Digital Government Units:
Origins, Orthodoxy and Critical Considerations for Public Management Theory
and Practice

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Abstract

From 2011 onwards, 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. DGUs represent a common machinery of government phenomenon insofar as they all exist at the centre of the state, and adopt a shared orthodoxy, favouring agile, user-centric design, open-source technologies, 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, resources and powers, adding notable complexity to this recent public management trend. Acknowledging the speedy policy transfer that has seen DGUs spread globally despite a lack of critical appraisal of their value and shortcomings, the paper concludes by highlighting four critical considerations that governments and their observers should account for when assessing DGUs' as a potential instrument of digital era public management renewal.

Introduction

The public sector has on average lagged behind its private sector counterparts in keeping pace with technological changes accompanying the digital age, in many cases producing over-cost, under-used and sub-standard digital service offerings, and failing to capitalize on a broader 'digital transformation' of the state (Clarke & Margetts, 2014; Dunleavy, Margetts, Bastow, & Tinkler, 2006; Meijer, Boersma, & Wagenaar, 2009). In response to long-standing IT failures riddling the early 'e-government' period of the 1990s and 2000s, the 2010s have seen a series of governments introduce Digital

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Government Units (DGUs) dedicated to digital service delivery and broader digital transformation of public management practices. These units operate at the centre of their respective civil service administrations, and adopt a common philosophy of digital government, borrowing from the tech sector and startup culture by prioritizing user-centred design, data-driven decision making, open source technologies and platform models of service provision. And in contrast to earlier dominant theories of digital government proposed to date (Lathrop & Ruma, 2010; Noveck, 2009; O'Reilly, 2011), and e-government initiatives of previous decades, these units couple pluralistic procurement practices with *in-house* talent recruitment and *government-led* development of digital services, versus solutions which rely primarily on provision from non-governmental actors (Clarke, 2016a). However, while exhibiting important similarities as a common and growing public management response to the challenges of the digital age, these units diverge in their governance structures, resources and powers, differences that add notable complexity to this emerging machinery of government phenomenon.

Drawing on analysis of public documents addressing DGUs 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 thus the context with the most lessons and insight to offer to date—this paper assesses the origins of Digital Government Units, details their common philosophy of digital government, and analyzes the ways in which they differ in their on the ground implementation. The final section of the paper appraises the successes, deficiencies and long-term viability of DGUs, highlighting emerging issues that governments and their observers should account for when assessing DGUs as an increasingly preferred response to the challenges of digital capacity building in the public sector.

Digital Government Units are a growing trend, diffusing relatively quickly around the globe, but without a wealth of evidence to date to suggest that they provide the benefits their adherents promise, and without sufficient scrutiny of the risks and costs they may raise. At the same time, given some early successes, and in contrast to the failures of previous digital government models, DGUs may indeed represent a potent public management innovation worthy of cultivating and refining in the years to come. At the very least, the policy transfer that has seen DGUs spread across the globe at relatively

quick pace, and which has earned them what are in some cases significant budgetary allocations and broad mandates to ensure the state remains relevant and effective in the digital age, demands that they receive greater critical enquiry than they have to date (but see Margetts & Naumann, 2017; Mergel, 2017). Remedying this gap in scholarly and practitioner examination, this paper provides an early assessment of Digital Government Units, analysing their immediate and long-term implications for the machinery of government, service delivery and broader public sector renewal efforts in the digital age.

The Failings of Public Sector IT and the Genesis of Digital Government Units

While the first DGU emerged in 2011, with the establishment of the UK's Government Digital Service (GDS), the genesis of these units is found further back in history, amidst the long-standing track record of IT management failures that has plagued most governments to date. These failings have been documented in a range of research projects (6, 2007; Meijer et al., 2009), and are assessed most comprehensively in Dunleavy et al.'s 2006 publication *Digital Era Governance: IT Corporations, the State, and e-Government*. This research into early 'e-government' programs, as they were dubbed at the time, revealed that while governments were comparative Information Technology (IT) leaders in the 1950s and 60s, their capacity to keep pace with technological developments, and importantly, to attract talent in the field to their workforce, waned relative to the private sector from the 1980s onwards. This loss of comparative advantage in IT capacity was exacerbated by the rise of neoliberal New Public Management (NPM) reforms throughout the 1980s and 90s, a trend which saw many governments largely or wholly outsource their IT functions (versus investing in in-house capacity), following the free market ideology of NPM with its preference for private sector solutions, and criticisms of government inefficiency and waste.

Characterized by a lack of in-house IT expertise and a strict reliance on outsourcing, early e-government management offers a quintessential case study of procurement failure. Lacking the knowledge, skills and capacity to assess government's IT needs (e.g. specific technical requirements needed for a particular service or back-end corporate function), and to properly scrutinize offerings from private sector providers

(and, notably, their likelihood of meeting government requirements as they evolve over time), many governments signed onto long-term 'legacy' contracts, procuring services that would only meet their short-term needs, or that would not meet their needs at all.

Further undermining the robustness of e-government procurement, the IT market facing the state was in many jurisdictions not quite as open and free as theories of NPM presupposed, ensuring that governments were often negotiating contracts with a small number of private providers in an oligopolistic market, a fact not helped by the large contracts on offer from government, and the complex, onerous procurement processes to which their would-be bidders were subject, conditions which virtually eliminated the capacity of Small and Medium Sized Enterprises (SMEs) to compete for government work. Thus, riddled by information asymmetries and facing an uncompetitive marketplace comprised of few sellers, governments were in a less than optimal position to be purchasing IT solutions from the 1980s onwards, a reality that led many governments to lock in to contracts for ineffective services offered at inflated prices.

IT procurement was also plagued by fragmented, siloed machinery of government, as inherited from Weberian models of bureaucracy and the theory of Progressive Era Public Administration (PPA) shaping the organization of the modern welfare state from the late 19th century onwards (Dunleavy & Hood, 1994). Throughout the 1980s and 90s, the fault lines separating the operations of departments and their constituent units were exacerbated where governments embraced NPM's preference for decentralization (or 'agencification', as it is sometimes called), and further sliced and diced their machinery into competing units operating largely independently from each other without central coordination. In this context of fragmented government, the state did not conceive of nor procure its IT services as a 'whole of government' unit, but instead often purchased services on a 'one off' basis, for specific projects and units. 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, thus ensuring the government did not reap the cost-saving benefits that could accrue from negotiating contracts for these common services as one, much larger buyer.

