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**Coming to terms with new information and
communications technologies:
The role of the Chief Information Officer of the
Government of Canada**

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Institutional stability and change are issues that are common to public administration and public policy. Organization has always been a central concern in the study of public administration (Gow and Hodgetts) and in recent years institutions have assumed a prominent role in the study of public policy (Lecours). Common ground is provided when the institutional arrangements and dynamics of government organization are themselves the object of policy analysis and treated as policy instruments.

In the Canadian variant of the Westminster model, the federal government has a long history of policy-driven organizational change. Energized in the first instance by the work of the Glassco Commission in the early 1960s, this has been a feature of Canadian public administration ever since. Ministerial portfolios and the associated government departments and agencies have over time been structured and re-shaped to correspond to assumptions about the clusters of public policies and programs that are considered appropriate for meeting the requirements of Canadian society and economy. These clusters both reflect and shape policy sectors (or sub-systems, following Howlett and Ramesh) that include a wide and constantly evolving combination of institutional actors in and outside the public sector. A similar dynamic is at work in the institutional environment for public sector management, where functional disciplines such as human resources and financial management can be seen as the internal counterparts of policy sectors, each with a well-defined, but not static, institutional environment.

The government reorganization introduced by Prime Minister Kim Campbell when she came to office on June 25, 1993 was the product of nearly thirty years of policy-driven institutional change through the tenure of six prime ministers from both major political parties. The reorganization restructured most of the major ministerial portfolios in the economic and social policy sectors, creating new departments of Industry, Canadian Heritage, Human Resources Development, Health, and Public Security out of a matrix of existing functions but in new combinations. With one of its goals being to position the federal government to respond to the emerging information age (Mitchell), the reorganization has proved remarkably enduring, its main elements still in place sixteen years and three Prime Ministers later.¹

The Campbell reorganization also made important changes in the institutional arrangements for the internal management of government. The most visible was the merger of two departments – Public Works and Supply and Services – and other units that provide services to government to form the department of Public Works and Government Services (PWGSC). A new unit within the department was the Government Telecommunications and Informatics Services (GTIS), formed by combining the Government Telecommunications Agency, previously part of the disbanded department of Communications, and Supply and Service's Computer Services Bureau, reflecting the convergence of computing and telecommunications then underway in the private sector, most notably through the emergence of the Internet (Rowland).

A more significant change for management of the federal government, however, was the creation of a Chief Information Officer (CIO) in the Treasury Board Secretariat (TBS) and appointment to the position of a deputy minister reporting to the Secretary of Treasury Board. While the CIO's role and responsibilities were not spelled out in any detail, his office brought together units responsible for overseeing information technology (IT) management and spending in the public service and for using technology to improve

government administration and service to the public. The message was that IT had assumed a new prominence in public sector management and was an important part of positioning government to deal with the new knowledge economy and society.

The CIO position has taken root in Treasury Board Secretariat, although its mandate and internal organization – even the title – have undergone numerous changes since 1993.² Ten individuals have held the position, either permanently or on an acting basis, with the most recent appointment taking effect in May 2009. Successive CIOs have been associated with major government reform initiatives and have provided leadership to functional communities that are responsible for a tenth of government program expenditure. In the TBS hierarchy, the CIO parallels senior officials responsible for comptrollership and human resources management in defining and providing leadership to a major sector of government management activity, operating within the institutional model of horizontal, government-wide, management that has defined TBS since it was established in 1966.

The emergence and subsequent development of the CIO position provides a case study in institutional change and stability. Its establishment represented a response to technological forces that are largely beyond the control of government and that have led to major changes in all aspects of daily life and economic and social activity (Tapscott). The organizational model of the CIO was itself imported from the private sector and linked together a diverse set of ideas and skill sets, many involving highly specialized knowledge, that had previously been largely marginal in public administration and in any case not connected with each other. The CIO's focus on the management of both the government's technology investments and the information that they hold has given a new prominence to those disciplines individually and especially to how they work together. It also creates relationships that are largely unparalleled in other areas of public management, notably a dependency on the private sector for expertise and services, extensive collaboration with counterparts in the provinces, and a driving focus on service to the public – the result of an alliance with New Public Management-inspired concepts of citizen-centred service delivery.

New institutionalism provides a natural theoretical lens for looking at these developments, given that the CIO is embedded in the Government of Canada, easily the largest institutional environment in the country. At the same time, a number of questions arise. As Lecours points out (Lecours), new institutionalism encompasses several schools of analysis that agree that institutions are the single most important variable in explaining politics but differ on questions of causality and consequences. Indeed, the three most prominent all provide useful insights to the emergence and evolution of the federal CIO. Historical institutionalism focuses on the deep historical roots that underlie the CIO's establishment and agenda and offers an explanation for much of the evolution of the office. Rational choice institutionalism's concept of institutions as “stable rules of the game” fits well with the nature of the CIO's activities as an agent of horizontal management in the federal government and its focus on actor-driven change highlights the role played (and not played) by politicians and other high-level actors. This school of thought in particular fits with punctuated equilibrium and similar theories that highlight the importance of windows of opportunity created by external shocks such as major technological change and change of government. Sociological institutionalism

emphasizes the fact that the CIO was created to respond to a societally-driven phenomenon (new information and communications technologies) that carried with it its own values and culture; similarly the CIO organizational model and many of the incumbents have come from outside the public sector, bringing with them a particular perspective and culture that were largely alien to the established norms of Treasury Board Secretariat and the public service. These theories are elaborated in the next section.

