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Digital government units: what are they, and what do they mean for digital era public management renewal?

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ABSTRACT

From 2011 onward, Digital Government Units (DGUs) have quickly emerged as a preferred solution for tackling the over-cost and under-performing digital services and lagging digital transformation agendas plaguing today's governments. This article kickstarts a much-needed research agenda on this emerging trend, which has to date largely been ignored by public management scholars. DGUs exist at the center of the state, and adopt a shared orthodoxy, favoring agile, user-centric design, pluralistic procurement, data-driven decision making, horizontal 'platform' based solutions and a 'delivery-first' ethos. However, DGUs are differentiated in practice by their governance structures and resources, adding notable complexity to this recent machinery of government phenomenon. The article details the similarities and differences across six of the first DGUs introduced and highlights issues that researchers should address when assessing DGUs as an increasingly preferred instrument of digital era public sector renewal. This includes: their mixed record of success thus far; the risks of top-down reform efforts; external threats to DGUs' sustainability; and accountability dilemmas accompanying digital government reforms.

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Introduction

The public sector has a troubled history of over-cost, under-used and sub-standard digital service offerings, and has in general not kept pace with fast moving changes and evolving service standards in the digital age (Clarke and Margetts 2014; Dunleavy et al. 2006; Meijer, Boersma, and Wagenaar 2009; Norris and Reddick 2013; Longley and Zimmerman 2011; Dawes 2008). In an effort to reverse this trend, from 2011 onward governments globally have introduced specialized Digital Government Units (DGUs) dedicated to digital service delivery and broader transformation of public management practices.

Despite the speedy policy transfer that has seen DGUs crop up around the world and the ambitious public management reform remits assigned to these units, the public management research community has remained remarkably silent on DGUs (but see Margetts and Naumann 2017; Mergel 2017; Mergel, Edelmann, and Haug 2019). This article aims to reverse this trend by kickstarting a public management research agenda focused on DGUs as an increasingly preferred instrument of choice for digital era public management reformers the world over.

The article develops in four parts. Part 1 provides historical context, detailing the longstanding challenges that have plagued IT management in the public sector, and that inspired the

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emergence of DGUs in the 2010s. Part 2 details the research design that informs the article's description of DGUs, including their shared orthodoxy and divergent governance structures and resources. The paper draws on analysis of public documents describing six of the first DGUs to be developed, in Australia, Canada, Ontario, the United Kingdom and the United States, and interviews with officials in the UK government—the first jurisdiction to create a DGU and one that has to varying extents inspired other DGUs that followed it.

Part 3 provides definitional clarity as a starting point for a new research agenda on DGUs. Here, the article responds to the question: What is a DGU, and is this a coherent or varied public management phenomenon? DGUs are defined along three dimensions: orthodoxy, governance structures/powers and resources (staff and budgets). The article finds that these units all operate at the center of their respective civil service administrations, and adopt a common orthodoxy of digital government, prioritizing user-centred design, data-driven decision making, open source technologies, "platform" approaches and a "delivery first" ethos (terms that are defined in more detail later in the article). However, these units diverge in their governance structures and resources, adding notable complexity to this recent machinery of government phenomenon. The article concludes in Part 4 by outlining a series of research questions that public management scholars should attend to in order to advance our understanding of DGUs as an increasingly common, but as of yet under-scrutinized, response to the challenges of digital era capacity building in the public sector.

The troubled history of public sector information technology management and the genesis of digital government units

The failings of public sector IT have been documented in a range of research projects (6, Perri 2007; Meijer, Boersma, and Wagenaar 2009; Dunleavy et al. 2006). This research into early "e-government" programs, as they were dubbed at the time, revealed that, encouraged by the rise of New Public Management (NPM) reforms, many governments largely or wholly outsourced their IT functions to the private sector throughout the 1980s and 90s. Given that governments lacked sufficient in-house expertise to scrutinize private sector offerings, and given the market of providers capable of competing for large government IT contracts was relatively small, many governments signed onto long-term "legacy" contracts for ineffective services offered at inflated prices relative to those paid in the private sector (with some variation; for instance, the IT market in the US was comparatively large and certain reforms in the late 1990s improved US IT procurement, albeit not sufficiently enough to ensure government IT contract prices were comparable with those secured in the private sector, see Dunleavy et al. 2006, 75).

IT procurement was also plagued by siloed machinery of government, as inherited from the theory of Progressive Era public administration shaping the organization of the Weberian welfare state from the late 19th century onward (Dunleavy and Hood 1994). These siloes were deepened by NPM's preference for government decentralization (Dunleavy et al. 2006). In this context of fragmented government, the state did not conceive of nor procure its IT services as a "whole of government", but instead often purchased services for specific projects and units on a one-off basis. A range of IT systems would crop up across a given government, producing redundancies as systems were procured multiple times to do the same things (e.g., supporting client transactions) but via different contracts and with different suppliers. This approach meant that governments not reap the cost-saving benefits that could accrue from negotiating contracts for these common services as one, much larger buyer. This siloed approach also ensured that the digital infrastructure and databases underpinning government services and policy work were not always interoperable, rendering it difficult or impossible to link different programs and policy work across various government units.

To be sure, early e-government management was not one note. Countries such as Canada emerged as early e-government leaders specifically because they partially or wholly avoided the

trends described here (Accenture 2005; Borins 2007; Roy 2006; United Nations and Department of Economic and Social Affairs 2014). The UK, on the other hand, was in many ways ground zero for IT management failures from the 1980s onwards, described by Dunleavy et al. as "a world leader in ineffective IT schemes for government" (2006, 70). This unenviable accolade was in large part a product of the country's enthusiastic uptake of NPM reforms from the time of Thatcher to Blair, and resulted in a series of high-profile IT disasters in the UK (Public Administration Select Committee 2011).

Facing widespread criticism for these failures, IT costs of upwards of £16 billion annually as of 2009, and operating in a context of austerity reforms induced by the global financial crisis of 2007–8, IT management earned the attention of the UK Parliament's Public Administration Select Committee, who in 2011 published a report bluntly titled "Government and IT—a Recipe for Rip Offs: Time for a New Approach". The report highlighted a dearth of IT expertise, a lack of centralized, horizontal IT governance, and reliance on large-scale, long-term contracting with a small number of large private providers as central culprits driving IT failings in the UK government (see also Lane Fox 2010).

In response to these critiques, the UK Government Digital Service (GDS) was introduced in 2011. Responding to then Minister for the Cabinet Office, Francis Maude, GDS grew out of the structures of an existing team responsible for the UK's Directgov website (an earlier effort to create a government-wide, online service portal), and was initially headed by a group of digital innovators within and outside the civil service. Mike Bracken, former lead of *The Guardian* newspaper's digital transition, was selected as the organization's first Executive Director. GDS soon became the perceived global leader of innovative government digital services, topping the United Nations' e-government rankings (Department of Economic and Social Affairs 2016), joining four other countries as a founding member of the D5— "a group of the most digitally advanced governments in the world" (D5 2014)—and reversing the UK's historical reputation as a wasteland of IT failures.

