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Consolidated Report on the Evolving Role of the Chief Data Officer in the Government of Canada

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EXECUTIVE SUMMARY

This study of the Chief Data Officer (CDO) role was conducted between September of 2021 and February of 2022 with a primary focus on four Departments and Agencies in the Government of Canada (GC). These are Health Canada (HC), the Public Health Agency of Canada (PHAC), Agriculture and Agri-Food Canada (AAFC), and Transport Canada (TC). The report describes how the CDO role is evolving in the Government of Canada and provides recommendations on how it can be strengthened to achieve the goals of departmental data strategies moving forward.

For clarity, the acronym CDO will always refer to the Chief Data Officer in this report. When any other role with the same acronym is referenced, such as the Chief Digital Officer, it will not be abbreviated.

The findings of the study are based on data collected through three surveys, 20 interviews and 7 workshops conducted with key stakeholders in departments, and supplementary consultations and research. The three surveys were distributed to the following groups:

- GC departmental CDO organizations (9 responses total)
- Internal stakeholders in the four participating departments (78 responses total)
- External stakeholders in two of the four participating departments (9 responses total)

In many cases, multiple staff from the office of a senior official who received the survey would have contributed to a consolidated response (particularly in the case of the CDO offices) thus the total number of surveys received are comprised of input from a larger number of individual contributors. The relatively small sample size of the surveys means that they cannot on their own be considered a representative sample. However, combined with inputs from the twenty interviews and seven workshops that were held across the four government departments and agencies, we were able to identify areas of interest to the CDOs and their stakeholders. This analysis was combined with inputs from other departments, expertise from the Institute on Governance (IOG), and research from around the world to establish a set of key findings and recommendations for CDOs in the Government of Canada. We hope that others exploring this emerging role will find our observations and recommendations helpful.

The introductory and context section of the report describes some of the guidance and expectations that have been established for CDOs in the Government of Canada. The four departments that we studied, and all the departments that responded to the CDO survey, appreciate the value of data, are implementing their data strategies, and have appointed a CDO. However, we observed that the CDO role, governance, structure, and even the incumbents of the positions are still quite variable and shifting. During the six months we spent on the study there were structural changes, incumbent changes,

changes in governance models, and changes to investment levels amongst the CDOs we were engaged with.

All of the CDOs studied had identified developing a data strategy and data policies, and supporting data literacy in common as part of their mandate. Beyond this we found that the role varied significantly from department to department. The charts below highlight some of the variation in priorities and expectations of the CDO role amongst the CDOs and the stakeholders surveyed.

Ranking of CDO Priorities

1 = Highest Priority, 12 = Lowest Priority

Highest four priorities for each column are highlighted in green, lowest four in yellow.

	Internal Stakeholders	CDO Offices	External Stakeholders
Developing a departmental data strategy	3	1	2
Providing advice and guidance to business units on data related issues	4	2	9
Procuring and/or managing enterprise data management and analytics software	5	11	6
Developing policies for data usage across the organization	1	4	4
Facilitating the sharing of best practices	7	6	7
Improving data literacy through training and other educational opportunities	2	3	8
Serving as a Center of Expertise for data related trends and technologies	6	5	12
Open data	12	9	11
Data sharing (both internally and outside the department)	11	7	3
Collaboration with external stakeholders (i.e. other levels of government, academia)	9	8	1
Data collection and acquisition	8	10	5
Data quality assessment	10	12	10

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Radar Graph of CDO Office Responses to the Ranking of CDO Priorities
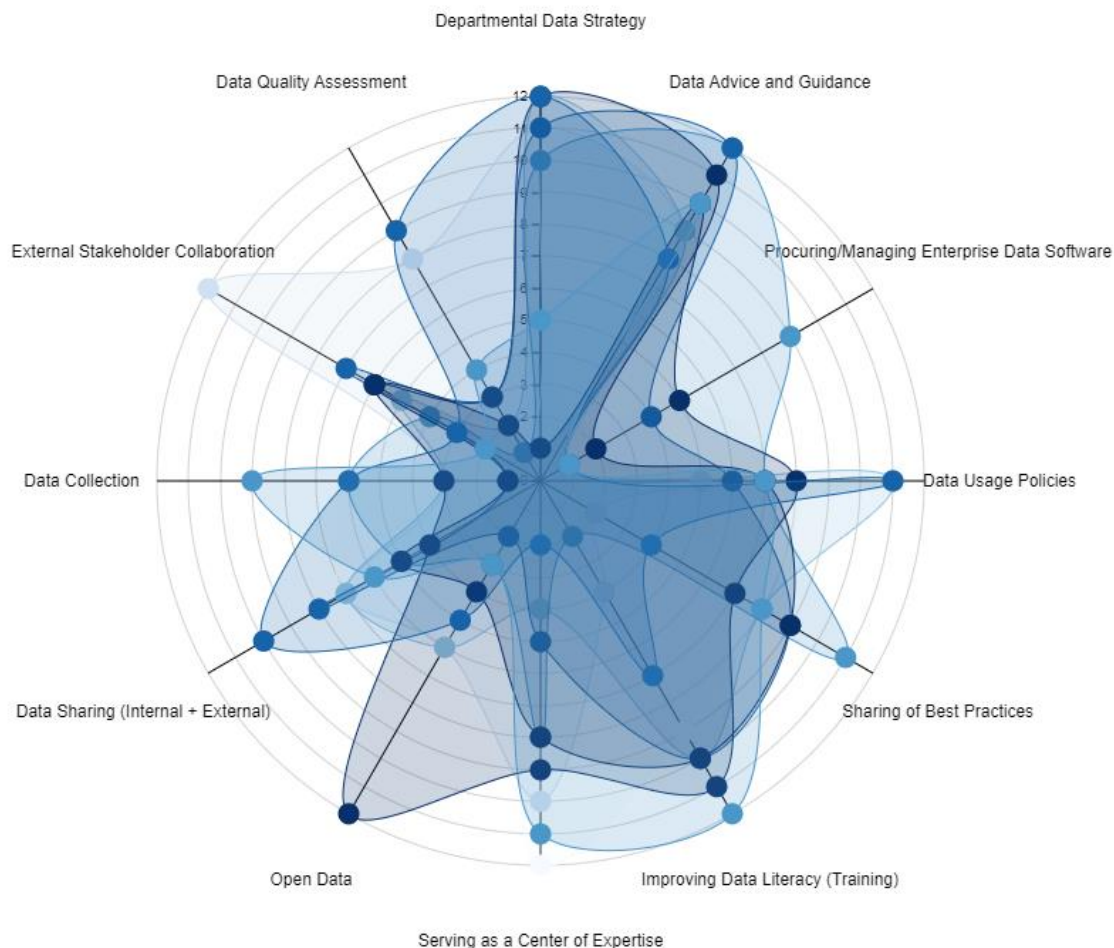
Our observations and findings from the study support having the Chief Data Officer closely aligned with the departmental Chief Digital Officer or Chief Information Officer function through structure and/or governance. The one recurring caution that we heard in this regard was not to let the lure of technology distract the organization and its leadership from the fundamentals of good data management and ensuring that data is used in evidence-based decision making. Central Agency guidance and support for sharing of best practices will go a long way to harmonizing these roles and maximizing the contribution of the CDOs over time. There are also good reasons to maintain flexibility in how these organizational models are implemented in specific departmental contexts

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There was a preference expressed by many of those interviewed for having data governance embedded in the existing departmental governance bodies with the minimum necessary incremental CDO specific governance. Building data competencies throughout the organization will help to ensure that data considerations are included in new initiatives and that policy, program, and funding decisions are evidence-based. This can also be strengthened by ensuring that CDOs have a seat at their department's senior management table, which was the case for six of the nine CDOs that were surveyed as part of this study.

Funding levels and funding models for the CDOs varied widely across departments. In some cases, the role was just being formalized and resourced while we were conducting the study. The right level of funding will depend on the nature of the organization and the expectations placed on the CDO. A core team with the capacity to implement the departmental data strategy and build a community of practice for data practitioners provides a good starting point. All the data strategies examined included the important hygiene factors of good data management. The business case for further funding can be made based on return on investment and the data impact on the department's mandate to improve societal outcomes.

Consistently demonstrating the value of good data and how it can be presented in support of government programs includes experimentation to explore the art of the possible. This included data aggregation. All stakeholders we heard from are looking to the CDO to help with aggregating data across systems, across programs, and across jurisdictions to help achieve their mandates. We also heard a caution to focus effort on aggregating data where there is a clear benefit.

Embedding data teams on assignments in program areas while maintaining a community of practice is being adopted by several organizations. There are several benefits to this model. The multi-disciplinary teams will allow the data analysts to better understand the department and individual business lines. Program analysts will get a better sense of how data can be used to support achieving the goals of their program. A community of practice can build on each other's experience while helping to meet real data needs.

The CDO role in the Government of Canada is still in its early stages. We are encouraging a conscious evolution through occasional reviews, engaging with a horizontal community of practice, and a shared understanding that while the specifics of the role will vary across departments it must deliver value. This is particularly important in the context of the most recent federal budget. The announcement of a strategic review that will aim to create savings of $6 billion over five years provides both a risk and opportunity for CDOs. It reinforces the imperative that their priorities align with making the operations of their departments more efficient and effective so that they are rightfully perceived as areas for strategic investment.

Finally, a desire to vastly improve the sharing of timely data across jurisdictions was consistently expressed throughout the study. Policy frameworks, data sharing strategies, and funding incentives have been used in the past to achieve this with varying degrees of success. Several stakeholders and workshop participants thought that an increased focus on ensuring essential data is available nationally should be considered, including pursuing policy and legislative changes where required.

We have made ten recommendations in this report that build on our key findings. The recommendations are grouped into three categories that we have called: **Engage**, **Enable,** and **Evolve**. Selecting the most relevant recommendations for a specific organizational context will improve the effectiveness of the CDO function and support broader digital transformation goals.

The **Engage** recommendations include a focus on clarifying and communicating the CDO role, vision and governance. Sharing best practices, which is about listening to others and sharing some of the hard lessons learned, will help to further inform this role. To further develop the support for the CDO engagement we recommend putting in place forums to encourage the sharing of data across jurisdictional boundaries to the extent possible. As highlighted by the pandemic, the complexity of data sharing arrangements in Canada's federated model of government certainly hampers aggregation of the data needed to address some national and international issues.

The **Engage** recommendations are as follows:

- Clarify and communicate the CDO role, vision, and related governance.

- Measure, demonstrate, and capture the value of data and analytics, including aggregated data.

- Improve data sharing between departments and jurisdictions to unlock value for citizens.

The **Enable** recommendations are focused on ensuring that CDOs have the resources needed to achieve their mandates. These recommendations are about establishing good data management practices, securing the necessary investments, and building data competencies. While we found significant support for the CDO role, most appeared to be under-resourced. Showing and quantifying the return on the data investment will allow the CDO function to evolve and, in the best case, lead to significant data driven benefits including better informed program, policy and financial decisions for the government and improved societal outcomes for citizens.

The **Enable** recommendations are as follows:

- Perform the core functions of good data management.

- Define and resource a long-term and predictable investment plan for data related infrastructure and tools**.**

- Address the funding model for the CDO and for data-driven projects.

- Build data competencies and establish programs to develop them through recruitment and training.

The **Evolve** recommendations are focused on the evolution of the CDO function over time. This includes continuously adapting the CDO role and its profile in government. To quote one interviewee, "Data is a very valuable asset. The CDO should have the same profile as the CFO." These recommendations also look at how to strengthen the connection of data teams to the business and evolve the CDO's role related to information management and open data.

The **Evolve** recommendations are as follows:

- Examine the longer-term evolution of the CDO position within GC organizations.

- Embed data teams in programs and business lines.

- Clarify roles for the CDO related to Information Management, Open Data and transparency initiatives.

This report and the study methodology behind it are aimed at improving data practices in government and optimizing the use of good quality, shared data for broad societal benefit as the CDO role matures. Several interviewees suggested that increased transparency in this regard will contribute to overall trust in government. With this in mind, we encourage the reader to consider and adapt our recommendations, as well as the key findings from this study to their specific context.

INTRODUCTION AND CONTEXT

This report presents the results from the study of the Chief Data Officer (CDO) role in the Government of Canada performed by the Institute on Governance (IOG). This study was developed to help inform the emerging structure and governance model for the CDO function in Government of Canada departments and to provide recommendations for strengthening this function.

Four Government of Canada departments formally participated in the study and several others, including three central agencies, provided valuable input. The four departments that commissioned the study were Transport Canada (TC), Agriculture and Agri-Food Canada (AAFC), Health Canada (HC), and the Public Health Agency of Canada (PHAC). The central agencies that were consulted are the Privy Council Office (PCO), Treasury Board Secretariat (TBS), and the Canada School of Public Service (CSPS).

While the selection of the four federal departments that commissioned this study was based on their expressed interest in examining the evolution of their Chief Data Officer function, they collectively provided an interesting variety of experiences to explore, including:

- A broad range of government functions including policy development, program delivery, science and research-based surveillance, regulatory enforcement, and emergency response. Given the ongoing COVID-19 pandemic during the study period, there was also a difference in operational intensity faced by those departments that were directly responding to the crisis.

- Department sizes range from Health Canada at 9,204 FTEs (amongst the top 10 largest GC departments), to TC and AAFC which are 6,339 and 5,495 FTEs respectively. PHAC currently has approximately 4,500 FTEs, up from 3,281 in 2021 having experienced rapid growth due to the response to the COVID-19 pandemic (2021 FTE numbers from TBS).

- Governance approaches to data and digital leadership roles ranging from highly centralized in the case of TC, to varying degrees of decentralization in the other three departments.

- A diverse and complex range of internal and external stakeholders that are central to the data ecosystem of all four departments, including regulators, inspectors, policy analysts, scientists, academia, private sector companies, as well as Provincial, Territorial, Indigenous, Municipal, and international levels of government.

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The study consisted of a series of surveys, interviews, and workshops that took place from September 2021 to February 2022. This report provides an overview of our findings from this work, as well as a series of observations and recommendations to help strengthen the CDO role in the federal government.