The question, then, is which of these lenses provides the most useful basis for understanding the CIO as a case study in organizational stability and change. To a considerable extent all three are helpful and even necessary, but the issue is whether one can provide a framework in which to situate the insights of the others. On the face of it, rational choice institutionalism offers the best prospect, with its emphasis on policy-driven decision-making and rules of the game, both of which are central features of the federal government's institutional environment. This paper will argue, however, that even these dimensions are conditioned by historically-derived characteristics of the federal system, although not exclusively or to the point of determinism.

A second line of enquiry goes to the question of what is an institution (Lecours: 6), more precisely, what kind of institutional context lends itself to the analysis involved in new institutionalism? On the face of it, the TBS CIO, even the larger Secretariat in which it is housed, is arguably not on a scale that lends itself to theoretical consideration. It is easier to justify such an approach, however, if it is accepted that the CIO is only one component of a functional program and community that extends across government and indeed that touches every public servant in one way or another. This leads to two related arguments that are made in the paper: that the functional management sector defined by the CIO constitutes a horizontal management subsystem; and that this sector/subsystem, which contains a variety of organizations knit together by rules of the game and a dominant culture, constitutes an institution that lends itself to examination through the various lenses of new institutionalism.

Part of the interest of the CIO position is that it was created at a moment in time, with relatively little evident precedent (although, as the paper will argue, deep roots) to draw upon – by some accounts it was the first public sector CIO in Canada. Neither it nor the sector it defines emerged wholly formed, however, which points to the third major line of enquiry in the paper: when can an institution be said to be “mature” and in that sense functioning to its full potential. Historical institutionalism's concept of a critical juncture carries with it the connotation of a decisive turning-point, but it does not provide much guidance for assessing when (or if ever) the change process is complete. The IT field uses the concept of institutional maturity both as a descriptive tool and to identify areas for further work, and this paper draws on that approach to argue that the CIO and the related information and technology sector are still at a relatively early stage of maturity. This helps both to explain the CIO's successes and failures since 1993 – with progress often seeming more circular than linear and a general sense of not living up to its potential – and to point to opportunities and challenges for the future.

The paper represents preliminary reflections on research conducted for a doctoral dissertation. The core of that research is a series of semi-structured interviews with all the incumbents of the CIO position since 1993 as well as a number of individuals who have worked with or had an opportunity to observe each of the CIOs.³ The paper begins with a

brief discussion of new institutionalism and then, in that context, looks at three issues: how to explain the establishment of the CIO position; the emergence of the IM/IT sector as a new institutional subsystem of Canadian public administration; and the institutional maturity and future prospects of the position and sector. The conclusion returns to the question of which element of new institutionalism is best suited to explain these developments.

New institutionalism

The various strands of new institutionalism agree that political analysis best starts from an institutional perspective.⁴ Rooted in different social science disciplines, they give different weight to history, actors and interests, societal and cultural factors, and to chance in explaining institutional stability and change. Although it is tempting to seek a synthesis of these approaches, this paper is concerned with selecting and honing a preferred lens for the purpose at hand, much like choosing among the social science disciplines.

Historical institutionalism starts from an assumption that institutions are largely autonomous and have inherent agendas based on their formal and informal patterns of development, influenced by ideas, interests and culture. History matters; pathways chosen early have an impact later, creating “path dependency” which, along with positive feedback, reinforces policy direction and stability but also contains its own (mainly incremental) change dynamics. Major changes occur at “critical junctures” arising from external forces, which can open new pathways or reopen ones previously abandoned or not taken. They can arise from tensions between institutions created in different historical periods – an important part of the story in this paper. They also need to meet the test of being “generative cleavages” and of being significant, swift and encompassing (Hogan). A sharper test of critical junctures is that they should encompass ideational changes that lead to paradigm shifts (Hogan and Doyle).

Rational choice institutionalism is a more empirical view linked to economics. Institutions are strategic, embodying formal rules of the game in an equilibrium distinct from society. The rules of the game and the self-interests of the actors make institutions self-stabilizing, seeing change as risky. Change comes when institutions become dysfunctional and produce sub-optimal results, leading the actors to make changes. Punctuated equilibrium theory can also explain change.

Sociological institutionalism is a more normative approach, linked to organizational theory. Institutions are cognitive, rooted in society and culture. They shape the use of power and include symbol systems, cognitive scripts and moral templates. The logic of appropriateness guides behaviour within institutions. Change arises in the first instance from organizational learning and convergence in responses by different institutions or parts of an institution to a similar dynamic. It comes from within institutions, growing out of a loss of legitimacy when the institution is no longer in touch with social and cultural codes.

These theories are of course independent of any given institution, each of which has its own formal structures and formalized cultural norms (conventions, in the terminology of the Westminster system). So, the federal government has its particular history, culture and rules of the game, both articulated in statute and policy and expressed through its

organizational culture. The paper tries, within the limitations of space, to flag these contextual elements through the lenses of new institutionalism.