GDS in turn set off a chain of policy transfer that saw jurisdictions across the globe create DGUs within central agencies as the preferred solution for acute and chronic IT failures. DGUs borrowing variably from GDS emerged in the United States, as the United States Digital Service (USDS) and 18f (2014), and in Australia, as the Australian Digital Transformation Agency (DTA) (originally dubbed the Digital Transformation Office) (2015). The Government of Canada announced the creation of a Canadian Digital Service (CDS) in its March 2017 budget, explicitly noting that the unit would be modeled on GDS, USDS and 18f (Government of Canada 2017). Also in Canada, in the province of Ontario, another DGU was formed in 2017, called the Ontario Digital Service (ODS). ODS grew out of existing work on digital government transformation that had been led by civil servants within Cabinet Office and the Department of Communications and that had in part been inspired by GDS. For example, Ontario civil servants were adopting the GOV.UK source code and consulting with GDS officials to inform their work, although notably Ontario's adoption of cloud technology and agile approaches predated GDS' official formation. Most recently, DGUs have been introduced in the Canadian province of Nova Scotia and through recent reforms to France's Etalab.

Francis Maude (Minister of the UK Cabinet Office from 2010 to 2015), fueled this policy transfer as an active ministerial champion for GDS internationally by engaging directly with other governments in exporting GDS' model and approaches abroad. In addition, GDS spread their model by working openly through a blog and by publicizing early successes, as when they won the "Design of the Year" award for gov.uk from the UK Design Museum in 2013 (Terrett 2013). The UK government has also identified digital government as a priority area for asserting their global leadership and influence, with the government's 2017 Government Transformation Strategy stating that "we will work with other governments to set global standards for digital services and technology, both through our bilateral international relationships and especially through

international partnerships such as the D5 and the Open Government Partnership" (Cabinet Office 2017).

This process of policy transfer has equally benefitted from the consulting firm Public Digital. Headed by former GDS leaders, the firm has been recruited by other DGUs outside the UK for guidance.[1] And most recently, transfer between DGUs has built on the GDS-to-others model, to also include staff transfers, often at higher leadership levels, between DGUs created subsequent to GDS.

Inspired by GDS, all DGUs are dedicated in-house units of digital expertise operating at the center of government, versus being line department-specific. Each is mandated to reverse well-documented deficiencies in public sector IT governance, and more ambitiously, to transform public management practices in general. Beyond these baseline similarities, to what extent can and should the various DGUs emerging globally be treated as a coherent public management phenomenon, versus being treated as a set of loosely related but ultimately quite different institutions? And what are the implications of DGUs for not only the design and delivery of digital era public services, but for public management reform more broadly?

The field of public management research has to date offered few comprehensive, scholarly studies to respond to these questions. Three exceptions deserve mention. Margetts and Naumann (2017) offer some insight into the UK's Government Digital Service in a discussion on tech entrepreneur Tim O'Reilly 'government as a platform model' in a 2017 article comparing GDS' approach with that of the Estonian digital government. Ines Mergel examines DGUs' origins and functions in a report prepared for the IBM Center for the Business of Government (2017) and in a 2019 article (Mergel 2019). Mergel also discusses DGUs with her coauthors as part of a larger empirical study that explores how experts define 'digital transformation' in the public sector (Mergel, Edelmann, and Haug 2019). Beyond these useful and welcome early contributions to the study of DGUs, there remains a dearth of systematic, comparative, and historically and theoretically grounded studies parsing the orthodoxy, governance structures, resources and implications of DGUs as a recent public management phenomenon that is quickly gaining traction in the halls of today's governments. This article contributes to addressing this gap in the field by first defining the common and divergent characteristics of DGUs, and second, by mapping out a research agenda to guide research on DGUs going forward.

Research design

While DGUs continue to emerge globally at both the national and sub-national level (for example, as noted already, in Nova Scotia [Canada] and through recent reforms to France's Etalab), this article focuses on the first six DGUs created from 2011 onward. These include: the UK's Government Digital Service (GDS), the Canadian Digital Service, the Ontario Digital Service, the Australian Digital Transformation Agency, 18f (United States) and the United States Digital Service. These DGUs were selected because, at the time of data collection and writing, they were the only DGUs in existence. Within these cases, the article's conclusions draw most heavily on the experience of the UK government. This was a deliberate choice given that, as the first DGU (formed in 2011), GDS is the organization with the most insight to offer to date on DGUs as a nascent phenomenon. In addition, GDS also deserves particular attention at this stage of DGUs' development given that GDS has to varying extents inspired all of the DGUs that followed it (as noted in the discussion on the origins of DGUs in the previous section).

To analyze these DGUs, the article draws on two primary data sources. The first is documentary evidence addressing the six DGUs under examination. These documents were collected through systematic web searches from 2011 to 2017. Using the DGUs' names as well as the names of key initiatives each has undertaken as the search terms, each government website was scanned for any documentation relevant to the DGUs under study. Using the same search terms,

commercial web browser searches were used to identify media commentaries, social media content, professional publications and blogs relevant to the DGUs. Next, references to the DGUs were identified in key government planning and strategy documents, such as annual reports, budget documents, speeches, press releases, and parliamentary reports.

The second data source informing the article's definition of DGUs is a set of five elite interviews, conducted with officials working in the UK's Government Digital Service. As noted already, the article pays particular attention to the UK case, given that it is the longest-running and most influential DGU to date. UK interviewees were identified through government blogs, online directories, and via LinkedIn. These interview subjects worked in a range of functional areas (communications, web development, service design, policy) and at varying levels of authority (from mid-level civil servant to senior executive). These interviews were semi-structured and all interviewees participated without attribution. All interviews were transcribed before analysis.

The documents and interview transcripts were analyzed deductively in order to identify differences and similarities across DGUs along three dimensions: orthodoxy, governance structures/powers, and resources (staff, budget). Second, the data were analyzed inductively to identify challenges and issues emerging in each of these DGUs to date. This second level of analysis informs the DGU research agenda that is developed in Part 4 of the article, and is also partly deductive, where analysis is supplemented by existing research tracking the history of digital government reforms in the public sector, and the literature on public management reform more generally.

In interpreting the results of the analysis, it is important to underscore that at the time of data collection and writing, the Canadian Digital Service and the Ontario Digital Service had only recently been formally established (each in 2017). Thus, analysis of these two DGUs is preliminary at this stage, and is supported by a smaller corpus of documentary evidence as compared with the more established DGUs under examination. It is also important to note that other DGUs have emerged since the time of writing, and that all of the DGUs under examination are in a sense, "works in progress", adapting in real-time as they learn from their experiences and those of other jurisdictions, and respond to shifting political contexts and priorities. These limitations of the research design, and the concomitant need for future research that builds on this early examination of DGUs, are addressed in further detail in the article's proposed research agenda (Part 4) and in the conclusion.

DGUs and the new digital government orthodoxy

Each of the DGUs examined is committed to reforming digital services and adopts a similar orthodoxy of reform in doing so. On this dimension, DGUs can be treated as a coherent phenomenon in digital era public management. This shared orthodoxy reflects current best practices in digital service design and management and can be understood in part by what it rejects: the traditional model of government IT of the 1980s, 90s and 2000s, which has now been identified as a driver of early e-government failures, as discussed in the first section of the article. This new orthodoxy also brings with it a new vocabulary, including the words "agile", "platform", and "user experience", reflecting the infiltration of language, ideas and values from the tech sector to government, a key feature of the new digital government orthodoxy propagated by DGUs. This shift in orthodoxy and vocabulary is depicted in Table 1.

The first feature of the new digital government orthodoxy adopted by DGUs rejects so-called 'waterfall', government-centric approaches to development, in favor of agile, user-centric development. The agile, user-centred approach sees products released early as prototypes, and continually refined based on user experience, as opposed to developing projects via a so-called waterfall model: on long timeframes, primarily internally, and with a view to satisfying government requirements and needs (e.g., corporate policy processes, departmental ownership of programs and services) (Rasmusson n.d.; Mergel 2019). DGUs' adoption of agile, user-centred design falls

Table 1. Traditional approaches to government IT versus current digital government orthodoxy.