Importantly, this decentralized model of IT procurement not only produced redundancies and raised costs, but also undermined the capacity of government to work horizontally across various units when it did wish to do so; programs and services, and the data, information, and people underpinning them, became locked in to varying IT systems that were not always interoperable. In this sense, weak IT procurement both reflected and drove siloed governance, undermining capacity for systems-based, horizontal management and 'joined up' service delivery in the public sector.

To be sure, early e-government management was not one note. Instead, public sector organizations exhibited varying degrees of success and failure in the domain. For example, the Government of Canada arose as an early e-government leader in part because it avoided the trends described here, retaining in-house capacity to guide smarter procurement and serving as a pioneer of so-called 'citizen-centred' digital services, which were organized around service users' needs as part of a horizontal governance model in its Service Canada initiative, versus being developed and delivered in isolation along departmental lines (part of Canada's general resistance towards NPM trends) (Accenture, 2005; Borins, 2007; Roy, 2006; United Nations & Department of Economic and Social Affairs, 2014).

At the other end of the spectrum, the United Kingdom 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, p. 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, but also resulted from a series of longer-standing, endemic management failures—both IT-specific, and related to the broader governance of Whitehall—which led to a series of high-profile IT disasters in the UK. The government faced cost-overruns, delivery delays and flat-out failure across a range of IT projects, including those underpinning the Child Support Agency, an attempted National ID Card, the Defence Information Infrastructure Programme, the Single Payment Scheme by the Rural Payments Agency, the National Offender Management System, a National Health Service electronic patient record system, the Universal Credit programme, and finally, the roll-out of the UK's first attempt at a 'whole of government'

service-focused website, Directgov, launched in 2004 (Public Administration Select Committee, 2011).

As of the mid-2000s, these failings had been heavily scrutinized by the media, think tanks, academic researchers, and most creatively, by the civic technology firm MySociety, who in 2005 launched the website directionlessgov.com to highlight the deficiencies of the government's own attempt at web renewal in Directgov. The spoof site was created in a morning and drew on Google to support its search function, producing results that were reportedly often more quickly generated and more accurate than those offered by the official government web portal (Cross, 2007).

Facing this criticism, IT costs of upwards of £16 million 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 (PASC) in 2010. By July 2011 the committee had published a report bluntly titled "Government and IT—a Recipe for Rip Offs: Time for a New Approach". The study 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.

Alongside the committee's work, another strain of activity also tackled the government's IT management challenges. In October 2010, Martha Lane Fox, then Digital Champion for the UK and former dotcom entrepreneur, published an analysis of Directgov. The review, titled "Directgov: Revolution not Evolution" issued four recommendations: (1) adopt a "digital by default" strategy that places all transactional services on the government's central web presence; (2) mandate the release of Application Program Interfaces (APIs) to third parties to "Make Directgov a wholesaler as well as the retail shop front for government services and content"; (3) create a central department to exercise supreme control over all government web content, commissioning contributions from departments; and (4) create a CEO for Digital with authority over all online user experiences and online spending (Lane Fox, 2010, p. 2).

In response to the Lane Fox report and broadly accepted critiques of the UK's IT management, the Government Digital Service (GDS) was introduced in 2011, albeit initially as a project titled 'Alphagov', primarily focused on building a new government

website to replace the failed Directgov. As this work unfolded, GDS developed into a Cabinet office unit with a whole of government mandate on digital strategy, services, hiring and procurement (preceded by two earlier efforts at creating a whole of government digital unit—the Office of the e-Envoy and the e-Government Unit). Responding to then Minister for the Cabinet Office, Francis Maude, GDS was initially headed by a group of digital innovators within and outside the civil service (including those involved with the civic technology firm MySociety), and was eventually led by Mike Bracken (former lead of *The Guardian* newspaper's digital transition) 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' practices, governance structure and ethos emerged in Ontario (a Canadian province) (2011)[2], in the United States, as the United States Digital Service and 18f (2014), and in Australia, as the Australian Digital Transformation Agency (originally dubbed the Digital Transformation Office) (2015). Most recently, the Government of Canada announced the creation of a Canadian Digital Service in its March 2017 budget, noting that the unit will be modelled on GDS and DGUs in the United States (18f and the US Digital Service) (Government of Canada, 2017). Confirming this policy transfer, in a 2017 speech, Scott Brison, the Minister under whom the Canadian Digital Service will be managed, again cited 18f, the USDS and GDS as models from which the CDS would draw, and noted that he and his team had just returned from meetings with the "pioneers" of GDS in London, UK (Brison, 2017). The Minister noted that he himself attended the UK government's Digital Academy (part of GDS as of May 2017), focused on training civil servants in user-centered and agile design.[3]

This policy transfer has manifested not only in the creation of DGUs as central government units and offices, but also in the specific instruments and approaches that

these DGUs adopt. For example, GDS' Key Performance Indicators (KPIs) for digital services have been adopted by DGUs in Australia and Ontario. In addition, the Australian Digital Transformation Agency has adopted GDS' practice of mandating that all digital services satisfy specific criteria in its Digital Service Standard before having their spending approved. Most obviously, we see the diffusion of GDS' tactics in the spread of the source code underpinning gov.uk, the whole of government website created by GDS to replace Directgov. The source code has now been adopted by DGUs in Australia and Ontario, and also in jurisdictions that do not have DGUs, such as Israel and New Zealand, leading to a convergence in the visual 'look and feel' and core functionality of a selection of government websites across the globe.

This policy transfer was aided by Francis Maude (Minister of Cabinet Office from 2010 to 2015), an active and vocal ministerial champion for GDS who engaged directly with other governments in exporting GDS' model and approaches abroad (see, for example, Maude & Tremain, 2014). In addition, GDS promoted policy transfer by working openly through a blog[4] detailing their triumphs and challenges, and by publicising early successes, such as winning the 'Design of the Year' award from the UK Design Museum in 2013 (see 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 Mike Bracken, Tom Loosemore and Ben Terrett.[5] As they note on their site: "We founded GDS. We transformed digital delivery for the UK government. Now we're working outside the UK—helping governments, public institutions, transnational organisations and political leaders do the same" (Public Digital, 2017). Most recently, transfer between DGUs has built on the GDS-to-others model, to also include transfer between DGUs created subsequent to GDS. For example,

in 2016 the Ontario Government hired former 18f Deputy Executive Director Hillary Hartley as their Chief Digital Officer to lead the Ontario Digital Service.

