect with the governance risks identified by a combination of garbage can theory, policy entrepreneurship, and policy capture as elaborated in Section 6.

5.1 Multi-Level Procurement Governance

Public procurement is carried out at different levels of government, ranging from local and institutional procurement (eg by Universities) to regional and State level, as well as sometimes internationally. There are also increasing trends of centralisation and collaboration that alter the traditional structures of procurement governance, including with a cross-border dimension. This implies that some aspects of procurement governance are multi-level, in particular concerning eg the establishing of a procurement legal regime or, increasingly, policy priorities. In the EU, the European Commission has been pushing for a set of policy goals that squarely includes innovation,[69] and Member States are systematically monitored for its implementation—although the metrics are never quite clear. At national level, States are also adopting policy frameworks that repeatedly stress the goal of digitalising procurement, as well as stressing the need to revise procurement processes to ensure that they are innovation-friendly,[70] as discussed in the next section 5.2. Translating these high-level policies and goals into operational change is left to the levels of governance closer to the day-to-day operation of procurement, which can generate pressures to adopt digital technologies (or to be able to report doing so), despite the operational needs and framework not being necessarily ready for that. This is reflective of the top-down approach that tends to underlie digital transformation programmes, especially when they are coupled with centralisation and standardisation, as also discussed in section 5.3.

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[68] This would be a clear instance of technology determinism. Dunleavy, 'Digital era governance' (n 1) 404-406. Its exploration in detail exceeds the possibilities of this Chapter. For discussion in relation to blockchain, see Uta Kohl, 'Blockchain utopia and its governance shortfalls' in Oreste Pollicino and Giovanni De Gregorio (eds), *Blockchain and Public Law. Global Challenges in the Era of Decentralisation* (Edward Elgar 2021) 13. For a useful overview of the relevance and need to contextualise techno-legal interactions by reference to Science, Technology, and Society (STS) studies, see Ryan Calo, 'The Scale and the Reactor' (SSRN, 15 April 2022) < https://ssrn.com/abstract=4079851 > accessed 7 September 2022.

[69] European Commission, 'Strategic Procurement' < https://single-market-economy.ec.europa.eu/single-market/public-procurement/strategic-procurement_en > accessed 5 September 2022.

[70] 'AI Watch Landscape' (n 13) 25.

5.2 Innovative Procurement (of Innovation)

The use of procurement as an innovation catalyst has been an ongoing policy consideration, and one that has had growing policy relevance over the last decade, especially in the EU.[71] While innovation procurement has mainly focused on the procurement of the process (ie R&D services) and outcomes of innovation,[72] there has been increasing attention to innovative procurement (ie innovation in the way procurement is carried out) as an enabler for the procurement of innovation.[73] This is perhaps particularly clear in the context of GovTech, where it has been stressed that '[d]elivering digital transformation through GovTech cannot be separated from the purchasing of GovTech'.[74]

Such policy approach creates a conflation between the importance of ensuring that the public sector is benefitting from market innovation as a technological dimension of value for money, on the one hand, and the perception that procurement rules and procedures are inadequate for the purchasing of such innovation, on the other. The perceived inadequacy of procurement rules stems from the touted advantages of less structured and formal processes of information gathering and co-creation of (concept or pilot) solutions, such as hackathons and other challenge-based approaches. The claim is that the full-fledged application of procurement rules could put some of the innovators off or introduce rigidities that could derail the innovation process.[75] However, there is little evidence that alternative, procurement compliant approaches would not lend satisfactory results, even if they would be difficult to manage.[76] Regardless, the conflation of the intended procurement outcome and the way it is carried out generates policy pressure 'to do things differently',[77] and to digitalise procurement as part and parcel of adjusting procurement practices to the (perceived) demands of the procurement of innovation—which compounds the effects of other dynamics pushing for the adoption of digital technologies for procurement governance. Some of those dynamics are largely the result of reduced digital capability in the public sector.

