Breaking All the Rules: Information Technology Procurement in the Government of Canada

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Abstract

The Government of Canada has recently faced intense parliamentary and public scrutiny of the role played by private contractors in its information technology (IT) projects, most notably in the case of the ArriveCAN application. With these ongoing investigations as its backdrop, this paper analyzes patterns in federal government IT procurement between 2017 and 2022, drawing on a comprehensive analysis of the federal contracting open data set. We reveal that the federal government betrays accepted best practice in modern government IT procurement on several key dimensions. We argue that the Canadian approach to IT procurement is an historically overlooked but crucial driver of its failing digital reform efforts. We conclude by turning to IT procurement policy reforms gaining traction outside Canada that may help the Government of Canada improve how it buys and deploys IT going forward – a task we argue is essential if the government wants to avoid future IT contracting scandals, and deliver on its long-standing promise of digital era modernization.

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1. Introduction

Over the past two decades the Government of Canada (GC) has committed to a series of public management reforms with the goal of modernizing federal public administration for the digital age, culminating most recently in the 2023 strategy "Canada's Digital Ambition"[1]. Despite these promises, in practice, federal digital government reform efforts have to date been insufficient and ineffective. Since at least 2010 and most recently in a 2023 report, the Office of the Auditor General of Canada has warned that the government remains precariously reliant on aging IT infrastructure, undermining both internal operational efficiency and the reliability and quality of public-facing services (Office of the Auditor General of Canada, 2010, 2023). At the same time, the GC does not have a credible or sufficiently resourced plan to adopt modern public digital infrastructures that are now well-developed in other jurisdictions, including cloud, digital identity and integrated, cross-government data and service platforms. The government faces a gap in an estimated 7,000 digital roles (May, 2022), with the policy profession and senior leaders in particular lacking the digital literacy required to effectively oversee policy and service design in a digital context.

Archaic corporate policies deny public servants access to widely accepted modern digital work tools. And, policies promoting modern digital ways of working, such as the Digital Standards[2], are optional and widely ignored in the daily business of government operations. Most crucially, chronic issues in federal public management – well documented in the Canadian public administration literature (see Axworthy & Burch, 2010; Bakvis & Juillet, 2004; Savoie, 2003) – remain alive and well, and are regularly noted as barriers to digital government modernization. Risk aversion, excessive oversight, reporting burdens and entrenched organizational silos render it incredibly difficult, and in some instances, impossible, for federal public servants to work across disciplines, to iterate and learn from service users, and to keep pace with now broadly accepted best practice in modern service design (Clarke, 2019).

The public has felt the deficiencies of the federal public service in recent service failures, including delays in passport processing and lagged immigration processes.

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[1] https://www.canada.ca/en/government/system/digital-government/digital-ambition.html

[2] https://www.canada.ca/en/government/system/digital-government/government-canada-digital-standards.html

Canada's Digital Ambition strategy itself acknowledges these failures, noting that "despite being one of the most connected countries in the world with over 94 percent of people having Internet at home, Canada has the lowest usage frequency for digital government services among a 2020 survey of 36 countries" (Government of Canada, 2023).

While digital government has largely escaped political scrutiny in Canada to date, recently federal IT procurement in particular has emerged as a subject of sustained parliamentary and media attention. The House of Commons' Government Operations and Estimates Committee has since 2022 investigated the government's reliance on outside contractors for a range of functions, but especially for IT services.[3] This culminated in investigations of the ArriveCAN mobile application developed to manage border crossings during the COVID-19 pandemic, and a 2024 Auditor General report which found that the departments implicated breached basic standards of responsible procurement, failing to properly document costs and allowing contractors to help design procurement competitions that they themselves won (Office of the Auditor General of Canada, 2024). This follows on several previous Government of Canada and Auditor General analyses – dated as early as 2000 – that identify weak procurement practices as a driver of failed federal IT projects (Office of the Auditor General of Canada, 2000; Shared Services Canada, 2011).Historical and ongoing scrutiny of federal IT procurement practices finds justification in other jurisdictions; IT procurement has emerged as a key area of reform and attention in the efforts of leading digital era governments (Clarke, 2024; Dunleavy et al., 2006).

Drawing on accepted best practice in public sector IT procurement, as adopted in leading digital era governments, this paper evaluates patterns in federal government IT contracts. We analyze publicly disclosed procurement data describing IT contracting in the federal government between 2017 and 2022, and reveal that the federal government betrays accepted best practice in modern government IT procurement on several key dimensions. We argue that the Canadian approach to IT procurement is an historically overlooked but likely crucial driver of its lagged and failing digital reform efforts. The paper concludes by presenting IT procurement policy reforms that will help the Government of Canada improve how it buys and deploys IT going forward, with a view to enriching ongoing and welcome political

[3] https://www.ourcommons.ca/committees/en/OGGO/StudyActivity?studyActivityId=11822892

scrutiny of federal IT contracting, and in turn, advancing the government's efforts to modernize for the digital age.

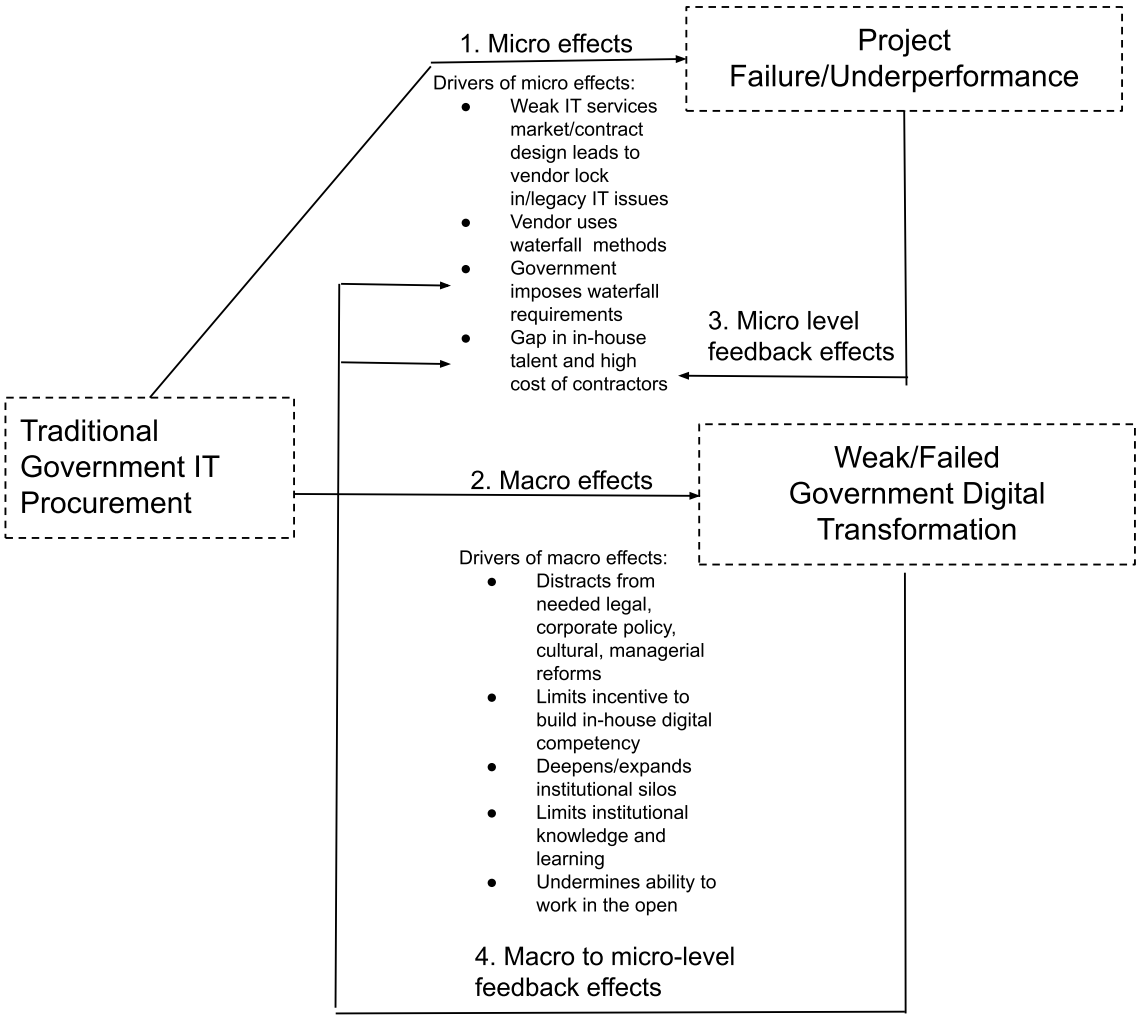
2. Background

2.1 The Role of IT Procurement in Government Digital Transformation

Government digital transformation refers to the set of interrelated technological and administrative changes (procedural, legal/policy, and organizational) that governments must undertake to modernize their operations and services for the digital era (Mergel et al., 2019). This definition contrasts with "e-government", in that it does not focus strictly on governments' application of particular digital technologies to reinforce or introduce incremental changes to existing processes of administration (typically for the narrow purposes of efficiency and service improvements) (Gil-Garcia et al., 2018; Meijer, 2015). Rather, government digital transformation is a comprehensive public administration reform agenda involving both discrete instances of technology adoption alongside more comprehensive changes to the organization and governance of public sector institutions in response to the pressures of the digital age. These pressures include demand for higher service standards, the failures of neoliberal privatization and New Public Management (NPM) reforms, the potential of new technological advances and data sources/data analysis techniques, public cost-cutting imperatives, and state-led economic development agendas (Clarke, 2019; Dunleavy et al., 2006; Kattel, 2022; Mergel et al., 2019).