Traditional Approaches to Government IT ('e-government')	*Current Digital Government Orthodoxy*
Waterfall design, the long release cycle	Agile, iterative design
Government-centric (focused on adhering to internal government standards, processes and needs)	User-centric (focused on identifying user needs, and tailoring government standards and processes around these needs)
Limited reliance on data in decision making and design	Heavy reliance on data-driven decision making and design
Managing legacy contracts with a small number of big IT providers	Building in house and procuring with a competitive, pluralistic marketplace
Favors proprietary solutions	Favors open source solutions
Siloed ('one use', department/initiative specific project development and IT management)	Horizontal, platform models ('multiple use', whole of government project development and IT management)
Risk-averse, process-first, hierarchical organizational culture	Hacker, delivery-first, 'flatter' organizational culture

in line with a larger trend that has seen governments enthusiastically adopt 'design thinking' via digital initiatives but also policy innovation and policy renewal commitments (Clarke and Craft 2018; Johansson-Sköldberg, Woodilla, and Çetinkaya 2013). The prime public-facing example of the agile approach in action was GDS' decision to release their new website as alpha and beta sites, refining these websites as users interacted with them, versus developing them internally and only inviting users to test the sites once they were largely complete.

The second feature of the new digital government orthodoxy addresses procurement. Part of this work rests on the DGUs' creation of in-house solutions that prevent the need for procurement in the first place, challenging historical practice that saw many governments turn to contracting for their IT needs as a rule. To be sure, DGUs also acknowledge that procurement will invariably remain an important complementary instrument to in-house development, and that in many cases contracting is superior to in-house development. This appreciation for the ongoing importance of IT outsourcing is reflected in the emphasis on procurement reforms in the mandates of DGUs. These reforms prescribe the use of open source alongside the proprietary solutions typically favored in government IT procurement (Cassell 2008). DGUs also support procurement by helping departments break down large contracts into smaller components so that a more pluralistic, competitive marketplace of large, medium and small suppliers can bid on government work (sometimes termed 'modular contracting').[2]

The third feature of the digital government orthodoxy common across DGUs tackles siloed models of IT project management. In lieu of this approach, DGUs rely on open standards and adopt 'platform-based' approaches. Platform-based approaches ensure that a given digital service is interoperable and repurposable across government so that it can support a range different public services delivered across various departments (Fishenden and Thompson 2013). GDS describes this model as one which centrally aggregates *demand* across government for common services, functions, etc., but which disaggregates the *supply* of these services, functions, etc., in departments (Cabinet Office 2017) (elsewhere dubbed an "intelligent center/devolved delivery" model, see Clarke, 2016; Clarke and Margetts, 2014; Dunleavy and Margetts, 2015). The government-wide websites for which certain DGUs are responsible (i.e., in Australia, Ontario and the UK) and platforms for common service functions are two example of the kinds of platform-based digital service approaches adopted by DGUs. Government-wide websites, such as GOV.UK, set a common underlying code, functionality and 'look and feel' (e.g. colors, logos, fonts, organization) for all government departments' websites. Departments can then piggyback on this common, central website platform to share information relevant to their work and their services online. Common service functions on the other hand, are a platform that provides the digital

infrastructure needed to support service transactions common across various departments and policy files. For instance, regardless of the policy file or department in question, before providing an online service, it is often necessary to verify a service applicant's identity (e.g. to ensure eligibility, prevent fraud). Rather than having each department develop their own unique means of verifying service users' identities online, a common verification platform can be built that can then be repurposed across a range of government services delivered at the departmental level. In the UK, GOV.UK Verify is one such identification-verification platform. Likewise, the USDS' Login.gov is a platform that provides a universal login system for government services that departments can use to deliver their own unique services (versus each department developing their own login system).

The final features of the new digital government orthodoxy speak to the culture within which digital service design and management unfolds. Each DGU endeavors to create an exclusive space, both physically and organizationally, in which their staff can operate outside the constraints that limit scope for digital innovation in the bureaucracy-proper (the same logic of innovation labs, see Carstensen and Bason 2012). As one GDS official put it in a 2012 interview: "It's like a startup … It's like Google".[3] This is immediately apparent when one walks into the offices of DGUs, which are typically free of drab cubicles, clunky desktop computers and business-attired civil servants. Instead the offices are often open concept, decorated in Post-it covered walls mapping projects, and filled with casually-dressed employees, a modest attempt to feed off the trend that sees tech firms create unconventional workspaces featuring things like slides and even Lego rooms (Crowley 2013).

Operating in an organization that attempts to be 'born digital', free of the legacies of hierarchy, silos and traditional bureaucratic processes entrenched in established government units, DGUs emphasize that they have what the USDS dubs a "a bias for action, focusing on delivery above all else" ("U.S. Digital Service" n.d.). 18f echoes this sentiment, with the phrase "Delivery is the strategy" stated clearly as their opening descriptor on their website (2016a). Posters stating: "Work on stuff that matters" and "Show the thing" are hung on the walls of Australia's DTA. Similarly, in a 2016 recruitment call, the Cabinet Office team acting as the forerunner to the Ontario Digital Service explained: "Our unit structure is fluid to enable team members to self-organize around work, deliver quickly and operate autonomously" (Abdulla 2016b). And as explained by Mike Bracken, in the UK "[GDS'] strategy was to be disarmingly simple: to deliver", focusing on users of the service and not on what he criticized as "risk-averse" policies and internal government processes (Bracken 2013).

To be sure, while the units themselves create unique spaces at the center of the state to foster this tech startup-inspired organizational model, they do not strictly work in isolation from the rest of the bureaucracy. Rather, DGUs in some cases post staff in departments and agencies to work on specific projects, as is the case for 18f, GDS and CDS, for example. Likewise, in some cases, those outside the DGUs' staff contingent spend time working in the DGUs on initiatives relevant to their mandate. In each of these instances, the units aim to diffuse their alternative model of operations and general philosophy of digital government (as depicted in Table 1) across the bureaucracy-proper. As 18f explains: "We can embed a fully-dedicated 18F team within your agency to work hand-in-hand with you to increase your internal digital capacity, help you form new digital habits, and ultimately drive organizational culture change" (2016b).