The establishment and antecedents of the CIO position

On the face of it, the establishment of the CIO position is not a strong candidate for a critical juncture, given that it was tangential to the June 1993 reorganization and initially was as much a merger of activities as something really new. As will be discussed later in the paper, however, it did set a course that has become increasingly distinctive over time. At the same time, this course has been heavily shaped by the institutional antecedents of the strands that have at various times come together in various combinations under the CIO's auspices. Even more decisive was what was included in the original package of CIO responsibilities and what was not.

The TBS CIO was a spinoff more than an element of the planning for the June 1993 reorganization, which was led by Privy Council Office (PCO) to prepare for Cabinet formation by the leader chosen by the Progressive Conservative party to succeed Brian Mulroney when he retired. The provision of advice on ministerial portfolios and Cabinet decision-making followed a well-established pattern (d'Ombrain) and PCO's proposals, conveyed through Cabinet Secretary Glen Shortliffe, were accepted in their entirety by incoming Prime Minister Campbell (Campbell).

The precipitating factor for creating a TBS CIO was the decision, during the planning process, to wind up the previously independent Office of the Comptroller General (OCG) and incorporate it, along with its head Andy Macdonald, back into TBS, from which it had been separated in the late 1970s. Macdonald, who had an undergraduate engineering degree, was also chair of TIMS⁵, an interdepartmental committee of deputy ministers that had been established in the late 1980s to give senior officials an opportunity to study the impact of new information and communications technologies on the public sector. He had become aware of the then new position of CIO through contacts with banking and other private sector firms that were making major investments in technology. At his suggestion, it was considered a natural fit for him to be assigned to set up a CIO position for the federal government, reporting to the Treasury Board secretary, Ian Clark, an avowed supporter of the introduction of new technologies into government.

The reorganization planners did not work out a mandate for the CIO position, which was left to TBS to propose to Treasury Board ministers later in the summer. Even then, a major ministerial concern was the title – originally proposed as Chief Information Officer, it was changed to Chief Informatics Officer to avoid any connotation of a government propaganda agency. In practical terms, the original CIO mandate was shaped by the existing units and files that it had inherited from the Office of the Comptroller General (OCG) and TBS. The core was the OCG financial management information and systems unit, which had been working on automating the public accounts and related government bookkeeping. A second major element was the unit from the TBS Administrative Policy Branch (APB) responsible for Treasury Board policies and standards with respect to the management of information technology. A third was work begun earlier by APB to look at the use of IT in support of service to the public. A fourth was follow-up work to the Public Service 2000 (PS2000) initiative that had run from 1989-2001 to modernize administrative functions in government, including through

shared services and the application of technology. All these functions were combined into the Office of Information Management Systems and Technology (IMST), which reported to the CIO (Clark).

Each of these strands had its own history, often going back a generation, although there was much less of a history of working with each other. In addition, there were at least two major Treasury Board concerns with a significant bearing on the CIO's responsibilities that were not included in the original package of responsibilities. An overarching factor was assumptions about the role of Treasury Board, which had been evolving in the period leading up to the June 1993 reorganization and indeed have continued to evolve, with implications for the CIO.

Treasury Board was created in 1965 as part of an earlier application of private sector-inspired rationalism to public sector management. Based on the recommendations of the Glassco commission on government organization, the establishment of Treasury Board was an effort to bring together oversight of the various aspects of management practice that were then considered important – primarily financial and personnel management – and to link them to central control of program spending. An overarching issue was striking the balance between managing the government as a single entity and as a series of departmental programs. This was reflected in an organizational doctrine that distinguished between central agencies and common service organizations supporting “those general interests of government which transcend departmental interests” (Glassco 1: 51) and program departments supporting individual ministerial responsibility. While program departments have both policy and implementation roles with respect to their mandates, these roles are separated at the government-wide level, with central agencies defined by their support to ministerial decision-making and common service organizations providing operational services to government, within the terms of government-wide – usually Treasury Board – policy.

The Glassco commission's report 4 addressed the issues of paperwork and systems management in the government, painting a generally dismal picture of the state of records management and sounding a cautionary note about the newly emerging fields of automatic data processing and data transmission. The government installed its first large computer in 1957, to manage Army payroll, and shortly after added, or had plans for, major computer acquisitions in other areas of national defence, the census, public service payroll, processing tax returns, weather forecasting and issuing unemployment insurance and pension cheques – these largely remain the major mainframe computing environments in the federal government. An Interdepartmental Committee on Electronic Computers, made up of the main user departments, was established in 1956 to advise TBS on these purchases but the commission found there was no policy guidance from Treasury Board on their management or on encouraging collaboration among departments. In the area of data transmission, the commission expressed concern about the lack of compatible equipment and common coding, limiting the government's ability to realize “the benefits from integrating the flow of information ... by automatic handling throughout, which will facilitate the exchange of common information through different systems (210).” The commission concluded that “The duplication and mistakes of the past, when automatic data processing was in its infancy, will be multiplied many times in

the future unless concerted action is taken promptly to ensure skillful application of this new technology (210-211).”