Inspired by GDS, all DGUs are mandated to reverse well-documented deficiencies in public sector IT management, opting to do so with the creation of dedicated in-house units of digital expertise operating at the centre of government, versus being line department-specific. In the next section the paper details the shared orthodoxy, that is, philosophy of digital government, that unites DGUs as a coherent set of machinery of government phenomenon, before considering the governance and resource arrangements that differentiate DGUs as implemented in practice.

DGUs and the new digital government orthodoxy

Each DGU is committed to reforming digital services, and adopts a similar philosophy, or orthodoxy, of reform in doing so. This 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 paper. This shift in orthodoxy is depicted in Table 1.

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
Favours proprietary solutions	Favours 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

The first feature of the new digital government orthodoxy adopted by DGUs rejects so-called 'waterfall', government-centric approaches to development, in favour of agile, user-centric development. The agile approach sees products released early as prototypes, and continually refined based on user experience and other feedback loops, as opposed to developing projects 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) over those of the users to which the service is directed (Rasmusson, n.d.). The prime public-facing example of the agile approach in action was GDS' decision to release their new website as alpha[6] and beta[7] sites, testing and 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 (as per a traditional 'waterfall' model of development). Similarly, 18f and the USDS released the source code for their new Web Design Standards as an alpha version on the code sharing site, GitHub, in order to identify issues early in the process of their development (18f, 2017).

The second feature of the DGU's digital service philosophy addresses procurement. Part of this work rests on the DGU's creation of in-house solutions that prevent the need for procurement in the first place, challenging historical orthodoxy that saw many governments turn to contracting for their IT needs as a rule. This emphasis on in-house provision equally contradicts the emphasis on crowdsourcing, peer-production and open data-driven external digital service provision that has characterised dominant theories of digital government introduced from the mid-2000s onwards (see Lathrop & Ruma, 2010; Margetts & Dunleavy, 2013; Noveck, 2009, 2015; O'Reilly, 2011), as part of a recent but typically overlooked re-interpretation of the now commonly cited public management paradigm 'government as a platform' (Clarke, 2016a).

To be sure, while DGUs depart from historical trends in asserting that high-quality digital services can originate in the state, produced by civil servants (versus outside tech firms alone), they also acknowledge that procurement will invariably remain an important complementary instrument in building government's digital infrastructure (e.g. databases, hardware and software) and service offerings (both corporate, e.g. pay systems, and citizen-facing). Here, DGUs balance in-house generated solutions with efforts to promote procurement with a more pluralistic market of providers that includes SMEs and by turning to open source solutions, in lieu of contracting primarily with large providers of proprietary solutions.

To support this new approach to IT procurement in practice, DGUs offer departments guidance on working with open source solutions, on developing requests for proposals that include requirements for agile and user-centered design, and on breaking down complex contracts into individual components to scale down procurement, all with a view to fuelling a competitive market of suppliers and more informed contracting. For example, in Australia, the Digital Transformation Agency created a Digital Marketplace to support open, competitive procurement.[8] GDS has created a Digital Buyers Guide[9], created a spending control policy[10] and a Technology Code of Practice.[11] 18f offers a Request for Proposal Ghostwriting service[12] and a blanket Agile Purchase Agreement.[13] 18f also created a Micro-purchase 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. In these cases, the DGUs create replicable standards, templates and tools to guide technology decisions across departments that lack the in-house expertise required to intelligently work with outside providers, while also ensuring that government contracts are not structured in a way that marginalizes or wholesale disqualifies open source solutions and smaller providers.

The third feature of the digital government orthodoxy common across DGUs tackles decentralized, siloed models of IT project development and management. In lieu of this approach, DGUs rely on open standards, open APIs and adopt 'platform-based' approaches that allow individual solutions to be reused and repurposed across government to serve a range of ends. 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 centre/devolved delivery" model, see Clarke, 2016; Clarke & Margetts, 2014; Dunleavy & Margetts, 2015). In addition to limiting costly redundancies and allowing for more efficient central maintenance and updating of services, this model also ensures interoperability between various government programs and services, and is thus one of the preconditions for user-centric service delivery, inasmuch as whole of government standards ensure individual services work well together (for example, can draw on the same databases) and have the same front end 'look and feel' and core functionality, ensuring citizens are not lost in a maze of wildly varied digital government services and processes.

This approach is most obviously at play in the common websites for which certain DGUs are responsible (i.e. in Australia, Ontario and UK) and to an extent, in the US, wherein 18f and the USDS do not manage the whole of government web presence centrally, but have generated the US Web Design Standards that inform web products.[14] By this model, the DGU develops code and design standards that departments and

individual programs then adopt when developing their front-end digital presence on the web.

In other cases, the whole of government, platform model underpins digital initiatives that support common service functions, as in GOV.UK Verify, which supports online identity verification, key to enabling online service transactions across government programs, and GOV.UK Notify, which can be used whenever a department needs to integrate a notification function into a given service. The USDS' Login.gov is another example of a common platform, in this case, operating as a universal login system that allows service users to access a range of government services with one account. All of these common components and platforms intend to create a consistent, high-quality baseline on which departments can piggyback to produce an elegant coherence across government services, but also to lever existing work completed at the centre in the DGU; there are thus both quality and efficiency rationales for the common component/platform model, rationales which respond directly to criticisms of the government's historical tendency to develop and manage IT in costly, uncoordinated silos, often 'starting from scratch' on a case by case basis.

In addition to supporting the creation of common components and platforms, DGUs are also developing common government-wide policies and governance infrastructures to guide digital initiatives. For example, GDS has built a data group to drive a cross-Government Data Programme, which aims to improve how the government collects, manages and uses data in its decision-making. To this end, GDS is working to build a common data infrastructure whereby all government data is held in "canonical registers" that are then accessed using APIs, enabling easier access to, and interoperability of, data across the civil service. In addition, GDS, a Data Leaders Network and a steering group are building common policies and governance structures for the management and sharing of government data (Government Digital Service, 2015). Alongside such common policies and governance structures, DGUs also promote common, whole of government approaches in the area of oversight and accountability, most clearly embodied in the generation and internal and external reporting of standard KPIs for digital services, as is the case for the Australian and UK DGUs.

The final features of the digital service reform philosophy driving these units relate less to specific tenets of service design and management, and more to the culture within which digital service design and management unfolds. Each DGU endeavours 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 & Bason, 2012). As one GDS official put it in a 2012 interview: "It's like a startup…It's like Google".[15] This is immediately apparent when one walks into the offices of DGUs, which are free of drab cubicles, clunky desktop computers and business-attired civil servants. Instead the offices are typically open concept, decorated in post-it covered walls mapping projects, and filled with Macbooks and 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).

