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Working Paper

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8/2022 April

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Dynamic capabilities of the public sector: Towards a new synthesis

Rainer Kattel*

Abstract

The COVID-19 pandemic has shown how important public sector capacities and capabilities are in terms of reacting to crises, and re-configuring existing policies and implementation practices. Prior to the pandemic, policy makers were increasingly turning their attention to challenge-driven innovation policies in order to tackle climate emergencies and other 'wicked' societal challenges. Such a 'normative turn' also assumes the existence of what can be called dynamic capabilities in the public sector. This paper offers a new synthesis of how to conceptualise dynamic capabilities in the public sector. The paper synthesises existing state capacity, public sector innovation capacity and dynamic capabilities literature. Using three brief case studies (the UK's Government Digital Service, the city of Barcelona and Sweden's Vinnova), the paper discusses the origins and constitutive elements (sense-making, connecting, shaping) of dynamic capabilities. The paper also discusses how dynamic capabilities could be assessed.

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1. Introduction: growth is not enough

Economic policy makers are increasingly in agreement that it is not enough to focus on economic growth rates; what matters as much is the direction or kind of growth (Daimer, Hufnagl and Warnke 2012; Mazzucato and Perez 2014; Mazzucato 2016; Chang and Andreoni 2020). This realisation takes the form of the rise of green central banking (Campiglio et al. 2018), an increased focus on better coordinated macro-economic and innovation policies (Cimoli et al. 2020), and developing a new generation of innovation policies framed in the context of the UN's Sustainable Development Goals (Mazzucato 2017; Schot and Steinmueller 2018). Such a 'normative turn' (Daimer, Hufnagl and Warnke 2012) in (economic) policy goals has intensified both conceptual and policy discussions globally. For instance, the re-emergence of mission-oriented policies, policies inspired by socio-economic transitions theory and a responsible innovation approach exemplify these new emerging framings. The COVID-19 pandemic showed why such challenge-driven innovation matters greatly, enabling historically rapid vaccine development, and rapid policy and institutional innovation (Mazzucato and Kattel 2020).

The pandemic responses also show why implementation issues are as important as policy framings; the crisis-handling focused the attention on public sector capacities and capabilities, and how these are not necessarily correlated with the level of development (Mazzucato et al. 2021). Indeed, this paper assumes that 'post-growth' innovation policy needs to rely on a deeper and more nuanced understanding of public sector capacities and capabilities (Borras and Edler 2020). The abilities to assess and adjust policies and implementation practices are intrinsically important to such policy frames as missions or socio-economic transitions (Kattel and Mazzucato 2018). Such abilities have been brought together under the umbrella term of 'dynamic capabilities', defined as 'the ability of an organisation and its management to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments' (Teece, Pisano and Shuen 1997). While its origins can be traced to the resource-based view of the strategic management of organisations (Penrose 2009; Ongaro and Ferlie 2020), it has led to wider academic discussions and practical applications (Zollo and Winter 2002; Helfat and Raubitschek 2018; Teece 2018). However, scholarly discussion of this concept in the public sphere is relatively young and nascent (Piening 2013; Kattel and Mazzucato 2018; Kattel and Takala 2021; Mazzucato et al. 2021). On the other hand, there has been quite a rich discussion of state capacities going back at least to the 1970s and 1980s (Heclo 1974; Skocpol 1979; Evans, Rueschemeyer and Skocpol 1985). Furthermore, recent years have seen the emergence of a burgeoning discussion on innovation capacities in the public sector (Kattel et al. 2014; Gieske, Van Buuren and Bekkers 2016; Meijer 2019). Based on these three research strands, the paper offers a new synthesis of key concepts related to public sector capacities and capabilities, with a particular focus on innovation. The paper also tests the conceptual synthesis through a sample of brief case studies in order to unpack how public organisations are operationalising dynamic capabilities and what the potential ways are to assess these capabilities. Thus, this paper is interested in the following three research questions:

- What are the sources of dynamic capabilities in public organisations? I am specifically interested in who initiates dynamic capabilities and how are they initiated.

- What are the constituent elements of dynamic capabilities in the public sector? In other words, what specifically makes capabilities dynamic?

- How can we assess whether, in a given organisation or policy area, there are dynamic capabilities present? What are the qualitative and/or quantitative ways of assessment?

In the order to answer these questions, the paper, first, builds a conceptual synthesis of dynamic capabilities within public organisations; and, second, offers three brief case studies of dynamic capabilities in practice to test the conceptual synthesis. This enables the discussion of emerging trends and how dynamic capabilities are created, nurtured and assessed in the public sector today. All three cases can be seen as influential examples of dynamic public sector organisations: the UK's Government Digital Service (GDS) is widely regarded as a paradigmatic public sector digital agency; the way the city of Barcelona tackles citizen data rights is seen as a radical challenge to global digital platforms; and Swedish innovation agency Vinnova is arguably doing pathbreaking work in applying modern mission-oriented innovation policies. Third, the paper proceeds by briefly discussing how the conscious creation and nurturing of dynamic capabilities in public organisations is leading to what can be called Neo-Weberian innovation agencies in the public sector. And finally, the paper reflects on key avenues for future research.