IT procurement affects the outcomes of digital government reform efforts on both a micro and a macro level, as depicted in Figure 1.

Figure 1: Micro and Macro Effects of IT Procurement on Government Digital Transformation



Micro-level effects of IT procurement on digital government reform outcomes

At the micro level, the importance of effective procurement to government digital transformation outcomes is most evident in the case of the acute technological aspects of government digital transformation, that is, those aspects that rest on the successful integration of hardware, software, and specific technological expertise and methods into public administration processes.

While governments can effectively build and maintain technology assets and expertise in-house, many public sector technology needs are met through procurement with the private sector. These technology needs fall into three

categories: (1) *equipment*, such as computer hardware, mainframes, and phones; (2) *licensing*, including licenses for use of specific software and IT systems, or for cloud computing and data storage, and (3) *IT consulting services*, including instances where governments contract out IT work to private sector firms and staffing agencies, or recruit outside technology and management consulting firms to advise on, lead and/or directly deliver policies, programs and services.

What conditions determine the success rate of IT procurement in a given government? In their seminal 2005 study of NPM-era e-government reforms, Dunleavy et al. (2005) found that governments need to maintain sufficient internal IT expertise to effectively design requests for proposals (RFPs), select bidders and oversee the development, and then maintain, the products that outside providers deliver. They also uncovered a close negative relationship between a government's IT performance and the market power of its domestic IT industry. Poorly designed and poorly managed IT contracts awarded within non-competitive markets lead to both acute high-cost policy failures and longer-term under-performance resulting from the legacy IT systems these contracts embed in specific programs and processes of public administration.

Other analyses focus on the methods employed by, or imposed on, private IT service providers contracted to work with the public sector. Specifically, these analyses critique outside IT services providers that follow the "waterfall" model of software development, a model that is now viewed as a clear driver of IT project failure. Waterfall methods entail long linear, project timelines with pre-determined, large scope deliverables, few feedback loops between design and implementation stages of work, and large upfront budgetary commitments. This approach is contrasted with the now-preferred "agile" method that shortens deliverable timeframes and narrows project scope, builds in user research and iteration, and rests on more adaptive budgeting and contracting models (Ganis, 2010; Mergel et al., 2021; The Standish Group, 1995). To be sure, the vast majority of private sector IT firms no longer employ waterfall methods as a default (Dima & Maassen, 2018), but they may nonetheless use this approach when working with governments given public sector IT project management approaches that presume a linear, large budget, long timeframe waterfall model, or in cases where governments directly design contracts as large, long-term projects (Clarke, 2024).

Last, previous evaluations of government contracting for IT services argue that the higher cost of outsourced versus in-house talent can drive higher than necessary IT

project costs, undermining the overall 'value for money' of a given IT initiative. The Ontario Treasury Board Secretariat determined in 2016 that IT consultants cost "about 30 percent more" than similar full-time staff, factoring in salary and benefits (Office of the Auditor General of Ontario, 2018). The UK National Audit Office found that "specialist staff are generally paid twice as much as their nearest permanent equivalent" in the civil service (National Audit Office, 2016, p. 9). The 2024 Auditor General report investigating the ArriveCAN application estimated that "the average per diem cost for the ArriveCAN external resources was $1,090, whereas the average daily cost for equivalent IT positions in the Government of Canada was $675" (Office of the Auditor General of Canada, 2024). Depicted as feedback loop 3 in Figure 1, the failings of government technology projects that result from a dearth of in-house competency and an over reliance on outside contractors can reinforce the public sector technology talent gap; outside technology talent becomes less inclined to pursue government technology jobs (given their reputation for lags and failures). Further, interviews with federal public servants reveal that the regularity of federal IT project failures can incentivise executives to distance themselves from technology projects, rather than becoming educated about how to better manage them, fuelling the very competency gap that drives these IT failures in the first place (Clarke, 2024).

Macro-level effects of IT procurement on digital government reform outcomes

Beyond its influence on the success/failure rate of specific IT projects, IT procurement also has a deeper, more pernicious, macro effect on a government's capacity to implement digital government reforms. In line with findings in the literature on the "consultocracy" (Sam & Scherer, 2006; Ylönen & Kuusela, 2019), the Hollow State (Rhodes, 1994; Terry, 2005), vendor capture and dependency cycles (Sturdy et al., 2022) and recent studies of US digital government reforms (Wilson & Mergel, 2022), Clarke (2024) finds that government contracting in the licenses and consulting services categories in particular can generate an external IT expertise dependency cycle that undermines broader commitments to digital administrative reform; facing a dearth of in-house capacity, public managers rely on external providers of software and IT expertise to meet immediate digital capacity needs, which in turn limits incentive to invest in the longer term, and more complex, project of public sector digital competency building efforts, and to pursue the organizational and policy reforms that are required to deliver on the larger project of digital public administration modernization.

Others identify how IT contracting conducted on a project by project or department by department basis can further institutionalize and add complexity to silos across public administrations, rendering efforts to 'join up' government and tailor its operations to user needs more difficult (Borins, 2007; Clarke, 2020; Dunleavy et al., 2006; Fishenden & Thompson, 2012). In addition, research into public sector IT contracting highlights how poorly designed intellectual property clauses can limit a government's ability to capture, interpret and openly share data about its operations and clients, with those data instead resting with the contracted private vendor (Scassa, 2013, 2017). Further, in cases where governments procure proprietary software (versus open source, reusable solutions), they can further limit their ability to coordinate services and the technical systems and databases underpinning them across different units of government and various programs (undermining efforts to achieve horizontal, platform governance), and can become locked in to particular technology solutions even when those technologies fail to meet current or future user needs. Last, where private sector vendors are partly or wholly leading on a given IT project without sufficient and competent oversight and control from within the contracting government unit, capacity to 'work in the open' and communicate transparently about the relevant policy/program can be limited by non-disclosure clauses or simply by the fact that the contracting unit is so far removed from the project that discussing it with the public would be impossible (Clarke, 2019).

In these ways, poorly governed and excessive reliance on IT contracting and procurement not only threaten the success of digital era reform at the micro level of a given technology implementation, but also at the macro level of more fundamental digital era administrative reforms. Introducing a vicious feedback loop (depicted as feedback loop 4 in Figure 1), this can mean that even when a private technology vendor is recruited and equipped to work using modern digital methods now accepted as best practice, they find themselves unable to do so given the contracting government organization is not structured or equipped to integrate those methods into their policy, budgetary and management structures, leading to likely project failure (Boots, 2022b). A second feedback effect may materialize as weak or failed technology projects and digital renewal efforts undermine a government's attractiveness as a potential employer to in-demand digital talent, widening the digital in-house capacity gaps and high-consulting costs that drive IT project failures.

2.2 A New Set of Rules: The Emergence of Modern Public Sector IT Procurement

Acknowledging the close connection between IT procurement and digital government reform outcomes (both at the micro and macro level), and learning from decades of research into failed IT procurement, researchers and governments have in recent years advocated for policy measures that together form a new set of best practices, or rules, for modern public sector IT procurement. Table 1 contrasts this modern government IT procurement model with traditional public sector IT procurement.

Table 1: Traditional Government IT procurement versus Modern Government IT procurement

	Traditional Government IT Procurement	**Modern Government IT Procurement**
1. Contract Value	No stated limit, tends to be large	For software projects specifically, smaller (no more than $2M per year)
2. Project Duration	No stated limit, tends to be long (multi-year)	For software projects specifically, shorter (no more than 3 years, including option years)
3. Supplier Market	Small number of large providers	Large number of varied providers (small, medium and large)
4. Source of IT expertise	Outsourcing as a (near) default	Balance of in-house expertise and contracted staffing
5. Data and IP ownership	Vendor ownership	Public ownership
6. Software License Type	Proprietary	Open source, reusable

The first two variables – those that limit contract value and project duration – align with the principles of agile project management, and are viewed as essential risk management tools given the high degree of uncertainty built into software projects specifically, and the reality that attempts to plan over lengthy periods of time, and to define a broad scope of deliverables up front (as per the waterfall method), tend to

lead to project delay, underperformance or failure, and also ensure that overall project success is disproportionately dependent on one vendor and contract performing well. A 2015 analysis of IT project success rates published by the consulting firm The Standish Group found that projects using an agile approach have almost four times the success rate of projects that follow a waterfall method. When agile methods are combined with smaller project size, the failure rate is only 4 percent (The Standish Group, 2015).