On a more symbolic level, we found the interconnection between the mandates of the four departments provides an interesting synergy in our current context of supply chain disruptions and public health concerns. A healthy population requires the availability of high-quality, nutritious food, which in turn relies upon a well-functioning transportation system for distribution to nurture more healthy people. A foundation of this virtuous cycle – like so much of what government does – is good data and the ability to draw insights from the analysis of that data.
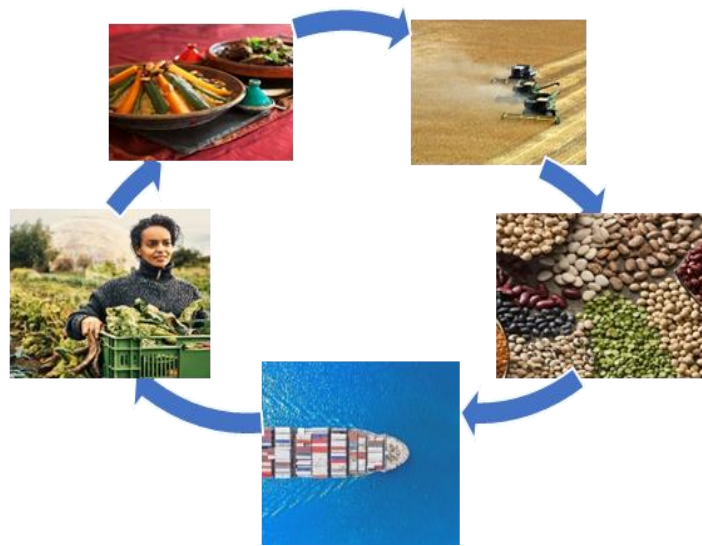
It was a pleasure working on this study at a critical time in the development of the Chief Data Officer role. CDOs are leading the move to more data enabled program delivery, policy decisions, and regulatory enforcement. In fact, data is at the core of everything that the government does. Be it economic modelling, policy development, service delivery to citizens and businesses, or providing transfer payments to other levels of government, all the basic functions of government rely on the availability and interpretability of high-quality, timely, relevant data. Data is so central to a well-functioning government that it can at times lead to it being taken for granted. Yet as the rapidly evolving technology and public governance landscape has shown, a focused effort around data is needed to ensure that public institutions have the resources they need to be effective as they address the policy challenges of today's world.

Traditionally data was collected, managed, and analyzed in physical formats – pen and paper, or perhaps typewritten. This had implications for the velocity and volume of data that could be generated and consumed. This played to the strengths of large public administration organizations that could allocate human and financial resources towards data related problems. However, the digital revolution over the past few decades has upended these assumptions. Now generating, storing, and analyzing data is relatively inexpensive and fast. Today's challenge is one of organizational agility and the ability to keep up with not just the pace of change, but the enormous quantities of data being produced by governments as well as a wide range of stakeholders and partners that governments work with. As Taki Sarantakis, President of the Canada School of Public Service, commented in a recent article in Policy Options, "Contemporary public administration, which traces its very heritage back to data, is far less sophisticated in data today than the digital giants. Data is not utilized for public good applications anywhere near the degree to which data is utilized for commercial gain".

In the 1990s governments around the world responded to the creation of the Internet as we know it today with a concerted effort to make information and services available online to the general public for the first time. The early 2000s saw the evolution of the social web and the rise of social media platforms that changed the way we communicate and inverted traditional ways of engagement between governments and citizens. These developments also saw an increasing focus on what was termed "Open Data" with a push for governments at all levels to release more data in formats that allowed for reuse or repurposing by third-parties or even individual citizens, with the goals of both improved transparency and government efficiency.

The relationship between digital and data is an important and symbiotic one in the public sector. The UK government has created an explicit Professional Capability Framework for what they call the "Digital, Data and Technology Profession". The creation of new leadership positions in government organizations are increasingly also recognizing the link between these two areas of work, for example the establishment of a Chief Digital and Data Officer for the Government of Ontario. We've also seen an international movement towards a larger emphasis on data governance issues to accelerate progress on digital government reforms, such as the recently released OECD Recommendation on Enhancing Access to and Sharing of Data. These examples are representative of a broader move towards recognizing that data is the fuel that propels the digital revolution. Put simply, there is no "digital government" without data, and data cannot reach its full potential without a digitally transformed government.

Adding to the urgency on this topic is the rise of Artificial Intelligence (AI) and the increasing incorporation of machine learning, semantic analysis, and algorithmic decision-making applications into the infrastructure of government. These advances in the data science profession provide the opportunity to dramatically improve the

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responsiveness and business intelligence available to government organizations, and also potential methods for greater administrative simplification and efficiency. At the same time, they raise legitimate concerns about the potential ethical implications of the use of such tools and the harm they could do to both individuals and trust in government if used without the appropriate ethical and privacy safeguards in place.

Against this backdrop, 2018-2019 saw three important pieces of policy direction published in the Government of Canada. The first was the Data Strategy Roadmap for the Federal Public Service which laid out both a vision and accountabilities for departments with regards to how they manage data assets. Importantly, this included having each department produce a data strategy and establish a Chief Data Officer role within their organization. That same year the Policy on Service and Digital was published by the Treasury Board Secretariat. This Policy – which amalgamated a number of existing policy instruments in the digital and service space - required Deputy Heads to determine clear roles and responsibilities over data, and to make plans to use data as a strategic asset. This included developing service inventories for all federal departments and collecting data on related performance metrics for those services that would be tracked in the future. Finally, the Directive on Automated Decision-Making was published which provided guidance on the responsible use of AI and algorithmic tools when being used by Government of Canada departments to provide services to the public.

Additionally, as part of the Roadmap for Open Science that was published in early 2020, the Government of Canada Chief Science Advisor recommended that Deputy Heads create a Chief Science Data Officer. The even more recent Digital Operations Strategic Plan from May of 2021 also strongly positions data as essential to digital government and decision making. To support the requirement for improved data literacy, both Statistics Canada and the Canada School of Public Service, have developed learning resources in recent years to support upskilling across the public service.

Departments and agencies across the government of Canada have responded to these developments in part by establishing Chief Data Officer positions and departmental data strategies. As might be expected in early stages of this evolution, these CDOs have been established with a variety of different types of reporting relationships, structures, and mandates. This study was designed to explore and inform this evolving role as CDOs move towards their next stages of maturity.

KEY FINDINGS

Since the call for establishing Chief Data Officer positions in the 2018 Data Strategy Roadmap for the Federal Public Service, a variety of operating models have been put into place in departments across the Government of Canada. This approach has created the opportunity to compare different departmental models to look for potential lessons that can inform the next stage of maturity and evolution for CDOs. Through the surveys, interviews, workshops, and research that comprised this study, we have attempted to gain a better understanding of the variety of current approaches to providing a CDO function in Government of Canada departments – both commonalities and differences – to inform the recommendations in the following section.

In addition to the four departments that were a formal part of this study (TC, AAFC, HC, and PHAC), we engaged with the Chief Data Officer Council and encouraged other departments to complete the CDO Office survey that had been created. Five other departmental CDO Offices did so, namely: Canadian Border Services Agency (CBSA), Immigration, Refugees, and Citizenship Canada (IRCC), Royal Canadian Mounted Police (RCMP), Natural Resources Canada (NRCan), and the Department of National Defense (DND). Below are some of the key findings that were observed across this sample of nine Chief Data Officers in Government of Canada departments.

CDO ROLE – POSITION IN THE ORGANIZATION

Across the nine CDOs that were surveyed, we found the following with respect to the creation and positioning of these roles within their departments:

- All of the CDOs that responded to the survey were established between 2018 and 2021. We are aware that there were CDO roles established before this in several departments, including the first official departmental CDO at Employment and Social Development Canada (ESDC) as early as 2016.

- In most of the departments the CDO position was filled through an at-level appointment or added to an existing role (i.e., to the responsibilities of the Chief Digital Officer). One of the nine departments surveyed held an internal competition for the role, and one held an external competition.

- 6 of the 9 CDOs were considered to be full-time positions. For the other three, one was combined with the Chief Science Data Officer role for the department, and two others saw approximately 20% of their time focused on the CDO role with other duties/titles taking up most of their time.

- The majority of the CDOs (5 of 9) were classified as EX-03 positions *(Note: "EX" refers to "Executive Group" positions within the Government of Canada job*

classification system). Two of them were EX-04s, and two of them were EX-02s. However, in two of these cases the level of the position was tied to the individual currently holding the CDO role, not the position itself, so it is possible that in the future a new CDO appointment might be at a different classification level. Additionally, in part as a result of the varying classification levels, only 6 of the 9 CDOs are a member of the senior management committee of their department.

- The positioning of the CDO within their department's organizational structure is split along three lines. A large minority (4 of 9) sit within the Digital, CIO, and/or information services branches of their departments (e.g., Transport Canada). 3 of 9 CDOs are part of their department's Strategic Policy branch. The remaining two CDOs (PHAC and DND) are part of data-specific branches in their department. (e.g., The Corporate Data and Surveillance Branch at PHAC).

- While the majority of CDOs do not have formal reporting relationships outside of their home branch, in two cases (AAFC and IRCC) there are joint reporting relationships for the CDO between the Digital/IT and Strategic Policy branches of their organization.

Given how new the role of the CDO is in most departments, one other finding of note was that, while varied, there was a fairly low level of awareness and familiarity with the CDO function amongst the four departments that were part of this study. This was particularly and understandably true for the small number of external stakeholders who replied to the survey.

Level of Familiarity and Interaction with the CDO Function in Your Department

Category	External Stakeholders	Internal Stakeholders
Extensive		14%
Regular		15%
Occassional		21%
Aware but No Interaction	11%	32%
Not Aware	89%	12%

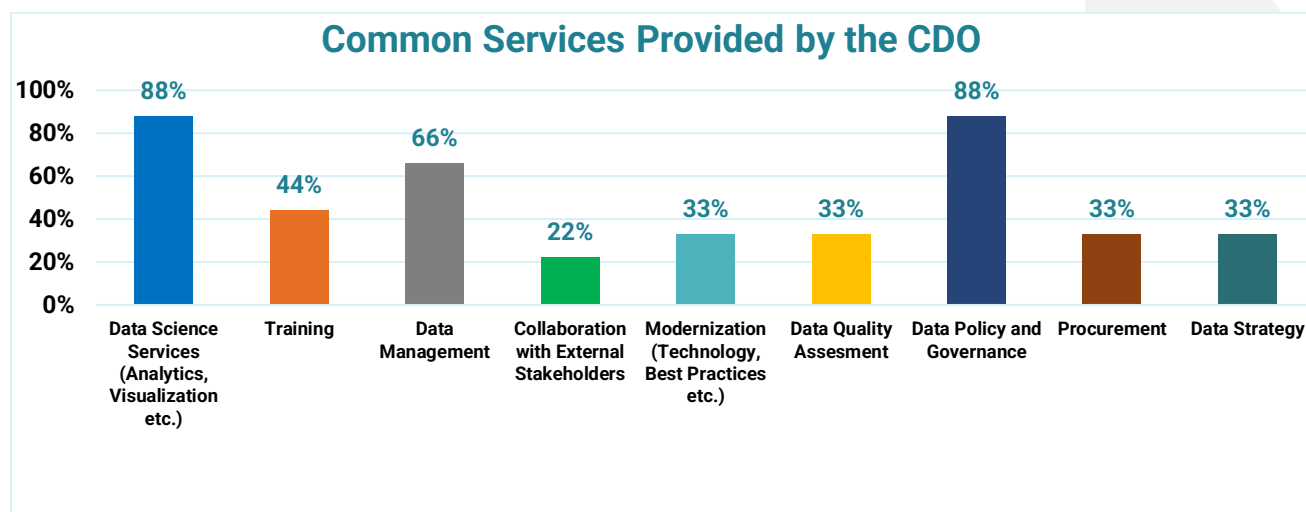**■ External Stakeholders ■ Internal Stakeholders**
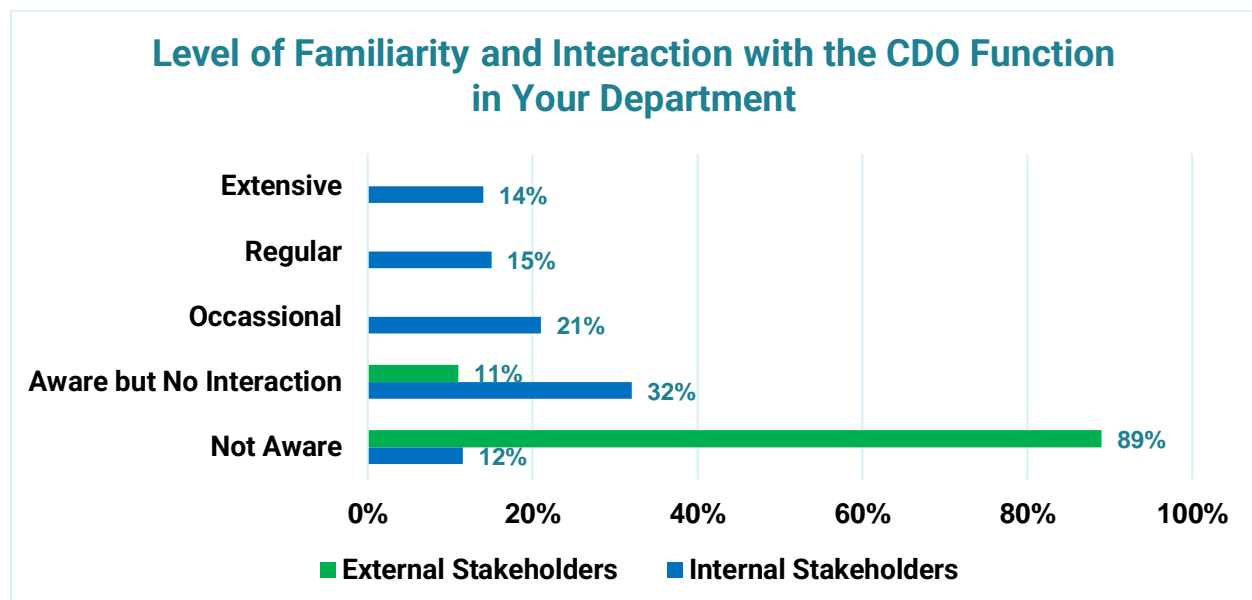
CDO ROLE – RESOURCES AND PRIORITIES

In examining the nine CDOs that were surveyed, we see a wide range of resource levels being provided to support this role, with some being quite informal in their operations and others having fairly substantial teams and budget to support their activities:

- The annual budget of the CDO Offices surveyed ranged from as low as $2 Million to as high as $47 Million. For a sense of proportionality to the size of their departmental budgets, this ranged from as low as 0.07% to as high as 1.95% of the overall departmental budget (*based on 2021-22 Main Estimates*).