2. Transformative State capacities, innovative capacities and dynamic capabilities: towards a new synthesis

2.1 State capacity literature

The literature discussing state capacities is distinctly situated in the tradition of Max Weber's theories of the state and bureaucracy. The key vantage point for authors such as Peter Evans, Theda Scokpol and others writing in this tradition is the idea of autonomy. The capacity of the state to act on its goals is seen in the ability to stave off or at least navigate pressure from various groups and forces in society (Skocpol 1985). While this understanding of autonomy goes back to Hegel's theory of the state (Drechsler 2001), it is best expressed in Weber's idea of bureaucracy based on political neutrality and expertise (Weber 2002; Kattel 2015). The main elements of the state capacity in this tradition are: sovereign integrity as control over the state's territory; loyal and skilled officials; raising and deploying financial resources (including changes to taxes and earmarked funding, and the ability to borrow); area-specific skills; and adaptability of state capacities (Evans, Rueschemeyer and Skocpol 1985; Skocpol 1985; Cingolani 2018). As Evans et al. argue, these are the areas in which we should assess state capacity. An important additional element in this school of thought is the idea of legitimacy, which plays a key role in autonomy, at least implicitly. Mazepus argues that there are three types of legitimacy: input legitimacy, throughput legitimacy and outcome legitimacy: 'input is about governing *by* the people (usually referring to representation through a vote in elections), throughput is about governing *with* the

people… and output is about governing *for* the people' (Mazepus 2018; italics in original). While in different contexts all three types can play an important role in gaining and retaining autonomy as the capacity to act, throughput legitimacy carries perhaps most weight in Weberian theory of state capacity.

Interestingly, these authors quite explicitly assume that the idea of dynamic and adaptable traits within the autonomy is part of state capacity. For instance, Weiss 1995 calls this the transformative capacity of the state (Weiss and Hobson 1995; Weiss 1998). More specifically, the idea of dynamism in state capacity has two quite different roots: first, literature looking at successful (in the sense of developmental outcomes) revolutions from above (Trimberger 1978); and second, discussions around the welfare state in post-World War II Europe (Heclo1974). While the former focuses on military bureaucracies and their seizure of power, Heclo's discussion focuses on the idea of bureaucratic expertise at the heart of state capacity and especially as key to its ability to adapt. As Heclo puts it: 'Insofar as policy has evolved as a corrective to social conditions, civil servants have played a leading part in identifying these conditions and frame concrete alternatives to deal with them' (302). More specifically, on Swedish bureaucracy, he notes: 'Between 1890 and 1913, Swedish administrators played a key and probably a primary role in developing basic analysis and exhaustive information which underlaid the construction of a Swedish pension policy' (ibid). In Heclo's view, the role of administrative actors in welfare state reforms was both expansionary and restrictive; in other words, civil servants' proposals both reacted to existing policy concerns as well created new alternatives that went beyond correcting existing problems.

In the last decade, these Weberian notions of capacity based on autonomy, throughput legitimacy, sense-making skills and the ability to implement policies have been complemented by what can be called the Schumpeterian alternative. Above all, Breznitz has shown that some of the key innovation agencies in the US, Finland, Sweden, Israel, Ireland and Singapore were not central Weberian agencies with 'embedded autonomy' as assumed in the developmental state discussions of Evans and others (Evans 1995; Evans and Rauch 1999), but rather (at least initially) peripheral agencies (Breznitz and Ornston 2013; Breznitz, Ornston and Samford 2018).

These agencies were crucial sources of the policy innovations necessary for promoting rapid, innovation-based competition through explorations in innovation policy, driven partially by continuous, radical experimentation in their core mission and by the existence of sufficient managerial capacities (or slack) (Karo and Kattel 2014) — and these agencies' peripheral status was a vital component of their success. It reduced the likelihood of political interference and opened up space for policy experimentation and the formation of new public-private interactions. In other words, they excelled at creating throughput legitimacy for their initiatives. Thus, the Schumpeterian alternative to the core Weberian state capacity discussion argues that the adaptive and dynamic traits of state capacity can be engendered by initially peripheral and essentially non-Weberian organisations. As Kattel, Drechsler and Karo 2019 have shown, first, such 'central-decentral' dynamics in state capacity help explain dynamic capabilities on the system level, but not on the organisational level; and second, the dynamics can be explained through Weber's theory of authority, in particular through the interplay between charismatic and legal-rational forms of authority (Kattel, Drechsler and Karo 2019). Thus, the Schumpeterian alternative

can be firmly placed within the Weberian tradition as well; and from the Weberian standpoint, Schumpeterian charismatic organisational forms will, in time, be 'rationalised', socialised into existing legal-rational forms.

The state capacity discussions, however, have not further deepened the adaptive and dynamic traits of the state capacity, but have rather extended the discussion to sub-categories of capacities within or in parallel to state capacities, such as policy and administrative capacity (Painter and Pierre 2005; Wu, Howlett and Ramesh 2018). Thus, for instance, Wu, Ramesh and Howlett provide a synthesis definition of policy capacity as 'the set of skills and resources — or competencies and capabilities — necessary to perform policy functions' (2018: 3). While these analytical frameworks are helpful tools and concepts, they rarely focus on dynamic changes within skill and resources, competencies and capabilities.

2.2 Public sector innovation capacity literature

As shown above, the Weberian tradition of state capacity assumes that part of the capacity is also its ability to renew and adapt according to the changing environment, and that bureaucrats have a key role in this. Indeed, Skocpol explicitly mentions 'innovative civil officials' (Skocpol 1985). In the last decade, this line of inquiry has coalesced around the idea of innovation or the innovative[1] capacity of public sector organisations (Gieske, Van Buuren and Bekkers 2016; Meijer 2019). However, the concept of innovative capacity needs to be contextualised through a brief look at new public management (NPM) reforms, as these profoundly challenged and altered the concept and practice of state autonomy.

The NPM reforms gathered momentum in the 1980s (Hood 1991; Drechsler 2005) and both expanded and limited the idea of autonomy so central to the Weberian view of state capacity. The NPM reforms, first, aimed to increase managerial autonomy of public agencies and thus enabled, for instance, the privatisation of state-owned companies and supported the creation of at-arm's-length agencies. These practices opened the public sector up for an influx of private sector managerial practices such as strategic management (Lapuente and Walle 2020; Ongaro and Ferlie 2020) and digital transformation practices such as agile management (Dunleavy et al. 2006b; Mergel 2020). However, second, the NPM reforms also brought focus to short-term efficiencies in the form of performance management practices based on the measurement of inputs and outputs, benchmarking and an overall stronger drive for governance indicators (Kattel et al. 2014; Dooren, Bouckaert and Halligan 2015; Drechsler 2019).