In an effort to enforce smaller contract sizes and duration, the UK government has since 2018 introduced centralized IT spend controls alongside measures that require reviews and approvals for any automatic contract extensions or new hosting contracts that exceed two years in duration[4]. These spend controls – introduced in 2011 – are credited with saving £1.3 billion over five years (about $2.3 billion CAD) (National Audit Office, 2017). Departments' procurement spending was limited, as part of these spend control measures, by the government's Technology Code of Practice, which instituted a maximum cap on the size of IT contracts, limited certain types of contracts (including web hosting) to a maximum of two years, and eliminated automatic contract renewals. The Technology Code of Practice also recommended that departments move away from large contracts with a single supplier, to using multiple suppliers, and to "disaggregate" the technology that underpins departmental programs. In the United States, digital service teams are employing modular contracting to break up what would otherwise be high dollar value, lengthy contracts into multiple, smaller contracts with a view to de-risking projects and building in scope for iteration and adjustment as a project develops and is tested with its target users. Notably, modular contracting can also render it possible to more easily pivot from a provider that is failing to deliver sufficiently high quality work, as opposed to long-term contracts which favour vendor lock-in. In other cases, governments are working to streamline their internal procurement processes so that the administrative burden of crafting and launching an RFP is reduced, and public servants do not feel pressured to create large, long term contracts in order to avoid repeated cycles of high-effort procurement.

How small should a contract value be, and what should its duration be, in order to maximize the chances of project success? The Standish Group (2015) analysis finds that IT projects exceeding $10 million USD in value are significantly likely to fail (in

[4] https://www.gov.uk/guidance/digital-and-technology-spend-controls-version-5

their analysis, only 6.4 percent of projects over that threshold succeeded; at the $6 million USD threshold only 13 percent of projects succeed, while projects under $1 million USD have a 57 percent success rate). Given the specificity of its directives, and the fact that its dictates roughly align with The Standish Group analysis, we take our rule for contract size and length from a 2019 publication, "De-risking custom technology projects", authored by Robin Carnahan (current head of the US General Services Administration), Randy Hart and Waldo Jaquith which recommends "that no more than $2 million be spent on any single contract annually, and that no contract last for more than three years, including option periods" (Carnahan et al., 2019).

A third set of measures focuses on the supplier market, using RFPs and contract requirements in order to expand the number of firms eligible to bid for government IT contracts and prevent vendor capture. These measures emerge from research showing that the large size and onerous requirements of government contracts often preclude small and medium sized firms from bidding for government contracts, instead generating small clusters of large firms with few competitive pricing pressures, and with the opportunity to "lock in" their technology solutions and limit scope for other providers to work with a given government. The UK government's spend controls encourage a more pluralistic market of providers by ensuring that companies holding contracts for service provision are prohibited from holding a contract with the same unit of government for system integration. Efforts to simplify government IT contracts by eliminating onerous requirements (and instead managing risk by reducing the contract value and length) also open scope for smaller providers to bid on government RFPs (Smith & Waterman, 2016).

The fourth variable on which traditional versus modern IT procurement can be contrasted focuses on the in-house staff to contractor ratio. This dimension relates specifically to contracts for IT consulting services (as opposed to hardware and software licensing procurement). There are to date no firm rules on the optimal balance between in-house IT expertise and contracted IT expertise, but as a general rule, the research to date suggests that governments must maintain some degree of in-house expertise to avoid acute IT project failures, as well as more chronic barriers to digital government reform (as discussed in section 2.1) (Brown et al., 1998; Clarke, 2020; Kattel, 2022; Wilson & Mergel, 2022). Internal IT expertise enables governments to design and build digital services in-house, but as discussed above, to better solicit, partner with, and hold to account outside IT contractors. Several governments have in recent years introduced measures to raise the level of in-house digital competency within their public administrations, via in-house training

academies, specialized executive training, short term fellowships targeting technologists and by creating Digital Service Teams and Digital Government Units mandated to recruit technology talent into government.

The fifth and sixth variables differentiating traditional and modern IT procurement focus on data and IP ownership and licensing types, respectively. Modern IT procurement favours public ownership of the data and IP informing or produced by IT systems and the transactions they support, in order that governments avoid losing access to valuable insight into their operations and service users. Maintaining public ownership of these data and IP can also ensure that these data and IP are subject to public sector data governance policies and laws, including privacy laws, data security laws, and freedom of information/transparency requirements in the public sector. Similarly, modern IT procurement favours open source software. This is for several reasons. Open source software can prevent government data, programs and services from becoming locked into closed, proprietary commercial systems. Open source technologies complement modular contracting, by ensuring a range of different vendors can work on the same project, or pick up on the work of a previous vendor, given interoperability between their various products and services (Jaquith, 2023).

Open source is also preferred because it enables governments to better coordinate policies and services across different departments and programs, given it allows technology to be more easily re-used and reconfigured, which can generate cost-savings. Last, open source software is more secure and auditable than closed solutions, supporting government's obligations to protect the integrity of public digital infrastructure, citizens' data, and to remain transparent and accountable to the public. Governments have adopted various measures to encourage uptake of open source versus proprietary solutions, ranging from recommendations in policy or guidelines (such as Canada's optional Digital Standards) to legislative direction (such as France's *Loi n° 2016-1321 du 7 octobre 2016 pour une République numérique*).[5]

Across these six dimensions, we are now witnessing considerable effort amongst a range of governments to dispense with traditional and now broadly-criticized IT procurement practices, and to instead adopt modern IT procurement approaches that are viewed as key to broader public sector modernization and digital reform

[5] https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746/

agendas. To what extent is the Government of Canada keeping pace with this international policy trend?

3. Methodology

In this paper we explore the Government of Canada's rate of progress from traditional to modern IT procurement (as depicted in Table 1), using publicly-available contract award disclosure data, and building on the analysis initially conducted via the voluntary organization Ottawa Civic Tech.

The data analysis code used here (written in R) is publicly available on GitHub[6]. A more detailed technical methodology is available on an online open access research tool developed in the course of the research underpinning the paper, govcanadacontracts.ca. This website also includes a data overview that covers all categories of federal government procurement spending, not just IT.

3.1 Data Source

The primary data source for the analysis is the Proactive Disclosure of Contracts dataset, published by the Government of Canada[7] pursuant to section 86 (1) of the *Access to Information Act*. Prior to 2017-2018, departments did not consistently publish this contract data in a machine-readable format. Since 2017-2018, however, the Treasury Board Secretariat has published this information in a government-wide dataset using comma-separated values. As a result, our analysis covers the time period from the 2017-2018 fiscal year to the 2021-2022 fiscal year (starting April 1, 2017 and ending March 31, 2022).

Given that the Proactive Disclosure of Contracts dataset is regularly updated, including occasional updates of contract data from previous fiscal years by departments, our analysis specifically uses a November 15, 2022 download of the dataset (retrieved directly from open.canada.ca).

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[6] https://github.com/goc-spending/contracts-data

[7] https://open.canada.ca/data/en/dataset/d8f85d91-7dec-4fd1-8055-483b77225d8b

The dataset as presented by the Government of Canada has several limitations and idiosyncrasies. First, the dollar values indicated in the dataset for each contract or amendment are contract award amounts: the amount of money that the department commits to spending through the contract, rather than a transactional record of funds being spent at a particular point in time. Also, for many IT and professional services contracts that are issued with "task authorizations", the contract value represents the maximum amount of money that could be spent under the contract. Depending on the value of task authorizations issued under the contract, the actual amount spent could be lower. Departments may or may not amend their published contract entries to match this spending at the conclusion of the contract (Treasury Board of Canada Secretariat, 2022).

In some cases, incomplete contract information is provided. This includes a small number of pandemic-response medical equipment contracts from the Public Health Agency of Canada where the vendor name is marked "Redacted/Caviardé"[8]. In other cases, the agency did not provide contract values, instead indicating that the contract value "is not disclosed to support Canada's economic interests and the negotiating position of the Government of Canada"[9] [10]. Although these contracts date from 2020-2021, the redacted vendor names and contract values have never been subsequently disclosed in updates to the data set.

In addition, the dataset does not use consistent labelling or categorization schemes across departments. Vendor names are not normalized across departments, nor are distinct identifiers used to ensure consistent labelling of vendor names. Also, the Government of Canada has several categorization and financial classification structures for government spending and procurement contracts, including economic object codes (used in the Public Accounts), Goods and Services Identification Number (GSIN) codes, and United Nations Standard Products and Services Code (UNSPSC) codes.