Illustrating how this culture transfer can happen in practice, a manager from a line department working on the common website in the Australian Digital Transformation Office (DTO) (as it was labeled at the time) explained in a blog post:

> I'm still excited about the weeks ahead at the DTO and utilising the agile way. I want to bring the ideas back to the department. I believe that many in the department want to share more openly, want to try new things, but are not sure how, or if they can. I am looking forward to helping them explore a new approach.
>
> (Keilar 2016)

The organizational culture championed by DGUs reflects the types of professionals that these units attract. This includes web developers, but also designers and product managers, two

functions that have not traditionally formed part of the public sector workforce. In contrast, designers and product managers are commonplace in the tech sector, and are part of the set of human resource specializations that have developed within the broader agile management movement, as defined earlier in the article. Describing GDS, a UK official explained: "this is an unusual initiative in government. I know we're trying to recruit people from Google and Facebook and all sorts of digital agencies. We're trying to get the message across: this is government, but not as you know it. This is a completely differently proposition".[4] Echoing this sentiment, recruitment calls for DGUs typically attempt to lure talent from the private sector by arguing that working in a DGU will allow individuals to work on socially-impactful projects without suffering the red tape, hierarchy and 'paper pushing' embodied in the pejorative stereotype of government bureaucracies. For example, the USDS offers calls to action such as: "*Change lives every day:* We need top technologists to serve tours of duty, working on the nation's biggest challenges" (2016a, emphasis in original), while also describing their team as "emoji, post-it, and sticker enthusiasts" (2016a), and assuring potential recruits on its "Frequently Asked Questions" page: "Don't worry — most days you can dress like you're at any other startup. Every now and then we dress up for important meetings, so it's good to have at least one formal outfit in your closet" (2016). Similarly, in 2016 the ODS' predecessor in the Cabinet Office issued an unconventional recruitment call on LinkedIn that began with "Hey, do you want to work here and make government better? So do we" and explained that recruits would "ignite disruption and innovation in every corner, mobilize new ideas, start small, learn from mistakes, measure performance and build upon success" (Abdulla 2016a). These branding efforts have been boosted by high-level political endorsements of DGUs, as when former U.S. President Obama underscored the public impact one can have through government careers in a 2016 speech directed at the technology industry at the SXSW Interactive festival, and when former UK Prime Minister David Cameron praised GDS as "one of the great unsung triumphs of the last parliament" in a 2015 speech (CNN Money 2016; Evenstad 2015).

In sum, DGUs can be discussed as a coherent set of phenomena inasmuch as each represents a government unit operating at the center of the state with a shared philosophy, evident in their common commitment to agile, user-centred design, pluralistic procurement and centralized platforms/components, and in their shared rejection of process-first, hierarchical, formal bureaucratic culture in favor of a tech startup-inspired culture. Where these units diverge, however, is in the specific governance structures by which they operate, the powers they wield and the resources to which each DGU has access. The next section details these differences.

DGUs: variation in governance structures, powers and resources

Table 2 illustrates that while each DGU is located within central units of their respective administrations, the budget, staff numbers and specific powers assigned to each unit vary considerably. Based on data available at the time of writing in 2017, budgets range from $12M USD in the ODS to $140M USD in GDS. Staff numbers also vary widely, from a low of 19 in CDS, to GDS' arsenal of 653 staff. Sitting as an exception to the other units, 18f operates as a sort of in-house consultancy, with departments funding their work on a project-by-project, cost-recovery basis.

In interpreting these budget and staff figures, it is important to note that this is not an "apples to apples" comparison. Rather, variation in part reflects the size of the population that each DGU serves, as well as the range of services that the government in question provides to this population depending on the governing structure within which it operates. In addition, these resources in part reflect the evolution of each unit as they have developed since their inception. For instance, prior to 2015, GDS' annual budget was $71.9 M USD (£58 M), an annual funding allocation that nearly doubled in 2015 (Curtis 2015). Similarly, the USDS' budget and mission has grown with time. USDS was originally created in response to the failure of HealthCare.gov, the

Table 2. Governance structures, resources and powers in DGUs.

DGU	Location in the Machinery of Government	Annual Budget (USD)	Staff	IT Spending Control	IT Hiring Control
Government Digital Service (UK)	Cabinet Office	$140M (£112.5M)[8]	653[9]	✓	✓
Ontario Digital Service (Canada)	Cabinet Office	$12M ($16M CAD)[10]	84[11]	X	X
United States Digital Service	Office of Management and Budget (OMB), within the Executive Office of the President of the United States	$14M[12]	200[13]	X	X
18f (U.S.)	General Services Administration	Cost-recovery, funded by departmental budgets	200	X	X
Australian Digital Transformation Agency	Department of the Prime Minister and Cabinet	$18M ($23.9M AUD)[14]	100	✓	X
Canadian Digital Service	Strategic Policy Branch, Treasury Board Secretariat	Not available	19[15]	X	X

Notes: 1) Unless otherwise specified in endnotes, staff numbers are approximate and breakdown between full-time, part-time, and contract staff unavailable. 2) Budget numbers reflect funding to support the operations of the DGU. DGUs may have access to additional funding allocated to specific projects and digital agendas/strategies on which they work (e.g., $63.7M AUD is allocated annually to support the Australian Digital Transformation Agenda, with $23.9M AUD of that amount allocated annually to the DTA specifically).

front end web interface for Obama's signature policy initiative, the *Affordable Care Act*, that cost $500 M USD in contracting fees only to fail on the initiative's launch date (Coren 2017). Since tackling HealthCare.gov, subsequent budget allocations have expanded USDS' mandate to cover work with a range of departments and specific initiatives prioritized by the President, and budget proposals for the 2017 fiscal year would fund USDS teams in 25 agencies with a view to raising staff numbers to 500 (Goldstein 2016).

In addition, in evaluating these budget and staff allocations it is necessary to account for the broader digital government ecosystem in which each DGU operates. This ecosystem includes all actors and institutions with management and budgetary control over digital government initiatives, including but not limited to Chief Information Officers (CIOs), service delivery units and Open Government teams. GDS' comparatively larger budget and staff numbers are in large part a reflection of the centralized control over digital governance allocated to this DGU. GDS entered somewhat of a whole of government power vacuum on digital and IT governance, with departments largely managing IT on their own, with little central coordination (a symptom of NPM reforms that reinforced a decentralized Whitehall from the 1980s onwards). Given the high-cost, high-failure track record associated with this decentralized model, pressures to reduce the costs of government, and strong ministerial backing within Cabinet Office, GDS was well placed to quickly acquire power over the unwieldy mess of IT management it inherited. GDS has thus acquired both spending control and hiring control for IT across the entire government, was granted whole of government jurisdiction over all digital services and manages the entire UK government website (with web content generated in departments, following GDS guidelines and templates). Its large budget and staff contingent reflect this expansive mandate.

Differently, control over government websites, service delivery, and IT hiring and spending is more diffuse across central agencies and departmental actors in other jurisdictions where DGUs have emerged. In these cases of diffuse digital governance infrastructure, total spending and staff allocations for digital are also necessarily more spread out across departments and units, as opposed to being held by a central coordinating institution. For example, the USDS'

work is part of a larger sphere of activities handled by CIOs, the Office of Federal Procurement Policy, and the Technology Transformation Service (TTS). Likewise, CDS and ODS also operate in an already populated ecosystem of players with control over digital, in part reflecting their early efforts as e-government leaders in the early 2000s, in which whole of government infrastructures on digital were established via CIOs and horizontal service initiatives (Roy 2006; Borins 2007).

Importantly, in decentralized digital governance contexts, DGUs not only have fewer resources at their immediate disposal (diffused as total budgetary and staffing allocations over digital are to a range of players), they also have fewer levers at their disposal to effect digital initiatives across government, since these levers are shared amongst a range of actors outside the DGUs' immediate control. Differently, where DGUs enjoy IT spending control that they can wield without the interference of other actors, it is possible to assert significant top-down influence through initiatives such as Digital Service Standards that act as gatekeepers to funding for digital initiatives. In the UK, this power allows GDS to dictate to departments with language such as: "To pass point 17 (report performance data) in your service assessments you **must** set up a dashboard on the Performance Platform. You **must** show how you're using the dashboard to share metrics for the following 4 key performance indicators (KPIs): user satisfaction, cost per transaction, completion rate, digital take-up" (Government Digital Service 2016, emphasis added). Contrast this with the language used by USDS and 18f when describing their Web Design Standards. They note: "**While they're not a requirement**, if an agency doesn't already have an established style guide, the draft U.S. Web Design Standards can help save time, money, and effort" (18f 2017, emphasis added).