In development theory and practice, NPM-inspired reforms focused on market-failure-based approaches and coalesced in the 1990s around the so-called Washington Consensus policies focused on deregulation, opening up domestic markets, and relying on foreign direct investments and exports to drive economic transition and growth (Williamson 2002; Wade 2003; Kattel, Kregel and Reinert 2012). These practices distinctly diminished the idea of state autonomy and with it the concept of state capacity shrank around efficiency gains through liberalisation and macro-economic stability. The challenges of decentralisation in search of efficiencies were

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[1] These concepts are used interchangeably in what follows.

predicted by Rueschemeyer and Evans in their 1985 discussion of state capacities: 'If decentralisation destroys the ability of the state to act coherently in ways reflecting general goals and diagnosis, then the unique character of its contribution is lost.' And as predicted by Peters and Savoie in 1994, the NPM reforms focused overly on big machine-like organisations in the public sector and the perceived inefficiencies in these, rather than on the innovative capacities of public sector organisations (Peters and Savoie 1994).

Public sector innovative or innovation capacity discussions can be thus seen, at least partially, as a response to NPM reforms and as an emerging need within public organisations to develop capacities of renewal and adaptation, but also capacities of better coordination and engagement with stakeholders. While there has been a virtual explosion of studies looking at public sector innovation (Kattel et al. 2014), very few have focused on underlying capacities. The literature review by Gieske et al. distils innovative capacities into three capacities: combinative or connective capacity; ambidextrous capacity; and learning capacity; all acting on three levels of individuals, organisations and inter-organisational networks (Gieske, Van Buuren and Bekkers 2016). Similarly, Meijer's model of public innovation capacity is perceived as a system of innovation and the innovation capacity consists of five functions: mobilising; experimenting; institutionalising; balancing; and coordinating (Meijer 2019). While the idea of autonomy plays almost no role in these studies, it is noteworthy how co-creation (connectivity, networks, mobilising) plays a key role in these conceptions of capacity. The importance of such practices has led some public administration scholars to argue that we are witnessing the emergence of a Neo-Weberian state.

Introduced by Pollitt and Bouckaert in 2011, the Neo-Weberian state posits that a new paradigm of the state is emerging in the era of post-New Public Management reforms. The Neo-Weberian state emphasises the importance of public organisations in providing public services, and at the same time recognises the need for more citizen engagement in the design and delivery of public services (Drechsler and Kattel 2009; Pollitt and Bouckaert 2011). In a similar vein, new public governance theories emphasise the importance of the co-creation and co-production of public services, hence a more horizontal understanding of public administration (Osborne, Radnor and Strokosch 2016). We can also see in these co-creation practices a recognition of the importance of throughput legitimacy in policy making. Thus, learning through engagement increases the legitimacy of new initiatives (Mazepus 2018). Dunleavy, Margetts and others have taken a step further and argue that at least some of these changes in public administrations are related to the digital revolution transforming societies (Dunleavy et al. 2006b, 2006a; Margetts and Dunleavy 2013). In this view, digital technologies enable and drive a deeper transformation in public administrations and services. This is reflected in the adaptation in the public sector of new working practices from (strategic) design and agile software development practices, randomised control trials, and experiments from private and third sectors. As recent studies have shown, such practices are mostly taken up by new, often (initially) peripheral public organisations in the form of public sector design, digital and innovation labs (Hill 2015; Bason 2017; Tõnurist, Kattel and Lember 2017; Mergel 2020). These working practices focus on agile processes such as prototyping and experimentation, relying on epistemological frameworks from action research and ethnography rather than economics or public policy analysis (van Buuren et al. 2020).

2.3 Dynamic capabilities literature

The literature focusing explicitly on dynamic capabilities in the public sector is relatively small. The key authors both in public and private sector dynamic capabilities are strongly associated with evolutionary economics, and build on Nelson and Winter's seminal work in this area (Nelson and Winter 1974, 1982). The main unit of analysis for evolutionary economics is organisational routine:

> We use this term to include characteristics of firms that range from well-specified technical routines for producing things, through procedures for hiring and firing, ordering new inventory, or stepping up production of items in high demand, to policies regarding investment, research and development (R&D), or advertising, and business strategies about product diversification and overseas investment. In our evolutionary theory, these routines play the role that genes play in biological evolutionary theory. They are a persistent feature of the organism and determine its possible behavior (though actual behavior is determined also by the environment); they are heritable in the sense that tomorrow's organisms generated from today's (for example, by building a new plant) have many of the same characteristics, and they are selectable in the sense that organisms with certain routines may do better than others, and, if so, their relative importance in the population (industry) is augmented over time (Nelson and Winter 1982: 14).

Importantly, routines are not good or bad: there is not one single ideal routine to be obtained or learned. In this view, dynamic capabilities play the role of changing or renewing existing organisational routines; and dynamic capabilities are patterned organisational behaviour of learning and change — in other words, also routines (Eisenhardt and Martin 2000; Zollo and Winter 2002). Piening concludes a literature review of dynamic capabilities in the public sector by offering a similar definition: dynamic capabilities can be 'described as bundles of interrelated routines which, shaped by path dependency, enable an organization to renew its operational capabilities in pursuit of improved performance' (Piening 2013). Following private sector dynamic capabilities literature (Teece, Pisano and Shuen 1997; Helfat et al. 2008), Gullmark suggests differentiating between dynamic managerial (leadership) capabilities and dynamic organisational capabilities (Gullmark 2021). The former denotes abilities to sense opportunities and set the direction of changes required, the latter signifies the organisation's routines in its main processes. Gullmark also suggests that dynamic managerial capabilities tend to be less routinised than organisational ones: politicians and managers focused on learning and change are more difficult to 'routinise' than, for instance, organisational structure (Gullmark 2021). Dynamic capabilities engender, thus, from managerial and organisational experience and learning (Helfat et al. 2008).