Commenting on DGUs' alternative organizational cultures—specifically, as manifest in GDS—a UK official observed in a 2011 blog post:

> The idea is to give a blank sheet of paper (as others have said) to people who are approaching the conundrum, not the situation. The whole approach to the project was not "how do departments and agencies do this and how can we make it better?" but "what is the problem we are trying to solve?". And that disinterested approach (not uninterested, note, this team are a committed bunch) is the key to coming up with something that is a fresh way of doing things.
>
> (Leach, 2011)

Writing on this "blank sheet of paper", to quote this official—operating in an organization 'born digital', and free of the legacies of hierarchy, silos and traditional bureaucratic processes entrenched in established government bureaucracies—DGUs emphasize that they have what the US Digital Service dubs a "a bias for action, focusing on delivery above all else" ("U.S. Digital Service," n.d.-b). 18f echoes this sentiment, with the phrase "Delivery is the strategy" stated clearly as their opening descriptor on their website (18F, n.d.-a). Posters stating "Work on stuff that matters" and "Show the thing" are hung on the walls of Australia's Digital Transformation Agency. Similarly, in

a 2016 LinkedIn post advertising new positions, the Director of Digital for 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 that serve government's internal needs more than they prioritize the needs of citizens (Bracken, 2013).

To be sure, while the units themselves create unique spaces at the centre of the state in which this alternative, tech startup inspired organizational model can flourish, 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 and GDS, for example. Likewise, those outside the DGUs' staff contingent spend time working in the DGUs on initiatives relevant to their mandate. In each of these cases, 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 (18F, n.d.-b)." According to Ben Balter, former US Presidential Innovation Fellow and Open Government advocate at GitHub:

> 18F's secret sauce is that it is insistently dogmatic about collaborating in the open, and after expending a great deal of organizational energy painting a picture of a citizen-centric future and doing their best to inspire agency stakeholders that the way 18F approaches technology is vastly superior to the status quo, they will simply refuse to work with an agency unless the agency agrees to adopt 18F's culture and workflow, at least for the project at hand…Sure, it's leading by example, but it's also the teach-a-CIO-how-to-fish strategy, and for them, culture's a first-class deliverable right along side the open-source code that that very culture necessitates.

> (Balter, 2015)

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 labelled 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 alternative, tech startup inspired organizational culture championed by DGUs both reflects the types of people that these units attract to their rank and file—that is, designers and developers from the tech sector—while also serving as a marketing tool that allows these units to attract this talent to their fleet in the first place. Describing GDS, an official in the UK 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".[16] 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 meaningful, socially-impactful projects within government 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" (U.S. Digital Service, n.d.-a, emphasis in original), while also describing their team as "emoji, post-it, and sticker enthusiasts" (U.S. Digital Service, n.d.-a), 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" (U.S. Digital Service, 2016). Similarly, in 2016 the Ontario Digital Service's unconventional recruitment call on LinkedIn 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 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).

Thus, DGUs can be discussed as a coherent set of machinery of government phenomenon inasmuch as each represents a government unit operating at the centre 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 favour of a tech startup-inspired culture. Where these units diverge, however, is in the specific governance structures by which they operate, and the resources and powers to which each DGU has access. The next section details these differences.

DGUs: Variation in Governance Structures, Resources and Powers

Table 2 illustrates where each DGU is located within their respective machineries of government, the leadership structure under which each DGU operates, budget, staff numbers and specific powers assigned to each unit. As evident in the first column of the table, while each unit sits within the centre of government, certain variations exist.

GDS, the Ontario Digital Service, the USDS and the Australian DTA all operate in units that are part of the civil service administration, but which are close to the political centre of power (either Cabinet Offices/Departments of the Prime Minister and Cabinet in the case of Ontario and Australia, or the Office of Management and Budget within the Office of the President for the USDS). Differently, 18f operates in a central agency—the General Services Administration (GSA)—but in one that is more peripheral to the centre of political power and which offers administrative support and governance to departments. Having only been announced in the March 2017 budget, the Government of

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Canada's DGU's specific 'home' is yet to be determined. It is expected that the unit will be led by a team formerly housed within the Chief Information Officer Branch, and as of 2016, located in the Strategic Policy Branch of the Treasury Board Secretariat. This arrangement would approximate that of 18f's placement in the GSA.

Table 2: Governance Structures, resources and powers in DGUs

DGU	Location in the Machinery of Government	Leadership & direct reporting structure	Annual Budget (USD)	Staff	IT Spending Control	IT Hiring Control
Government Digital Service (UK)	Cabinet Office	Executive Director, reporting to Minister of Cabinet Office	$140M (£112.5M)[17]	653[18]	✓	✓
Ontario Digital Service (Canada)	Cabinet Office	Chief Digital Officer, reporting to Minister of Digital Government, Minister of Cabinet Office, and the Head of the Ontario Public Service	$12M ($16M CAD)[19]	84[20]	✗	✗
United States Digital Service	Office of Management and Budget (OMB), within the Executive Office of the President of the United States	USDS Administrator, reporting to the Deputy Director of the OMB	$14M[21]	200[22]	✗	✗
18f (US)	General Services Administration	Executive Director, reporting to the Associate Administrator of GSA's Office of Citizen Services and Innovative Technologies	Cost-recovery, funded by departmental budgets	200	✗	✗
Australian Digital Transformation Agency	Department of the Prime Minister and Cabinet	Chief Executive Officer reporting to the Prime Minister and the Assistant Minister for Cities and Digital Transformation	$18M ($23.9M AUD)[23]	100	✓	✗
Canadian Digital Service	Treasury Board Secretariat	TBD	TBD	TBD	TBD	TBD

Notes:
- Unless otherwise specified in footnotes, staff numbers are approximate and breakdown between full-time, part-time and contract staff unavailable
- 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).

We also see variation in the area of leadership and reporting structures. The heads of GDS, the Ontario Digital Service and the Australian Digital Transformation Agency enjoy immediate access to political leaders. GDS' Executive Director reports directly to the Minister of Cabinet Office, while in Ontario, the Chief Digital Officer (a Deputy Minister level position created in 2016) reports directly to a Minister of Digital Government (currently Deputy Premier Deb Matthews) and the Minister of the Cabinet Office (along with the Head of the Ontario Public Service, the top administrative position within the civil service). The CEO of the DTA reports directly to the office of the Prime Minister, and on certain matters, to the Assistant Minister for Cities and Digital Transformation.