Following Glassco recommendations, an Administrative Policy Branch (APB) was set up in 1970 to provide central direction to departments in the areas of technology, records and procurement, among others. Reflecting ministerial concerns about containing costs and infused with values of prudence and probity, APB’s policies sought to ensure “adequate equity, control and restraint” (Paton and Dodge: 8). This orientation shaped APB’s approach to information technology, which primarily involved reviewing major IT project proposals and preparing an annual summary of departmental IT spending plans. APB had only a limited capacity to consider broader issues of technology management or the implications of technological change. It was also responsible for Treasury Board policy with respect to contracting, which again was oriented towards procedural correctness and cost containment. Although IT management and contracting policies were housed in the same branch, they were not linked to any degree.

A third APB responsibility was government record keeping, where Glassco had noted its importance in documenting both “the obligations of the citizens to their governments” and, in a democracy, the even greater importance “to record the obligations of a government to its people” (Glassco 1: 198). Everything from forms management, report preparation and correspondence processing to filing and disposition of records was criticized, citing costs and inefficiency of government operations. While APB began to address some of these concerns, a major change occurred in 1983 with the passage of the *Access to Information and Privacy Acts* (ATIP), giving citizens a right to ask for records and have them produced within 30 days. This led to an integrated set of Treasury Board policies for the management of government information holdings, encompassing records and published material, based on a comprehensive life-cycle model, both to meet public rights of access under ATIP and to improve the quality of government decision-making. The need to reconcile ATIP with the system of security classifications led to the creation of a Government Security Policy, covering all aspects of security in government but treating it fundamentally as an information policy. In 1988, an additional set of policy tools was created with the introduction of the Government Communications Policy, governing all aspects of public communications, ranging from publishing and federal identity to advertizing, public opinion research and sponsorship – again addressing issues raised by Glassco (Glassco 3).

The development of the suite of information, communications and security policies in the late 1980s coincided with the growing impact of New Public Management thinking on TBS’s understanding of its role, leading to a shift in focus from control to enabling management in departments, a process accelerated by PS2000 (Clark) and leading to major revamping of APB’s policies and approach (Paton and Dodge). A more managerially-oriented policy was also developed for the management of information technology, with a growing appreciation of both information and technology as strategic tools. This in turn was linked to the issue of improving service to the public, another topic with a long pedigree (Heintzman and Marson). By the early 1990s, the convergence of computing and telecommunications in the larger economy was generating interest in the potential of electronic communications both for internal government work and especially

for service to the public. This led APB in 1992 to issue a “Vision 2001” document, outlining the potential of the innovative use of information and technology (TBS 1992).

The comptrollership function had its own, largely separate existence during this period. The Glassco commission report had led to the winding up of the earlier system of pre-audit financial controls through the Comptroller of the Treasury and their replacement with a regime based on financial management policies administered by TBS. By the mid-1970s the Auditor General was characterizing the government’s finances as being out of control, which led to the creation of OCG as a separate central agency under Treasury Board in 1978 as well as the appointment of the Lambert Royal Commission on Financial Management and Accountability, which reported in 1979. It can be speculated that OCG’s genesis made it more immune for longer to the winds of New Public Management, but in any case it was not actively involved in the soul-searching about role and mandate that TBS went through in the late 1980s and early 1990s. OCG did launch an initiative to automate financial information, but this was largely in isolation from thinking in APB, which was structured to tackle the issue of reconciling the management of technology with that of information. OCG had become isolated from the other central agencies when the government’s fiscal situation began to deteriorate in the early 1990s and this, combined with its being culturally out of tune with the rest of the units supporting Treasury Board ministers, contributed to the decision to fold it back into TBS.

These developments taken together conditioned the environment in which the CIO began his work in 1993, creating a number of pathways that have had a profound influence on the subsequent evolution of the position of CIO and the management policy sector it defines. Before moving to the next section of the paper, which looks at the sector defined by the CIO’s role and mandate, it is important to note the key features of the situation at the time of the June 1993 reorganization.

The reorganization coincided with – and was intended to respond to – profound changes in the use of information and technology that were affecting both society at large and internal government operations. There was little certainty about where these developments would lead, beyond the fact that they would continue to be significant, and TBS was at best in the position of helping the government to ride the tiger. The thinking that was going on in TBS was largely built on the presence in APB of policy centres concerned with the management of both information and IT, looking at these areas individually and, more importantly, in combination. The reorganization was also in the context of intensive discussion, at the time of Public Service 2000, of the role of TBS and of the nature and use of policy instruments available to it, including both management policies and budget controls.

This dynamic was not, however, carried over into the mandate of the new CIO. The OCG had not been part of the internal TBS debate and the unit working on automating financial systems, which was one of the two foundation elements of the new office, was even further removed from thinking about Treasury Board instruments. The other major unit assigned to the CIO, the IT management policy unit from APB, had been part of the TBS discussions, but it had until very recently been oriented towards control of IT spending and standard setting, in the context of public and political concern about the costs and risks of major investments in technology. The reorganization also separated that unit from the information, communications and security policy unit, which remained in APB and

which was more deeply imbued with both the TBS discussion and with wider consideration of the implications of technology for the government as an information-intensive organization. In other words, the reorganization was a reconfiguration of existing organizational cultures and professional disciplines as well as of responsibilities, separating some that had a history of working together and combining others that had not. It is fair to say that, apart from the issue of management of major IT projects, the CIO's mandate was largely below the political radar, when the position was first created. The CIO did inherit another recent APB concern, however – the implications of technology for service to the public – and this became a major focus, even its salvation, in the first decade or more of the office's existence.

