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INTERNAL AUDIT OF SOFTWARE ACQUISITION AND MAINTENANCE

September 2005

7053-30-10 (CRS)



Canada

SYNOPSIS

This report presents the results of an audit of software acquisition and maintenance within the Department of National Defence (DND). The primary audit focus was on Commercial Off-The-Shelf (COTS) software and contracts for software-related professional services. In fiscal year 2003/04, the Department spent $38M to acquire software licences and $40M for software maintenance. In addition, $41M was expended on related professional services. These figures are, in some measure, affected by a major alleged fraud which significantly inflated the costs to the Department. However, it remains that the costs of software development, licenses and maintenance will be substantial for a large, diverse organization.

The audit results have emphasized the importance of a lead authority to provide overall direction for the full life cycle for software. The visibility of funding sources and costs is essential, as is the design of effective procurement/contracting strategies, particularly given that the industry is becoming increasingly concentrated. This is supported by earlier work that Gartner performed with respect to Information Management (IM) Governance. It is similarly underlined by best practices research conducted by Chief Review Services (CRS) – significant gaps exist between noted best practices and what the audit team observed.

A key concern centres on the lack of a corporate view of software acquisitions and especially, a consolidated repository of information on assets and costs. Foregone benefits include: support to forecasting/budgeting and monitoring; economies of scale; ensuring software compatibility; applying updates, security patches and enhancements; keeping requirements and licenses current; and, monitoring expenditures and costs.

Gartner Inc. estimates that organizations with robust Information Management/Information Technology (IM/IT) asset management can realize cost savings of 30 per cent during the first year and 5-10 per cent annually for the next five years. Plans are now in place within DND for the implementation of an automated asset management system. This establishes a basis for the design of overall software procurement strategies, providing direction on asset reporting and controlling costs.

This audit also confirmed the results of prior audit and review work which cited risks regarding confirmation that products or services were received. Work performed with Gartner, proposed that current payment processes be stabilized along with a clear delineation of accountability. An important step taken by management was to arrange for the co-location of pertinent technical and procurement staffs.

Management Action Plans: *The principal audit recommendations are targeted at having an organization designated/confirmed as the lead authority for overall software asset management, including: the implementation of an automated asset management tool for software; identifying requirements; strengthening financial information; improving procurement/contracting strategies; and, ensuring sound internal controls over the payment of invoices. The Information Management Group has noted that most of the required actions fall within the functional responsibility and authority of that Group.*

The management action plans indicate constructive attention to the majority of recommendations contained in this report. It is also worth noting that these actions are occurring in the context of a larger program of improvements, including: the revitalization of comptrollership; the work of a new Departmental Oversight Committee on Contracting; as well as action taken in response to other CRS reports (e.g., report on Contracting for Professional Services in the Information Management Group). CRS has also highlighted the importance of effective functional authorities, providing: straight-forward guidance; enablers (e.g., training, information systems); monitoring; and, pilot improvement initiatives.

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RESULTS IN BRIEF

INTRODUCTION

An audit of software management was included in the Chief Review Services (CRS) Internal Audit & Evaluation Work Plan 2004/05-2005/06. The funding, acquisition and recording of software licenses was an area of difficulty noted through other CRS work.

OBJECTIVES AND SCOPE

The audit objective was to assess the management of the software life cycle, defined as needs analysis, acquisition, maintenance/upgrade and ultimate replacement or disposal. Some specific activities of the life cycle involve financial/contract management, license management and software development through the use of professional services.

The audit focused on expenditures recorded as software and software professional services in the Department's Financial and Managerial Accounting System (FMAS). This includes purchases made through the Materiel Group or directly by various Level 1s (L1s). Software for Enterprise Resource Planning systems (ERPs) was excluded, as it has been included in other CRS audits.[1]

PROFILE

In fiscal year (FY) 2003/04, total expenditures for software licenses and maintenance were $78M. This included $38M for licenses and $40M for software maintenance. Moreover, expenditures for related professional services totalled $41M.

[1] Recently conducted CRS ERP audits include the MASIS and the HRMIS (People Soft) audits.

OVERALL ASSESSMENT

We cannot provide assurance as to the efficacy of the life cycle management of software. A key weakness centres on the lack of complete and reliable management information to assist this process. Clearly, some improvements are being made, but significant gaps exist between the current framework and best practices documented in this report. Experience has shown that software licenses are an area of vulnerability with respect to monitoring and confirmation of requirements and services received.

Notwithstanding the significance of total annual expenditures on software licenses and maintenance, amounting to $78M in 2003/04, the Department of National Defence (DND) does not have a system to monitor and support the management of these purchases. Without the benefit of a central/consolidated repository, the Department will continue to expend excessive resources to manage software assets, some of which may be obsolete, not utilized or not appropriately updated with respect to licensing, security patches or other enhancements. There is insufficient visibility of budget sources and assets acquired and utilized.