Last, the dataset has a number of outstanding issues related to manual data entry. This includes inaccurate start and end dates (resulting in a small number of contracts

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[8] https://search.open.canada.ca/contracts/?sort=contract_value+desc&page=1&search_text=%22Redacted%2FCaviard%C3%A9%22

[9] https://search.open.canada.ca/contracts/record/phac-aspc,C-2022-2023-Q1-00694

[10] https://search.open.canada.ca/contracts/record/phac-aspc,C-2020-2021-Q4-00337

that appear to be hundreds or thousands of years in duration), missing financial and commodity coding, and inconsistent vendor naming.

A substantial portion of the analysis effort involved compensating for these data quality issues.

3.2 Data Handling

Normalizing Vendor Names

Prior to matching vendor names, punctuation, accented characters, and capitalization were removed, as well as frequently-used suffixes (for example, "Ltd", "Limited", "Limitée", etc., as well as many international equivalents). We then matched vendor names against a detailed normalization table. This normalization table includes approximately 6,000 entries (across 823 vendors) that match to "canonical" names for each vendor. The normalization table is an expanded version of an earlier iteration created as part of the 2017-2019 Ottawa Civic Tech project. R's fuzzyjoin package was used to suggest possible matches, which were then confirmed manually. Known mergers and acquisitions as well as subsidiary companies are included in the normalization table where known. Overall, the vendor normalization process consolidated approximately 168,000 unique vendor names (in the source data) into 116,000 normalized vendor names.

Industry Categorization

As noted, the dataset does not have a consistent method for categorizing contracts by industry. The source data includes entries for economic object codes and for GSIN codes (in the "commodity code" field). It includes entries from all areas of government procurement activity, from coast guard vessels to language training to gardening to military explosives. Given our research's specific focus on information technology, we translated these entries into a simplified set of top-level categories based on the US Government Services Administration (GSA)'s "Government-wide Categories"[11]. The analysis uses the 10 civilian categories included in the GSA structure, adds an 11th "Defence" category (rather than the 9 additional defence-related categories used in the United States), and a 12th "Other and uncategorized" category used for both

[11] https://www.acquisition.gov/content/category-management

international development transfers and for the small number of contracts that had insufficient information to be categorized. These twelve categories are visible in the "Categories" sections of the analysis website[12], and in Figure 2 below.

We chose to use the GSA's Government-wide Categories structure for two reasons: it included information technology as a distinct top-level category, rather than being nested below professional services. And, it was concise enough (adapted to twelve options) to facilitate manual categorization and data correction. In comparison, there are around a hundred GSIN codes and several dozen top-level UNSPSC segments.

About 77 percent of contracts in the CSV dataset included economic object codes; these were matched directly to one of the twelve categories above. For contracts without economic object codes, these were matched using the description field. A text classifier model was trained using the initial set of descriptions and categories and run in a Jupyter Notebook. This model was used to generate an expanded matching table of descriptions to categories, which was then manually reviewed before using it to categorize the remaining contracts.

Many information technology-related contracts were listed using a general "other professional services" economic object code. To compensate, additional information technology contracts were identified using the commodity code field (based on IT-related GSIN codes). Following this step, a final set of information technology contracts were identified using specific keywords in the "description" and "comments" free text fields in the source dataset. GSIN codes and free text fields were also used to differentiate subcategories of IT work, based on the technology needs described above. Specifically, IT devices and equipment, IT software licensing, and IT consulting services, and "Other IT", which includes telecommunications and networking equipment. We separate these from the other three categories because for most federal departments, telecommunications and networking contracts are solely issued by Shared Services Canada (SSC). SSC contracts comprise 73 percent of the "Other IT" category, measured by dollar value.[13]

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[12] https://govcanadacontracts.ca/all/#categories

[13] SSC is still fairly dominant in the other 3 categories, but less so: 56 of devices and equipment; 46 percent of software licensing, and; 19 percent of IT consulting services (measured by dollar value across the full dataset, compared to other departments).

In the dataset, professional services contracts are categorized separately from information technology contracts, forming the fourth largest category of contracts by dollar value in the analysis (after facilities and construction, information technology, and defence). A number of these contracts (listed as, for example, management consulting) are likely IT-related but are not counted in the information technology category, outside of contracts with recognizably IT-specific keywords. Non-IT professional services include, for example, accounting and audit services, translation services, and scientific and policy research services (among others).

With economic object codes being used as the primary categorization method, there was a significant level of category overlap between defence-specific information technology or transportation and logistics contracts issued by the Department of National Defence (DND) and civilian equivalents issued by other departments. To differentiate these, all DND-issued information technology or transportation and logistics contracts are bulk-listed as "Defence" at the end of the categorization process. As a result, information technology-specific findings below exclude DND and are limited to civilian public service departments and agencies.

Associating amendments with original contracts

To prevent double-counting the value of the same (amended) contract when examining spending over time, we used two amendment matching approaches. This was necessary to compensate for inconsistent use of unique procurement IDs.

First, entries were grouped by matching department, vendor, and procurement ID (after removing extraneous suffixes and normalizing vendor names). Second, any entries not grouped using the first method were grouped by matching department, vendor, original value, and start date (which allows matching contract and amendment groups without consistent procurement IDs). Across the entire contract set, approximately 91 percent of contracts with amendments were matched using the first method and 9 percent were matched using the second method.

3.3 Data Analysis

After contracts were matched with their amendments, the most-recently-issued amendment in the group was used to determine the "canonical" total value and end date for each contract.

Using the original start date of the contract and the end date indicated by the most-recently-issued amendment (or, for contracts without amendments, the contract's original end date), a "per day" cost of the contract was determined by dividing the total value of the contract by the number of days (inclusive) between the start and end of the contract. This "per day" cost was then used to calculate costs for specific time ranges, particularly fiscal years, since it can be easily filtered to a specific time range and then summed up using the per-day cost.

During this stage of the analysis, inflation-adjusted totals were calculated using constant 2019 dollars. We used quarterly data from gross domestic product price indexes published by Statistics Canada[14], retrieved by the cansim R package (von Bergmann & Shkolnik, 2023). Quarterly values (based on the "General governments final consumption expenditure" price index) were used to determine constant dollar amounts for "per day" costs that could then be summed up in later steps in the same way as current dollars.

In calculating spending over time, we assumed a completely consistent, linear spending of money on a given contract throughout its entire duration. In practice, spending on a long-term contract likely varies significantly from month to month and year to year, as project deliverables are completed or component goods are delivered by the vendor. Given this, dollar values for any specific time period should be considered estimates, since contract spending and payment amounts (which are not publicly disclosed) would have taken place at unknown points in time along longer-term and multi-year contracts.

4. Findings

Figure 2 presents estimated government-wide contract spending across all categories. IT contract spending has grown by 27 percent between 2017-2018 and 2021-2022, after correcting for inflation. As a category, IT had the third-highest level of growth over this five-year period after security-related contracts (a 65 percent increase) and medical-related contracts (a 275 percent increase, largely related to pandemic response activities). As noted above, it is likely that a portion of the 'professional services' category includes IT-related work, a dynamic not captured in

[14] https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610010601

our analysis given it was not always evident which professional services contracts were IT-related and which provided other types of services (e.g. auditing).