Karo and Kattel 2018 adopt these basic evolutionary views into the policy-making context. In their view, public sector organisational capacities for learning and change are best understood by focusing on the pattern: organisational routines (e.g. HR practices), how these are deployed in searching and selecting new solutions to existing tasks (e.g. recruiting new skills to the organisation), and political, policy and administrative contexts in which the search and selection take place (e.g. who actually applies for and is selected to fill the new post). The latter, in particular, strongly differentiates private and public sector dynamic capabilities, as changes in

routines and learning in the public sector are not motivated and driven by market pressures, but by political and policy changes and practices. Thus, the question of the directionality of change in public policies and their implementation needs to be located in the intersection of dynamic capabilities and the political context.

2.4 Assessing capacities and capabilities

There is almost no existing literature or research on how to assess dynamic capabilities in the public sector. Indeed, most existing discussions focus on outcomes (e.g. efficiency) or external factors (e.g. funding) (Karo and Kattel 2018). Laaksonen and Peltoniemi 2018 provide a literature review of how private companies operationalise and measure dynamic capabilities, and find four causal structures: managers' evaluations; financial data; company's experience, actions and performance; and or employees' experience, actions and performance (Laaksonen and Peltoniemi 2018). Interestingly, their literature review shows that most measurements of dynamic capabilities in business also assess outputs and outcomes, rather than routines, which creates a somewhat tautological loop: since a firm has been successful (as measured in x) it must have had dynamic capabilities.

We run into similar problems when we look at state capacity assessments. Cingolani 2018 offers a detailed overview of the ways in which existing scholarship attempts to measure state capacity. Among the more than 50 different measurements, state capacity is measured either through a precondition (e.g. meritocratic civil service recruitment) or outcomes (e.g. corruption index) or proxies (e.g. presence of post offices in regions) (Cingolani 2018). None of the measurements topicalises routines.

Interestingly, Meijer offers a framework of assessing innovation capacity in public organisations, which is based on the measurement of specific functions (such as experimentation in city governments) through surveys (e.g. by asking, 'City X is successful in experimenting…', 'The administrative executives of City X support experiments with data-driven innovation…' etc) (Meijer 2019). This framework comes perhaps closest to the idea of assessing routines and outcomes separately, although Meijer does not explicitly differentiate them.

Karo and Kattel 2018 develop an evolutionary framework for policy capacities that are based on organisational and managerial routines. Each of these routines could be described in terms of their characteristics, so, for instance, personnel management routines can be described through what type of recruitment and motivation systems are preferred within the organisation. Here we propose to use such a qualitative approach to assessing routines key to dynamic capabilities as well. Indeed, we propose that assessment practices are part of the main constitutive elements of dynamic capabilities.

2.5 Towards a new synthesis

Summarising the literature discussion above, we can propose the following analytical building blocks to better conceptualise dynamic capabilities in the public sector. First, when talking about capacities and capabilities in public organisations, the key analytical units are various organisational routines. Second, dynamic capabilities are themselves routines, namely routines of

renewal of managerial and organisational capabilities and capacities. The need and processes of renewal are located within the political context, such as changes in leadership, perceived lack or vanishing of legitimacy, ineffective existing policies, and so forth. Thus, third, dynamic capabilities as managerial and organisational routines need to be understood in a wider context of state capacities as existing routines to design and deliver policies. The dynamic capabilities are directed at renewing state capacities. Fourth, while state capacities can be seen as long-term routines, dynamic capabilities have a shorter temporal nature. Fifth, there needs to be a complementarity between the long-term capacities and short-term routines; for instance, how do small experiments and pilots get scaled up and lead to the required commitments of new resources (e.g. investment). Sixth, sources of dynamic capabilities can be located in both managerial as well as organisational routines.

Based on these basic assumptions and the literature review above, we further hypothesise that the following routines are constituent elements of managerial and organisational dynamic capabilities:[2]

- Sense-making routines: analytical, assessment, information-gathering and processing routines that enable new learning, appraisal and evaluation patterns. These routines can relate to analysing outputs and outcomes (value), as well as the internal performance of an organisation.

- Connecting routines: networking and boundary-spanning routines that enable new networks and coalitions of internal and/or external stakeholders to be built. The routines help to (re-)build legitimacy and buy-in for new solutions.

- Shaping routines: routines to design and implement specific new directionality for an organisation or policy area, embed and mainstream new solutions into long-term routines, either in policy or in management, and be able to provide resources and support for new initiatives.

The next section tests these propositions through three case studies.

3. Case studies of dynamic capabilities in practice

3.1 Case selection

As the study of the dynamic capabilities of public organisations is a relatively nascent field, there is not a well-known population of cases to choose from. Rather, the case selection has to focus on so-called influential cases (Gerring 2008; Crowe et al. 2011): cases that are widely emulated or highly regarded by policy makers and/or academics as examples of particularly dynamic organisations. Ideally, the case selection should also cover not only traditional innovation/economic policy agencies, but a wider set of actors, especially a new emerging group

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[2] This broadly follows Teece et al. (1997), as they argue that in private organisations the dynamic capabilities consist of sensing, seizing and transforming routines (Teece, Pisano and Shuen 1997).

of public organisations, such as digital agencies. The cases should also include not just central government agencies, as many co-creation practices take place on the local level.

The paper proceeds to discuss the following cases: the UK's Government Digital Service (GDS), the city of Barcelona and Swedish innovation agency Vinnova. The case study descriptions and discussion are based on desk research and numerous interviews in all three cases.[3] In what follows, the cases are briefly introduced.