Moving further from the centre of political power to reporting structures within the civil service administration, USDS is headed by an Administrator, a sub-cabinet level, high-ranking civil service appointment of the US President. The USDS Administrator previously reported to the Chief Information Officer, but as of December 2016, now reports directly to the superior ranking civil servant in the department, the Deputy Director of the Office of Management, placing the USDS' leadership one level removed from the political leadership of its agency (although at least under the Obama administration, the USDS Administrator also had a direct informal reporting relationship to the President's Chief of Staff). 18f is furthest removed from the political centre of power, reporting to an Associate Administrator within the GSA.

Turning to the resources at each DGU's disposal, annual budgets range from $12M USD in the Ontario Digital Service to $140M USD in GDS. Staff numbers also vary considerably, from a low of 84 in the Ontario Digital Service, 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. To be sure, 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 and scope of services that the government in question provides to this population depending on the governing structure within which it operates (e.g. the UK government is heavily centralized, providing most

services to the public, while the Ontario government is a sub-national provincial government within a federal system that also includes a national and municipal governments).

In addition, these resources are not constant over time, and in part reflect the growth and evolution of each unit as they have developed since their inception. For instance, prior to 2015, GDS' annual budget was $71.9M USD (£58M), 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 front end web interface for the *Affordable Care Act* that cost $500M in contracting fees only to fail on the initiative's launch date, preventing people from signing up and thus crippling US President Barack Obama's signature healthcare initiative in its earliest days (Coren, 2017). Since tackling HealthCare.gov, subsequent budget allocations have expanded USDS' mandate to cover work with a range of departments (including the Departments of Homeland Security and Veterans Affairs, the State Department, and the Internal Revenue Service) and specific initiatives prioritized by the President. Growing budgets have also led to the creation of a 'rapid response team' (in 2015), 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). Likewise, recent growth in the Ontario Digital Service reflects its expanding mandate, with control over the government's website, Ontario.ca, transferring from the Department of Communications to the DGU in 2017.

Finally, in interpreting these budget and staff allocations, it is important to account for the broader digital government ecosystem within which each DGU operates. This ecosystem includes all actors and institutions with management and budgetary control over digital government, including but not limited to central and departmental Chief Information Officers, service delivery units and Open Government teams. GDS' comparatively larger budget and staff numbers are in large part a reflection of the centralization of governance over digital allocated to this DGU. GDS entered somewhat of a whole of government power vacuum on the digital file, with departments largely managing IT on their own, with little central coordination. 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. Importantly, GDS has acquired both spending control and hiring control for IT across the entire government. In addition, GDS 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). Thus, GDS essentially manages the government-citizen interface in the UK central government, and is in turn implicated in almost all government policies and programs, dependent as they are on the backend databases, IT systems, and front-end service and communications interfaces by which they are implemented. 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 government 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 diffuse. For example, the USDS' work is part of a larger sphere of activities handled by Chief Information Officers, the Office of Federal Procurement Policy, and the Technology Transformation Service (TTS), an organization comprised of the Presidential Innovation Fellows (an initiative that recruits tech talent to work with civil servants on time limited bases), 18f, an Office of Acquisitions (run through 18f and dedicated to procurement reform), an Office of Products and Programs (supporting government's transition to the cloud, the government website, data governance and open data, crowdsourcing platforms, and tools, training and platforms to support digital initiatives), and a Technology Advisory/Advocacy Team (General Services Administration, 2016).

Canada's forthcoming DGU will, like USDS but unlike GDS, operate in an already populated ecosystem of digital government players with whole of government and departmental mandates. Public Services and Procurement Canada has jurisdiction over procurement processes. Service Canada and a service delivery unit in Treasury Board Secretariat (TBS) manage the government website and government services in

general (both on and offline). Shared Services Canada has control over corporate IT services and infrastructure, including government databases. An Open Government unit in TBS works on open data and online citizen engagement, the last of which is also governed through a Communications and Consultations Secretariat in Privy Council Office. Innovation labs and hubs across the civil service, as well as a central innovation hub and a Deputy Minister Committee on Policy Innovation support the uptake of new digital policy instruments, such as big data, crowdsourcing and A/B testing. Finally, a well-established network of Chief Information Offices operating across departments and centrally coordinated through the Chief Information Office Branch in TBS also have jurisdiction over digital services, information management and IT in the government.

Thus, in decentralized digital governance contexts such as the one found in the US and Canada, 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, in jurisdictions such as Australia and the UK, 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, n.d., 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 Australian DTA), and those that operate under a *collaborative model*, offering support and guidance to departments without having the powers to directly dictate to them (e.g. USDS, 18f, ODS and likely, the Canadian Digital Service, given its comparatively diffuse digital governance structure).

In sum, while united by a common philosophy of digital government, and each representing dedicated digital service units at the centre of government, DGUs are not a strictly uniform machinery of government phenomenon. Rather, each varies in terms of their proximity to centers of power, the resources at their disposal, and the concomitant influence they wield relative to other government actors implicated in digital government initiatives. Keeping in mind their similarities and differences, the final section of the paper outlines four critical considerations that DGUs and their observers should account for in appraising the benefits, risks and future trajectories of DGUs as instruments of digital era public management reform.

Benefits, Risks and Future Trajectories of DGUs: Four critical considerations

1. Evaluating DGUs' record of success so far

The relatively swift proliferation of DGUs across the globe, and the policy transfer perpetuated by GDS and its champions, begs the question: Are DGUs the optimal solution for digital government failings, justifying their spread as the preferred option for governments attempting to build digital capacity going forward? To be sure, 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.

In the first instance, 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, and that is championed in certain cases by prominent private sector tech leaders (as is the case

for 18f and the US Digital Service, promoted vigorously by figures such as Tim O'Reilly and Jennifer Pahlka) and political leaders (e.g. Obama in the US, and David Cameron and Francis Maude in the UK), 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, leaving government IT with a dearth of cutting edge digital skills. This talent is key to reducing the information asymmetries that have traditionally plagued IT procurement in the public sector, and to supporting efforts to build in-house where appropriate, versus the strict contract-out model that has failed digital government initiatives for decades. As such, DGUs' recruitment successes should not be downplayed.