- The size of the teams for CDO Offices also had a significant range, from as low as 15 FTEs (Full-Time Equivalents), to as high as an estimate of 200+ FTEs. When looking at FTEs on a per capita basis we again see a wide range amongst the departments surveyed, with this ranging from as low as 0.27% to as high as 1.95% of the overall departmental FTE count (*based on 2021 TBS data*).

- In the case of one mid-sized department, they reported that their CDO had no dedicated budget and that there were only four individuals supporting the CDO function, all on a part-time basis (including the CDO themselves).

The wide variation in CDO resources between departments raises the question as to what the "minimal viable CDO organization" might look like. The answer to this question of course is highly dependent upon what the mandate, responsibilities, and priorities of the CDO are. Again, based on the nine departmental CDOs surveyed, this varies widely. When asked about the types of services that their CDOs provide, we saw the most common areas cited by more than two-thirds of respondents being data policy and governance, data science services, and data management as indicated in the graph below (percentage represents percentage of survey respondents listing that service as being one that they provide):

Common Services Provided by the CDO

Service	Percentage
Data Science Services (Analytics, Visualization etc.)	88%
Training	44%
Data Management	66%
Collaboration with External Stakeholders	22%
Modernization (Technology, Best Practices etc.)	33%
Data Quality Assesment	33%
Data Policy and Governance	88%
Procurement	33%
Data Strategy	33%

When asked to rank a list of 12 common CDO functions in order of priority, we found a wide range of answers amongst the CDOs. While there was a fair bit of consensus on the importance of leading the development of departmental policies and data strategies, as well as providing advice and guidance on data to the department (like the graph above), there was much less consensus on the other functions listed. The following radar chart visually illustrates the wide range of responses to these questions:
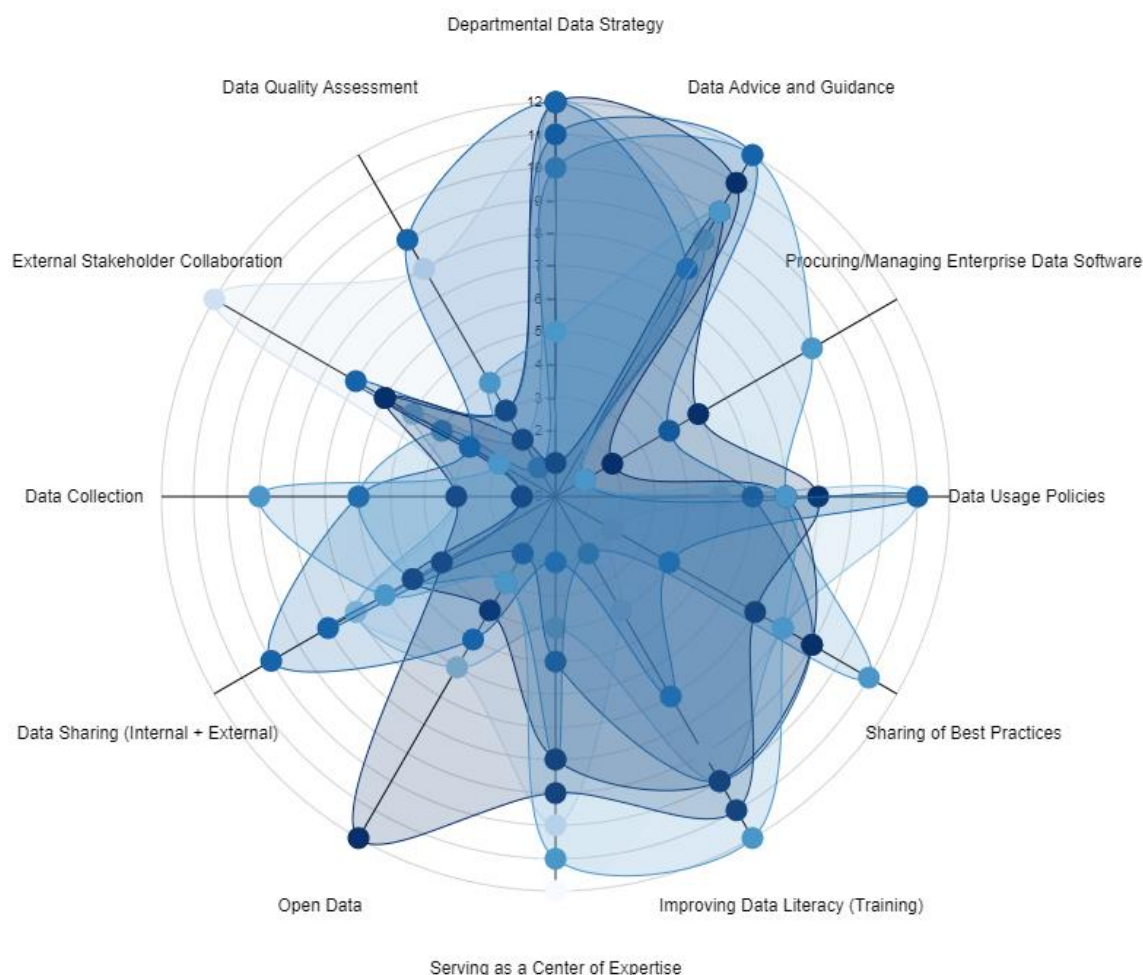
This same question was also asked amongst respondents to the Internal Stakeholder and External Stakeholder surveys that were conducted as part of this study. Their responses as summarized in the table below show that there was even less consensus on priorities for CDOs amongst these different groups, with a few notable exceptions such as developing data strategy and policies being highly ranked by all three groups, and data quality assessment and open data being ranked low by all three groups.
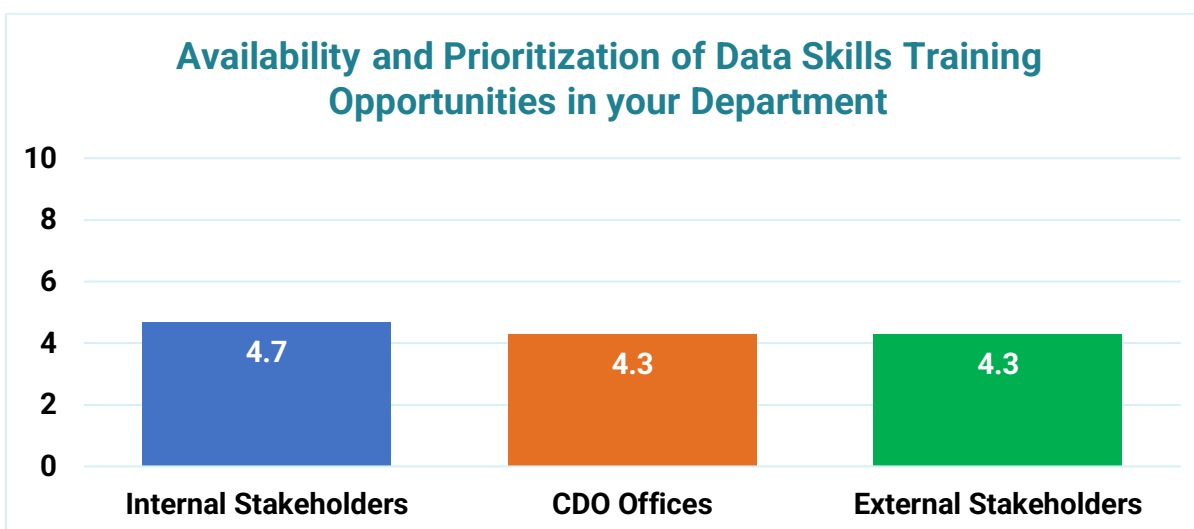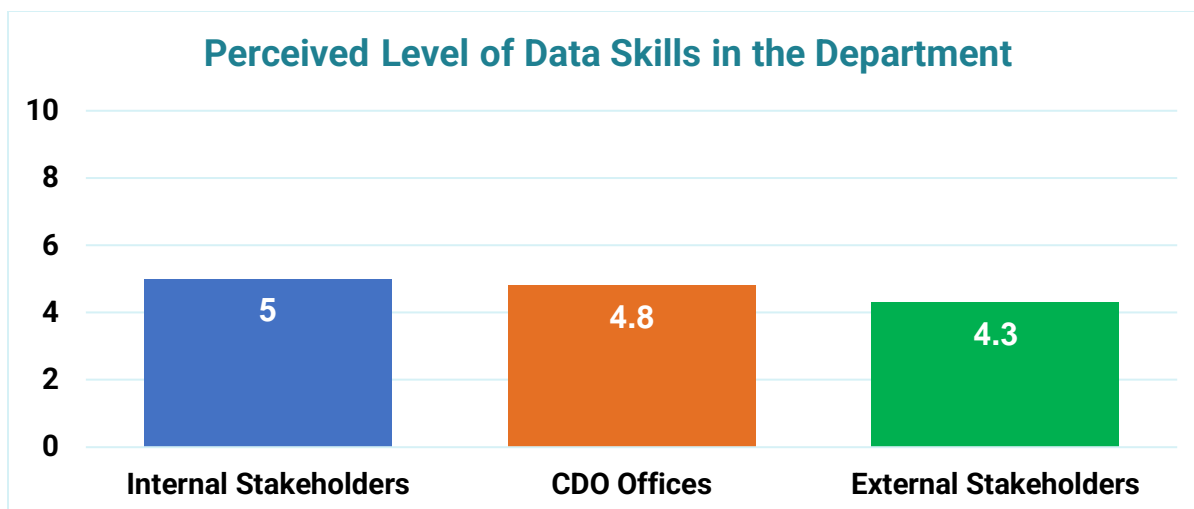
1 = Highest Priority, 12 = Lowest Priority

Highest four priorities for each column are highlighted in green, lowest four in yellow.

	Internal Stakeholders	CDO Offices	External Stakeholders
Developing a Departmental Data Strategy	3	1	2
Providing advice and guidance to business units on data related issues	4	2	9
Procuring and/or managing enterprise data management and analytics software	5	11	6
Developing policies for data usage across the organization	1	4	4
Facilitating the sharing of best practices	7	6	7
Improving data literacy through training and other educational opportunities	2	3	8
Serving as a Center of Expertise for data related trends and technologies	6	5	12
Open data	12	9	11
Data sharing (both internally and outside the department)	11	7	3
Collaboration with external stakeholders (i.e. other levels of government, academia)	9	8	1
Data collection and acquisition	8	10	5
Data quality assessment	10	12	10

There were a few areas of notable divergence between the different groups surveyed. External stakeholders ranked both collaboration with external stakeholders and data sharing to be amongst their highest priorities. These two functions were however ranked comparatively lower by both internal stakeholders and CDO offices. For the CDO offices surveyed, procuring and managing enterprise data management and analytics software was ranked on average 11 out of 12 on their list of priorities. This was however ranked significantly higher by internal and external stakeholders, and as we heard in our interviews and workshops remains a barrier in many departments as reflected in our recommendations later in this report.

Also of note, improving data literacy through training is a topic that came up often throughout the course of our study. This ranked highly on the list of priorities for both CDOs and Internal Stakeholders in the four departments studied. This issue was also highlighted in the results of our survey which saw CDOs, internal, and external stakeholders all finding a fairly low level of perceived data skills in the department and a correspondingly low level of prioritization and availability of training opportunities.

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Perceived Level of Data Skills in the Department

Internal Stakeholders	CDO Offices	External Stakeholders
5	4.8	4.3

Availability and Prioritization of Data Skills Training Opportunities in your Department

Internal Stakeholders	CDO Offices	External Stakeholders
4.7	4.3	4.3

Finally, with regards to resources for CDOs it is important to consider the context of the most recent federal budget that was released in April 2022. Specifically, the announcement of a Strategic Policy Review that will aim to create savings of $6 billion over five years, and $3 billion annually by the 2026-27 fiscal year. This provides both a risk and opportunity for CDOs and reinforces the imperative that their priorities align with making the operations of their departments – and the government as a whole – more efficient and effective so that they are rightfully perceived to be areas of strategic investment as government rebalances its fiscal priorities in the wake of the COVID-19 pandemic.