Founded in 2011, GDS has become the international gold standard for public digital agencies; it has won awards and praise among its peers and heads of governments alike, and its blueprint has been copied in numerous countries (Clarke 2019). The story of its foundation and success — and seeming demise — has been told in op-eds, blog posts (Ross 2018; Greenway 2020; *The Economist* 2020) and academic case studies (Birkinshaw and Duncan 2014; Eaves and Goldberg 2017; Kattel and Takala 2021). GDS was created as a result of major and widespread dissatisfaction with government IT in the UK. Following a series of high-profile IT failures, in 2011 the UK Parliament's Public Administration Select Committee published a report titled *Government and IT — a Recipe for Rip-Offs: Time for a New Approach* (House of Commons Public Administration Committee 2011). The report highlighted a dearth of IT expertise, a lack of centralised, horizontal IT governance, and a reliance on large-scale, long-term contracting with a small number of large private providers as central culprits driving IT failings in the government. At the same time, the newly elected coalition government appointed the internet entrepreneur Martha Lane Fox as the UK's 'Digital Champion' and commissioned her to review the government's online presence. Fox recommended that there should be a new, central digital team, in absolute control of the overall user experience across all digital channels, and it should be headed by a CEO reporting directly to the cabinet secretary. Mike Bracken, former lead of *The Guardian* newspaper's digital transition team, was selected as the organisation's first executive director.

The GDS blueprint for a digital agency rests on the following features (Kattel and Takala 2021):

- *Focus on search and experience*: Government's digital presence should be optimised for citizens and businesses searching for information, finding and trusting its provenance.

- *Work through teams and communities of practice*: While GDS is a central government agency, it does not have sole responsibility for digital transformation in the UK central government. Accordingly, the role of GDS is to organise and maintain communities of practice (designers, software engineers) across central government and local authorities.

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[3] The paper relies on 48 interviews altogether, carried out between December 2019 and October 2021. The interviews for the GDS case study are described in detail in Kattel and Takala (2021); for Barcelona in Fernandez-Monge Cortazar et al. (2021) and the interviews for Vinnova have not been used in previous work. In all cases, the interviews were semi-structured and lasted for about one hour in each individual case. The selection of interviewees focused on organisational leadership, mid-level management and other key change agents. Thus, the interviews provide predominantly internal viewpoints on issues discussed in this paper.

- *Working in the open*: From the outset GDS relied on the principle of openness in the sense of open-source software, sharing practices and tools, and reflecting on its own activities in public-facing blogs.

- *Design principles as ways of working*: GDS started with creating 'Government design principles',[4] which are a mixture of ideas and ways of working from service design and agile software development.

- *Evidence from user research*: As the first principle of the 'Government design principles' states, user needs and corresponding research are the main sources of evidence and data for GDS. While this has been complemented in time with economics-driven research and analysis (value for money approach), user research remains fundamental to the way GDS thinks of its impact.

In the decade since its foundation, GDS successfully reshaped digital procurement practices through spending controls (major government IT projects have to receive GDS' approval) and through the creation of a digital marketplace.[5] As argued by the OECD, 'In 2009 fewer than 20 companies retained 80% of the UK's £16 billion of annual IT spending. GDS has helped the UK digital, data and technology (DDaT) sector to evolve from a highly concentrated, uncompetitive market in 2009 to a highly diversified, competitive market; as of 1 October 2018 almost 5,100 suppliers are available to the UK public sector through the digital marketplace, over 92% of which are small and medium-sized enterprises (SMEs)' (OECD 2018). GDS created and professionalised a new digital, data and technology career path in the civil service and a widespread community of practices that includes public and private sector employees. Its focus on user experience revamped the UK Government's presence on the internet through the unified gov.uk landing page and it created design principles for other government websites.

Barcelona has come to embody bottom-up urban transformation in terms of digital capitalism and urban planning (Morozov and Bria 2018). Ada Colau led Barcelona en Comú, a new political platform emerging from social movements with no ties to existing political parties, to a dramatic victory in the local elections of 2015. Colau's city government has sought to operationalise an alternative agenda around citizen data rights, setting out a proactive role for city governments as institutional champions and custodians of citizen data rights. The new government's vision relied on two realisations: 'First, that technology should be used to revamp participatory democracy and, second, that the smart city paradigm for using technology in cities was limited by its adoption of a top-down, "tech-first" solutionist approach' (Fernandez-Monge Cortazar et al. 2021). Key features of Barcelona's digital agenda can be summarised as follows (Fernandez-Monge Cortazar et al. 2021):

- *Civic engagement*: Extensive reliance on and support from civic networks consisting of social movements and university researchers-activists resulted, in February 2016, in the creation of the platform Decidim[6] to support the co-production of the Municipal Action Plan. The platform featured 2,000 proposals from the city council for citizens to comment

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[4] Available at https://www.gov.uk/guidance/government-design-principles.

[5] Available at https://www.digitalmarketplace.service.gov.uk/.

[6] The platform can be accessed here: https://decidim.org/.

on. Citizens and organisations could also publish proposals, with more than 400 meetings held to discuss these proposals and define new ones.

- *Creating a new position within the city government of chief technology and digital innovation officer (CTIO), and a data office*: Francesca Bria, at the time senior programme lead at the UK's innovation foundation, NESTA, was appointed to the role of CTIO in June 2016. The CTIO was a new executive-level role, representing the elevation of digital strategy far beyond that of IT. The municipal data office (MDO) was created in 2018 and is in charge of the governance of all the data owned or under the custodianship of the city of Barcelona.