A new sector of public management

There is no evidence that those deciding to set up a CIO in TBS saw this as the establishment of a new sector of public administration. At best it can be said that they believed that the management of IT and IT-enabled reform of administrative services and service to the public deserved more attention and that creating a high-level leadership position was one way of providing such attention. Organizationally the CIO was on the same level as the senior TBS officials responsible for human resources, comptrollership and administrative policy, with the first CIO holding the personal rank of a deputy minister. On the other hand, the responsibilities of the CIO were as much in the nature of a project office as of the leader of a government-wide functional discipline.

Over time the logic of the Treasury Board policy model, combined with the agenda and relationships inherent in the substance of the CIO mandate have, however, defined an administrative “territory” that has assumed the characteristics of a sectoral institutional environment. This section of the paper will sketch its elements while the next section will consider the question of institutional maturity and future prospects. In order to set up both discussions this section will begin with a brief account of the evolution of the CIO's responsibilities.

Evolution of the CIO mandate

The main elements of the Campbell reorganization were confirmed by Jean Chrétien in his Cabinet formation in November 1993, including the creation of PWGSC and windup of OCG. The CIO's initial focus was development of the *Blueprint for Renewing Government Services Using Information Technology* (TBS 1994), that built on Vision 2001 and remained the foundation for later work. In late 1994, following the appointment of a new Treasury Board Secretary, APB was wound up, with most of its functions transferred to the TBS Comptrollership sector that had replaced OCG but the information, communications and security policy unit transferred to the IMST sector, reporting to the CIO. In early 1995, IMST and the Comptrollership sector were combined in a new Financial and Information Management branch under a TBS Deputy Secretary, who assumed the CIO functions although not the title. FIMB was in turn broken up in 1997 to re-create a comptroller-general's office and a CIO branch, both reporting to a new TBS Secretary. Reflecting the addition of information policy responsibilities, as well as practice elsewhere, the CIO was restyled Chief Information Officer and a new CIO was recruited from the private sector.

In 1999, following the recruitment of a second CIO from the private sector, responsibility for most policy areas was transferred to other units in TBS; Access to Information, Privacy, and Government Security other than IT security were moved to the TBS budget office while the Government Communications policy and policy with respect to service to the public, other than electronic services, were combined to form a new Service sector, reporting direct to the TBS Secretary. The aim was to allow the CIO to focus on IT-related issues, including Year 2000 preparations, electronic service delivery, major IT projects and strengthening the IT function in general. The CIO continued to be responsible for policy on information management, narrowly defined, but it was considered that serious attention to the IM agenda would have to wait until the more pressing technology issues had been addressed.

With this more focused mandate, the fourth and fifth CIOs successfully addressed Year 2000 and launched Government On-Line (GOL), an initiative to bring the 130 major federal services to the public fully into the electronic environment. By 2002, with GOL well established (and two more changes in TBS secretary), the ATIP and security policy functions were transferred back to the CIO, as was service policy, in order to provide closer integration with CIO activities. The Communications policy, however, was combined with the TBS departmental communications office. Then, in December 2003, as part of Paul Martin's Cabinet formation, the GOL project office, including responsibility for the Secure Channel project, was transferred to the renamed Information Technology Services Branch (ITSB) in PWGSC. No changes were made when the Harper government came to office, which coincided with the end of GOL, but in 2008 an internal TBS decision was taken to transfer policy responsibility for service both to the public and to government to a reconstituted TBS Service sector.

CIO relationships within government

These changes, in several cases reversing earlier decisions, were in most cases precipitated by changes in government or TBS Secretary, reflecting changing views on the appropriate role of the CIO and the agenda they were asked to pursue. Some conclusions are possible, however, about the nature and extent of the CIO's institutional universe, which might be thought of in terms of a series of concentric circles, in each case with a set of roles and responsibilities defined by a combination of Treasury Board policies and related legislation, creating a government-wide set of goals and accountabilities. In all cases there are functional communities of specialists whose work is defined by these policies, linked by an array of interdepartmental committees led or sponsored by the CIO. In most cases the legislation and policies are also intended to shape program management in departments, through its use of information and technology.

At the heart of the CIO function is Treasury Board policies and related instruments with respect to information technology and the management of information, the former a part of the CIO mandate since 1993 and the latter since 1994. These policies, which are based on general administrative authorities in the *Financial Administration Act (FAA)*, create common processes and standards across the government, which are implemented by functional communities, in most cases built around departmental CIOs at the Director General or sometimes ADM level, supported by specialized staff whose positions are at least in part defined by the requirements and accountabilities of the Treasury Board

policies and related guidelines and standards. The functional communities involved include computer systems staff and systems engineers, librarians and archivists, records managers and file clerks and an array of others.⁶ The policies also assign roles and responsibilities to related organizations, including but extending beyond the Glassco rubric of common service organizations. The inner circle of CIO partners includes the Information Technology Services Branch (ITSB) of PWGSC in the IT area and Library and Archives Canada, with archival authorities under the *Library and Archives Act*, in the IM area.