Within DGUs, then, we can identify variation between those units that operate within a *strong, top-down model*, setting standards and exerting direct influence over departments' digital services (e.g., GDS and the DTA), and those that operate under a *diffuse leadership model*, offering support and guidance to departments without having the powers directly to dictate to them on matters such as hiring or spending (e.g., CDS, ODS, USDS and 18f). To be sure, this is not to suggest that DGUs operating within the diffuse leadership model are lacking in any control or ownership on digital projects; these DGUs are given tactical control over the digital initiatives that departments or central administrators assign to them. For instance, as mentioned, early in the USDS' tenure, it was asked to design and manage HealthCare.gov after its initial failure, and CDS was recruited by the Canada Revenue Agency to conduct user research and related reforms targeted to low-income tax filers (McKenna and Havelock 2018). DGUs have ownership of these projects at the request of the departments working with them, and their power is limited to the design and execution of the particular service reforms assigned to their control.

In sum, while united by a common philosophy of digital government, and each representing dedicated digital service units at the center of government, DGUs are not a strictly uniform phenomenon. Rather, each varies in terms of the resources at their disposal, and the concomitant influence they wield relative to other government actors implicated in digital government initiatives. Accounting for these similarities and differences, and detailing insights identified through analysis of each DGUs' experiences thus far, the final section of the article outlines four critical issues that public management researchers must attend to as part of a rigorous research agenda that appraises the benefits, risks and future trajectories of DGUs as instruments of digital era public sector renewal.

Benefits, risks and future trajectories of DGUs: a public management research agenda

Evaluating DGUs' record of success so far

It is still relatively early days to evaluate the long-term impact of DGUs, yet it remains prudent to evaluate their successes and failures even at this early stage given the speed with which DGUs

have cropped up across the globe, and the hopes and dreams for digital transformation driving this adoption. Evaluating the benefits and drawbacks of DGUs should be the first priority of a research agenda focused on this recent public management trend.

As researchers undertake this work, it is important to account for the limited evidence we have thus far on the outcomes of DGUs. At a basic level, DGUs have proven their worth in the area of talent recruitment. As noted above, by offering the opportunity to work on pressing social challenges in a unit that defies pejorative stereotypes of government bureaucracy, DGUs have generated interest in government careers amongst tech talent that have since the 1980s opted instead for more lucrative and competitive private sector opportunities. This talent is key to reducing the information asymmetries that have traditionally undermined public sector IT procurement, and also enables in-house development, versus the strict contract-out model that has failed for decades.

Early evidence also reveals that DGUs have generated impressive service improvements and cost-savings in certain cases. For instance, as noted already, GDS has produced an award-winning website, and surveying the sites of other DGUs reveals a series of new or improved services that have been produced in less time and at a higher quality than has ever been standard in digital government service delivery. The work of DGUs has received international praise, as in the OECD's focus on 18f's Micro-purchasing Platform as an "innovative solution" that has "has turned procurement rules on their head" (Organization for Economic Co-operation and Development 2017). GDS claims to have saved the government £1.7 billion in 2014 alone (Foreshew-Cain 2015). Yet, these successes deserve greater scrutiny before drawing the conclusion that DGUs are indeed the optimal means of transforming governments for the digital age.

First, it is worth remembering that DGUs have tended to tackle low hanging fruit as a first order of business, opting to demonstrate success early in order to justify investment in their resources and powers. Acknowledging that service improvements and cost-savings do not necessarily accrue linearly, it is possible that a spike in early successes will be tempered with time as these units take on the more complex organizational reforms, legacy service transformations and cultural shifts required of digital service renewal. Indeed, a 2017 UK National Audit Office (NAO) evaluation of GDS noted that "While many government services are now available online"—reflecting GDS' early success in revamping the government website, for example—"departments and GDS have struggled to manage more complicated programs and to improve the complex systems and processes that support public services" (2017, 7).

In addition, this same NAO report found that certain departments have not been able to adopt GDS' platforms, such as Verify, easily or quickly, and have instead continued to use and develop their own department-specific services. This experience points to the limits that a centralized unit stacked with digital talent and potent government-wide powers will ultimately face when comparatively less digitally-capable departments must build on and work with centrally developed platforms and standards. In part reflecting weak implementation at the departmental level, GDS has reported that while 12 of the 25 exemplar services it prioritized as part of its initial work program will see benefits outweigh costs of development within ten years, ten of those services will still see development costs outweigh expected benefits in the same time period (National Audit Office 2017).

Accordingly, in evaluating the successes and failures of DGUs thus far, researchers will be advised to keep note of the much larger challenges at play in updating analog era governments for the digital age: cleaning up decades of poor information management, updating complex corporate and legal policy requirements, engendering a culture of innovation in the bureaucracy, tackling dense hierarchies and risk-averse accountability structures, building horizontal links across siloed units, and operating with a bureaucracy that is for the most part unacquainted with the techniques and approaches driving today's digital innovations (e.g., data science, design thinking). While a DGU may provide the necessary central leadership, talent, and proof of concept

case studies to chip away at these challenges and may itself be designed from the ground up as a "born digital" organization, the DGU has not yet proven a sufficient instrument to ensure that these complex and long-standing public sector renewal challenges are conquered. This suggests that when assessing the value of DGUs, researchers must appreciate the broader context in which these units operate, and the constraints they face in attempting to reform deeply entrenched legacies at play in this broader context; not all delays and failures will be the fault of the DGU, but may rather simply reflect the gravity and scope of digital transformation as a project of contemporary public sector renewal.

Second, in evaluating the track record of DGUs thus far, researchers should test the hypothesis that the wins achieved by DGUs have depended less (or perhaps not at all) on the fact that they emerged from a DGU as a machinery of government innovation per se, and instead depended on the DGUs' adoption of agile, iterative user-centric design, more sophisticated data-driven, decision-making models, and blending of in-house development, open source technology, pluralistic procurement processes and horizontal platform approaches. By this argument, the new digital government orthodoxy is the causative driver of digital government success, not DGUs.

This theory would help explain digital success stories that have arisen absent the presence of a DGU. The obvious example here is Estonia, which has emerged as a global leader in digital government but has not followed the UK's lead in developing a DGU as other countries have. Instead Estonia governs its digital services through the Estonian Information Service Authority. While operating via a different model, Estonia nonetheless shares with DGUs their digital government orthodoxy, building platform-based infrastructures, using open source code and prioritizing data science and user-centred design (Margetts and Naumann 2017).

Similarly, New Zealand has made great advances in digital government by driving a cross-agency collaborative approach and engaging users directly in service design. New Zealand uses both open source and proprietary technologies, pluralistic procurement practices (with common capabilities and all-of-government pricing available to all agencies), and common standards and architecture. Following this model, the government has joined the UK and Estonia as a founding member of the D5, but has to date not yet opted to create a separate DGU, preferring instead to drive these reforms through what their Chief Technology Officer (CTO) Tim Occleshaw dubs "a model of networked leadership" enacted through a Digital Government Partnership. Within this model, digital service reform is led through a Service Innovation Working Group. This is a management committee comprised of deputy chief executives from nine government agencies.[5] The committee coordinates digital reforms and initiatives underway across the government, but unlike a DGU, does not have a staff of tech experts and is not responsible for designing and delivering digital services directly.