- *Digital service standards*: The city's digital plan included digital service standards focused on 15 principles that guided the way the city would operate with regards to digital services. These included a focus on digital users; attention for those needing digital support; the introduction of agile and multidisciplinary teams; the use of open code and standards; and the protection of privacy, security, ethics and accessibility. Crucially, the city also created ethical digital standards, with an open-source policy toolkit available on GitHub for others to use.

These programmes, introduced under the then-new city government, promoted an alternate vision of the role of technology and innovation in cities, one centred around the notion of technological sovereignty and citizen data rights. This has been the focus of an increasing number of studies and discussions (Ribera-Fumaz 2019; Sadowski 2020; Charnock, March and Ribera-Fumaz 2021), and the city of Barcelona is seen as being at the forefront of a new agenda to 'take back citizen data' from corporations, while also supporting experiments in citizen-led decision-making through open-source, privacy-enhancing participatory tools and platforms (Fernandez-Monge Cortazar et al. 2021).

Vinnova, established in 2001, has been until recently a relatively standard innovation policy agency, advising the government on innovation policy, and designing and implementing innovation support measures (Chaminade and Edquist 2006). However, starting from 2018, with Darja Isakson's tenure as its head, Vinnova has begun quite a profound transformation, both as an organisation and in particular in the way it approaches innovation policy. Today, Vinnova can be seen as one of the pathbreaking innovation agencies in applying modern, challenge-led or mission-oriented innovation policies that focus on utilising innovation and technology to tackle grand challenges.

The challenge Vinnova faced in 2018 was its effectiveness in driving systems change through innovation. Or, in the words of Dan Hill, Vinnova, like almost all other public innovation agencies, does not innovate. Agencies like Vinnova mostly fund private actors to innovate and are thus acting mostly as managers of public funds, rather than innovators themselves. While Vinnova and other public actors in the Swedish innovation landscape have been attempting to apply transformative innovation policies for almost a decade, there seems to have been a general consensus that government actions remained ineffective. For instance, Vinnova supports about 3000 projects in parallel, managed in organisational silos with little interaction and often with conflicting goals. And Vinnova is not the only actor in the Swedish innovation system; there are

further numerous public bodies supporting innovation in multiple activities, facing similar challenges.

In response, Vinnova embarked on an organisational transformation, focusing on a mission-oriented approach. It created a new position of director of strategic design and hired Dan Hill — a designer — to this post. Under Hill's leadership, Vinnova has created one of the most interesting processes for designing and implementing mission-oriented policies. Drawing on the criticism of typical technocratic policy design processes, a more detailed, engaged innovation practice was developed for designing the Swedish missions. Taking the mission themes of healthy sustainable mobility and healthy sustainable food as their starting points, Vinnova coordinated intensive co-design sessions across Sweden, with up to 400 different stakeholder organisations engaged in 'actors' workshops' (Hill 2020). This approach and the resulting missions have garnered a lot of positive attention in the international media (Orange 2021; Peters 2021) and from scholars (Penna et al. 2021).

Key features in Vinnova's approach to mission-oriented policies are:

- *Strategic design approach*: In addition to creating a new post of director of strategic design and applying design tools in mission design, Vinnova has made strategic design skills available across the organisation through training and workshops. Traditional innovation management takes place at arm's length from innovation practices and public managers focus on aggregate analytics as learning tools. However, Vinnova attempts to professionalise much more hands-on approach to innovation, sending out employees for observation gatherings and in general encouraging new experiences as part of innovation policy practice.

- *Bottom-up policy design*: Vinnova used not only design tools to engage a wide range of actors, but it also engaged non-traditional innovation policy actors from museums to school children in stakeholder discussions.

- *New public value model*: One of the key obstacles for public agencies to engage more directly with transformative change and innovation is their focus on supplying capital and other resources to private and public actors such as municipalities. In order to engage both with the demand and supply side of major challenges such as mobility, Vinnova focused on creating a new public value model. Thus, for instance, in the case of mobility, it moved away from mobility understood through transportation to mobility understood through multiple value propositions, such as health, environment, transportation etc. Such an approach should enable better collaboration and coordination.

The following discussion is structured according to the constituent elements of dynamic capabilities — sense-making, connecting and shaping routines — and provides examples from each of the three cases.

3.2 Sense-making

In all three cases, there was a strong sense that existing capabilities and routines to analyse and capture policy outputs and outcomes lead to unsatisfactory results. In the case of GDS, there was a long-standing understanding that government IT purchases lead to very costly failures (Dunleavy et al. 2006a) and this was increasingly seen as a political problem (Fox 2010). Importantly, we can interpret the IT procurement failures as gradually diminishing public sector autonomy through the oligopolistic influence of big IT firms. At the root of these issues was a flawed understanding of public sector IT as mainly a driver of efficiency and savings.

Barcelona faced a somewhat similar challenge: perceived loss of control over citizen data via outsourcing smart city solutions to big IT firms and public spaces transformed through urban platforms such as Airbnb, Uber and others. Smart city solutions created together with big IT firms led to analytical lenses (and data dashboards) that had relatively little to do with governing the city, but enabled the outsourcing of key digital functions. At the heart of Barcelona's 2015 civic challenge to existing solutions was a need to increase both democratic accountability and city capacities. In other words, as in the case of GDS, it can be seen as a case of existing sense-making routines leading to diminished civic and managerial autonomy.

Vinnova, however, faced a different challenge. Globally, innovation policy appraisal and evaluation have been focusing on, first, evaluating single measures (e.g. R&D tax credits) rather than policy mixes (Edler et al. 2016) and, second, evaluating through a cost-benefit matrix how much a policy measure fixes a specific market failure (Kattel et al. 2018). As innovation policy is gradually shifting towards tackling societal challenges, such management practices and evaluation metrics are woefully ill-equipped to help policy makers to design and implement the new generation of innovation policies (Mazzucato, Kattel and Ryan-Collins 2020). In order to avoid 'mission whitewashing' — putting new labels on existing policies — Vinnova needed to think outside the box and build new sense-making routines.