Figure 2

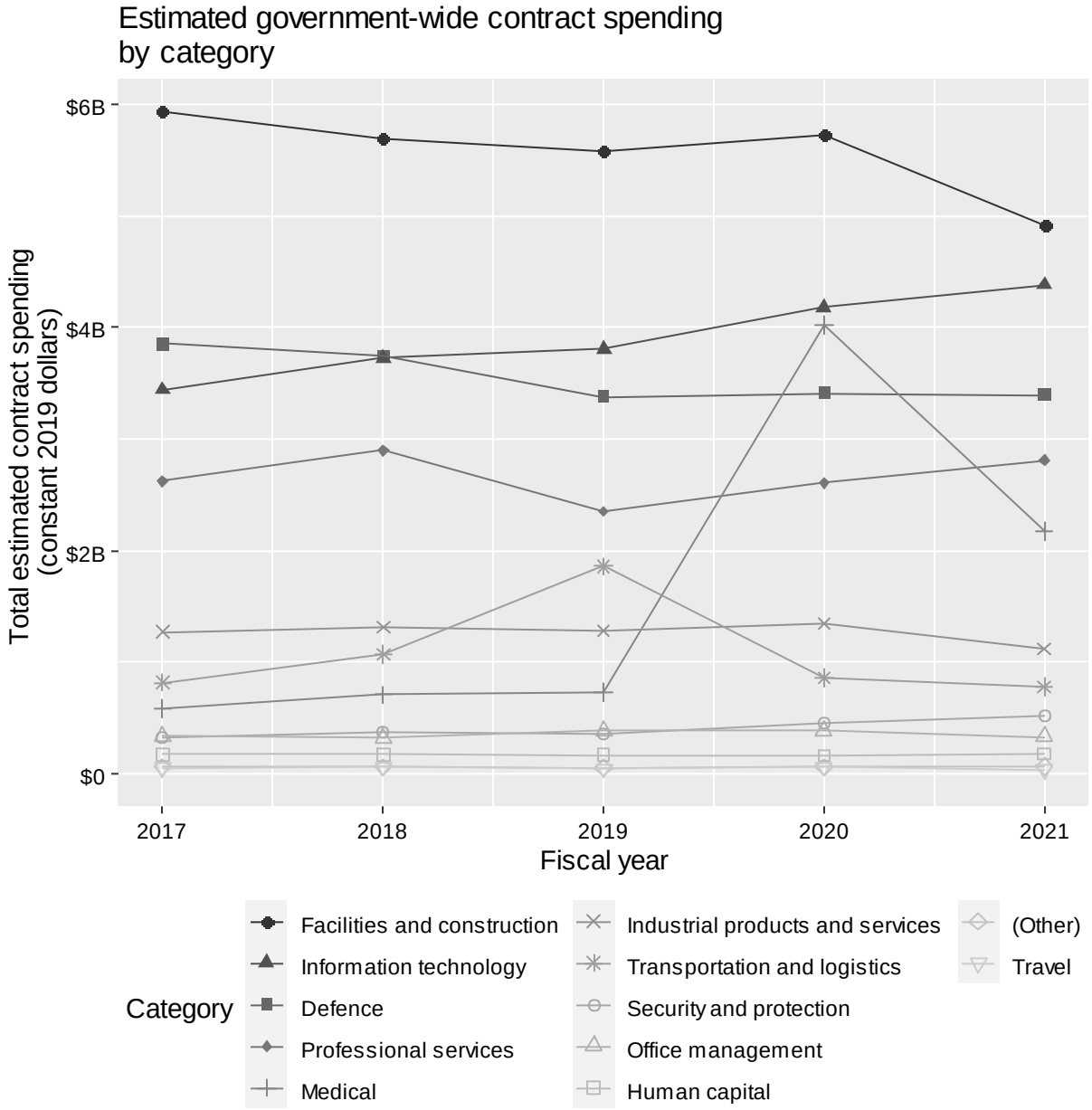


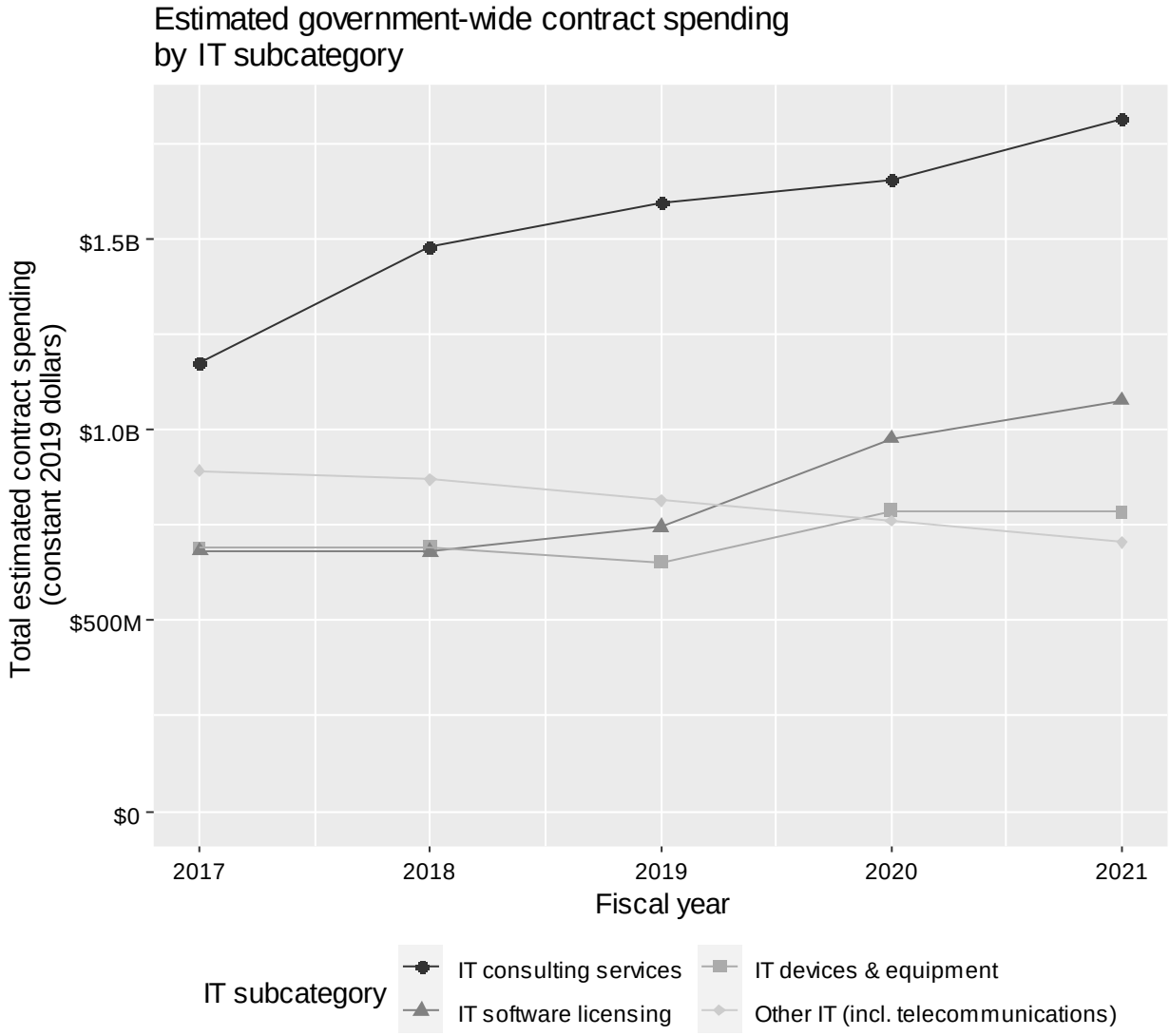
Figure 3 breaks down IT contract spending across various types of IT spending, including spending on IT *devices and equipment*, *software licensing*, and *consulting services*. A fourth category, *Other* is primarily composed of telecommunications services and network equipment contracts.

Spending on *devices and equipment* has remained relatively stable while spending on *consulting services* and *software licensing*[15] have both increased by more than 50 percent between 2017-2018 and 2021-2022 (spending on consulting services is discussed in further detail in section 4.2).

Over the five years of the analysis, Government of Canada departments spent $7.9B on IT *consulting services*, $4.3B on *software licensing*, $3.7B on *devices and equipment*, and $4.1B on *Other*, including telecommunications. These totals exclude IT spending from the Department of National Defence (as described in the "Industry Categorization" section above).

[15] Spending on software licensing grew over 50 percent from 2017-18 to 2021-2022 (from $683 million to $1.08 billion in constant 2019 dollars). This category also includes contracts for cloud computing infrastructure and software-as-a-service products.

Figure 3



To what extent did IT contract spending between 2017-18 and 2021-22 align with best practices in modern IT procurement? To answer this question, we organize our analysis below around each of the six dimensions of IT procurement presented in Table 1.

4.1 Contract Values and Duration

Among Government of Canada contracts for IT consulting services and software licensing active between 2017 and 2022, 99 percent were no more than $2 million

per year (34,220 of 34,633 contracts)[16]. However, the remaining 413 contracts represented 53 percent of the dollar value spent on these two IT subcategories. In other words, the majority (53 percent) of IT spending is allocated to contracts that break the $2 million/year threshold for likely project success. Amongst these 'rule breaking' contracts, the average contract value was $24M, with a range of just over $2M to $1.08B.

94 percent of IT consulting services and software licensing contracts in the dataset are no more than 3 years in duration (31,364 of 34633 contracts). Similar to the total contract amount analysis, however, the remaining 3269 contracts represented 57 percent of the dollar value spent on these subcategories. Amongst these 'rule breaking' contracts, the average contract length was 4.3 years, with a range of just over 3 years to 17.6 years in duration.

Table 2 below provides an overview of contract durations and cumulative dollar values, by IT subcategory, for all contracts active over the full 2017-2018 to 2021-2022 time range analyzed in the dataset.

[16] We excluded "devices and equipment" and "Other IT" contracts from this portion of the analysis, given that these have less relevance for IT implementation efforts (including software development and service delivery) conducted by departments. Devices and equipment as well as telecommunications contracts are typically procured on a different cycle and scale, partly on account of SSC's predominant role and partly since these purchases tend to be more generic across departments than IT consulting and software licensing contracts.