5.3 The Public Sector Digital Capability Gap

Most public procurement organisations have limited digital capability.[78] Contrary to what maturity models and other guidelines would recommend,[79] such limited digital capability does not necessarily prevent public sector organisations from engaging—and certainly does

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[71] See eg European Commission, 'Guidance on Innovation Procurement' (Notice) C(2021) 4320 final.

[72] C(2021) 4320 final, 5. For discussion, see Pedro Cerqueira Gomes, *EU Public Procurement and Innovation. The Innovation Partnership Procedure and Harmonization Challenges* (Edward Elgar 2021) 41-44.

[73] European Commission, 'Guide on public procurement procedures and instruments in support of innovation' < https://ec.europa.eu/docsroom/documents/47179 > accessed 5 September 2022.

[74] Hoekstra et al, 'GovTech and procurement' (n 20) 24, emphasis omitted. This qualified by the possibility of digital transformation being developed fully in-house.

[75] 'AI Watch Landscape' (n 13) 25; Hoekstra et al, 'GovTech and procurement' (n 20) 9 and 28. This is reflected in the OECD, Recommendation of the Council on Digital Government Strategies (2014) at paragraph 11.

[76] Hoekstra et al, 'GovTech and procurement' (n 20) 24 ff.

[77] Which is even elevated to the category of principle; see OECD Digital Government Toolkit, Principle 11 < https://www.oecd.org/governance/digital-government/toolkit/principle11/ > accessed 5 September 2022.

[78] This is uncontroversial. See eg the UK's Central Digital and Data Office, 'Transforming for a digital future: 2022 to 2025 roadmap for digital and data' (Policy Paper, 9 June 2022) < https://www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025 > accessed 5 September 2022.

[79] Eg Kevin C Desouza, 'Artificial Intelligence in the Public Sector: A Maturity Model' (2021) IBM Centre for the Business of Government < https://businessofgovernment.org/report/artificial-intelligence-public-sector-maturity-model > accessed 8 September 2022.

not shield them from efforts from the private sector to engage them—in projects of digital transformation.[80] This digital capability gap creates risks of exploitation of the limited technical knowledge available at public agencies and 'this dependency risk can become even more significant once modern GovTech solutions replace older government components'.[81] Indeed, limited digital capability opens public buyers up to risks of policy capture,[82] where the private sector determines the 'feasibility boundary' (or art of the possible) and the public sector follows in the award of contracts for the implementation of digital technologies without sufficient assurances that their abstract benefits will ever be realised.[83]

One way to try to address the digital capability gap is for public organisations to engage consultants and service providers with such knowledge and skills. As more general studies have shown, such a strategy can provide short-term solutions, but creates medium- and long-term problems, especially as the reliance on outside resources can further the tendency of hollowing out of the public sector's capabilities.[84] It can also exacerbate problems resulting from technical and intellectual debt associated with digital technologies, especially if there is no continuity in the engagement of consultants. Such strategy also generates additional risks of conflict of interest that can become difficult to identify and manage. From a governance perspective, it is thus a less than ideal fix.

Another way to try to address this capability gap is through collaboration and centralisation in the procurement of digital technologies.[85] While this can allow pooling expertise and capabilities, it also has governance implications. Centralised procurement in particular, in its drive to standardise needs and create economies of scale (eg the 'buy once, use many times' approach to technology[86]), reduces or completely excludes the chances of operational influence over the procurement process. In other words, it transforms the digitalisation of procurement into a top-down process and makes it susceptible to risks of technological-centricity that can generate difficulties in rollout and adoption of the centrally procured technologies. Moreover, not only the procurement, but also the adoption and continued use of digital technologies at operational level requires digital capabilities. Centralised and collaborative procurement can thus only go so far in alleviating the digital capabilities gap. Finally, centralisation of digital technology procurement raises the stakes for potential providers, which can in turn reactivate issues of risk of capture as the reward for influencing technology decisions grows. From a governance perspective, this is also a less than ideal fix.