In addition to these gains in the area of recruitment, early evidence 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 government 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, pp. 99, 100). GDS reports 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 fend off critics and justify investment in their fleets 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. It remains to ask whether early successes on certain files and services will scale to a degree that proves DGUs a potent driver of broader digital transformation across a given government. 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 programmes and to improve the complex systems and processes that support public services" (p. 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 alongside these centralized platforms (reflecting this, GDS has suggested that it is likely to underspend on its annual £150M budget by £45M in 2016/17 because of lower than expected use of their central services by departments) (National Audit Office, 2017). This experience points to the limits that a centralized unit stacked with digital talent and potent government-wide powers, as is the case in the UK, will ultimately face when comparatively less digitally-capable departments must build on and work with centrally developed tools, services 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 programme will see benefits outweigh costs of development within 10 years, 10 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, it is important to keep note of the much larger challenges at play in updating analogue era governments for the digital age—cleaning up decades of poor information management, addressing complex and in many cases dated corporate and legal policy requirements, engendering a culture of innovation in the bureaucracy, tackling complex hierarchies and risk-averse accountability structures, 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 can 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 public sector renewal challenges are conquered.

At a basic level, this suggests that governments adopting DGUs should do so with a realistic appreciation for the broader context that DGUs operate in, and the constraints they will 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. Practically speaking, this analysis suggests that those adopting DGUs should not do so in lieu of also investing in talent recruitment, capacity building and broader organizational reforms within departments, an approach that the UK government has started to take of late with its Digital Academy, set to train 3,000 civil servants outside the DGU annually (National Audit Office, 2017). We also see this approach at play where teams of digital experts recruited by the DGU are embedded in departments, either as staff or on a temporary basis for projects, and where line department staff are invited to work with the DGU on time-limited bases (as in the Australian example cited earlier).

Second, in evaluating the track record of DGUs thus far, it is important to note that where we have seen successes emerging from DGUs, it is not necessarily the case that the DGU, as a machinery of government innovation, is responsible for these wins. Instead, it may be that it is DGUs' adoption of what this paper has termed the new digital government orthodoxy that explains their successes. That is, one might reasonably argue that the wins achieved by DGUs have depended less (or perhaps not at all) on the fact that they emerged from a DGU *per se*, and instead 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, more pluralistic procurement processes and horizontal platform approaches.

This theory helps explain digital success stories that have emerged 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, who manages three horizontal infrastructures for digital services (X-Road, a system of data registries; an electronic ID system; and eesti.ee, the citizen-facing web portal by which services are accessed). Building on these platforms, departments then develop their own digital services and are responsible for them. However, while operating via a different machinery of government model, Estonia nonetheless shares with DGUs their digital government orthodoxy; they prioritize platform-based infrastructures, use open source code, share their code openly, have prioritized data science and user-centred design, and both build in-house and procure from a pluralistic marketplace of providers (Margetts & Naumann, 2017). Thus, the Estonian case suggests that it may be less the DGU model that is key to digital government success, and more the adoption of the new digital government orthodoxy that proves crucial to digital transformation.

To be sure, one might argue that Estonia's success is in fact owed to a set of factors unique to its context as a small country that has had the opportunity to start 'from scratch' in designing a digital government in ways that countries burdened with legacy systems would relish were it an option. By this argument, it may be that outside cases such as Estonia, a DGU is needed as a sort of jump-starter unit that can work within legacy systems to eek out broader digital reforms and service improvements, and in particular to attract the digital talent needed to implement and advocate for the new digital government orthodoxy in the face of established IT management practices. Yet, we can also look to examples beyond Estonia for evidence that a DGU is not necessarily the causative driver of digital government success, but that instead, it is the digital government orthodoxy a government adopts that is key.

For example, New Zealand—still a small country, but one with legacy IT systems comparable to those in other jurisdictions—has made great advances in digital government, particularly its digital service offerings, 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, New Zealand 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 Tim Occleshaw dubs "a model of networked leadership" enacted through a Digital Government Partnership. Within this, digital service reform is led through a Service Innovation Working Group comprised of deputy chief executives from nine government agencies.[24]

Thus, while the evidence to date suggests that the new digital government orthodoxy bears fruit, and should be the preferred best practice for today's governments, it is not yet clear that DGUs as a machinery of government reform are crucial to achieving digital government success. Indeed, at least one analysis of GDS' early cost-savings credits this not primarily to GDS management, but rather to the work of GDS' counterpart, Liam Maxwell, the Chief Technology Officer who was tasked with reforming government procurement to break up and cease the creation of new monopolistic, long-term legacy contracts as per the new digital government orthodoxy; £1.1 billion of the £1.7 billion cost savings credited to GDS in 2014 were the product of Maxwell's procurement reforms (Glick, 2015).

In sum, while DGUs are advocated by a powerful instrument constituency (Béland & Howlett, 2016), led in particular by the UK government as part of their efforts to assert global leadership on digital government, and by the private consultancy firm Public Digital, it remains prudent to question whether DGUs can secure long-term, broader digital transformation if not coupled with investment in the digital capacity of the rest of the bureaucracy, and whether it is DGUs themselves or the orthodoxy they adopt, that are key to digital service improvements. To date, it appears safe to conclude that DGUs have proven potent as vehicles for recruiting digital talent to the fleets of government and in developing certain high-quality platforms and services. It may also be the case that in the long-run, these units prove their worth as internal jump-starters of broader digital transformation, but 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, governments and their observers will benefit by paying particular attention to the effectiveness, and deficiencies, of the various governance structures that differentiate DGUs, a point to which the paper turns next.

2. Governance and the DGU: strong top-down control versus collaborative models

This paper has identified variation across the governance structures, and correlating resources and powers, at play in each DGU and which structure the relationship between the DGU and the rest of government. In particular, the paper identified variation across DGUs depending on whether they adopt a strong, top-down model, setting standards and rules for departments, and exerting direct influence over departmental activities (as in GDS and the DTA), versus the collaborative model which sees DGUs creating optional guidelines and/or working with departments to support their priorities and digital initiatives. This begs the question: which of these models is optimal, and under which conditions?

To be sure, from the perspective of those leading digital government reforms from within the DGU, more power and resources prove useful tools when attempting to mandate whole of government reforms that are shaped by the new digital government orthodoxy (e.g. use of open source technologies, agile development, adoption of cross-government platforms). This is after all 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.

In the first instance, such a model will not even be possible for governments facing an existing ecosystem of actors that already have whole of government control over areas such as service delivery, IT and procurement (as in the example of Canada and the US, as detailed above), or where departments have already invested heavily in digital infrastructure, staff contingents and renewal agendas. Indeed, as noted already, much of the centralized power given to GDS was only possible because at its genesis the UK government had so little whole of government infrastructure governing its operations in

place, a symptom of NPM reforms that reinforced a decentralized Whitehall from the 1980s onwards.