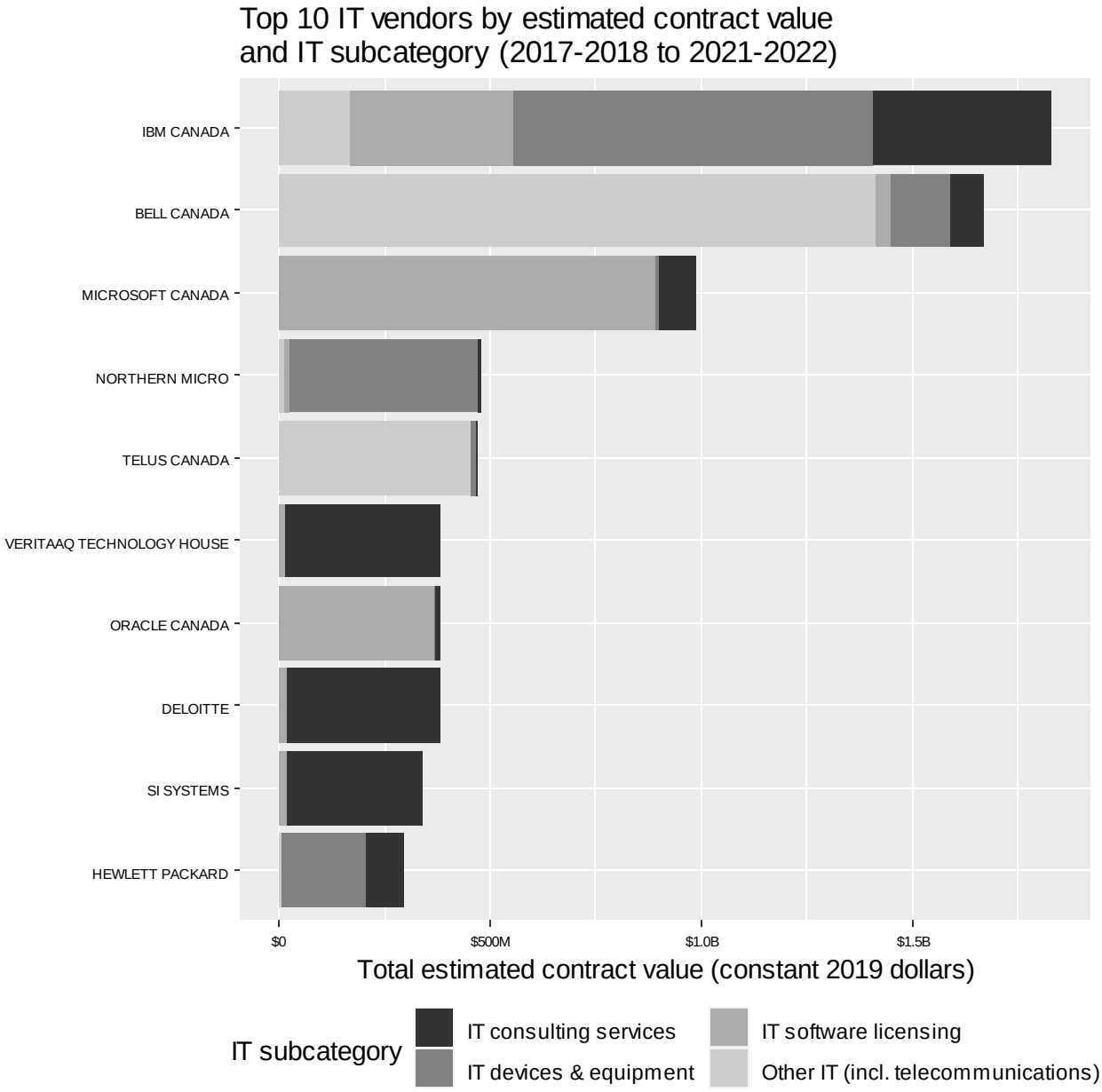
Table 2: Contract Durations and Cumulative Dollar Values, by IT Subcategory, 2017-2022

Contract duration	1 year or less		1 year to 3 years		3 years to 5 years		5 years to 10 years		Over 10 years	
Subcategory	**# of contracts**	**$ value**	**# of contracts**	**$ value**	**# of contracts**	**$ value**	**# of contracts**	**$ value**	**# of contracts**	**$ value**
IT Consulting Services	12,274	2.0B	6,155	4.4B	1,598	3.2B	472	2.7B	23	532.9M
IT Devices and Equipment	9,804	1.5B	1,219	625.7M	667	1.1B	1,890	2.0B	7	51.8M
IT Software Licensing	11,291	1.5B	4,483	1.3B	798	1.9B	517	2.6B	21	258.8M
Other IT	9,188	926.8M	1,330	419.0M	655	522.5 M	530	3.2B	69	2.7B

4.2 Supplier Market

In the data examined here, the ten largest IT vendors measured by contract dollar value represent 37 percent of the total estimated spending on IT contracts over 2017 to 2022. These vendors conduct a range of types of IT work, detailed in Figure 4 below.

Figure 4



The scale of market concentration in Government of Canada IT contracting defies straightforward analysis. Comments from industry participants indicate high barriers to entry, where new entrants are at a disadvantage compared to vendors with existing relationships with government departments (Decoste, 2019). Being able to navigate "contracting and procurement minefields" (Sali, 2018) is also described as a key skill in becoming a successful government vendor. For vendors, this can include being added to Standing Offer and Supply Arrangement mechanisms for particular IT activities. These mechanisms make it easier for departments to quickly issue contracts to vendors when needed, but are likely to favour incumbents and large firms.

It is difficult to assess the level of market concentration for two reasons. One limitation of our analysis is that we did not have data to indicate the comparative size of each vendor (for example in staff numbers or annual revenue), which would enable us to determine the extent to which small and medium enterprises (SMEs) win contracts compared to large industry players.

The second limitation is that the Government of Canada does not disclose data on subcontractors, nor does it require contractors to disclose this data. Scrutiny of the ArriveCAN app highlighted the existence of "pass through" vendors, who specialize in winning government contracts and then enlist other vendors as subcontractors to complete the work (Curry, 2023b)[17]. The lack of available subcontractor data similarly prevents determining the extent to which SMEs versus large industry players receive government contract dollars. As the ArriveCAN example shows, small firms may subcontract to large multinational firms, or vice versa (Curry, 2023a).

Over the time range of the analysis, at a surface level, three vendors received more than $100 million per year in estimated information technology contract spending (23 percent of total IT spending); 10 vendors received more than $50 million per year (38 percent of total IT spending) and an additional 64 vendors received more than $10 million per year (38 percent of total IT spending). The remaining 22 percent of total IT spending was spread across more than 7,000 unique vendors (Table 3 below). Among these thousands of vendors, it is possible that many of these are "pass through" vendors subcontracting other firms; this cannot be determined from the available public data.

[17] This approach also has implications for set-aside programs, such as the federal government's requirement that 5 percent of the total value of federal contracts are awarded to Indigenous businesses. The Canadian Council for Aboriginal Business reported that "phantom joint ventures" risk corroding the integrity of these programs (Curry, 2024).

Table 3: Market dominance by scale segmentation

Value of contracts awarded	Number of vendors	Total dollar value (2017-2018 to 2021-2022, constant 2019 dollars)	Percentage of overall IT spending
Over $100M per year	3	$4,487,483,445.25	23%
Over $50M per year, less than $100M per year	10	$3,403,521,469.42	17%
Over $10M per year, less than $50M per year	63	$7,334,484,019.54	38%
Less than $10M per year	7056	$4,315,670,808.27	22%