A second tier is provided by the other major CIO policy responsibilities. The two ATIP policies are based on the *Access to Information* and *Privacy Acts*, with the President of Treasury Board serving as the designated minister under both Acts responsible for their implementation across the public sector. TBS works with the department of Justice on policy issues and has an ongoing – although not always easy – relationship with the Information and Privacy Commissioners, who have ombudsman-like powers to monitor the operation of the Acts and report to Parliament. Through its policy role, TBS also provides functional leadership to the community of departmental ATIP coordinators. The Government Security policy, which is based on s. 7 of the *FAA* and a number of other statutes, covers a wide range of administrative functions, including IT security, information classification, personnel security clearances and building security. The communities it defines include departmental security officers in each department and ten “lead security departments” with roles under the policy, including CSIS, RCMP, Communications Security Establishment, PWGSC, PCO and Public Safety.

The third tier is defined by the service and government communications policies, which have been part of the CIO mandate in the past and continue to have working relationships with the CIO, especially in the electronic sphere. Again there are significant institutional linkages – notably, in the case of service policy, with Service Canada, and in the case of the communications policy with heads of communications in departments and with the Consulting, Information and Shared Services Branch of PWGSC.

CIO relationships outside government

The CIO’s internal relationships are complemented by others outside the public sector. While the internal relationships parallel those found in other areas of public sector management, the external ones flow from the nature of the information and technology spheres and have only limited counterparts in the realms of financial and human resources management. The oldest is with the private sector, which has been the primary supplier of technology goods and services since the first computers were obtained in the 1950s. Relationships with the provinces began to develop with the need to exchange electronically held data and accelerated with the emergence of web-based citizen-centred service delivery, raising attendant policy issues in areas such as privacy, security and identity. An additional thread is provided by the fact that the provinces and territories deal with most of the same national suppliers as the federal government.

The private sector relationship is the most complex and problematic (Roy). To a considerable extent it is symbiotic: the rapidly changing nature of technology leaves governments largely dependent on the private sector to develop and supply new technologies and provide expertise in their use, while the scale and complexity of the

public sector makes it the most important and challenging market for the private sector. Federal government purchases of large computers in the late 1950s and 1960s were consciously distributed among the major suppliers, helping to support the industry at the time but complicating later efforts at rationalization. The federal government also chose a technology management model where to a large extent it has been its own project manager in developing major systems, resulting in both a sizeable public service workforce of IT specialists and a significant number of contract technology workers; this has created tensions between small and medium-sized Canadian firms and larger, mainly global, corporations, most recently in the context of government moves to integrate network functions (May).

The management of the private sector relationship is highly diffused. The Acquisitions Branch of PWGSC has the lead role in managing all government contracting, including for technology goods and services. It operates within a contracting policy framework set by Treasury Board, on advice from the office of the Comptroller General. One of the major clients for technology purchases is the IT Services Branch of PWGSC, which has a wide range of relationships of its own with suppliers and is currently seeking to consolidate purchasing of government-wide network, telecommunications, desktop and database services. Departments have extensive direct dealings with the private sector, including for the design of new systems and help with running the existing. The TBS CIO – unlike many provincial counterparts – has little direct authority over these relationships but has influence as the senior policy advisor to the government on technology issues, including major new projects requiring Treasury Board authorization. An extra dimension is provided by the fact that four of the five permanent CIOs appointed since the CIO branch was organized in 1997 have come from the private sector under interchange arrangements through the Information Technology Association of Canada (ITAC); while they have brought with them IT expertise, a continuing challenge for them has been connecting with the complex public service governance environment .

TBS CIOs and their predecessors have a long history of working with provincial and international counterparts. The federal CIO co-chairs the Public Sector CIO Council (PSCIOC), made up of the federal, provincial and territorial CIOs plus municipal representation. Established in the late 1990s, the PSCIOC has addressed common interests ranging from sharing perceptions of technological developments to issues arising from interjurisdictional data sharing and collaboration in providing services to the public, including privacy and identity management. Through the logic of citizen-centred service delivery and involvement in service policy, CIOs have had a variety of relationships with the Public Sector Service Delivery Council (PSSDC), although over time the federal lead has shifted to the head of Service Canada. The two councils have joined in supporting a not-for-profit research organization, the Institute for Citizen-Centred Service (ICCS – Brown 2007). Internationally, TBS CIOs have developed close working relations with counterparts in the UK, US, Australia and New Zealand and have participated actively in e-government networks sponsored by the OECD and other international organizations.