Thus, while the evidence to date suggests that the new digital government orthodoxy bears fruit, it is not yet clear that DGUs as a machinery of government reform are crucial to achieving digital government success. In turn, while DGUs are advocated by a powerful instrument constituency (Béland and Howlett 2016), led in particular by the UK government as part of their efforts to assert global leadership on digital government, any government pinning their hopes and dreams on a DGU as a cure-all for their digital deficiencies is, at this stage, doing so on a shallow evidence base.

In thickening this evidence base, researchers should pay particular attention to the effectiveness, and weaknesses, of the various governance structures that differentiate DGUs, a point to which the article turns next.

Governance and the DGU: strong top-down control versus diffuse leadership models

The article identifies variation across these DGUs depending on whether they adopt a strong, top-down model, setting standards and rules for departments, and exerting direct influence over

departmental activities, versus the diffuse leadership model which sees DGUs creating optional guidelines and/or working with departments to support their priorities and digital initiatives. From this observation, a crucial research question arises: which of these models is optimal, and under which conditions?

Greater powers and resources are likely useful when attempting to mandate whole of government reforms (e.g., use of open source technologies, agile development, adoption of cross-government platforms). Historically, this has been one of the key rationales for central agencies granted horizontal power over and a capacity to coordinate the vertical hierarchies of otherwise largely independent and siloed departments and agencies (Painter 1981). Despite this, early evidence also suggests that the strong top-down approach may not always be the optimal option for a given government developing a DGU.

First, the strong top-down model may generate resentment and resistance amongst departments subject to the spending controls, hiring powers and standard setting that DGUs enjoy at their expense. For example, in the UK, GDS is perennially rumored to be under threat of dissolution as departments challenge its spending control and authority over digital services (Margetts 2016; Neville 2015; Glick 2016), reject its common platforms, and refuse to work with GDS on major digital initiatives (Malik 2014). Some have suggested that these tensions are to blame for an exodus of senior GDS leadership from 2015 onwards (Greenway 2016; Margetts and Naumann 2017). Acknowledging the potential for departmental pushback it can generate, New Zealand's CTO has argued that their digital agenda deliberately rejects the power and spending centralization that certain DGUs have pursued, and that NZ's preferred model of collaboration and networked leadership has enabled the government to progress further, and more sustainably, than some of the country's peers.[6]

Further research into these questions may find that resistance to centralized, top-down control is more likely in governments that lack a consistent tradition of whole of government management. This is particularly the case in the UK. Despite episodic efforts to institute centralized management approaches, which in certain respects act as precedents to GDS (for instance, Tony Blair's early 2000 introduction of the Prime Minister's Delivery Unit, see Kelman 2006), UK government departments have historically operated relatively independently from each other, especially as a result of 'agencification' and disaggregation under NPM reforms (Dunleavy and Hood 1994; Dunleavy et al. 2006), as noted in the opening sections of the article. In governments where departments are more accustomed to accepting the rules and standards of powerful, established central agencies, a DGU mandating whole of government platforms and standards may instead be perceived as less of a foreign, invading entity. Further, much of the resistance that GDS faced in particular was fueled by generalized resentment of its staff and their perceived arrogance within departments at its earliest stages of development. In particular, resistance to GDS came from those who were turned off by the unit's self-promotion and recruitment efforts, and concomitant rebukes of the civil service proper as inefficient and ineffective. Describing GDS in a 2013 interview, a digital communications manager within a line department remarked:

> They're not troubled by the twin demons of modesty and humility, let's put it that way… They think they're doing God's work, and the atmosphere around it is a bit up itself. I think the difficulty is that for people who are still doing digital in the departments, who aren't in this sort of golden team, those people who are doing very difficult jobs and are very good at what they do, and in lots of cases much better than some of these people doing jobs centrally, they are being told that they're rubbish and that they've been doing it wrong all these years. And they're [GDS is] sort of "it's okay, we're here now, we're here now" and you know it's very irritating, it's extremely irritating to have someone come 'round and say: "Oh, oh, yeah, yeah, you did fine with your funny little website, but now we're going to do it properly".[7]

It is thus possible that the control wielded by GDS would have been more acceptable across the UK government had the power they were given over digital not been coupled with what were, ultimately, initial failures on GDS' behalf to build strong relations between their staff and

those in departments. In light of this, GDS has with time changed its tone, now emphasizing the importance of collaborating with departments and listening to their needs and insights (see Bracken 2015). GDS is also working with department-led peer review in exercising its spending controls and is socializing 'Whitehall-proper' to its methods through a Digital Academy set to train 3,000 civil servants annually (National Audit Office 2017). These efforts reflect GDS' recognition that broader digital transformation cannot simply be rammed through by a powerful agent at the center of the state, but demands instead robust, high-trust collaborative links between this central unit and the rest of the civil service.

A similar pattern has followed in other jurisdictions, even in those cases where a strong top-down model of DGU has not been adopted. For example, given their unconventional, comparatively younger workforce and deliberately disruptive mentality, USDS and 18f have been framed as fueling "tensions between the geeks and the lifers" (Levy 2016). To quell such concerns, the USDS' recruitment page emphasizes that its staff must have the social skills to work collaboratively with those outside the DGU. The webpage notes: "Technology alone doesn't change things — it's the people who push our mission forward. Strong EQ [emotional intelligence], compassion, and tenacity are just as important as being a great technologist" (U.S. Digital Service n.d.).

It remains unknown whether ongoing efforts to build stronger links between DGU staff and the bureaucracy-proper can sufficiently ameliorate the challenges that previous research suggests can arise when central agencies attempt to exert influence over the activities of line departments (Painter 1981; Bakvis and Juillet 2004). Research into the effectiveness of top down versus diffuse leadership models of digital government transformation will thus be in a position to speak more broadly to debates on the machinery of government arrangements amenable to public sector reform and especially the limits and potential of central agencies as vehicles of reform.

DGUs' long-term sustainability

As with previous machinery of government innovations, DGUs may ultimately dissolve, or at least see their spread wane, with time. Ongoing research on DGUs will be strengthened by tracking the external threats that are already calling into question the long-term staying power of DGUs. For example, early evidence suggests that DGUs are coming under attack from technology firms who have lost access to lucrative government contracts in the face of in-house development and DGUs' procurement reforms. In particular, lobbyists for technology firms have been reported to discredit the effectiveness of DGUs' offerings in order to convince political leaders to fall back on private sector contracting as the preferred solution for digital services.

More potent a barrier to long-term political support for the DGU is their costs. While DGUs promise cost savings, in the short term, they add what are in some cases large budget lines to the government's balance sheet; countering critiques that digital government reforms have ushered in a return to neoliberal, small-state models of public management (Bates 2012; Johnson and Robinson 2014; Longo 2011), DGUs and the digital government orthodoxy they adopt signal a return to the state given the investment in state capacities and staff contingents they necessitate (Clarke 2018). To be sure, compared to the skyrocketing costs of failed IT projects, the costs of a DGU may in many jurisdictions be considered a small expenditure worth pursuing if it prevents failures going forward. Nonetheless, combined with the pressures a new administration might face from external tech firms and the critiques of departments weary of the DGU, it remains that DGUs which do not early and regularly prove their worth will likely face the scrutiny of incoming governments questioning the investment and powers they receive. This is likely a particularly high risk where governments are elected on a platform promising austerity reforms and tax cuts. Indeed, conscious that their budgetary allocation would draw attention in a domain in which cost-overruns and failures were already highly politicized, in the early days of GDS, UK officials

were particularly concerned that the initiative would be dissolved not only if the government lost the next election, but even if a Cabinet shuffle meant they lost their champion in then Cabinet Minister Francis Maude.