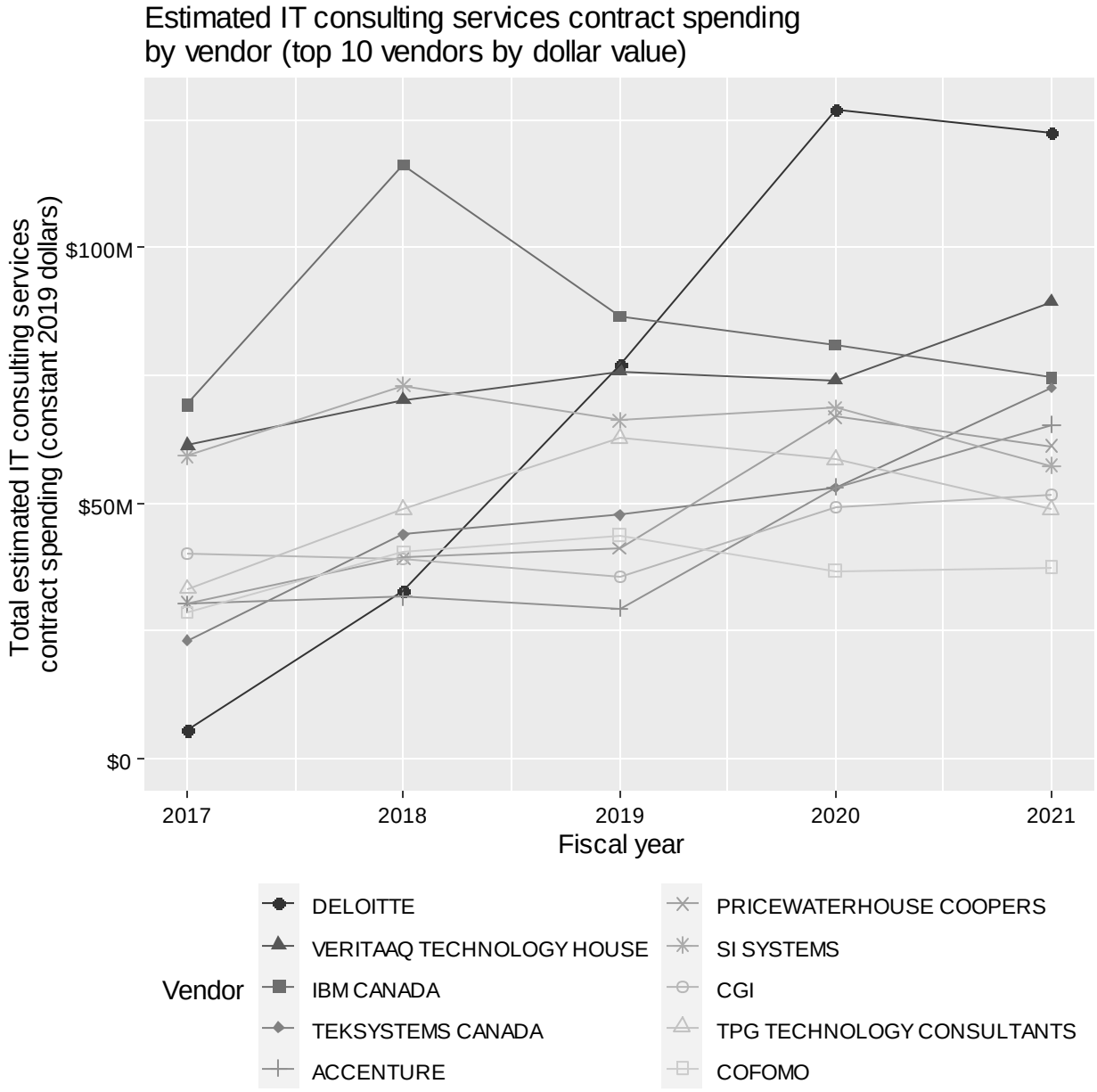
4.3 Source of IT Expertise

From 2017-2018 to 2021-2022, spending on IT consulting services has grown by 55 percent, after correcting for inflation, from a total of $1.17B to $1.82B per year (in constant 2019 dollars). The total spent on IT consulting services over the five year period under examination was $7.72B (in constant 2019 dollars).

Throughout this period, there is a notable increase in departmental spending on IT consulting services from prominent management consulting companies. Over this time period, one of these companies (Deloitte) became the largest provider of IT consulting services, measured by dollar value, while two others (Accenture and PricewaterhouseCoopers) are also among the ten largest providers. Figure 5 below illustrates IT consulting services spending from the ten largest vendors in this subcategory (in constant 2019 dollars).

In total, the federal government spent $2.83B on IT consulting services contracts with these ten firms over the period of analysis, amounting to 37 percent of total spending in this subcategory.

Figure 5



The continued growth in contracts for IT consulting services over the past five years likely reflects in part departments' increased emphasis on digital transformation efforts, including federal budget funding to upgrade critical legacy systems. But to what extent does it reflect comparatively limited investment in in-house expertise, thus breaching best practice in modern IT procurement, which calls for a balance between in-house expertise and outside IT services provision?

For an initial point of comparison, the annual budget for the Canadian Digital Service, created to help build in-house IT expertise in the Government of Canada, is $25.8

million annually (relative to the $566 million spent on average annually on outsourced IT services from these ten firms, over the five years under examination). For a more granular picture of the ratio of in-house to outsourced IT expertise, Table 4 below estimates the number of contractor staff engaged by the ten departments with the largest IT consulting services spending compared to the number of in-house IT staff they employ. Note that consultant and contractor rates vary based on the role and level of experience requested by the department. The Government of Canada does not typically disclose per diem rates for government IT contractors (the daily rates of pay, per contractor resource, for each type and seniority of work defined in the contract). In its examination of the ArriveCAN app, the Office of the Auditor General estimated that the average per diem cost for contractors working on the app was $1,090, compared to an average daily cost for equivalent in-house positions of $675 (Office of the Auditor General of Canada, 2024).

In the analysis below (Table 4), we used a low-end and high-end estimate of IT contractor per diem rates across government to estimate the annualized number of IT contractor staff in the ten departments with the largest number of in-house IT staff. Based on data received from departments through Access to Information requests in 2022, we chose per diem rates of $800 for the low-end estimate and $1,400 for the high-end estimate. Based on the estimated total dollars spent on IT consulting services for each department, these per diem rates were used to calculate an estimated number of IT contractor staff (and resulting ratios of IT contractor staff to in-house IT staff). Given this approach, the high-end per diem calculation results in a lower number of estimated IT contractor staff, while the low-end per diem calculation produces a higher number of estimated IT contractor staff[18].

Here, it is important to note again that these numbers likely under-report the total spending on outsourced IT services, given “professional services” is a separate

[18] The values here depend substantially on the methodology used to determine estimated IT contractor staff counts from contract data. The method used here shows an estimate of between 3,200 and 7,800 contractor staff across all departments (excluding the Department of National Defence), on an annualized basis. Another method indicated values as high as 5,900 to 16,000 contractor staff. In-house, the federal government had approximately 20,000 IT staff in 2021-2022. A 2019 report from the Information Technology Association of Canada, in comparison, suggested that the combined total of in-house IT staff and IT contractors was 80,000 people (Information Technology Association of Canada, 2019). The variation in contract durations and per diem costs, and, ultimately, lack of publicly-available information from departments, make more accurate contractor staff estimates difficult to determine.

category of contract spending not included in our analysis' IT category and it is highly likely that some of the services falling in that category are IT-related.

Table 4: Estimated Annual Number of IT Contractor Staff by Department

Department	**In-house IT staff count (2021-2022)[19]**	**Total $ spent on IT consulting services (2021-2022)**	**Estimated IT contractor staff count**	**Ratio of IT contractor staff to in-house staff (estimated)**
Shared Services Canada	5,068	$326,837,658.60	938 to 1641	19% to 32%
Canada Revenue Agency	2,320[20]	$89,714,711.93	257 to 450	11% to 19%
Employment and Social Development Canada	2,099	$219,987,536.68	631 to 1104	30% to 53%
Statistics Canada	904	$16,351,290.90	47 to 82	5% to 9%
Canada Border Services Agency	774	$202,043,583.07	580 to 1014	75% to 131%
Public Services and Procurement Canada	766	$229,908,340.71	660 to 1154	86% to 151%
Immigration, Refugees and Citizenship Canada	602	$130,865,966.12	375 to 657	62% to 109%
Global Affairs Canada	489	$64,163,189.61	184 to 322	38% to 66%

[19] https://hrdatahub-centrededonneesrh.tbs-sct.gc.ca/

[20] https://www.tbs-sct.canada.ca/ems-sgd/edb-bdd/index-eng.html#infographic/program/CCRA-ISS07/financial and https://www.tbs-sct.canada.ca/ems-sgd/edb-bdd/index-eng.html#infographic/program/CCRA-ISS06/financial

Environment and Climate Change Canada	451	$25,385,967.24	73 to 127	16% to 28%
Royal Canadian Mounted Police	444	$47,295,831.34	136 to 237	31% to 53%

Given the data we have available, we are not well-equipped to appraise whether or not the ratios presented here are acceptable or breach optimal in-house to contractor staffing ratios. In part, this is because there is as of yet no accepted standard for such a ratio, as already discussed.

Nonetheless, certain ratios presented in Table 4 suggest a striking imbalance between in-house expertise and external IT service reliance. For example, PSPC, CBSA and IRCC all have possible ranges of in-house to contractor ratios that would mean they rely on more outsourced IT workers than in-house IT staff. Such a ratio would be unimaginable in other core public sector job categories, such as policy analysis, program evaluation, or communications, and is particularly striking given the central role that the IT function plays in delivering key public services in the digital age.

Moreover, it is difficult to make numbers-based evaluations of the proper ratio with the available data, given such an appraisal depends in part on an analysis of the functions and responsibilities of the IT workers captured by these data. Recent analyses highlight the importance of in-house staff maintaining business and product ownership roles, with external consultants properly contracted to perform tasks like web development, for instance (Craig, 2022). We cannot appraise this division of labour given the data available. Further, it is unclear if the in-house staff reflected in these data possess the skills and authority to sufficiently hold outside contractors to account; in cases where they do not, the number of outsourced staff becomes more problematic. More granular data that identified the roles, responsibilities and skillsets of in-house IT staff versus outsourced staff would greatly enrich analysis on this question. Despite this lack of data, the GC's own admission of its digital skillsets gaps, as acknowledged in the Digital Ambition strategy and by the Chief Information Officer suggest that we should expect that these in-house staff do not in many instances possess the skills required to sufficiently manage these contractors.