Enhancing institutional maturity

Related to the question of what is an institution is the issue of when an institution can be said to come into being. Implicit in this line of thinking is that institutions continue to

evolve, even within relatively stable circumstances. The technology industry uses a concept of capability maturity integration (Carnegie-Mellon), a continuous improvement approach that looks at a range of related elements in an organization in terms of the degree to which they are integrated with each other and are harnessed to a common purpose. The model describes a number of levels – typically four or five – representing a gradation from highly atomized, discrete functions through increasing levels of mutual awareness and inter-connection to higher levels of integration and ultimately redefinition into something qualitatively different, where in effect the whole has moved beyond the sum of its original parts. An understanding of progress towards higher levels of maturity has been linked to the concept of transformation, both of the institution itself and of its work and relationships, and this approach has been widely influential, from Accenture's annual assessment of e-government (see, for example, Accenture) to Treasury Board policy on major project management. The approach is used both as a descriptive methodology and as a diagnostic tool for identifying future courses of action. At the same time, it should be noted, the top levels are rarely achieved, seen more as an ideal to be aspired to, so the focus is on the hard work of incremental change in the lower reaches.

If the role and mandate of the CIO can be understood as defining a horizontal institutional environment within the federal government, the question then is how mature is that institution and what are its future prospects? This is an issue that will be an important part of later stages of this research project, but findings to date offer some initial insights. The picture that emerges is of a low level of institutional maturity, with a progression over time towards greater maturity that has been both slow and highly uneven. As indicated in the earlier account of the evolution of the CIO, it took the position several years to stabilize organizationally and its territorial mandate has been adjusted regularly, as recently as a year ago in the area of service policy. The CIO's mandate defines a wide range of organizational actors and functional communities within the public service for whom the CIO is the primary contact point with central agencies. There is little indication, however, that these groups see each other as part of a common management sector linked by common goals – that, for instance, ATIP coordinators, desktop administrators and departmental librarians consider that they are part of a common community in the way that labour negotiators, trainers and recruiters are all part of the human resources management discipline.

One factor is that the legislative and policy framework in the areas covered by the CIO have developed piece-meal and there is no overarching statutory framework that links the various elements together, in the way that the *FAA* shapes the comptrollership function. Another symptom of immaturity is the uneven and generally limited use of Treasury Board institutional levers. The CIO from the outset abandoned the APB role of monitoring spending on technology, although it did conduct one major review in 2005 (Brown: 63). There are therefore no reliable metrics for managing the IT infrastructure and even fewer for managing information.⁷ In earlier years there was considerable ambivalence about playing a Treasury Board policy role, with respect both to the instruments involved and the substance. In recent years, the CIO has made policy management a central feature of the branch's work, but for a narrower range of policies than in the past. One reflection of these developments is that the Management Accountability Framework, the template used by Treasury Board to assess departmental management performance since 2003, did not include information and IT management in

its original framework, and currently these are largely cast in process terms under the rubric of Stewardship, which is linked to the “departmental control regime” (TBS MAF).

A good example of when the CIO has been visibly successful was Government On-Line (GOL), in the course of which there was significant movement towards situating government services to the public on-line in the context of a multi-channel service environment. This built on a number of winning conditions. The initiative built on political support that came out of the IHAC process, leading to two Speech From the Throne references and a significant allocation of new funds. The two CIOs who developed and then saw through the GOL concept enjoyed strong support from the senior bureaucratic level, including from TIMS, which served as a steering committee for the initiative, and the longest-serving CIO was promoted to the personal rank of deputy minister during that period. There was sustained support and continuity at the political level – for the first five years of GOL there was majority government and Paul Martin had supported it as Finance minister, before becoming Prime Minister. Conceptually GOL built on meticulous research into public needs and interests (Heintzman and Marson) and it incorporated an innovative management model in developing the new territory of web-based service delivery (Brown), all factors in five successive first-place international ranking by Accenture (Accenture). To a considerable degree, a virtuous circle was established, helped by a relatively narrowly defined focus and notwithstanding limited progress in other areas such as the use of IT in shared administrative services.

Since the completion of GOL, however, which coincided with the change in government in 2006, there has been a consolidation phase and something of a sense of marking time. While the position and sector have stabilized in terms of role and agenda, several sets of tensions can be identified that characterize the current level of maturity and will be factors in the longer term. The first relates to the public policy goal for the CIO. From the outset there has been a tension between efficiency and innovation, between the CIO as the leader of an administrative discipline and as the government’s change-agent-in-chief. Underlying this has been the relationship between information and technology – initially the issue was whether they should both be part of the CIO’s mandate and latterly it has been whether they should be linked, and if so in what way. Information as a driving element of knowledge-based government is gradually coming into focus, but that potential is a long way from being realized.

A further challenge is that the holistic, integrative characteristics of networked computing leads to a different management model for the government “enterprise” than the one inherent in the Canadian Westminster model, as shaped by Glassco, with greater organizational integration both at the front end services to the public and in the backroom services to government (Borins). While movement is being made towards this model, it is fraught with administrative and political difficulties (Flumian et al) and progress has been slow. Layered on top of these questions are others that point to the larger context: the role of Treasury Board in the post-Gomery era; the role of government and the political sense of ownership for what government does and the risks it takes, especially after five years of minority government – which by its nature is not linked to the longer term; not to mention the future direction of technology – which by nature is all about the longer term. All of these factors will require the CIO to continue to redefine itself, which is inherent both in the nature of the subject matter and in the current level of institutional maturity.