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[80] Albert Sanchez-Graells and Michael Lewis, 'Digital Technologies, Hype, and Public Sector Capability' (*howtocrackanut*, 13 July 2022) < https://www.howtocrackanut.com/blog/2022/7/13/digital-technologies-hype-and-public-sector-capability > accessed5 September 2022.

[81] Nitesh Bharosa, 'The rise of GovTech: Trojan horse or blessing in disguise? A research agenda' (2022) 39 Government Information Quarterly 101692, 8.

[82] OECD, 'Preventing Policy Capture. Integrity in Public Decision Making' (2017) 39.

[83] This links with insights derived from the study of commercial determinants of policymaking. For discussion in the procurement context, see Lisa Montel and John Coggon XXX. See also Eleanor Aspey and Richard Craven, 'Regulating complex contracting: a socio-legal study of decision-making under EU and UK law' (2018) 81 Modern Law Review 191.

[84] Although not specific to digitalisation, the analysis is telling in Bridget C E Dooling and Rachel Augustine Potter, 'Regulatory Body Shops' (2022) < https://ssrn.com/abstract=4186402 > accessed 8 September 2022. See also H Brinton Milward and Keith Provan, 'Managing the hollow state. Collaboration and contracting' (2003) 5 Public Management Review 1.

[85] As promoted by eg the European Commission, C(2021) 4320 final, section 2.5.2.

[86] CDDO, 'Transforming for a digital future' (n 78).

6. Garbage Can Processes, Policy Entrepreneurship, and Capture

This section zooms in on the governance risks that digital technologies' allure and policy irresistibility generate in a context of a policy- and decision-making characterised by top-down pressures, reinforcing effects between different strands of the digitalisation of the public sector, and limited institutional capacity. This section first adopts the perspective of garbage can theory[87] to stress some aspects of procurement policymaking processes that makes them particularly susceptible to capture. It then combines insights from policy entrepreneurship[88] and regulatory capture theory[89] to highlight capture risks in this setting.

Garbage can theory explains the institutional dynamics of 'organized anarchies'. These are organizations with a combination of: (a) problematic preferences, that is, 'a variety of inconsistent and ill-defined preferences'[90] whereby the organisation 'discovers preferences through action more than it acts on the basis of preferences';[91] (b) unclear technology, whereby the organisation 'operates on the basis of simple trial-and-error procedures, the residue of learning from the accidents of past experience, and pragmatic inventions of necessity';[92] and (c) fluid participation, whereby participants in decision-making 'vary in the time and effort they devote to different domains'[93] and change capriciously for any particular kind of choice. I submit that procurement governance, and in particular procurement policymaking,[94] is an example of such organized anarchy, given the complexity and lack of clarity on how to balance competing goals, the lack of clarity on how procurement is carried out and on how it could be carried out differently in a digital setting, as well as the fluid participation of several actors in the multi-level procurement governance setting.

The 'garbage can process is one in which problems, solutions and participants move from one choice opportunity to another in such a way that the nature of choice, the time it takes, and the problems it solves all depend on a relatively complicated intermeshing of elements';[95] where 'decision-making in the public sector as seen through the lens of this model reflects the serendipitous, and almost accidental, confluence of streams of problems, solutions, opportunities and actors'.[96] In other words, it is a model of decision-making where 'solutions go looking for problems with which to link'.[97] As extended to policymaking, the model stresses the importance of 'windows of opportunity' for policy formulation and implementation, when