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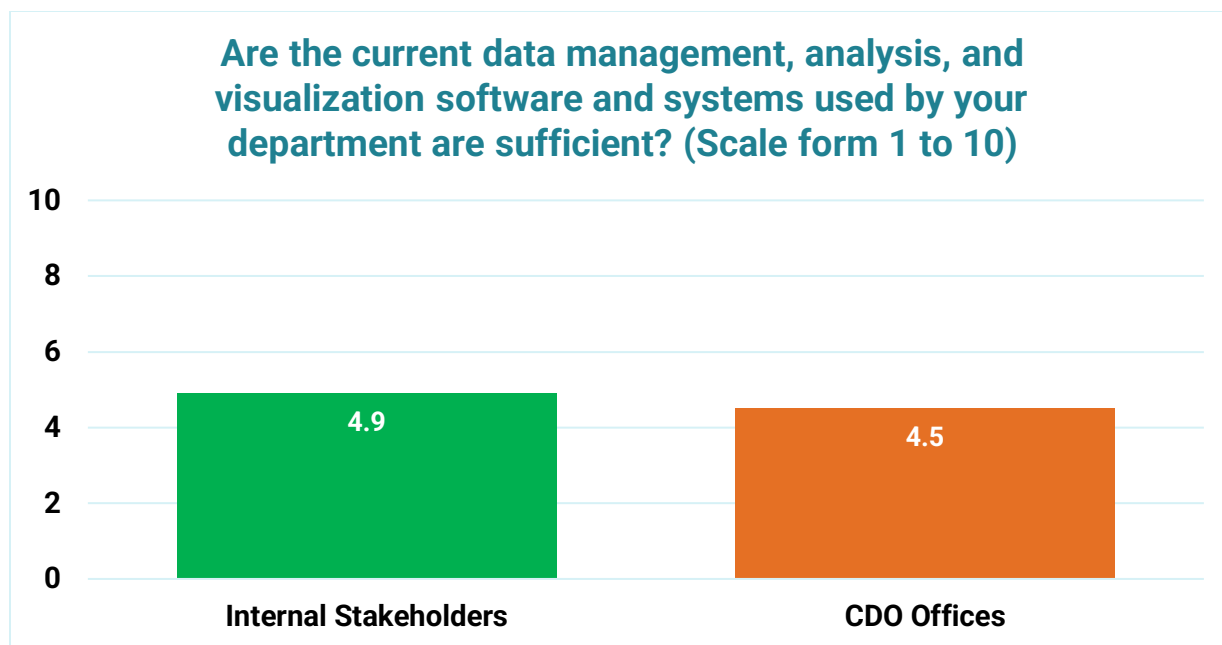LEADING EXPERTISE EXPERTISE DE POINTE

CDO GOVERNANCE MODEL AND RELATIONSHIP WITH DIGITAL

The research conducted through this study has highlighted the evolving governance models that have developed between different departments with respect to the CDO function and the CDO's relationship with their Chief Information Officer or Chief Digital Officer counterparts. This in part reflects the very different starting points and operational contexts for the creation of the CDO in different departments, as well as the relative newness of the role in the government context.

- CDOs generally describe a moderate amount of formal governance in place at their department to support the CDO function. Asked to rate the level of formal governance on a scale of 1-10, the average response amongst the 9 CDOs surveyed was a 5.78. However, it should be noted that this ranged from a low of 3 to a high of 8.

- There was also a mixed approach to horizontal data governance structures in the departments surveyed. Some CDOs reported putting in place new data governance committees that they chair, while other CDOs have taken an approach of leveraging existing executive committees in their department and avoiding creating new committees specifically focused on data.

- The majority of CDOs surveyed do not have a formal governance relationship with their Chief Information/Digital Officer in their department. Of those that reported having such a relationship, this was either because the role was held by the same person (e.g., Transport Canada), or because the CDO reported to the CIO (e.g., AAFC).

- Despite this lack of a formal relationship between the CDO and CIO (or Chief Digital Officer) in most departments, there is clearly a necessary synergy between the roles for both to succeed in their respective missions. We did find that while formal governance was still evolving, less formal coordination and communication approaches were used to stay in synch between these related C-suite roles. For example, of the nine CDOs surveyed, five indicated that procurement and implementation of data management systems and analytics software for their department is a shared responsibility between the roles. This is notable given the finding from our surveys that there is a fairly low level of satisfaction from both internal stakeholders and CDOs with existing data systems and software tools available.

Are the current data management, analysis, and visualization software and systems used by your department are sufficient? (Scale form 1 to 10)

	Internal Stakeholders	CDO Offices
Value	4.9	4.5

In the 9 months since this study commenced, there have been two other significant developments related to data governance that have taken place in the Government of Canada from a central agency perspective. In March of 2022 a new position of Chief Data Officer for the Government of Canada was created, with Stephen Burt being appointed to the role (Stephen was previously Assistant Deputy Minister for Data, Innovation, Analytics at the Department of National Defense). This new GC CDO position was established as part of the portfolio of the Chief Information Officer for the Government of Canada, a position which has in recent years been elevated to that of a Deputy Minister at Treasury Board Secretariat (TBS). Second, the TBS Office of the CIO has been engaging with the digital and data communities in the Government of Canada on emerging guidance related to the governance of data related functions at the departmental level. They have been more explicitly encouraging departments and agencies to have data, digital, and information management functions housed together within their organizational structure. Where this consolidated organizational model is not adopted, alignment of Chief Digital Officer and Chief Data Officer roles is being recommended through internal governance structures.

It is also worth noting that over the past few years issues around the responsible use of Artificial Intelligence and data for service delivery have become more prominent and have received more attention from central agencies. In April 2020 the TBS Directive on Automated Decision Making took full effect, with mandatory requirements for departments that are using automated systems for decision-making that impacts citizens, businesses, or other external stakeholders. That same month, the TBS Policy on Service and Digital also took effect which amongst other impacts has made it mandatory for departments to create service inventories and collect metrics with which to evaluate services that they provide. Both of these developments in government-wide

policy direction have obvious links to the newly created CDO positions in departments. They also raise questions of responsibilities and resources between the data and digital leads within departments. Reducing this potential competition for resources and confusion over respective mandates is one of the advantages of a consolidated Chief Data Officer – Chief Digital Officer structure.

BARRIERS AND OPPORTUNITIES FOR CDOS

The surveys to all three audiences covered by this study (CDO Offices, Internal Stakeholders, External Stakeholders) also asked a series of questions related to barriers to accessing and sharing data. These questions were identical to ones asked in a 2019 survey by PCO's Results and Delivery unit to Chief Results and Delivery Officers across the federal government as a way to benchmark the more recent results. Below you can see the results of the responses to these questions amongst the four different respondent groups.

Major Barries to Accessing and Sharing Data

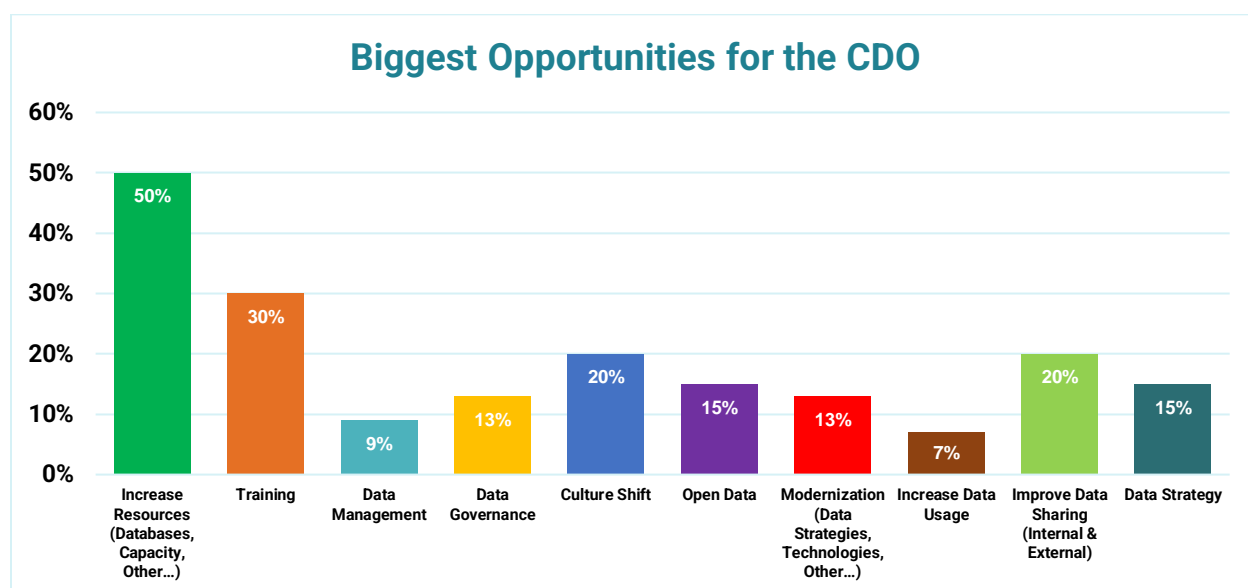| Barrier	Internal Stakeholders	All CDO Offices	External Stakeholders	2019 PCO RDU Survey
Data not in the right format	23%	77%	38%	17%
Lack of funding	31%	55%	25%	17%
Lack of staff	33%	66%	38%	17%
Staff lack required skills or training	48%	55%	75%	21%
Commitments are qualitative	6%	55%	0%	25%
Lack of information technology	25%	55%	75%	29%
Lack of awareness of what data are available	58%	77%	75%	29%
Data does not exist	17%	33%	75%	33%
Lack of access to data from other organizations	35%	88%	13%	38%
Data quality	29%	55%	75%	38%
Lack of access to data internally	40%	88%	13%	42%

Responses indicate that CDOs generally saw greater barriers across the board than the other respondent groups - perhaps in part due to the enterprise-wide view that they need to take by virtue of their role. Notable exceptions to this are a few instances where external stakeholders identified greater frequency of concern around lack of training, lack of IT tools, poor data quality, and lack of data itself. It is also worth noting that

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amongst internal stakeholders, lack of awareness of what data is available and lack of required skills or training were the most frequently cited barriers.

The surveys to all three audiences in the study also asked a series of qualitative questions with respect to the biggest opportunities, barriers, and the future for the CDO function in their department.

With respect to the biggest opportunities for the CDO, as indicated by our manual categorization below, we see that increasing resources, training, and improving data sharing were most frequently cited.

Biggest Opportunities for the CDO

Category	Percentage
Increase Resources (Databases, Capacity, Other…)	50%
Training	30%
Data Management	9%
Data Governance	13%
Culture Shift	20%
Open Data	15%
Modernization (Data Strategies, Technologies, Other…)	13%
Increase Data Usage	7%
Improve Data Sharing (Internal & External)	20%
Data Strategy	15%

We also leveraged collaboration with our colleagues at the University of Ottawa and the data science firm Sysabee to perform some automated analysis of the responses to these qualitative questions. Using the Leximancer text analysis tool, our colleagues at the University of Ottawa were able to create a relational mapping of key concepts that occurred in the responses to this question as seen below. It found that concepts related to data management, governance, capacity and usage were most prominent, with a secondary focus on data access.

Q1: "What are the biggest opportunities for the CDO in your department?
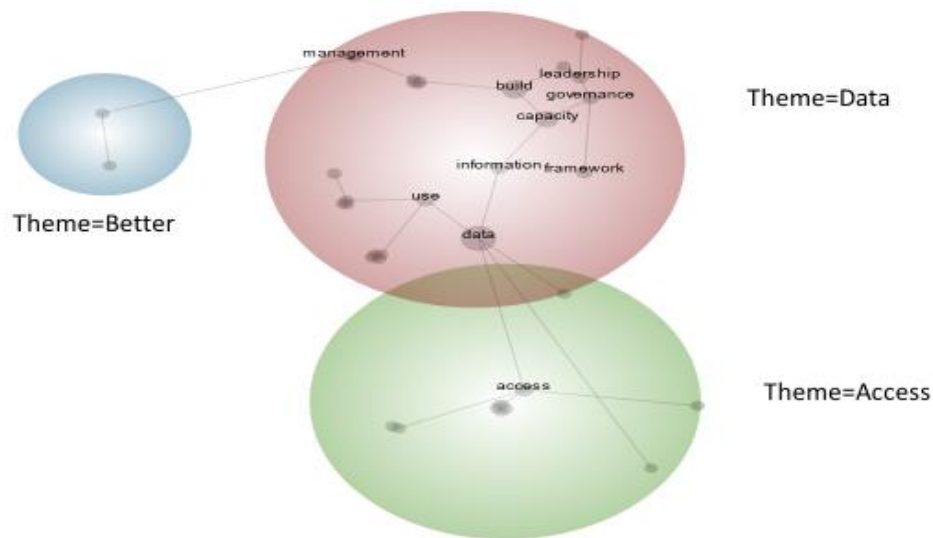
This aligned with the text analysis performed by Sysabee on this same dataset which found concepts related to data management, data strategy, use of data, and data governance appeared most frequently.

With respect to major barriers for the CDO, our manual analysis found that need for training and capacity, lack of resources, and a non-supportive culture around data were most frequently mentioned.
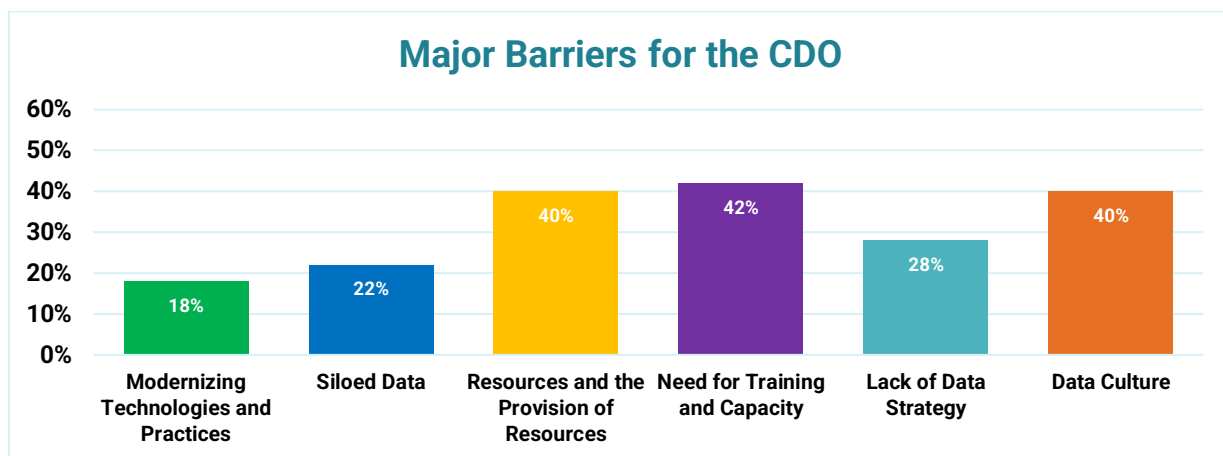
Analysis by our partners using automated text analysis tools also saw data literacy and capacity building related issues identified strongly. Data management also came up frequently in the text analysis. In the Leximancer cluster map below we see the largest focus being on timeliness and achievability, with sub-themes related to resistance to culture change and capacity building highlighted. Themes related to data systems, funding, and security also emerged in this analysis.