Conclusions

The Treasury Board Chief Information Officer is an instructive case study of institutional change. It represents a comparatively new phenomenon in Canadian public administration, one that is paralleled in all the provincial governments and – within national contexts – internationally. Notwithstanding a great deal of organizational churn and many bumps on the road, the position and the sector it defines are by now well established; in the nature of the subject matter and the current state of institutional development they will continue to evolve.

The CIO is also a case study in the application of new institutionalism theory. In the first instance it serves to demonstrate that the concept of an institution can be applied to a horizontal management function within a large entity such as the government of Canada. This function is defined in the first instance by the organizational location of the CIO – embedded in the central agency responsible for management – but more fundamentally by the organizational doctrine in the federal government, which manages specialized management activities on a decentralized basis, framed by a range of horizontal policy instruments that are interwoven with the vertical accountabilities of program departments. This horizontal model and related organizational doctrine, owe their origins to the work of the Glassco commission, and while somewhat frayed at the edges they have provided the basis for all the functional areas of management in the federal government, some – such as the human resources and financial sectors – with extensive institutional structures and histories. The cases study suggests that the CIO is taking its place as a high-level policy sector alongside the two more established ones.

If it can be said that the CIO and allied organizations and functional communities constitute an institutional environment – and in that sense an institution for analytical purposes – then it follows that this institution is of a scale and complexity that makes it an appropriate case for applying new institutionalism. This leads to the question of which of the three major lenses of new institutionalism best applies.

In many respects, all three schools offer important insights. Rational choice thinking can be found embedded in the institutional assumptions of Treasury Board and management in the federal government as well as in the policy-driven approach to organizational change. While the paper has largely assumed the power of societally-driven technological and cultural changes that have been the backdrop for the work of the CIO, these are an essential part of the story. In the end, however, historical institutionalism offers the most robust framework, in view of the importance it attaches to historically-derived institutional context, which is unique to each institution. Part of the federal government context has been to embed rational choice elements in the institutional fabric, but these have all too frequently been blunted by friction between rules of the game and cultures in different parts of the new institutional environment that have been established at different times and places. Combined with a lack of sustained common assumptions – in effect of continuous movement down stable pathways – progress has been uneven, often circular rather than linear.

This points to the requirement to add a dimension of institutional maturation to any model of institutional change. Hogan's test that a critical juncture needs to be generative, significant, swift and encompassing needs to be adapted when applied to organizational

change, given the complexities involved – especially if the institutional context and the change it is going through are significant. In some respects, the creation of the CIO was not a dramatic step at the time, and indeed at an early stage the position was folded into another area of TBS. But the CIO was backed up by a powerful ideational change (following Hogan and Doyle): the emergence of networked technologies as a defining element in social and economic life, epitomized by the launch of the World Wide Web in 1993, a few months before the CIO was created (Rowland). These forces are still powerful and still working their way through – witness the current discussion of the implications of the broadband-based Web 2.0 both outside and inside government – and it is likely that it will take a generation for the full effects of the 1993 critical juncture to be realized.

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¹ Only two of the ministerial portfolios created in 1993 have undergone major change and both currently are close to the Campbell original. Paul Martin split Human Resources Development Canada (HRDC) in two but it was re-united as Human Resources and Social Development by Steven Harper. Public Security was reversed by Jean Chrétien in late 1993, but Paul Martin established a Public Safety portfolio with most of the same elements, apart from Immigration, although with a different institutional structure within the portfolio and the addition of emergency preparedness. This was retained by Steven Harper.

² As full disclosure, the author was Executive Director, Information, Communications and Security Policy in TBS from 1994-97 and worked for the first three CIOs.

³ At time of writing, 73 interviews had been conducted. Interview participants have also included all Treasury Board Secretaries since 1993, most chairs of TIMS (see fn.4), officials from PWGSC and other departments, senior private sector officials and several current or former provincial CIOs, notably from Ontario. Although many of the interviews were on the record, for the purposes of this paper they are all treated as off the record.

⁴ Except as noted, this account of the various elements of new institutionalism is based on Lecours and related articles in the same book, although there is an extensive literature behind each one. The commentary is mine.

⁵ TIMS – Treasury Board Secretariat Advisory Committee (TBSAC) Information Management Subcommittee. Both groups were made up of deputy ministers assigned to them by the Clerk of the Privy Council. TBSAC was chaired by the Treasury Board Secretary and TIMS by a departmental deputy minister who was also a member of TBSAC.

⁶ Although there has been some consolidation, the occupational groups linked to CIO policies can mostly be traced back to the period after the introduction of collective bargaining in the 1960s and do not reflect subsequent changes in technology or in thinking about the management of information and technology. As a result, the specialized support to the CIO in departments is spread across several occupational groups and union bargaining agents. For example, the National Archives and National Library were merged to form Library and Archives Canada in 2003, reflecting convergence between their respective sub-disciplines of information management, but public service librarians and archivists remain in distinct occupational groups with separate union representation.

⁷ Ian Wilson, the recently retired head of Library and Archives Canada, has regularly made the point that the entire information holdings of the government are carried on the books at a value of \$1 and are therefore not managed as a government asset.