Yet even where a DGU does not face this constraint, DGUs may suffer when they earn too much power and influence over departments, given the resentment and resistance that this can generate amongst departments subject to the spending controls, hiring powers and standard setting that DGUs enjoy at their expense. In the case of the UK, certain departments have directly challenged GDS' control over their affairs. Tension between the Department for Work and Pensions and GDS prevented the two from working together on the DWP's massive flagship overhaul of the UK benefits systems (Universal Credit) (Malik, 2014). Revenue and Customs rejected GDS' Verify platform, favouring its own verification service instead (Evenstad, 2017). Amidst this resistance from Whitehall-proper, GDS is perennially rumoured to be under threat of dissolution as departments challenge its spending control and authority over digital in the government (Glick, 2016; Margetts, 2016; Neville, 2015), which some have suggested inspired an exodus of senior GDS leadership from 2015 onwards (Greenway, 2016; Margetts & Naumann, 2017). Acknowledging the potential for pushback from departments that can result when power over digital services (especially spending) is centralized, New Zealand's Chief Technology Officer Tim Occleshaw has argued that their digital agenda deliberately rejects the power and spending centralization that certain DGUs have pursued. He argues instead that their preferred model of collaboration and networked leadership has enabled New Zealand to progress further, and more sustainably, than some of the country's peers.[25]

To be sure, resistance to centralized, top-down control may be more likely in governments that lack a tradition of whole of government management—particularly the case in the UK given the deep decentralization it adopted under the NPM banner, as noted above. In governments where departments are used to accepting the rules and standards of central agencies, a DGU mandating whole of government platform approaches and standards will likely be perceived as less of a foreign, invading entity. Further, much of the resistance that GDS faced in particular was fuelled 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, status quo oriented 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".[26]

Again expressing this sentiment, a member of the UK's civic technology community and former Cabinet Office employee commented in 2012:

> I think the interesting thing is if you talk to civil servants who aren't kind of "GDSonites" then they say "oh GDS is such arrogant wankers coming in and telling us how to do our jobs". I mean I'm sure you've come across—I'm sure you've experienced the reputation of GDS within Whitehall, as you know not entirely positive. You know they are seen to be arrogant.[27]

Reflecting these concerns, in 2013, Labour's shadow secretary for the Cabinet Office remarked "[GDS] has taken an approach that has, at times, alienated people at the coalface of service delivery" and "staff in key Whitehall departments" (Onwurah, 2013).

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 emphasising the importance of collaborating with departments and listening to their needs and insights. For example, GDS is now working with department-led peer review in exercising its spending controls. GDS is also working to educate and

socialize 'Whitehall-proper' to its methods and approaches through its Digital Academy, as discussed. These efforts in part respond to the fact that GDS initiatives have in some cases fallen short of ambition once they are implemented in departments with comparatively weaker digital capacity. However, they also reflect GDS' recognition that broader digital transformation cannot simply be rammed through by a powerful agent at the centre of the state, but demand instead robust, high-trust collaborative links between this central unit and the rest of the public service, as alluded to by Occleshaw's preference for networked leadership and a more horizontal model of digital governance. We see this shift in tone in GDS in the following blog post, titled "It's not about us, it's about collaboration", from GDS' Director Mike Bracken in 2015, which noted:

> The simple truth is: the best work happens when there's **collaboration between departments and the centre**. Everyone looking sideways, seeking help. All of our successes have been a direct result of collaboration with departmental teams, working together to build brand new services, redesign old ones, and reshape departments themselves.

(Bracken, 2015, emphasis in original)

To be sure, 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, deliberately 'disruptive' mentality, and their habit of openly discussing and praising their work (partially driven by perpetual fears of having their budget cut, and of needing to demonstrate their value), USDS and 18f have been framed as fuelling "tensions between the geeks and the lifers" (Levy, 2016). To quell such concerns, the USDS' recruitment page now gives a nod to the value that non-technologists bring to the table, and emphasises 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.-a).

However effective these efforts are to build stronger links between DGU staff and the 'bureaucracy-proper', experience thus far suggests that governments introducing or

already managing DGUs should consider that while increased centralization of power may allow the DGU more levers to effect change across a government, these levers may ultimately become impotent should they generate such gross resentment in departments that mutiny ensues. This issue points to a broader set of questions that arise around the likely sustainability of these DGUs as they move forward.

3. DGUs' long-term sustainability

DGUs' long-term sustainability is threatened not only by internal resistance from the bureaucracy, but also from external resistance emanating from the technology firms who have lost access to large, lucrative government contracts in the face of in-house development, adoption of open source technologies 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 (Shueh, 2016a, 2016b). This was particularly the case in the transition to the US government, in which in the early days of the Trump administration some surmised that outside technology providers were convincing the new government to abandon the USDS and 18f in favour of a return to large-scale and proprietary contracted solutions for digital services. Subsequent reports from Whitehouse officials and those within these DGUs confirmed that funding and support for USDS and 18f would continue under President Trump, but only after careful internal efforts by these DGUs to convince the new government of their value (Coren & Collins, 2017), and even still amidst concerns that the president's hiring freeze would clash with the units' recruitment efforts (Ulanoff, 2017).

This points to another challenge that DGUs must weather when facing a change in political leadership. These units are in some cases branded as the innovation of particular administrations, with, for example, GDS tightly associated with David Cameron and Francis Maude and 18f and the USDS having been labelled "Obama's stealth startups" (Gertner, 2015). Similarly, in Canada, Treasury Board President Scott Brison has dubbed the Canadian Digital Service "Trudeau's Techies", referring to the current Prime Minister (Brison, 2017). The more prominent such branding, the more likely it may be that future

governments will prefer to dispense with a DGU given its association with previous administrations.

More potent a barrier to long-term political support for the DGU is their costs. As noted in Table 2, 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 & 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 (a return to the state that has been pursued even alongside austerity reforms in other areas of government, as was the case in the UK in particular). 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 future 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. 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 recent change in administration in the US 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 & Collins, 2017; Ulanoff, 2017). To be sure, Trump's polarizing and highly controversial 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. There is thus not simply a demand question to consider when new political leadership takes hold in a government (i.e. will this new leadership maintain support and funding for the DGU?). There is also a supply question, as in, will those outside government consider joining DGUs given the rise of new leadership and the policy priorities they bring with them?