With the exception of Enterprise Resource Planning software, no organization is responsible for overseeing overall departmental requirements for the acquisition and maintenance of software licences. Accordingly, L1/Groups have the option to determine their own requirements without a strategic view and opportunities to integrate, bundle or otherwise achieve compatibility or economies of scale. This can work to the advantage of vendors, especially given a trend towards concentration in the industry. Procurement and contracting strategies need to be designed to deal with current technology and the market-place.

The audit noted numerous instances where software licenses were purchased and software was developed without adequate justification/business case. There are no departmental guidelines or instructions describing the type of information required to justify software procurement. Consequently, in the absence of a central authority responsible to identify/coordinate and confirm software requirements, the nature of software acquired or developed may not be consistent with future DND-supported Information Management/Information Technology (IM/IT) capabilities.

PRINCIPAL OBSERVATIONS

Asset Management

The Department has no centralized/consolidated asset records for software licenses and no direction has been provided to L1s with respect to requirements for recording software assets. Over the past five years, several DND studies have identified the need for such asset records. However, there has been little or no progress in resolving the issue. Gartner Inc.[2] estimates that organizations with robust IM/IT asset management can realize savings of as much as 30 per cent during the first year and between 5-10 per cent annually during the next five years. For DND, a 10 per cent savings through improved software asset management could result in annual savings of as much as $7M.

A centralized/consolidated system for software licenses would also confirm compliance with various software agreements, specifically with respect to ensuring that only the authorized number of licenses are installed.

The Information Management Group has plans to develop an automated IM/IT asset management system. When implemented, the system will provide tools to record and monitor license inventory, inventory and asset management, and software and security patch distribution. In the interim, responsibilities for maintaining records are not clearly assigned and policies for software asset management are very limited.

Identification of Needs

With few exceptions, there is no overall departmental strategy for the procurement of software. Concern about this situation was raised in a l997 memorandum raised within the Directorate of Common Procurement and Supply (DCPS). The memorandum stated that “funding of software is unpredictable, we tend to buy what we can afford, (often at year end) as opposed to what we need.” Efforts to raise awareness of the issue did not result in substantial change. In general, standards to support software needs identification have not been defined.

Software licenses are often purchased and software developed without the support of a complete business case. Neither the volume purchased, nor the choice of software is fully justified. In addition, several relevant costs (e.g., training, conversion) are omitted from the analysis.

[2] Gartner, Inc. “Life Cycle Management Underpins IT Asset Management”, F. O’Brien, 6 August 2004.

Financial Management of Software Resources

The accurate and complete financial information required to cost-effectively manage expenditures for software licenses and maintenance is currently not available. While some improvement has occurred in FY 2003/04 through the introduction of new, more specific General Ledger (GL) accounts, further improvements are necessary.

Improved visibility of IM/IT expenditures requires that software license and maintenance costs be fully identified through both business planning and the FMAS. ……..
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Guidance for the recording and reporting of fixed capital assets provides limited information about rules for the capitalization of software.

Acquisition and Contracting

License and maintenance contracts include many of the Terms and Conditions (T&C) necessary to protect the interests of the Department. In some instances, however, the T&C are quite vague – specifically, contracts require more detail with respect to the level of maintenance and support to be provided.

Software-related professional services contracts do not consistently include clear deliverables and milestones. In addition, contract work delivered is not fully consistent with the Statement of Work (SOW), and budget overruns are common. The audit team also noted the existence of conditions that create employer-employee relationships; that is, the contractor essentially works as an integral part of the organization.

There is a need for more information to develop a procurement strategy for software. Such information should include the market intelligence and vendor information essential for improved contract negotiations. The lack of such information poses an obstacle to ensuring good value in terms of prices for software licenses and maintenance. Industry experts recommend the use of price protections (e.g., maintenance may be priced at a certain percentage of license list prices).

Performance measures or service level agreements for ADM(Mat) procurement services do not exist. Several Group/L1s Chief Information Officers (CIOs) interviewed were not satisfied with the service received from DCPS and with the timeliness of the overall procurement process. Public Works and Government Services Canada (PWGSC) confirmed that the time required to process transactions at DND is longer than occurs in other government departments.

PRINCIPAL RECOMMENDATIONS

There is a pressing requirement to implement an automated asset management tool for all DND software. A key requirement is that a lead organization be designated with authority to direct overall DND software management, including responsibility for the implementation of a centralized/consolidated asset repository. The selected organization should also conduct periodic compliance reviews, including verifying inventory holdings. Assistant Deputy Minister (Information Management) (ADM(IM)), with input from affected L1s/Groups, should take advantage of the IM Requirements Committee to identify software needs and to confirm/validate all software requirements.