[87] Michael D Cohen, James G March and Johan P. Olsen, 'A Garbage Can Model of Organizational Choice' (1972) 17 Administrative Science Quarterly 1 (hereafter Cohen et al, 'Garbage Can').
[88] Michael Mintrom, 'Policy Entrepreneurs and Dynamic Change' in M. Ramesh et al (eds), *Cambridge Elements in Public Policy* (CUP 2020) < http://www.cambridge.org/9781108461467 > accessed 7 September 2022.
[89] Andrea Saltelli et al, 'Science, the endless frontier of regulatory capture' (2022) 135 Futures 102860.
[90] Cohen et al, 'Garbage Can' (n 87) 1.
[91] Cohen et al, 'Garbage Can' (n 87) 1.
[92] Cohen et al, 'Garbage Can' (n 87) 1.
[93] Cohen et al, 'Garbage Can' (n 87) 1.
[94] The applicability of the model to EU policymaking generally supports this approach. Jeremy Richardson, *Policy-making in the EU. Interests, ideas and garbage cans of primeval soup* (Taylor & Francis 1996).
[95] Cohen et al, 'Garbage Can' (n 87) 16.
[96] B Guy Peters, 'Governance: A Garbage Can Perspective' (2002) Vienna Institute for Advanced Studies, Political Science Series Num 84, 13 < https://aei.pitt.edu/347/1/wp_84.pdf > accessed 8 September 2022 (hereafter Peters, 'Garbage Can').
[97] Cary Coglianese and Daniel E. Walters, 'Agenda-Setting in The Regulatory State: Theory and Evidence' (2016) 68 Administrative Law Review 93, 97.

there is alignment between the parallel movements of problems and solutions.[98] When those policy windows open, 'policy entrepreneurs must be prepared to exploit the opportunities'.[99]

I submit that the current policymaking environment surrounding digital transformation has opened such a window of opportunity for digital technology related policy entrepreneurship, and for attempts at policy capture by (GovTech) entrepreneurs. A couple of additional observations may be added now. Given the limited digital capability in the public sector, it is likely that those with (some) digital skills are internally seen as more capable of leading in digital transformation and, consequently, may enjoy increased opportunities for policy entrepreneurship. Such policy steer can be influenced by the specific vision or relationships of that policy entrepreneur, but those may not be observable to the rest of the organisation, which may in any case lack the ability (or incentives) to take a hard look or query specific policies or proposals. Relatedly, for the same reason, there are increased opportunities for capture by tech companies that either have an incumbency advantage (eg they are already providing e-procurement or consultancy services), or otherwise have a strong market position, reputation or salesforce. It is hard to overstress how standard governance challenges are heightened in the context of a window of opportunity where the allure of digital technologies can serve as sufficient justification for all sorts of policy decisions, including (and perhaps especially) decision concerning technological experimentation.

Any such instances of policy entrepreneurship or capture, in addition to other significant governance problems, may trigger the investment of excessive or unjustified amounts of resources by policymakers unable to resist the allure of digital technologies and their abstract promises. Beyond excessive experimentation, this can also eventually lead to the adoption of technologies that are not the best suited to the procurement function's needs, or technologies that create problems in the medium to long term, such as (further) technical or intellectual debt, or other issues (eg lock-in). This can have clear negative societal impacts.

One of the clear challenges in reducing such risks requires boosting the digital capability of the public sector, to which we will return in Chapter 8.[100] Another challenge is to take a hard look at the allure and policy irresistibility of digital technologies, reassessing the true potential benefits of digital technologies and, more importantly, the required enabling mechanisms, likely roadblocks, and new risks, to draw a feasibility boundary for their deployment in the governance of public procurement and thus establish what digital technologies could *realistically* bring to procurement governance. That will be the object of Chapter 7.

[98] John W Kingdon, *Agendas, Alternatives and Public Policies* (Harper Collins 1984) 21.
[99] Peters, 'Garbage Can' (n 96) 13.
[100] This is a core theme and recommendation eg of the Goldacre Review in the context of health data, which however offers very exportable insights on the challenges of data and technology-related governance reform programmes; Ben Goldacre and Jess Morley, 'Better, Broader, Safer: Using health data for research and analysis. A review commissioned by the Secretary of State for Health and Social Care' (2022) < https://www.goldacrereview.org/ > accessed 12 September 2022.