Finally, the change in administration in the U.S. highlighted a third factor that casts doubt on the long-term sustainability of the DGU model. In this case, the shift from an Obama to a Trump administration called into doubt DGUs' long-term capacity to draw in digital talent. While charismatic President Obama's call to action for the USDS and 18f was appealing to a liberal, educated class of Silicon Valley entrepreneurs, many have questioned the ability of a Trump administration to continue to attract this talent to its ranks, in particular as the administration calls for the creation of controversial policy programs such as the "Muslim registry" (Coren and Collins 2017; Ulanoff 2017). To be sure, Trump's polarizing policy initiatives represent an extreme, but the response to his victory from within the United States' technology and government community nonetheless points to the reality that the appeal of government to technology talent is in part contingent on the quality of the political leadership that these individuals are called to work for. The early successes of DGUs in attracting talent may wane as the tone and political leanings of government leadership shifts. Ongoing research into these external threats to the DGU will illuminate the political and economic conditions that are necessary to sustain DGUs, or alternatively, may reveal that alternative models of digital government capacity building are more sound investments, better capable of weathering the storm of external threats that at present challenge the livelihood of DGUs.

Accountability challenges in government digital transformation

The fourth issue in need of further scrutiny from the public management research community focuses on the accountability challenges that accompany digital government transformation. As control over digital services and the infrastructure underpinning them are increasingly managed by central bodies outside the departments under whom those service areas fall, the lines of accountability linking political decision makers to government programing and spending may become blurred. This challenge has already been documented in studies of horizontal governance more generally (Bakvis and Juillet 2004; Michels and Meijer 2008), and is particularly acute in Westminster systems, with their vertical lines of ministerial accountability, which entail that a minister can be held democratically responsible, and even be compelled to resign, over failings that take hold within his or her ministry. Where a service offering is over-cost, under-performs or fails to meet program objectives, but is primarily designed and managed from within a centralized unit outside the minister's control, it becomes less clear where to lay blame for government deficiencies. Rather than this simply reflecting a petty desire to maintain their control for control's sake, ministers may thus rightly push against DGU models that encroach upon their spending, hiring and managerial powers given that they may be held to public account for the outcomes of the DGU's work. Alternatively, where digital services are a success, and the DGU that helped deliver them claims this as a victory, there is also scope for departmental leaders to resent the blurred lines of ownership that render them less able to earn political capital for this win.

These accountability concerns gain in gravity when one considers that digital is increasingly not simply an add-on to a government's daily business, but rather underpins all of its operations, whether in terms of the databases and IT systems that policies and services draw on and feed into, or the front-end, citizen-facing interface with which the public interacts. With some predicting that governments are becoming their websites (Margetts 2011; Steinberg 2012), the ability to clearly identify managerial control and to appropriately apportion blame and rewards for the quality of a government's digital offerings becomes ever more significant. Furthest along in its trajectory, GDS' experience suggests that this accountability question looms ahead for DGUs that have followed its lead, and in particular, in

cases where the DGU is granted expansive powers over departmental initiatives as per the strong top-down model of DGU identified here. To this end, the 2017 National Audit Office report concluded:

> … there continues to be a risk that GDS is trying to cover too broad a remit with unclear accountabilities. To achieve value for money and support transformation across government, GDS needs to be clear about its role and strike a balance between robust assurance and a more consultative approach. 47

Further research is needed to identify how accountability can be structured and managed when dominion over service and program design is shared between a department and a DGU, or where dominion over this service and program is, effectively, the preserve of the DGU given the control they wield over it as the body that defines the standards and components on which its delivery is contingent. This research can draw on and feed into the existing literature on horizontal or shared accountability, which has to date not been integrated into discussions on whole of government digital reform agendas (Jarvis and Levasseur 2015; Michels and Meijer 2008; Phillips and Howard 2012).

In addition to accountability concerns arising from muddy lines of ownership, the new digital government orthodoxy advocated by DGUs raises new questions about ethical data governance in the public sector. These questions arise in the case of so-called 'tell us once' service reforms, a platform-based model that would allow data shared by citizens during individual service transactions to be shared across government and repurposed for other service functions. How can DGUs and other digital reform actors ensure they receive informed consent for such data sharing, and what rules are necessary to ensure such data are repurposed in ways that are equitable, fair, transparent, and that do not unduly harm individual citizens? Likewise, what principles and legal restrictions will guide the use of sophisticated data-driven decision-making, aided by artificial intelligence for instance, in the design and delivery of services - informing, for example, an individual's eligibility for a certain public benefit ? As DGUs continue to emerge, and the digital government orthodoxy they advocate is applied in practice, researchers will need to critically observe and inform the data governance regimes that emerge as part of this public management reform agenda.

Last, more research is needed into the accountability challenges, and subsequent tension between DGUs and the bureaucracy-proper, that are likely to arise as the 'outcomes over process', user-centric principles of the new digital government orthodoxy comes into conflict with the process-heavy, hierarchical accountability structures still at play in today's governments. Exemplifying this conflict, in 2017 18f came under fire in a report from the Office of the Inspector General, which observed that the DGU had not properly adhered to GSA IT security protocols. While 18f did not deny having breached the security protocols, 18f's co-founder and former executive director (and current CEO of the Canadian Digital Service) nonetheless defended the unit, arguing: "This report is not about security … It's about compliance. And that's why government falls so far behind the rest of the world when it comes to technology" and stating:

> As a taxpayer, I take a somewhat different view: as far as I know, those policies have added cost, added delays, and not made any of our services any more secure than they were before … but often in government, no good deed goes unpunished. Checking compliance boxes is often conflated with actual security.
>
> (Snow, quoted in Davidson 2017)

An analysis of the precise utility and effectiveness of the IT security protocols that Snow dismisses here is beyond the scope of this article. However, this example is raised to flag what has already been and will likely continue to be a site of conflict between the new digital government orthodoxy adopted by DGUs and existing accountability cultures within today's bureaucracies. On the one hand, Snow's invocation of this orthodoxy's preference for outcome-based accountability falls in line with a long line of critiques of ineffective hierarchical input or process-based accountability within the public sector (Olsen 2006), an approach to accountability that can support risk-aversion and a status quo orientation at the expense of public sector innovation (Carstensen and Bason 2012). At the same time, a complete rebuke of the accountability processes mandated by government can lead to breaches of basic standards of good governance,

breaches that rightfully warrant criticism. It remains to see how DGUs will balance their prioritization of agile, speedy delivery and user-experience with the equity and accountability concerns that can in some cases rationalize slower and more bulky processes within the state as compared to the tech sector organizations that these units seek to emulate. At a larger level, this suggests that as much as DGUs have learned the lessons of failed NPM reforms in their approach to procurement, for instance, they will also benefit by recalling that the naive glorification of private sector practices running through much of the public management reform literature has tended to ignore the unique dynamics that render public administration properly distinct, and in certain senses, superior to the practices emerging in the corporate world (Mintzberg and Bourgault 2000; Olsen 2006; Radin 2017). DGUs, with their tech sector-inspired orthodoxy, provide a potentially illuminating case to inform the broader literature on the influence that private sector management approaches have on government, and the risks that this poses for democratic governance.

Conclusion

Digital technologies underpin impressive innovations in communications, organizational structures and service delivery models, and are transforming individuals' expectations for their interactions with service providers. Governments have on average not kept pace with these trends, burdened in many cases by the legacy systems—both technical and cultural—of pre-digital public management paradigms. Cost-overruns and the poor service experiences facing citizens demand that governments act expediently but carefully in building their digital capacity going forward.