4.4 Intellectual Property

Amongst the 37,632 contracts for IT professional services and software licensing struck since 2017-2018, only three contracts explicitly mention "open source" (or variants of the term) in their description or comment fields. To be sure,the source data paints an incomplete picture of open source software procurement by the federal government; it does not include a specific field to denote open source-related contracts, and a number of known open source vendors appear elsewhere in the dataset without explicit references to open source. We thus cannot confidently appraise the extent to which open source software is prioritized given the available data. However, we anticipate that the vast majority of contracts would not involve open source software given the *Policy on Title to Intellectual Property Arising Under Crown Procurement Contracts* (2015) prevents procuring open source custom software that is not owned by the Government of Canada (outside of exceptional cases). The *Policy* requires that new intellectual property created through Crown procurement contracts (particularly for software products) is owned by the contractor rather than the government.

The source data does include a field for intellectual property ownership, although it is not consistently specified for each contract. Of IT consulting services and software licensing contracts that include this data, 83 percent specify that the contractor owns any resulting intellectual property (9,412 of 11,316 contracts). If this is indicative of a broader pattern in contracting data, it appears that the federal government is failing to sufficiently capture ownership of data and IP resulting from the IT products and services it buys. This finding casts doubt on the 'value for money' at play in government IT contracts, and also suggests that the government is failing to sufficiently capture and steward potentially enlightening data about its operations and service users.

5. Conclusions

5.1 Main Findings and Contributions

Since the early 2010s, the Government of Canada has committed to digital era modernization. But, as noted in ongoing parliamentary and political scrutiny of high profile IT failures, and by the government itself in its latest policy statement on digital

government reform, the Government of Canada is failing to modernize its operations for the digital age.

Acknowledging the relationship between IT procurement and digital government reform outcomes, this paper contributes to existing appraisals of federal digital government reforms the first comprehensive evaluation of Government of Canada IT procurement patterns. The analysis reveals that on several dimensions, the Government of Canada is betraying best practice in modern IT procurement. The majority of IT contracts issued by the Government of Canada have dollar values and contract terms that a strong body of evidence indicates will lead to project failures. The supplier market consists of a small number of prominent IT vendors, where three vendors receiving over $100M in contracts annually make up 23 percent of government IT contract spending, alongside a long tail of thousands of smaller IT vendors and contractors. Some of these may be "pass through" vendors, which win government contracts and subcontract the resulting work. However, the publicly-disclosed contract data does not provide any information that could be used to examine this phenomenon. The Government of Canada has a widely-acknowledged dearth of modern digital competency in house, and in certain departments, our analysis finds that private contractors outnumber in-house IT staff. Again breaching global best practice, government policies favour vendor-ownership of IP and data, and do not prioritize adoption of open source solutions, despite evidence showing they generate more cost-effective, secure, publicly accountable and higher quality digital services.

This paper's findings come at a pressing moment in federal public administration and speak to ongoing, high-stakes risks that jeopardize the delivery of federal public services. The Government of Canada is currently responsible for over 8,700 applications which demand maintenance and renewal, often resting on aging IT infrastructures that will need to be addressed – in many cases, through procurement initiatives – in the coming years (Treasury Board of Canada Secretariat, 2017). High-value, long-term IT contracts that the evidence suggests are bound to fail continue to be signed, most recently in May 2022, with the federal government signing a $193 million contract with Deloitte to support ESDC's Benefits Delivery Modernization. This project's outcomes will affect the millions of Canadians receiving major federal social security benefits; its failure could leave individuals without essential supports, and could in turn significantly breach public confidence in the state.

Agile pilots, innovation labs, and comparatively small investments in IT talent recruitment and training are swimming upstream against an institutionalised culture of IT procurement that betrays accepted best practice. Federal IT procurement is thus at odds with responsible public money stewardship, singles Canada out amongst its peers as a digital government laggard, and ultimately, threatens the quality of programs affecting the public's welfare. The status quo, as described and evaluated in this paper, is not a sustainable path forward for the federal government.

5.2 Policy Recommendations

First, formal spend controls, as adopted in the UK, and/or a mandated commitment to modular contracting, as advocated in US policy documents, should be pursued to help the federal government end its propensity to establish large, long-term contracts that invite project failure and promote vendor lock-in.

Second, the GC should actively promote a more competitive market for IT service contracts. The first recommendation on spend controls and modular contracting will support this goal by instituting more streamlined, short-term procurement approaches that can be managed by a broader range of firms and especially smaller vendors. Procurement should be designed around modern digital capacities. This includes capabilities in design research, service design, and software development in modern programming languages. Similar to the UK's Digital Marketplace[21], a key goal of this effort should be to engage small-scale, specialized digital vendors that don't normally engage in government procurements and that are outside of the National Capital Region. For firms participating in these new procurement approaches, barriers to entry should be dramatically lower than current Government of Canada procurement requirements, which impose significant administrative burdens that, as discussed above, favour incumbents and large, well-resourced firms.

Third, improving in-house public service technology capacity in the federal government depends on a number of urgent policy changes. This includes establishing market-competitive pay scales for software developers and cybersecurity experts (in a separate classification distinct from IT support and system administration roles); allowing departments to classify and hire technology staff that report directly

[21] https://digitalmarketplace.blog.gov.uk/2017/02/24/digital-outcomes-and-specialists-2-supplier-statistics/

to program and business teams (outside of departmental CIO and IT divisions); creating "dual-stream" career progression models for technology staff that enable compensation at the highest pay scales without management responsibilities (ie. "individual contributor" progression models, used in most modern technology companies); providing pathways to meet bilingualism requirements for technology staff in order to increase the available talent pool; and making permanent exemptions for digital specialists in the 'return to office' rules applied to the federal public service to allow the GC to recruit these experts from anywhere in Canada and to align with the expectations of technologists that expect to be able to work in distributed teams from a location of their choosing.

Last, the federal government should eliminate provisions preventing procurement of open source software in the *Policy on Title to Intellectual Property Arising Under Crown Procurement Contracts* (2015). This policy represents a clear recipe for ongoing lock-in to the vendors producing custom software for the government, reducing departments' ability to share and reuse resulting software and likely leading to frequent cases where the Government of Canada pays for the same or comparable software multiple times over. In lieu of the current default, a reverse approach should be instituted – where vendor ownership of intellectual property requires an approved exception case, rather than government ownership as is currently the case. In addition, the Government of Canada should begin a government-wide effort to exclusively procure and publish open source software. In doing so, it would follow the steps that peer countries have taken to reduce vendor lock-in, increase software reuse, and improve stewardship of taxpayer dollars.

5.3 Limitations & Future Research

As already discussed, contract values are estimates, and may not reflect amounts actually spent. Moreover, our evaluations of the government's contractor to in-house staffing ratios and intellectual property ownership were limited by a dearth of available data. Analysis of the vendor marketplace was similarly limited by a lack of data on the size of firms, and especially, a lack of public information on the use of "pass through" firms that use a government contract to then contract other firms to deliver the work. On these fronts, our analysis is suggestive of concerning trends, but not reliably conclusive.

Future research can build on the contributions here by accessing richer data to fill the gaps we have identified (should such data exist). We especially welcome research that

investigates the precise kinds of expertise that should be housed within government, and that generates an evidence-based rule to guide the in-sourcing versus outsourcing decision governments face when it comes to building capacity for digital service delivery. Future analyses that match vendors to specific projects, versus just contract amounts per vendor, would expose the extent to which vendors are recruited to evaluate each other's work, enable comparisons of firm performance and 'value for money' based on project success/failure rates, and open opportunities to explore the extent to which 'contracts beget contracts' in specific areas of government work. Finally, we invite appraisals that monitor and evaluate any IT procurement reforms introduced (or not) by the federal government.

This work will depend in large part on the Government of Canada improving how it collects and shares data on IT procurement and IT project outcomes; the government could adopt the Open Contracting Data Standard to begin this work[22]. Improving IT procurement will also depend on greater engagement on the subject from researchers, media and civil society, and most importantly, from political actors. Ultimately, the scale of changes required for better IT procurement outcomes – and better public service delivery, as a result – is large enough that it depends on political support and leadership. Public servant-led reform initiatives over the past several years, and decades of Auditor General scrutiny, have not been able to disrupt the patterns of vendor dependency that are visible in the continued growth of poorly managed IT consulting contracts. For long-established IT managers and leadership in the public service, there is an expectation that they can "wait out" transformation efforts, given the short turnover of senior leadership nominally leading these efforts (Boots, 2022a). The vendor-dependency status quo is sufficiently established that public, media, and political scrutiny is likely the only way to see it change.

[22] https://standard.open-contracting.org/latest/en/

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