Q2. What are the most significant challenges that your department's CDO will face in achieving its goals?
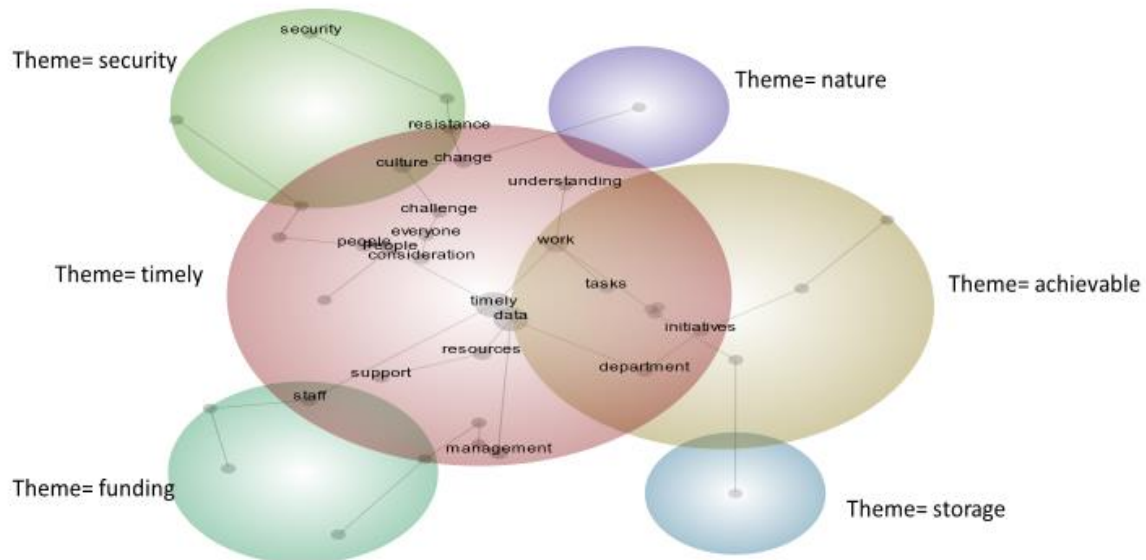
Finally, with respect to the final question on the future of the CDO function in government we see a clustering of themes related to supporting the CDO becoming a center of expertise with the knowledge, resources and access to data to provide support to the department. The text analysis also found a significant number of references to issues involving data management and the strategic use of data assets as being core to the future vision of the CDO.

Q3. What do you believe the future of the CDO function in government should be?

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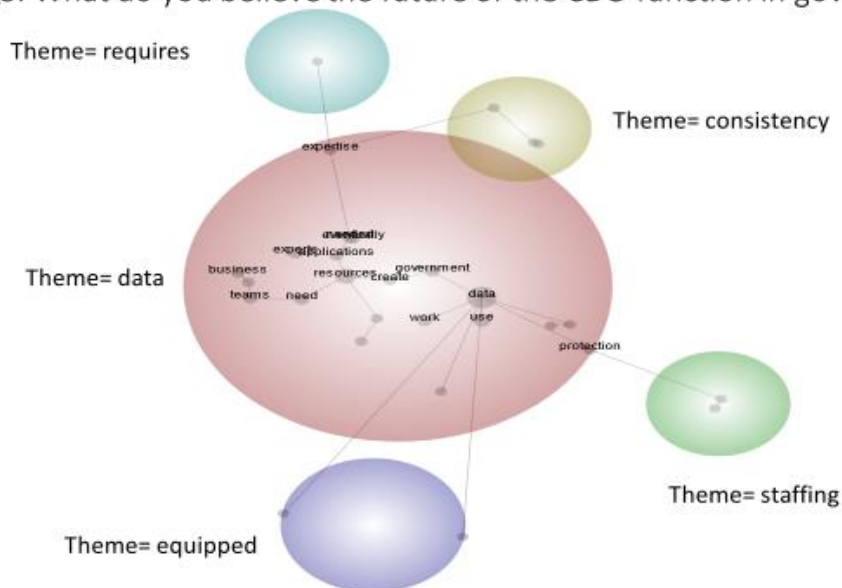
RECOMMENDATIONS

Based on the findings from this study informed by interviews, workshops, and responses to the surveys that were distributed, we have developed ten recommendations for CDOs across the Government of Canada. The recommendations are grouped into three categories that we have called: **Engage, Enable,** and **Evolve.** Selecting the most relevant recommendations for a specific organizational context we believe will improve the effectiveness of the CDO function and support broader digital transformation goals.

ENGAGE

The following recommendations are being proposed in response to the findings of the study that highlighted a lack of broad awareness of the CDO role, the need to strengthen the data culture within departments, and cross-jurisdictional challenges with regards to data sharing. All these recommendations reinforce existing departmental data strategies that were developed in response to the 2018 Data Strategy Roadmap for the Federal Public Service.

CLARIFY AND COMMUNICATE THE CDO ROLE, VISION, AND RELATED GOVERNANCE

Continue to communicate the new role of Chief Data Officer and how it relates to the roles of the Chief Digital Officer and/or the Chief Information Officer. There currently appears to be a low level of understanding across departments of the CDO role, which is not surprising given that it is a relatively new position. Efforts to communicate the CDO role need to be based on an established vision and strategy. They may include ongoing engagement of staff throughout the organization on topics related to digital services and data. This includes showcasing tangible examples of how data is being used across the organization to improve outcomes and sharing case studies to demonstrate how data is currently used in decision making and where it can be improved.

The CDO should have a very explicit description of where and how they engage with existing departmental governance bodies given the level of interest and sometimes confusion as to how this new function fits into existing processes. To this end, it would be beneficial to articulate how key stakeholders are being engaged as well as the development of a community of practice for data practitioners. Key stakeholders can support the establishment of the CDO role. The community of practice can expand the reach of the CDO organization into the program and policy areas of the department or agency. In cases where the CDO is not part of the Chief Digital Officer / CIO organization, governance is required to ensure collaboration and tight alignment

between these highly related roles. In its simplest form the CDO could be a participant in the Chief Digital Officer's management team meetings, complemented by regularly scheduled bilateral meetings. We would also strongly recommend that the CDO be made part of the senior executive committee of their department to ensure that they are able to participate in and influence discussions on all cross-cutting departmental priorities. Of the CDOs surveyed in our study, only 6 of the 9 were currently part of their department's senior management committee.

A final consideration is the relationship between the CDO and the Strategic Policy Branch. This can be reinforced by structure or governance. This is discussed further in the Evolve recommendations.

MEASURE, DEMONSTRATE, AND CAPTURE THE VALUE OF DATA AND ANALYTICS, INCLUDING AGGREGATED DATA

The CDO can help to demonstrate the value of aggregating program, scientific, and economic data in a departmental view. This will encourage horizontal data sharing and collaboration. If it does not exist already, the CDO should start with one program to demonstrate how an aggregate view can be presented in a dashboard with some capability to drill down into real-time or near real-time data. This should include building out a well-designed data pipeline to support the dashboard presentation layer as an exemplar data and analytics system.

One of the other important ways to demonstrate the potential of data-informed leadership would be to create and maintain a dashboard for the Chief Data Officer role that can be used for performance measurement on an ongoing basis. This will serve as an important focusing tool for prioritization within the CDO team and serve as a model of a program dashboard that could be adapted elsewhere in the organization.

The creation and maintenance of the CDO dashboard can also have a useful benefit of a form of what is sometimes in the tech sector called "dogfooding" – the practice of using one's own products or services to gain insights on real-world challenges and opportunities (i.e. eating one's own dogfood). This experience can help the CDO team to better understand the constraints and possibilities of data-driven decision-making within the department and build increased levels of empathy and hands-on understanding for the needs that must be supported for various business lines.

As a consistent reminder of the importance of evidence-based decisions, and the infrastructure needed to support this way of working, we recommend that the department adopt a standard template for all presentations, briefings, or reports going to relevant governance committees that would identify:

1) What data was used to support the recommendation?

2) What is the source of the data?

3) Level of effort involved to acquire and prepare the data?

4) What analytical tools were used with the data?

We would also recommend that the information from these templates be regularly collected by the CDO as an important data source for tracking progress and barriers to adopting a data-driven operating model across their department.

The value of aggregating data was a recurring theme in the interviews and workshops. This was true for the pockets of scientific data within departments, the aggregation of data across departments, and the value of aggregating data across jurisdictions. Given the capacity of CDOs and others in the data value chain, a caution was raised about ensuring that the effort needed to provide aggregated data should only be pursued where there is a real benefit and return on investment. There are also legitimate concerns about potential negative impacts that can arise from the power of aggregated data and having a clear understanding of the ethical implications in this regard was raised as an important consideration – particularly for public institutions.

A secondary challenge with data aggregation that was raised was the timeliness of the data. Timely aggregation at a national level is challenging and sometimes not necessary. Health data, safety data, economic data, and climate data are examples of where having a national and international view in near real-time is very important. The recent efforts to aggregate data related to the pandemic to inform public health advice provides valuable lessons for Canadian governments to build on.

IMPROVE DATA SHARING BETWEEN DEPARTMENTS AND JURISDICTIONS TO UNLOCK VALUE FOR CITIZENS

The recent COVID-19 crisis has underscored one of the challenges with regards to using data to make decisions and inform public policy outcomes, namely the fragmented nature of data that is held by different organizations and different levels of government. This was a theme that came up repeatedly in our interviews and workshops as being a major limiting factor for effectiveness in data-driven interventions. While some of these barriers to data sharing can be attributed to organizational culture, others have a foundation in policies and laws.

We would strongly encourage leaders and policymakers to take advantage of the window of opportunity coming out of the pandemic where attention has been put on these issues to try to move forward on greater data sharing capacities in the public sector in general. To support this, we propose that a working group be established under the guidance of the Federal CDO Council focused on Federal/Provincial/Territorial/Indigenous (FPTI) data sharing with a mandate to increase the level of horizontal alignment at the federal level. In parallel, a cross-

jurisdictional forum for data sharing could be established based on the model of other FPT Councils (i.e. PSCIOC the Public Sector CIO Council or PSSDC the Public Sector Service Delivery Council). The role of municipal governments should also be actively considered as part of these cross-jurisdictional forums given the valuable data collection and analysis that they perform. In addition to bringing together government jurisdictions to improve data sharing, we believe there is also a need to engage external stakeholders including industry and academia. Opportunities to bring these stakeholders into existing or new governance bodies should be explored in tandem.

Improving data sharing will require an incentive-based approach to these issues to ensure that all parties are motivated to participate. It will likely require work on identifying and modernizing laws and policies that are creating barriers to data sharing between organizations and jurisdictions. At the same time, privacy concerns when aggregating data must be considered, particularly in sensitive areas such as health. We believe that there are approaches that can accommodate this and finding the right balance will be important, as the ability in some cases to quite literally save lives through real-time data sharing must be weighed against the risk of causing harm when such data is misused. The current work on a Pan-Canadian Health Data Strategy could serve as an illustrative example for cross-jurisdictional collaboration in other domains.

ENABLE

The following recommendations are focused on foundational enablers that are required to better achieve the goals of departmental data strategies. These were informed by the results of the study which found that there was a lack of consistent focus on core data management functions, in part exacerbated by insufficient funding, infrastructure and tools, and skills development and recruitment of data expertise.

PERFORM THE CORE FUNCTIONS OF GOOD DATA MANAGEMENT

Along with ensuring data governance and stewardship, the core functions of the CDO include master data management with consistent vocabulary and data definitions, providing a data catalogue, and data quality assessments as well as enabling the protection and sharing of data as needed. This then allows data to be used as an enterprise asset. Performing these core functions provides the foundation for confidence in the data. They underpin all other aspects of the CDO contribution to the organization. They were consistently included as key activities in the CDO job descriptions and data strategies that we reviewed.

Whether data analytics should be considered a core function of the CDO is still open to some debate. The core functions described above are the enterprise-wide role that is needed to understand the business at a strategic level but does not necessarily need to be embedded in individual business lines. Analytics on the other hand benefits from

being embedded very close to the work of individual business units. This can be achieved by distributed data teams supported by a CDO led community or practice as described in the recommendation in the Evolve section below related to embedding data teams.

DEFINE AND RESOURCE A LONG-TERM AND PREDICTABLE INVESTMENT PLAN FOR DATA RELATED INFRASTRUCTURE AND TOOLS

One of the challenges that has surfaced throughout the study has been the difficulty in ensuring that employees have access to the tools and infrastructure that they need to be able to properly collect, manage, analyze, and present data in ways that will benefit their work and mandate. Both internal stakeholders and the CDO office suggested moderate to low levels of satisfaction with the existing suite of data tools available to them in their responses to the survey for the study – 4.9 out of 10 for Internal Stakeholders and 4.5 out of 10 for the CDO Office.

We recommend that meeting infrastructure and software needs related to data be prioritized with the goal of ensuring that all employees have access to the tools and data they need to do their job effectively. This may include increased use of cloud-based data management services and allowing greater use of open-source analytics tools by data professionals in the department.

Departments should put in place ways to measure progress against this on a regular basis and adjust course as needed, particularly based on user-feedback from employees. This should also be prioritized in departmental engagement with Shared Services Canada to ensure access to infrastructure – particularly cloud-based data infrastructure.

Anecdotally, we heard that teams sometimes rely on infrastructure and tools from third-party stakeholders that they are collaborating with, such as Universities, to have access to the capacity that they need. While we applaud the entrepreneurial spirit behind these approaches, we are concerned that in the longer-term the department's ability to make use of data will be impacted if it does not have direct access to the infrastructure and tools it needs. Moreover, not providing employees with the tools that they need to do proper data analysis can lead to frustration, sub-optimal work outcomes, and can be a retention risk for data specialists in the department.