DGUs have emerged as one solution for this challenge that is increasingly preferred the world over, with the UK Government Digital Service's introduction in 2011 leading to the emergence of DGUs in Australia, Canada, Ontario and the United States. Other governments are no doubt watching these DGUs closely, in particular given the international accolades they have earned, and the promises of savings and broader public sector transformation that these units and their backers have propagated.

The speedy policy transfer that has driven the spread of DGUs in recent years raises a number of pressing questions. What are DGUs, and how do they differ in their on the ground implementation? What does the record thus far suggest about the effectiveness of DGUs as vehicles of digital era public management renewal? Under which governance model should DGUs be introduced to a given public sector bureaucracy? What threats face DGUs moving forward? And how can the work of DGUs be managed so that robust standards of democratic accountability are preserved?

Outside a few recent and important contributions (Margetts and Naumann 2017; Mergel 2017; Mergel, Edelmann, and Haug 2019; Mergel 2019), the public management research community has failed to respond to these questions. To date, we know very little about what DGUs are, whether they are worthy pursuits for governments struggling to reinvent themselves for a digital age, and most importantly, how they are altering, and could alter, public sector governance more broadly.

This article sets the stage for subsequent research by identifying four critical issues that deserve greater scrutiny by public management scholars. Researchers need to appraise the successes of DGUs thus far, and in conducting these appraisals, must account for the unique governing contexts and broader public management challenges that temper DGUs' potential impact. Scholars should equally monitor developments in jurisdictions that have not developed DGUs, in order to evaluate alternative machinery of government arrangements that may be equally, or more, effective at ushering in the new digital government orthodoxy that has proven its value in recent years. This article has flagged Estonia and New Zealand as two governments worth monitoring in this regard.

Second, researchers should assess the benefits and costs that come with the strong top-down model of GDS and the Australia DTA versus those of the diffuse leadership approach adopted by other DGUs to date. At this stage, it appears that in appraising each approach, we are witnessing

the gap between 'being right and being effective'; while a strong top-down model may in theory be the most effective means of mandating whole of government reforms, in practice, the resistance this generates amongst departments may ultimately prove that a diffuse leadership approach bears more fruit in the long run. Future research should carefully monitor the gains and setbacks that each approach accrues, and should also examine if, how and why DGUs shift between top down and more diffuse approaches over time. This research will not only provide useful prescriptive insight to digital era governments, but will also speak to larger, long-standing debates on the role of central agencies and horizontal governance in advancing public management reforms (Aucoin 1990; Bakvis and Juillet 2004; Painter 1981; Pollitt and Bouckaert 2011).

Finally, this article has flagged a series of external threats to the sustainability of DGUs, and accountability challenges that scholars should evaluate when assessing the immediate and long-term implications of DGUs for contemporary governance. Early wins and demonstrated cost-savings will help DGUs combat resistance from private sector IT firms and incoming administrations that question the budgetary allocations assigned to DGUs. At the same time, in achieving these early wins and cost-savings, leaders of DGUs face a tricky balancing act in attempting to adopt a delivery-first, user-centric, agile work model while also satisfying, or alternatively, challenging, onerous hierarchical accountability requirements. While in some cases these requirements should rightfully be dispensed with, reflecting as they do a status quo oriented civil service culture anathema to innovation, in other cases, they are necessary to ensure standards of good governance and in particular, to ensure lines of accountability are clear enough that the public and legislature can keep their governments in check. This balancing act also represents an area ripe for scholarly enquiry moving forward, with the new digital government orthodoxy falling in line with longer-standing debates on the inefficiency of bureaucracy, but evading the insights of recent scholarly defenses of the role that hierarchies, siloes, and public sector values can still play in ensuring accountable, equitable public sector management (Olsen 2006; Radin 2017; Clarke 2019).

As a starting point for this research agenda, this article suffers a number of limitations which should be resolved in future work. The article focuses only on the first six DGUs created, and given the time of data collection and writing, captures these units at a particular time in their development (in some cases, in the early stages, as in CDS and the ODS). Research into DGUs created subsequent to the writing of this article, and tracking evolution of those this article did address, may call into question the definition of DGUs crafted here. Is the digital government orthodoxy shifting with time and experience, or depending on the jurisdiction in question? Are alternative DGU governance structures beyond the top down and diffuse leadership model emerging? In responding to these questions, and other research avenues flagged in this article, future research will build on this article's modest contribution by drawing on a broader set of research interviews (and not just those in the UK, as is the case here), document review, and through more rigorous comparative designs. The need for these studies is urgent.

Public sector organizations the world over are struggling to keep pace with the pressures of governing in a digital context. Digital service failures abound, and citizen trust in government continues to wane. As others have already noted, (Gil-Garcia et al. 2018; Margetts, 1999; Meijer, 2007), it is no longer acceptable for the public management community to ignore digital technologies and their role in contemporary governance. Research into DGUs is an obvious and much-needed first step toward public management researchers' digital awakening. This article contributes early conceptual clarity and lays out a research agenda to jumpstart this work.

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Notes

1. Senior executive, Government Digital Service, UK Government, May 25, 2012.
2. For example, in Australia, the Digital Transformation Agency created a Digital Marketplace to support open, competitive procurement. GDS has created a Digital Buyers Guide, created a spending control policy and a Technology Code of Practice. 18f offers a Request for Proposal Ghostwriting service and a blanket Agile Purchase Agreement. 18f also created a Micro-purchasing Platform which allows outside firms to bid on contracts to address software issues where the contract is valued at less than $3500 USD, thus reducing the cumbersome and lengthy procurement processes that would normally undercut smaller firms' capacity to bid on government work, and allowing departments to solve small challenges quickly and cheaply using simple credit card purchases outside the normal procurement process.
3. Senior executive, Government Digital Service, UK Government, May 25, 2012.
4. Senior executive, Government Digital Service, UK Government, July 8, 2012.
5. Tim Occleshaw, email message to author, July 10 2017. See also: https://www.ict.govt.nz/programmes-and-initiatives/government-service-innovation/result-10/.
6. Tim Occleshaw, email message to author, July 10, 2017.
7. Senior digital communications manager, line department, UK Government, August 6, 2013.
8. Annual amount allocated for four years, beginning in 2015, for a total of $557.5M USD (£450M). See: http://www.itpro.co.uk/government-it-strategy/25656/government-digital-service-gets-450m-mega-budget.
9. Number of FTEs as of March 2016. Staff count is expected to rise to 911 by the end of the 2016/17 financial year (National Audit Office 2017).
10. Annual amount allocated in the 2017 budget, see: https://www.thestar.com/news/queenspark/2017/06/10/ontarios-new-hire-wants-to-make-government-services-more-user-friendly.html.
11. Number of staff as of June 2017, see: https://www.thestar.com/news/queenspark/2017/06/10/ontarios-new-hire-wants-to-make-government-services-more-user-friendly.html.
12. Annual amount allocated in the 2016 budget, see: https://www.usds.gov/report-to-congress/2016/.
13. Number of staff as of January 2017. See: http://federalnewsradio.com/reporters-notebook-jason-miller/2017/01/u-s-digital-service-grew-monster-can-trump-rein/.
14. Annual amount allocated for 4 years, for a total of $72M USD ($95.4M AUSD), beginning in the 2015/16 budget. See: https://www.dta.gov.au/what-we-do/budget/.
15. Number of staff as of July 2017, see: http://digital.canada.ca/our-team.

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