In all three cases, we can argue that existing sense-making routines limited organisational learning and autonomy at the same time. New leadership and new organisational structures were critical to instil both new epistemological perspectives and to make sure there were rapid learning feedback loops. In the cases of GDS and Vinnova, implementation of strategic and user-centric design approaches enabled this; in the case of Barcelona, the new epistemological lenses are based on data rights and commons ownership of key digital assets. Importantly, the new sense-making routines can be seen as intrinsically dynamic as they rely on a diversity of perspectives and iterative learning processes (e.g. building prototypes, continuous workshopping etc).

3.3 Connecting

While in all three cases the vantage points are quite similar as far as dissatisfaction with the existing engagement, coordination and networking are concerned, yet the responses have been quite different. GDS was created with the hope of radically altering, among other things, government IT purchasing practices that were deemed to be highly oligopolistic and leading to poor digital services. The solution was threefold: first, bring into government cutting edge digital and design skills; second, create a community of practices within government agencies and local

authorities to help new skills and practices take hold; and, third, create a new procurement platform (digital marketplace) to enable SMEs to bid for government contracts. The community of practice extends to private and third sector actors, and can be seen as key to new dynamic routines in helping to connect various delivery (implementation) teams and support short feedback loops and continuous learning.

Barcelona's new data politics around data rights, commons ownership and technological sovereignty is strongly rooted in the idea of citizen movements and their autonomy. Interestingly, it can be argued that part of its success is creating a tension between competing notions of autonomy. On the one hand, Barcelona's data commons model is rooted in civic participation, citizen control of data and a supporting civic community of practice. On the other hand, the institutionalisation of the data commons model takes place through public organisations, with public funding of the required technologies and with the development of supporting bureaucratic autonomy and capabilities. However, precisely this tension between competing visions of autonomy enabled the establishment of new routines of co-creation between a variety of civic movements, organisations and public agencies.

As shown above, Vinnova's mission practices rely heavily on participatory practices. On the one hand, this enables the mould of the existing stakeholder engagement process that tends to favour the incumbents to be broken; on the other hand, it enables completely new voices to be brought into innovation policy design. For instance, next to typical actors from energy, food processing, waste management etc, the healthy sustainable food mission also brought in schools and pupils as key consumers of publicly funded food.

There are some important common features in all three cases. Typical stakeholder engagement in innovation policy tends to be highly punctuated: engagement usually takes place in the form of councils, forums, ad hoc meetings and similar at the beginning and the end of a policy cycle. This leaves large swathes of policy implementation insulated, feedback processes stretched across years, and with staff turnover and policy evaluation often outsourced to external experts, institutional or organisational knowledge remains scant and scattered. Such a weak knowledge base, in turn, diminishes the autonomy and legitimacy of public actors; hence maintaining or creating throughput legitimacy matters. Thus, through 'democratising' innovation through intensive and institutionalised engagement — especially evident in the cases of Barcelona and Vinnova — new dynamic capabilities have been instilled that enable learning, but also widen the autonomy space for policy actors and increase the legitimacy or buy-in of their actions. In essence, new connecting routines reshape the political economy surrounding a specific policy area. This is particularly clear in the case of GDS and Barcelona; in both cases, public actors successfully broke the oligopolistic power of big IT companies.

3.4 Shaping

In terms of shaping — executing or implementing — new activities, both GDS and Barcelona offer more mature cases as Vinnova's implementation processes are at earlier stages. GDS and Barcelona have, however, created powerful new shaping capabilities that have strong similarities. In the case of Barcelona, achieving greater citizen autonomy over the use of their data

necessitated a number of new standards, technologies and procurement practices. Similarly, in the case of GDS, new standards and procurement practices were vital. In both cases, the new data-related standards amount to making a new deal between public and private actors in terms of data ownership (Barcelona) and broken-down procurement contracts (GDS). However, in order to make sure that these fundamentally new rules and deals are in fact implemented, both Barcelona and GDS needed to build new internal capabilities. In both cases, outsourcing key functions to external companies hollowed out core digital skills from public agencies. Thus, in both cases, insourcing digital skills into public agencies played a key role. The GDS case is especially illuminating here as they went on to create a new professional pathway in the UK civil service based on digital and design skills. Coupled with communities of practices that include external and internal actors, this amounts to professionalising specific new routines around dynamic learning practices that enable the continuous shaping of government's digital transformation. GDS and Barcelona's CTIO office have both created guidebooks for these new practices, to be copied across other departments and local governments. And while such professionalisation might seem less dynamic — and, indeed, outright Weberian at its core — it is key in institutionalising new dynamic capabilities as routines for shaping public action.

4. Discussion

The discussion of the case studies is structured according to the main research questions of the paper, which are:

- What are the sources of dynamic capabilities in public organisations? We are specifically interested in who initiates dynamic capabilities and how they are initiated.

- What are the constituent elements of dynamic capabilities in the public sector? In other words, what specifically makes capabilities dynamic?

- How can we assess whether, in a given organisation or policy area, there are dynamic capabilities present? What are the qualitative and/or quantitative ways of assessment?

4.1 Sources

The three case studies show that there are three key sources of dynamic capabilities.

First, political leadership is key in either initiating or supporting the creation of dynamic capabilities. As we saw in the cases of GDS and Barcelona, elections and new political leadership played an important role in both cases. In Vinnova's case, its work in missions has also enjoyed high-level political support, with the country's prime minister participating in some of the hands-on, user-centred workshops.