ADDRESS THE FUNDING MODEL FOR THE CDO AND DATA-DRIVEN PROJECTS

Given how fundamental data is to departmental mandates, a recurring theme that came through in the study was that in general support for data activities was underfunded across the GC. The first requirement is to ensure that the CDO organization has a critical mass of resources available. As presented in the Key Findings section of this report, existing CDO budgets ranged from about 0.1 percent to 2 percent of the

departments operating budget. While the mandate and context of the CDO role will impact the resources allocated to it, it was apparent that less well funded CDOs were struggling to achieve progress against the goals of their departmental data strategies.

The second aspect of this challenge is considering how projects and programs are funded to ensure that the data collection, processing, and analytical needs are met. While modern government programs are dependent on a strong data component, the cost and resource implications of data are not always considered in the planning and budgeting process.

We recommend that departments put in place a methodology to specifically identify and fund data related needs – both technical and human resources specifically related to data - as part of governance. In cases where new programs are funded centrally through budget or Treasury Board submissions, we recommend that specific budget allocations to support data be incorporated into these submissions.

Addressing funding is of even greater importance in the current context of the forthcoming Strategic Policy Review announced in Budget 2022. As the government looks for areas to find efficiency and improved effectiveness in a post-COVID recovery context, the core roles of data and digital to the future of a modern public service need to be highlighted and championed. If data and digital is seen simply as a cost-center, there is a real risk that decisions made in the coming years will hamper the Government of Canada's ability to modernize and support the ambition of becoming a data-driven organization.

BUILD DATA COMPETENCIES AND ESTABLISH PROGRAMS TO DEVELOP THEM THROUGH RECRUITMENT AND TRAINING

We recommend developing a tiered data competency model to meet departmental needs. This should be pursued in collaboration with Statistics Canada and the Canada School of Public Service who have begun work in this area. The model could look like the following:

- **Tier One:** Competencies that all public servants in knowledge-based jobs require– e.g., basic numerical and data literacy, including understanding types of data and common data sources, typical uses for data, ethical use of data and some basic data manipulation and transformation techniques using a common tool like Excel.

- **Tier Two:** Competencies that regular users of data require – e.g., use of more powerful data analysis tools, basic knowledge of relevant scripting languages, business intelligence, statistical and data visualization techniques, data storage,

data management and proper data governance processes, and more advanced ethical considerations on the use of data (e.g., sources of bias in data).

- **Tier Three:** Competencies that data experts require – e.g., advanced statistical modelling, knowledge of algorithms and programmatic approaches for data manipulation, transformation and analysis, software and infrastructure requirements for data projects including data engineering, data architectures, machine learning and other artificial intelligence techniques, APIs and semantic integration between data systems.

The CDO can facilitate access to training to achieve progress in the three competency levels and ensure that funding is allocated in training budgets. If data is to truly be everyone's responsibility in the department, building data competencies must be a priority.

This three-tiered model can be supported by including data competencies in learning plans and performance agreements. They could be made mandatory for data-focused positions and included as assets for all roles. As a starting point, existing learning resources developed by Statistics Canada and the Canada School of Public Service can be more widely leveraged to support foundational data competencies.

Departments should also participate in government-wide efforts to attract and retain "Tier Three" experts. The emerging work from anywhere model opens the opportunity for more recruitment partnerships with academic institutions across the country. Smaller universities in cities like Halifax, Sherbrooke, and Regina may provide the greatest opportunity. Interns and recent graduates may prefer not having to relocate for their employment.

As a retention strategy, we strongly recommend embedding data experts in business lines where they have high affinity and will get intrinsic rewards from seeing the benefit that their work is bringing to societal outcomes.

EVOLVE

The following recommendations support the longer-term evolution of the CDO function within Government of Canada departments. They follow from issues that surfaced during the study related to organizational design, operational models, and the current roles of the CDO, with the intent of clarifying and strengthening the CDO's ability to achieve their vision and mandate.

EXAMINE THE LONGER-TERM EVOLUTION OF THE CDO POSITION WITHIN GC ORGANIZATIONS

Currently the CDO position in most government departments is closely tied on an organizational basis to that of the departmental Chief Information Officer or Chief Digital Officer. It is anticipated that this trend will increase given the emerging direction from central agencies. This is in our view a natural evolution as organizations move to better consolidate and support their digital and data functions. However, it is not without its own set of risks and disadvantages, chief amongst them that by being housed within a technology-focused organization, CDOs may find that the natural focus of the organization is on the data engineering aspect of the data pipeline, rather than analysis and analytics.

As the CDO role matures, we would encourage an evolutionary model rather than a static one. Just as the CIO role in government departments has evolved over the past two decades to move from being largely a back-office support function to now playing a much more strategic role around the senior management table, we believe that the CDO will need to have a similar evolution. As departments invest more resources into the creation, management, and use of data in their organizations, over time it may make sense for CDOs to become a separate entity that has a direct seat at the management table as a peer to their Chief Digital Officer colleagues. We believe that these two roles and areas of activity are large enough, complex enough, and distinct enough that they may become organizationally separate after what we might characterize as an incubation period together.

We also note that the scenario of a joint-reporting relationship for the CDO currently exists in some of the departments we studied. As outlined in the Key Findings section of this report, a joint reporting relationship has been put into place for the CDO between the technology and policy branches of the department. The linkage between these two parts of the organization is very important as it relates to the role of the CDO, and we would encourage CDOs who are part of the digital function within their department to ensure they have some type of formal connection through structure or governance with the strategic policy function, and vice versa.

In addition, in our research and interviews, the concept of a Chief Analytics Officer has come up repeatedly. In the private sector there has been a move in some organizations to create a Chief Analytics Officer role that is distinct from that of the Chief Data Officer. Whereas the CDO will naturally focus on issues of data management and systems, including policies and governance, a Chief Analytics Officer will be more focused on extracting value from data to directly support the needs of individual business lines as well as strategic decision-making by the organization as a whole. Currently most CDOs also have some level of an analytics function within their teams at varying levels of maturity. However, we do see the skill sets and approaches between these two ends of the data pipeline to be quite different in many respects. As CDOs continue to evolve, we would encourage them to consider at what point the creation of a separate Chief Analytics Officer role might make sense.

EMBED DATA TEAMS IN PROGRAMS AND BUSINESS LINES

The approach that some departments have started to take is to create data service teams that are embedded in business units. In addition to providing needed capacity for different areas of a department, this approach has benefits with respect to recruitment and retention of data specialists. This approach also has elements of the emerging DevOps model, converging development and operations, that has been demonstrated to be more agile and responsive in highly operational contexts.

However, there are several critical risk factors regarding the potential success of this model. Prominent amongst these are the technical risks around capacity and information technology. In our interviews and workshops, it was suggested that more flexibility around IT, HR, Procurement, and Legal Services, would enable greater innovation. Ongoing support from their departmental colleagues leading these internal services functions, particularly the Chief Digital Officer and/or CIO, will help to ensure success of embedded data service teams.

It should also be noted that while taking a distributed approach to embedding data teams is recommended, there is still a central role that CDOs should play in fostering a community of practice among data practitioners. While putting data specialists close to the business is a positive move operationally and from a recruitment and retention perspective, there is also value to be gained by ensuring that they remain connected to others working in their profession. We recommend the CDO consider how to provide professional networking and learning development opportunities on a regular basis amongst the data services teams while they are on "tours of duty" in specific business lines. Action Learning provides one model that would work in this context.

CLARIFY ROLES FOR THE CDO RELATED TO INFORMATION MANAGEMENT AND OPEN DATA AND TRANSPARENCY INITIATIVES

While we referred to the evolution of the CDO role above, we would like to call specific attention to their role as it relates to Information Management and Open Data. Information management has traditionally been focused on recordkeeping to meet both business needs as well as statutory obligations (e.g., Access to Information requests). Unstructured and qualitative data is however an incredibly important asset to the mandate of all government organizations. This is particularly true as government departments align themselves with the Government of Canada Digital Standards that put increased focus on human-centered approaches to program and product development which often rely on qualitative data gathering. This qualitative input to government plans, programs and policymaking also needs to consider traditional forms of Indigenous knowledge. Fortunately, advances in Artificial Intelligence and machine learning mean that qualitative or unstructured data may be more readily used as an input to government decision-making. We have an ever-increasing ability to process,

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analyze and understand large amounts of data in a variety of formats and structures. Until recently, this was infeasible at the required scale.

Essentially, the same things that need to be done with structured data need to be done in the IM realm with semi-structured or unstructured data, records, and documents. These include defining an information architecture, facilitating sharing, enterprise-wide reporting, developing metadata standards, integrating program, scientific, project, and administrative information, and providing tools that can find, analyze and manage information. We expect that emerging guidance from TBS on how IM functions should be structured and governed within departments will reenforce this information and data management synergy.

While Open Data scored low on the ranking of priorities by stakeholders and the CDO in our survey, we see this as an important enabler of both interjurisdictional data sharing and broader government transparency objectives. While the federal open data initiative is now over a decade old, it has in our view received less emphasis in recent years. Sharing more data publicly will require data management and cleaning practices that will ensure that shared data is of good quality for use both inside and outside of the department. More open data will also expose the department's data assets. The study's survey found only a moderate level of understanding of data assets by all stakeholders. Protection of personally identifiable and commercially confidential information is essential to maintaining trust in this context as is legal compliance and policy alignment.

There is also an important role that science-based departments can play with regards to encouraging open data in the scientific research domain. Scientific publications are often behind "pay walls" making them much less accessible. Reducing or eliminating the pay walls would improve access to the broader community of researchers and the public. Open access could provide important benefits to society at large. Health Canada's Open Science Action Plan is a good example of how government departments can approach this challenge.

ANNEX 1: METHODOLOGY

As illustrated below, the study methodology consisted of three online surveys, five interviews for each of the four participating departments (TC, AAFC, HC, and PHAC), two workshops per department, the development of a separate report for each of the four departments and two presentations of the results to each department. All the work from these four separate departmentally focused reports then fed into the creation of this public consolidated report that has been published by the Institute on Governance.
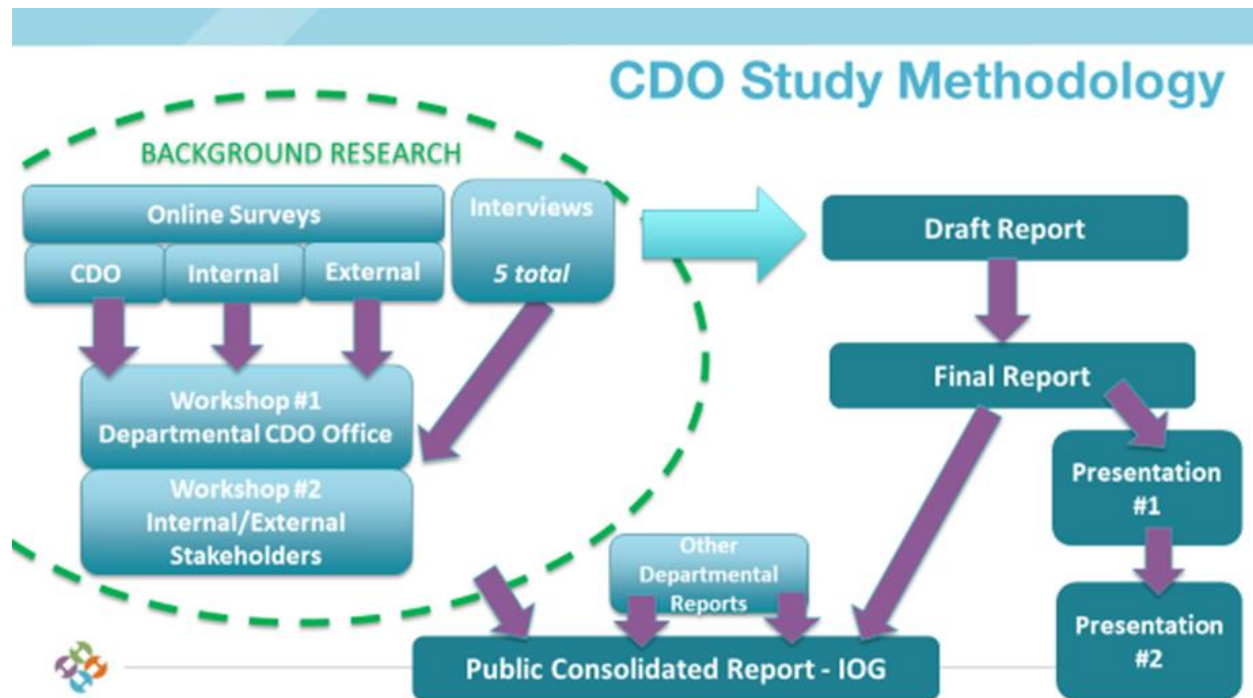
In collaboration with all four participating departments, the Institute on Governance developed three separate bilingual surveys as part of the study. The surveys were developed for three distinct target audiences: External Stakeholders, Internal Stakeholders, and CDO organizations. The following table shows the overall number of respondents to the three surveys.

Survey Type	Total Respondents
CDO Office	9
Internal Stakeholders	78
External Stakeholders	9

It should be noted that in many cases, multiple staff from the office of a senior official who received the survey would have contributed to a consolidated response (particularly in the case of the CDO offices) thus the total number of surveys received are comprised of input from potentially a significantly larger number of individual contributors.

Given the methodology and sample size it is important to note that the survey results should not be considered a representative sample of the views of stakeholders. They should be viewed as indicative of areas that may warrant further exploration, in combination with the other sources of information in this study.

In parallel with the survey, interviews and workshops were held with key stakeholders from each of the four participating departments. Overall, 20 interviews were conducted across the four departments participating in the study, comprising 30 individuals. The full list of stakeholders interviewed or participating in workshops can be found in Annex 3.

A total of seven virtual workshops were held with key stakeholders from departments. Each of these sessions provided an opportunity to share results from the surveys, to explore key themes in this report, and to solicit feedback from the participants. Breakout discussions on key themes from the study helped to inform and validate the conclusions in this report. We were pleased that one of the workshops was conducted jointly including participants from Health Canada and the Public Health Agency of Canada, allowing an opportunity to explore the close linkages and opportunities for synergy between the CDO offices in these two departments.