4. Accountability challenges in government digital transformation

In addition to threats faced from internal and external resistance to DGUs, accountability concerns may also plague not just the long-term viability but also the desirability of this centralized approach to digital services. 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 programming and spending become blurred. This challenge is particularly acute in Westminster systems, with their vertical lines of individual 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, underperforms 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 which 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.

<div align="right">p. 47</div>

To be sure, as with other reservations expressed in this paper's critical analysis of DGUs, this accountability issue is not raised to suggest that DGUs should not be pursued, nor to rationalize a siloed approach to digital service reform, which has historically led to project failures, low-quality, incoherent services and cost-overruns. What's more, the potential for blurred accountability will arise whenever governments adopt the centralized demand, decentralized supply model promoted by today's digital government orthodoxy, even where they do so outside a DGU (as in Estonia and New Zealand, for example). Rather, this issue is flagged here to compel governments adopting DGUs to consider how accountability will 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. Here, research into horizontal or shared accountability will serve as useful

sources of insight for governments promoting whole of government digital reform agendas (see Jarvis & Levasseur, 2015; Michels & Meijer, 2008; Phillips & Howard, 2012).

Last, accountability challenges, and subsequent tension between DGUs and the 'bureaucracy-proper' are likely to arise as the 'outcomes over process', user-centric principles of the new digital government orthodoxy come 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 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 qtd. 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 paper. However, this example is raised to flag what has already been and will likely continue to be a deep 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 excessive and 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 (Bason, 2010; Clarke, 2016b; Jarvis, 2016). 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 false glorification of private sector practices running through much of the public management reform literature has tended to ignore the unique constraints and dynamics that render public administration properly distinct, and in certain senses, superior to the practices emerging in the corporate world (Mintzberg & Bourgault, 2000; Olsen, 2006).

Conclusion

Digital technologies have transformed life outside the public sector, leading to impressive innovations in communications, organizational structures and service delivery models, and 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 (and concomitant dwindling levels of trust in the public sector) demand that governments act expediently but carefully in building their digital capacity going forward.

Digital Government Units 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 promises of savings and digital transformation that these units and their backers have propagated. Building on the few scholarly analyses that have to date critically examined DGUs (Margetts & Naumann, 2017; Mergel, 2017), this paper contributes conceptual clarity to discussions of DGUs, locating the genesis of these units in early e-government failures, detailing the new digital government orthodoxy that guides DGUs—and broader trends in digital era public management—and outlining how DGUs differ in their governance structures, powers and resources. This conceptual

clarification provides administrators and public administration scholars with a greater understanding of the contours of DGUs as a digital era machinery of government phenomenon. More important to guide practitioners' adoption (or rejection) of DGUs, and scholarly debates on digital era public administration, however, are the four critical considerations that this paper has laid out.

First, governments and their observers should remain cautious when appraising the successes of DGUs thus far, and in conducting these appraisals, these actors will need to account for the unique governing contexts and broader public management challenges that temper DGUs' potential impact. Practitioners and 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.

Second, those adopting DGUs within their civil service administrations will benefit by considering the benefits and costs that come with the strong, top-down model of GDS and the Australian DTA versus those of the collaborative 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 collaborative approach bears more fruit in the long run. Future research should carefully monitor the gains and setbacks that each approach accrues, research which will not only provide useful prescriptive insight to digital era governments, but which 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 & Juillet, 2004; Painter, 1981; Pollitt & Bouckaert, 2011).

Finally, this paper has flagged a series of external threats to the sustainability of DGUs, and accountability challenges that practitioners should anticipate when introducing a DGU to their civil service administration. Early wins and demonstrated

cost-savings will help DGUs combat resistance from private sector IT firms and incoming administrations that question the budgetary allocations and powers 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 PPA's hierarchies and siloes can still play in ensuring accountable, equitable public sector management (Olsen, 2006). The accountability issues at play in DGUs, and the other practical and theoretical debates raised by Digital Government Units at this early stage of their development, point to the need for more sustained analysis of this as of yet under-scrutinized public management trend. This paper contributes the conceptual clarity and critical considerations that should guide this research agenda as it develops.

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[2] While as of 2011 a group of civil servants within Cabinet Office and the Department of Communications were working with GDS officials to adopt their website's source code, and operating as a DGU on particular digital initiatives such as a student loans service, the Ontario Digital Service was only officially established as such in 2017, following the appointment of Hartley as Chief Digital Officer.

[3] https://www.gov.uk/government/groups/digital-academy

[4] https://gds.blog.gov.uk/

[5] See http://public.digital/. See also the following tweet from a member of Canada's new DGU, depicting a Skype call between the Canadian team and Bracken of Public Digital, along with the statement "Great call with @PublicDigitalHQ! So much to learn! #GCDigital"
https://twitter.com/PascaleElvas/status/847501052928589825

[6] https://www.gov.uk/service-manual/phases/alpha.html

[7] https://www.gov.uk/service-manual/phases/beta

[8] https://www.dto.gov.au/blog/making-it-easier-for-startups-and-sme-to-help-government/

[9] https://www.gov.uk/government/publications/digital-services-store-buyers-guide

[10] https://www.gov.uk/service-manual/agile-delivery/spend-controls-check-if-you-need-approval-to-spend-money-on-a-service

[11] https://www.gov.uk/service-manual/technology/code-of-practice.html

[12] https://18f.gsa.gov/2015/03/30/new-rfp-ghostwriting-service-to-improve-contract-success/

[13] https://ads.18f.gov/buyers/

[14] https://standards.usa.gov/design-principles/ and https://18f.gsa.gov/2015/09/28/web-design-standards/

[15] Senior executive, Government Digital Service, UK Government, May 25, 2012

[16] Senior executive, Government Digital Service, UK Government, July 8, 2012

[17] 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

[18] 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).

[19] 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

[20] 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

[21] Annual amount allocated in the 2016 budget. See: https://www.usds.gov/report-to-congress/2016/

[22] 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/

[23] 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/

[24] Email communication with Tim Occleshaw, July 10 2017. See also:
https://www.ict.govt.nz/programmes-and-initiatives/government-service-innovation/result-10/

[25] Email communication with Tim Occleshaw, July 10 2017.

[26] Senior digital communications manager, line department, UK Government, August 6, 2013.

[27] Citizen engagement consultant to the UK Government and former Cabinet Office policy advisor, UK Government, November 14, 2012