The second source of dynamic capabilities is new managerial leadership in public organisations. In all three cases, new managers played a very important role in creating and nurturing dynamic capabilities. Interestingly, in all three cases, the new managers had not previously worked in the civil service, but were involved in public-oriented projects and in two cases were in fact foreigners (Bria and Hill). In all three cases, the managerial posts were new. Thus, we can see here key

features of highly autonomous managers who fulfil brand new posts — they can shape them according to their vision as there are no existing routines — and as they are new and enjoy high-level political support, they can move quickly and with quite a radical agenda.

The third source of dynamic capabilities is particularly evident in the case of GDS, namely the creation of a new organisation. As we know from literature discussing innovation labs in the public sector, such organisations can often be highly dynamic and bring in new ways of working, yet they often lack the power to actually implement policies. GDS is the rare exception where the autonomy of a new organisation, capable new leadership and high-level political support created conditions for the new organisation to be highly effective in actually implementing changes.

4.2   Constituent elements

Dynamic capabilities are about renewing existing organisational routines. Thus, pinpointing their constitutive elements will be often context-specific. However, as argued in section 2, understanding the wider backdrop of state and policy capacities is key to dissecting dynamic capabilities. As the case studies show, diminishing state autonomy due to existing routines (such as IT outsourcing through poor procurement practices or ineffective innovation policy management through overreliance on market-fixing economic frameworks) seems to be a highly relevant context for dynamic capabilities. Accordingly, what dynamic capabilities enable is some state autonomy to be regained and a new window of opportunity for change to be created. However, as important as the creation of dynamic capabilities is, the nurturing of such capabilities through professional standards, career paths and institutional innovations in procurement and rules is equally important.

All three cases show that in order to regain/create state and policy capacity, dynamic routines in sense-making, connecting and shaping are vital to reshape the political economy around specific policy fields. A common thread of 'democratising' innovation as the foundational epistemic building block of dynamic routines is key to all three cases: innovation processes in the public sector should be fundamentally co-created by a diversity of actors.

4.3   Assessment

In all three cases, the new sense-making routines rely heavily on the idea of the diversity of analytical and epistemic perspectives. That is, questioning existing analytical routines and orthodoxy is part and parcel of the new sense-making routines. Following Karo and Kattel 2018 and based on the three case studies, we can propose the following exploratory assessment of dynamic capabilities as routines (rather than outcomes):

- Sense-making routines:

  - How multifaceted is the value proposition and are there mechanisms to make sure the understanding of value remains heterodox (e.g. going beyond smart city efficiency towards technological sovereignty, commons and data rights in the case of Barcelona)?

- Does the organisation purposefully support analytical diversity (e.g. combining user experience, cost-benefit and failure demand analytics as in the case of GDS)?
  - Connecting:
    - Does the organisation have routines purposefully keeping its networking intensity high (e.g. communities of practice developed by GDS)?
    - Are the policy design practices built on extensive, iterative and continuous engagement processes (e.g. the way Vinnova has developed its missions through more than 400 workshops in less than two years)?
  - Shaping:
    - Does the organisation develop practices for core skill development of its employees (e.g. GDS turned design and digital skills into a specific profession and career path?)
    - Are there practices that ensure the implementation of new initiatives is given managerial attention and resources (e.g. GDS works based on purpose-built teams next to a more traditional departmental structure)?

These guiding questions are based on the three cases studies and it is to be expected that applying them in different contexts would require adaptation.

5. Conclusions

5.1 The emergence of a Neo-Weberian innovation agency?

Today perhaps more than ever before, public organisations are caught between what seems to be a rock and a hard place: faced with tackling intractable or grand challenges, governments need to develop long-term solutions (no hackathon can solve climate change), yet some aspects of these challenges require an agile and dynamic response (e.g. the COVID-19-related pandemic and its multiple effects on societies or migration waves caused by conflicts and climate change) (Drechsler and Kattel 2020). In this context, the current paper has sought to add depth to the discussion of public sector capacities and capabilities, and attempted to show why it is useful to synthesise ongoing discussion on state and policy capacities, public sector innovation capacities, and emerging reflections on dynamic capabilities in the public sector.

The synthetic framework has been tested through three case studies of influential organisations that have developed dynamic capabilities. The cases showed that dynamic capabilities — understood as routines to renew existing organisational capabilities — coalesce around routines of sense-making, connecting and shaping. Importantly, the routines that dynamic capabilities target for renewal are closely related to the diminished state, and policy autonomy and legitimacy. Thus, as we can see from the case studies, organisations with dynamic capabilities focus both on long-term capacity renewal (e.g. in the form of building a professional workforce or functioning public digital infrastructure), and on installing and nurturing dynamic routines to ensure an agile

response to, and active steering of, contextual events (e.g. developing public procurement capabilities for agile procurement or user-focused analytical tools for analysing the use of public services).

Such organisations aim to be both dynamic and resilient by design. We can call these Neo-Weberian agencies. As we have shown, such agencies are characterised by focusing on long-term societal goals as one of the core elements of policies (rather than the short-term goals of competitiveness and growth, prevalent in the 1990s and early 2000s). An epistemic turn accompanies this normative turn through the incorporation of new methods and analytical tools, such as strategic design, complexity economics, foresight, policy labs etc. (Tõnurist, Kattel and Lember 2017). The Neo-Weberian (innovation) agency is an ideal-typical synthesis of such conceptual and empirical discussions. These agencies purposefully build and nurture dynamic capabilities, and development management and assessment practices, to understand such capabilities better.

5.2 Future research avenues

The current study is based on three influential case studies that enable exploratory testing of the dynamic capabilities framework. There is clearly a need for further cases, both going in depth, but also comparing similar and diverse contexts. The focus here is on influential and successful case studies; it would be important to learn from cases where the establishment of dynamic capabilities failed.

Importantly, all the cases featured here come from Western Europe. Future research should explore the developmental context and, in particular, bring in non-Western perspectives on capacities and performance. It is also pivotal to test assessment avenues developed here empirically.

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