Over the course of the study, we also met with officials from the Privy Council Office, the Canada School of the Public Service, and the Treasury Board Secretariat Office of the Chief Information Officer. We were invited in February 2022 to make a presentation to the Chief Data Officer Council to describe the study and share some early findings. We also held monthly progress and feedback meetings with all four participating departments and agencies which typically included the departmental CDO and key members from their team. These engagements helped support the methodology of our study and provided stakeholder input and feedback on an ongoing basis as our work progressed.

The process of developing the surveys, reviewing the survey responses, participating in the interviews, and engaging in workshops all contributed to a valuable exploration of the Chief Data Officer role across the four departments that participated in the study. We believe that the exploratory methodology used for this study was as beneficial to participants as the reports which provide our written observations and recommendations.
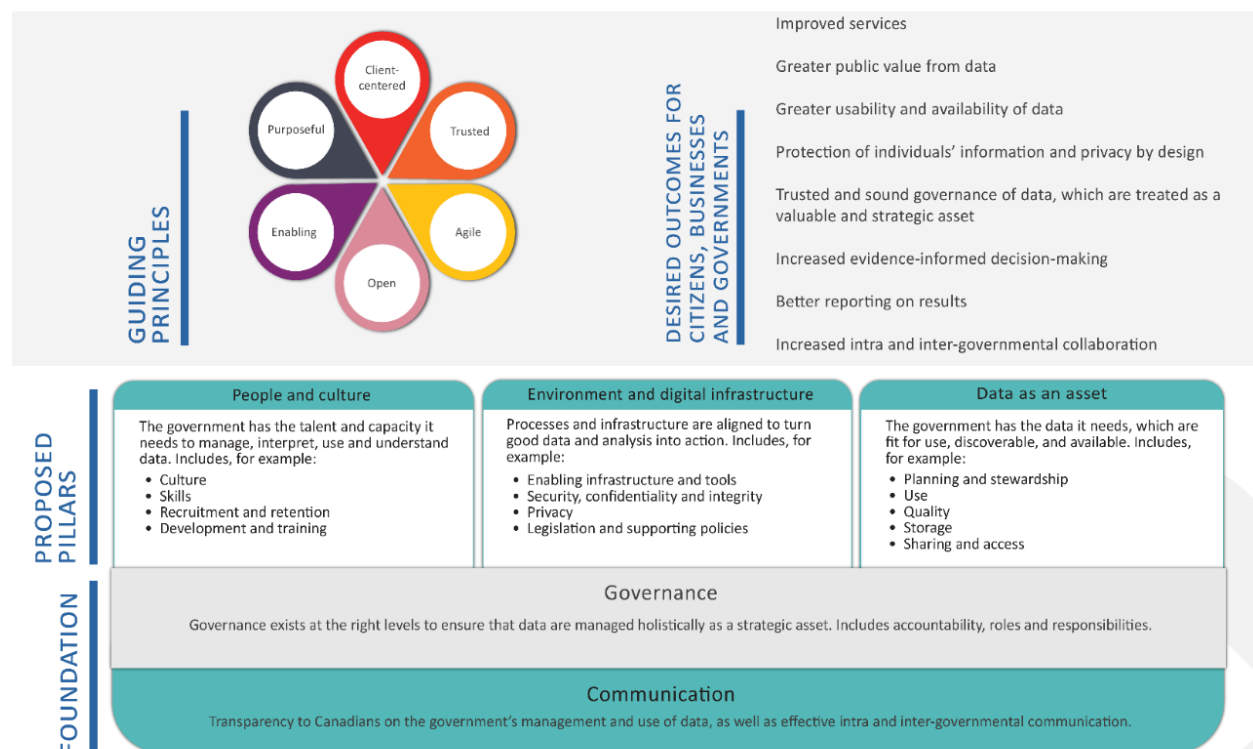
ANNEX 2: SUMMARY OF WORKSHOPS AND INTERVIEWS

The workshop and interview observations are presented as they relate to five dimensions of the 2018 Data Strategy Framework for the Federal Public Service. These are the three pillars of People and Culture, Environment and Digital Infrastructure, and Data as an Asset, as well as the two foundational elements of Governance and Communications. This framework, including the guiding principles and the desired outcomes, was well presented in the Data Strategy Roadmap for the Federal Public Service as illustrated below.

DATA STRATEGY FRAMEWORK FOR THE FEDERAL PUBLIC SERVICE

A whole-of-government approach to creating, protecting, using, managing and sharing data as a strategic asset, enabling informed decisions that lead to better outcomes and services for Canadians

GUIDING PRINCIPLES: Client-centered, Purposeful, Trusted, Enabling, Agile, Open

DESIRED OUTCOMES FOR CITIZENS, BUSINESSES AND GOVERNMENTS:
- Improved services
- Greater public value from data
- Greater usability and availability of data
- Protection of individuals' information and privacy by design
- Trusted and sound governance of data, which are treated as a valuable and strategic asset
- Increased evidence-informed decision-making
- Better reporting on results
- Increased intra and inter-governmental collaboration

PROPOSED PILLARS

People and culture	Environment and digital infrastructure	Data as an asset
The government has the talent and capacity it needs to manage, interpret, use and understand data. Includes, for example: • Culture • Skills • Recruitment and retention • Development and training	Processes and infrastructure are aligned to turn good data and analysis into action. Includes, for example: • Enabling infrastructure and tools • Security, confidentiality and integrity • Privacy • Legislation and supporting policies	The government has the data it needs, which are fit for use, discoverable, and available. Includes, for example: • Planning and stewardship • Use • Quality • Storage • Sharing and access

FOUNDATION

Governance
Governance exists at the right levels to ensure that data are managed holistically as a strategic asset. Includes accountability, roles and responsibilities.

Communication
Transparency to Canadians on the government's management and use of data, as well as effective intra and inter-governmental communication.

Please note that many of the following observations relate to multiple elements of the framework. We have tried to present them where they fit best. As well, the observations are sometimes in the form of direct quotes, but in most cases, we have consolidated and paraphrased them for the report.

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People and Culture Observations

The feedback from interviews and workshops on People and Culture included:

In all cases the most senior people that we engaged with were very supportive of the CDO role and the importance of data to their organization. This was clearly stated by one Deputy Minister who said, "Good data is core to us, to be a good regulator to understand safety, to make good policy."

Some enthusiastic study participants shared their thoughts that, "Data is everyone's responsibility!", "We want to help our stakeholders to understand the art of the possible, imaginative power"," "We're really excited about the future; it's just not coming fast enough."

Additional comments and suggestions about people and culture, primarily touching on data literacy, culture and capacity, from the interviews and workshops include:

"It's amazing to talk about supporting data literacy. It's amazing to talk about visualization. But sharing my own experiences, we don't have the foundations right now to support that."

Continue to support data literacy. We all agreed that there's a foundational skill set that should be enabled, supported, developed, perhaps, start baking that into the asset criteria for statement of merit criteria, to start incentivizing a trajectory towards a more data literate public service.

Adopt a tiered competency model where everyone needs baseline competencies, analysts require more, and data scientists require the most competency. Data literacy, it's understanding the risks and benefits and the context of the data having the skill set to manipulate that data and having the ability to accurately convey that data to a variety of audiences.

Deploy embedded multi-disciplinary teams to respond quickly to a data need, learn and move on. Prefer not to take five years mapping out everything within the ecosystem and then start executing. Much prefer more of a let's grab a use case that demonstrates value and learn approach.

Shift the Corporate Culture to bring data from all programs and modes together, connect the silos of excellence.

Building capacity through university recruitment. Half of the team's effort is recruiting and developing people that ideally will go into program areas. Collaborating on a GC Data/Digital Talent Hub.

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There's nothing like a notation in a performance agreement to get people to think about how to measure something and report on it. Could include something like capture and share complete, interchangeable, quality data.

Environment and Digital Infrastructure Observations

Most departments and agencies have a fairly large technical debt in legacy infrastructure and applications. Something needs to be done to address this so that we can reinvigorate or re-establish the trust in the data.

There's a perception that we're doing it, but we're not funded to do it properly. e.g., The corporate Geographical Information System (GIS) initiative is running on a shoestring.

The "Cloud" presents an opportunity for data storage and consolidation, but it is not easy to get there. The CDO can help to make this happen.

Due to the enhanced role of technology in the way we work there could be new opportunities right now that didn't exist six months ago. Data policy should also include getting into the cloud and adopting emerging technologies like real-time data capture, AI and machine learning. They're coming faster than some people suspect.

New ways of collecting and sharing data were identified. Satellites, drones, and sensors (Internet of Things) are providing an opportunity for data collection that could be used to reduce the burden of data provision on industry and on other jurisdictions. The data can be shared back to other jurisdictions and industry to improve transparency, trust and reciprocity. e.g., How will we collect and make effective use of real time data from autonomous vehicles?

Data as an Asset Observations

"From a maturity perspective, we really need to up our game in data management." The need for confidence that data is properly managed includes master data management, data cataloguing and the interoperability API's. The desired outcome is that data moves smoothly with full business line awareness while confident that data is managed, secure and available.

Creating an enterprise view of data assets and aggregating data to support policy development and program delivery were identified as desired outcomes.

Many interviewees and workshop participants acknowledged the tension between data sharing and privacy. Concern was expressed that we may be overly cautious with regard to privacy. It's easier to just not share data so we don't have to consider privacy and quality issues. Several interviewees felt that we needed to flip this around with more emphasis on the "Open by Default" model where only data that really requires privacy, or other restrictions, is not made accessible.

This was even more evident in some of the science interviews where concerns for open data and open science were expressed. The potential for aggregating data silos came up again in this context. [Health Canada's Open Science Action Plan](#) and Agriculture and Agri-Food Canada's collaborative [Drought Watch](#) initiative were cited as leading thinking and practice in this regard.

Timeliness of data – can we get to real time data? One interviewee described "data nirvana" as being able to spot trends in real time using patient data captured by doctors as they record symptoms and diagnose illness. A data triggered flag identifying the increased incidence of E. coli in the people of Walkerton in 2000 was given as a specific example of where an integrated, data-driven public health surveillance system would have made a difference. Unfortunately for the people that became sick and the seven that died in that instance, we did not have this system. We still do not have it.

Three other data as an asset comments from the interviews touch on data sharing and international standards:

CDOs have a role to really come in to say actually sharing data is the imperative. We have to find a way to do that while we are protecting information.

"The department is data rich, but people can only find their own stuff."

International collaboration determines many scientific data standards (e.g., satellite data)

Governance Observations

The first five comments relate to Departmental Governance and include a bias for action and thoughts on the business case for the investment:

In most cases the consolidated model, with the Chief Digital Officer and Chief Data Officer, in the same position or the same organization has been adopted. The model seems to be working well. "Our vision of transformation combines service, data, digital and change. It's much easier when they are under one person's responsibility." Where the consolidated organizational model has not been fully adopted, governance is being developed to ensure alignment.

The recurring concern that we heard regarding the consolidated model was the risk that technology and "hot" visualization techniques would override the fundamentals of good data management.

Regarding governance for the CDO function, the preferred model is to have CDO representation on existing governance bodies. This ensures that data related concerns and opportunities are considered without creating additional committees.

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Start putting stuff in motion. Get some things in front of people including the work on the data governance, the steward network and all of these foundation pieces. Much of this has been thought through and just needs to be familiarized.

By virtue of having a catalogue of all the data assets, by being clear what the policies are in the organization and knowing who's accountable for doing what, you can save every employee three hours a week. You multiply three hours a week times several 100 employees times 52 weeks a year. You have now paid for your group.

The next block of comments is related to governance at a Federal Government and Cross-Jurisdiction level:

The need for a horizontal governance body at the federal level is clear and supported.

While cross-jurisdictional data sharing came up frequently in the interviews and workshops, we did not find consistent cross-jurisdictional governance. Statistics Canada's engagements, the recent push for epidemic related data and the Pan-Canadian Health Data Strategy provide models for collaboration.

There are difficult design issues in our federated policy framework around anticipating what information will be needed and how best to collect it. In several sectors, including health, the information is almost universally a provincial responsibility. That becomes part of the challenge.

We've figured out through a lot of different initiatives, how to share information in a way that respects privacy and other requirements. We do it under interprovincial intergovernmental agreements.

Consider indigenous OCAP Principles: Ownership, Control, Access, Possession

Building on a suggestion to put cross-jurisdiction data sharing provisions into regulations and legislation the half serious suggestion was made to revisit the constitutional distribution of powers. Is what made for an acceptable agreement in 1867 well suited to our federation in 2022? While this observation is extreme, the spending provisions for the federal government can be and have been used to influence the cross-jurisdictional sharing of data that is of national interest to the benefit of all jurisdictions.

The final two comments relate to evolution of the CDO role into the future:

Continuously review and evolve the role of the CDO including clarifying the role of the CDO related to Information Management and Open Data.

Examine the longer-term evolution of the CDO position within GC organizations

- Should the CDO eventually become a separate ADM-level function that sits parallel to the Chief Digital Officer, not under it?

- Does a Chief Analytics Officer function get developed that is separate from the CDO?

<u>Communications Observations</u>

The feedback from interviews and workshops on Communications included:

Continue to refine and communicate Chief Data Officer governance and roles and their relationship to the Chief Digital Officer.

The CDO team has a literacy and communication function, they have a policy function, and they have an interoperability function.

Communicate in order to affect the appropriate governance of the data asset itself. This includes the policies used to assert the quality of those assets, the policies used for access to those assets, and policies used to ensure the protection of those assets for privacy and security.

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ANNEX 3: ACKNOWLEDGEMENTS

We appreciate the contributions of the interview and workshop participants from the four departments that participated in the study:

Agriculture and Agri-Food Canada (AAFC):

1. Elise Legendre - Chief Data Officer

2. Vidya ShankarNarayan - Assistant Deputy Minister, Information Systems Branch

3. Claudette Moise - Senior Advisor

4. Natasha Kim - Assistant Deputy Minister, Strategic Policy Branch

5. Paul Samson - Associate Deputy Minister

6. Chris Forbes - Deputy Minister

7. Kimberly Saunders - Chief Audit and Evaluation Executive

8. Shelley Monlezun - Director General, Strategic Management

9. Gilles Saindon - Assistant Deputy Minister, Science and Technology Branch

10. Liz Foster - Associate Assistant Deputy Minister, Science and Technology Branch

11. Susan Robertson - Acting Data Evangelist

12. Mark Tremblay - Acting Director, Data Management and Infrastructure

13. Katherine Neufield - Senior Data Policy Analyst

14. Granda Kopytko - Evaluator

15. Paul Normore - Acting Manager

16. Alexandre Parent - Team Leader, Office of Intellectual Property and Commercialization

17. Brad Hurd - Science Policy Analyst

18. Etienne Lord - Researcher, Digital Agronomy

19. Heather Cole - Biodiversity Data Manager

20. Isabelle Perron - Data Management Specialist

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21. Mitch Wensley - Associate Director, Economic Analysis Integration Section

22. Louise Pageau - Director, Digital Services and Innovation

23. Ryan McCullough - Manager, Systems, Data and Analysis Unit

24. Philippe Couroux - Manager, Science Solutions

25. James Ashton - Agri-Geomatics Manager

26. Rodrigo Ortega Polo - Bioinformatics Programmer

27. Stephen Duff - Chief Economist, Ontario Ministry of Agriculture, Food and Rural Affairs

Public Health Agency of Canada (PHAC):

1. Rhonda Kropp – Vice President, Corporate Data and Surveillance Branch

2. Christopher Allison – Chief Data Officer and Director General, Data Management, Analysis and Innovation

3. Patrick Lagioia – Director, Data Policy, Strategy and Governance

4. Scott McKenna – Chief Information Officer for HC and PHAC

5. Shelley Borys – Director General, Evaluation and Chief Audit Executive

6. Candice St-Aubin – Vice President, Health Promotion and Chronic Disease Prevention Branch

7.   Lianne Ouellette – Manager, Data Strategy

8.   Adam Probert – Senior Epidemiologist

9. James Taylor – Chief Dental Officer

10. Dana Paquette – Director (Acting), Centre for Corporate Surveillance Coordination

11. Allen Brown – Director – Surveillance Systems and Data Management

12. Eric Sutherland – Executive Director, Pan-Canadian Health Data Strategy

13. Dr. Howard Njoo – Deputy Chief Public Health Officer

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Health Canada (HC):

1. Gillian Dawson - Director, Chief Data Office

2. Raman Srivastava - A/Assistant Deputy Minister and Chief Data Officer (VP HR at CFIA)

3. Charles Kemp - Senior Analyst, Corporate Services Branch

4. Scott McKenna - Chief Information Officer for HC and PHAC

5. Stephen Lucas - Deputy Minister

6. Heather Jeffrey - Associate Deputy Minister

7. Pierre Sabourin - Assistant Deputy Minister, Health Products and Food Branch

8. Shannon Laforce – Executive Director, Transformation and Business Informatics, Health Products and Food Branch

9. Shelley Borys – Director General, Evaluation and Chief Audit Executive

10. Christopher Pollard - Director, Data Division, Office of the Chief Data Officer

11. Christine Minas - A/Executive Director, COVID-19 Task Force

12. Kayle Hatt - Analyst, Canada's Workforce Health and Safety, COVID-19 Task Force

13. Michael Mackinnon - A/Director General, Policy, Governance and Strategy

14. Kayle Hatt – Analyst

Transport Canada (TC):

1. Teresa D'Andrea - Director General, Service & Data Modernization

2. Raj Thuppal - Chief Digital Officer and Chief Data Officer

3. Michael Keenan - Deputy Minister

4. Arun Thangaraj - Associate Deputy Minister

5. Jim Lothrop - Director General, Innovation Centre

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6. Christian Dea - Chief Economist and Director General of Transportation and Economic Analysis

7. Kentia Dazulma - Executive Director, Data Strategy, Governance and Policy

8. Paul Nicholas - Manager/ Senior Policy Advisor

9. Julie Edwards - Manager, Resources and Management Services

10. Elie El-Hage - Director, IT Business Lines Advisory Services

11. Chantal Ayotte - Manager/ Senior Policy Advisor

12. Rida Al Osman - Executive Director, IT Service Management

13. Aalya Dhanani Essa - Senior Advisor

14. Robert Robinson - IT Director, Software Solutions

15. Kurt Chin Quee - Director General, Financial Ops, Admin Services and Chief Procurement Officer

16. Lori Buck - Director, Motor Vehicle Regulation Enforcement

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ANNEX 4: SURVEY DATA

Three bilingual online surveys were developed as part of this study on the role of the CDO in Government of Canada departments. The surveys targeted the following groups:

- Government of Canada departmental CDO organizations (9 responses total).

- Internal stakeholders in the four departments (TC, AAFC, HC, and PHAC) that participated in the study (78 responses total).

- External stakeholders in two of the four departments (TC and AAFC) that participated in the study (9 responses total).

The three surveys were made available via the online SurveyMonkey platform. The internal stakeholder survey was open for data collection from October until December 2021. The external stakeholder survey was open for data collection from October 2021 until January 2022. The CDO Office survey was open for data collection from October 2021 until February 2022.

Respondents for the internal and external stakeholder surveys were primarily identified and contacted by the CDO offices of the four departments that participated in the study. For the CDO Office survey we engaged with the CDO Council to ensure that CDOs across the Government of Canada were aware of the study and had an opportunity to complete the survey. As the surveys were often distributed to senior officials within departments, in many cases the responses represent the collective views of several members of their team from multiple parts of their organization.

As part of this public report, we are providing access all of the quantitative data that was gathered through these three surveys. This data is being shared in an anonymized format organized according to the three different surveys that were distributed but does not identify specific organizations or individuals. We have chosen not to include the open text responses to the surveys as in many cases these responses may have identifiable information. However, our analysis of the qualitative data can be found in the Key Findings section of this report.

Download CDO Study Survey Data (Excel)

We are also making available for download PDF copies of the survey questions that were asked of the three groups. These can be accessed at the following links:

CDO Office Survey Questions (PDF)

Internal Stakeholder Survey Questions (PDF)

External Stakeholder Survey Questions (PDF)

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ANNEX 5: ABOUT THE INSTITUTE ON GOVERNANCE

The Institute on Governance (IOG) is an independent, Canadian, not-for-profit, charitable institution founded in 1990. From our perspective, governance is concerned with how decisions important to an organization or society are taken. Governance also defines who should have power and why, who should have voice in decision-making, and how account should be rendered.

The Institute has over 30 years of experience in exploring and developing approaches to responsible and responsive governance in Canada and abroad. Our primary goal is to promote and share good practices, through offering solutions and continuous improvements in the capacity of organizations to deliver on their mission. Our work spans several areas related to public governance across Canada and globally.

Effective governance ensures objectives are realized, resources are well managed, and the interests of stakeholders are reflected in key decisions. The Institute has worked with a range of public purpose organizations, including public and para-public institutions, associations and other not-for-profit organizations. We understand that governance arrangements need to be customized to take account of an organization's particular mission, people, culture, traditions, relationships, and other considerations that may be relevant to their unique situation.

The IOG frames its approach to good governance around a set of core principles for public purpose organizations derived from international standards. Within this framework, we work with our partners to help them determine what governance structure, policies and processes will serve them best. At the IOG, we constantly strive to link principles with practice. Through publications, e-learning resources, board evaluation tools and training workshops, we contribute and disseminate information on sound governance practices.

IOG expertise in public sector leadership and skills development

Our large slate of leadership and learning offerings from the flagship Executive Leadership Program to one-day professional development courses provide public service leaders with the skills and competencies they need for the 21st century. Today, our unique programs support the policy and leadership development of Inuit leaders in Nunavut as well as Iraqi leaders overseas, with a focus on women.

The Executive Leadership Program (ELP) is for committed public service executives at the director level who want to hone their abilities to meet the ongoing challenges of a fast-paced working environment and the transformative world of declining social cohesion and trust in public institutions. We also offer leadership programs including: the Digital Executive Leadership Program, the Executive Leadership Program in

Municipal Intergovernmental Affairs, the Leadership Development Program in Science and Innovation, and Stepping into the Executive Cadre.

In addition to five leadership programs, the IOG offers over thirty subscription style one, two or three-day courses, five individual and group assessment tools, executive coaching Services, and course customization. All of our programs give participants the tools to succeed in the ongoing ambiguity and complexity of the public service environment. The leaders explore real challenges and deliver outcomes through experiential collaborative learning projects focusing on ongoing public value. Our expertise is rooted in our innovative leadership practices, ongoing and applied research, and practice-based insights.

The IOG Team Working on the CDO Study Included:

Ryan Androsoff, Associate, Digital Governance   LinkedIn

Ryan Androsoff is the Founder and CEO of Think Digital, a consultancy focused on helping public sector organizations to adapt and thrive in the era of digital disruption. Ryan is an international expert on digital government with a passion for public sector entrepreneurship and more than two decades of experience working with government and international organizations in Canada, the United States, and Europe. Since 2018 Ryan has partnered with the Institute on Governance to lead their digital leadership programs and to provide advisory services to government organizations to assist with their digital transformation efforts.

Ryan was a Co-Founder of the Canadian Digital Service, a startup organization within the federal government launched in 2017 with the mission of helping government design, prototype, and build better digital services. Previously, he had been a Senior Advisor in the Government of Canada's Treasury Board Secretariat since 2010, where he worked on initiatives to improve digital service delivery capacity across the federal government, led the development of the first government-wide social media policies, and managed the GCTools team responsible developing the Government of Canada's first whole-of-government on-line collaborative platforms (GCpedia and GCconnex). In 2015, Ryan spent a year with the OECD's Digital Government Team in Paris, France where he was involved in a number of projects including reviews in Northern Ireland and Slovakia as well as open data and digital capacity building in the Latin American, Middle Eastern and North African regions.

For his leadership and expertise in digital transformation initiatives, Ryan has been recognized by twice receiving the Treasury Board of Canada Merit Award (2013 & 2017), the GTEC (Government Technology Exhibition and Conference) Next Generation Leadership Award (2011), and in 2017 was named one of the 75 most distinguished

alumni of Carleton University's Faculty of Public Affairs. Ryan is currently serving as a member of the Advisory Council of DPI (Association of Public Sector Information Professionals).

Ryan's career has also included serving as a policy advisor to Canada's Minister of International Cooperation, as well as working at the World Bank in Washington, DC on initiatives to promote results-based management in international development. Having also spent a number of years working with political office holders, he has extensive experience as a communications, policy and campaign manager at the national, provincial, and municipal level in Canada. Ryan is a graduate of the Harvard Kennedy School of Government in Cambridge, Massachusetts where he earned a Master in Public Policy degree, with research focused on the impacts for governments of new digital technologies. Ryan also has an Honours degree in Public Affairs and Policy Management from Carleton University in Ottawa.

Peter Bruce, Senior Associate, Leadership and Learning   LinkedIn

Peter Bruce is a Senior Associate for Leadership and Learning at the Institute on Governance. Since 2017, he has been facilitating the IOG's Executive Leadership Program. He also provides advice on digital strategies for government organizations in Canada and internationally.

After 32 years of Public Service at the federal and provincial levels Mr. Bruce retired from the position of Senior ADM Strategy at Shared Services Canada in 2016. During his time in the Public Service, he worked in increasingly complex and interesting roles including VP/CIO/CTO at the Department of Justice, Library and Archives Canada, Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency and as Deputy CIO and Interim CIO for the Government of Canada at Treasury Board Secretariat.

Mr. Bruce also has extensive governance experience collaborating internationally, across Canadian jurisdictions, across the federal government, and with the private sector. He has been the elected or appointed chair of several organizations including the ICA (the International CIO Council), the cross jurisdictional PSCIOC (Canadian Public Sector CIO Council) and DPI, (the Association of Public Sector Information Professionals). He currently serves on the Board of the charity Kids Up Front Ottawa and on the Advisory Board for DPI.

He holds a degree in Computer Science from the University of Ottawa and an MBA from Queen's University. Mr. Bruce has also studied cognitive science and continues to explore leadership and the transformational possibilities created by advances in information and communications technology including artificial intelligence.

Tara Mirza, Administrator, Leadership & Learning

Degree(s): Bachelor of Public Affairs and Policy Management with a specialization in International Affairs concentrating in Security and Intelligence

Tara Mirza joined the IOG in November 2019. Prior to joining the IOG, Tara worked in the non-for-profit sector in event management and stewardship while completing her bachelor's degree. She also holds a Bachelor of Public Affairs and Policy Management with a specialization in International Affairs concentrating in Security and Intelligence degree from Carleton University.

Outside of her professional career, Tara enjoys spending time with her family, cooking, traveling and enjoys working out.

Shelby Torres, Analyst

Degree(s): Bachelor of Arts with specialization in English Literature and a minor in Feminist and Gender studies, Masters of Social Sciences in Feminist and Gender studies. Both from the University of Ottawa.

Currently, Shelby Villeneuve Torres is working towards the completion of a Master's degree in Feminist and Gender Studies at the University of Ottawa. She presently occupies an analyst role at the Institute on Governance where she conducts analytical research, drafts deliverables and provides support on a project exploring the ties between trust, democracy and social media.

Shelby began her career at Crown Indigenous Relations Northern Affairs Canada (CIRNAC) in 2016. During her three years, she assisted as general support to team projects, composed research summaries and projects, organized weekly newsletters amongst other tasks. Her time on the Northern Governance Branch allowed for a deep dive into learning the intricacies of governance.

In 2019, Shelby joined the Gender Based Analysis Plus (GBA +) team at Parks Canada and worked on the program's implementation. Shelby led and contributed to drafting, consulting and publishing internal and external documents such as the Parks Canada GBA+ Terms of Reference, Internal Communications Plan as well as Action Plan and other. While at Parks Canada, Shelby also worked closely with the LGBTQ2 chair in order to publish a departmental Trans People Integration Guide and other documents.