Note that the observations and recommendations pertaining to invoice processing and contracting for professional services have been, or are being, addressed through other reviews/audits.

Severed under Section 21(1)(b) of the AIA Advice, etc.

The audit has also raised issues around the visibility of IM budget sources. This is larger than the audit of software asset management, and is a critical issue. …… …… This issue is larger than software, and is to be substantially addressed through IM Functional Guidance. The larger corrective action will not be tracked by this audit, but will be the subject of specific follow-up work by CRS in 2006/07.

MANAGEMENT ACTION PLAN

Management actions plans provided by the Departmental Office of Primary Interests (OPIs) demonstrate constructive attention to the recommendations made in the report. For certain actions, CRS may request interim milestones through the normal follow-up and monitoring processes. Recommendations and corresponding management action plans are summarized below and presented in more detail at Annex G. Key recommendations to be tracked by CRS are summarized in the table on the following page.

SUMMARY OF KEY RECOMMENDATIONS & MANAGEMENT ACTION PLANS

Ser	Key CRS Recommendation	OPI	OPI Management Action Plan
1	**Responsibility, Authority and Accountability:** One Group should be designated as having responsibility for software asset management within the defence organization. This will include the implementation of an automated, consolidated repository of assets.	VCDS	ADM (Information Management), using the Information Management Oversight Committee, is tasked to take the lead in reviewing and revising, as appropriate, the DND software asset management governance structure and associated policies. ADM(IM) notes that the deployment and management of application software across the Integrated Defence Information Environment falls within ADM(IM)'s **functional authority** for Information Management. Action should include the acquisition of a software asset management system, consolidation of software baselines and implementation of release management, control and coordination of software licensing and procurement.
2	**Needs, Standards and Procurement Strategies:** The IM Requirements Committee should be used to obtain input from all L1s to: identify DND software needs; develop standards; and, provide options for procurement strategies.	ADM(IM)	The IMRC mandate and structure is being re-worked with a view to satisfying departmental software and standards requirements in a more structured fashion.
3	**Business Cases:** ADM(IM) and ADM(Mat) should develop guidelines defining standards for business cases for software acquisition/development.	ADM(IM) & ADM(Mat)	ADM(IM): The processes and guidelines governing the management of the IM Program will detail the IM Group contribution to software procurement/development thresholds & define the type of business cases required. ADM(Mat): Guidelines will be established.
4	**Software Procurement Strategy:** ADM(Mat) and ADM(IM), in collaboration with PWGSC, should identify information requirements to support the formulation of a DND software procurement strategy and to ensure that contract terms and conditions fully protect DND's interests.		ADM(IM): The need for an effective departmental software procurement strategy is endorsed. The IM Group is committed to working with ADM(Mat) and PWGSC to implement. The way ahead should include: identifying current software holdings; promoting a common master software inventory tracking system; taking advantage of opportunities to combine current contracts; and developing new contracting tools. ADM(Mat): Fully supports the recommendation. PWGSC establishes vehicles utilized extensively by DND and other government departments and agencies. DND does likely have some particular and unique requirements, but a multi-department initiative may be more appropriate and valuable.

INTRODUCTION

An audit of software management was included within the Chief Review Services (CRS) Internal Audit and Evaluation Work Plan for Fiscal Years 2004/05-2005/06.

AUDIT OBJECTIVES

The objectives of the audit were to:

- examine the management of the software life cycle for effectiveness and efficiency;
- assess the pertinent management controls; and
- identify best practices for software life cycle management to foster continuous improvement.

The software life cycle, as referred to in this audit, includes needs analysis, acquisition, maintenance/upgrade and ultimate replacement or disposal. Some specific activities of the life cycle involve financial, contract and asset management.

AUDIT SCOPE

The audit focused primarily on expenditures related to Commercial Off-The-Shelf (COTS) software and contracts for software-related professional services for fiscal year 2003-2004. Enterprise Resource Planning systems (ERPs) software was excluded because it has been included in other CRS audits.

A summary of the audit criteria is included in Annex B of this report.

METHODOLOGY

The following steps were conducted to gain sufficient audit evidence:

- judgmental sampling to identify and segregate software license and maintenance procurements from software-related professional services transactions.

- review of the procurement process for software licenses, maintenance and software-related professional services and the gathering of best practices information to identify audit criteria, audit risks, current gaps with Department of National Defence (DND) practices and potential improvements.

- interviews and documentation review.
- data gathering/analysis focused on expenditures, contracts and, where available, software licenses.
- review of approximately 21 software license or maintenance procurements and 14 related professional services transactions to assess them against the relevant audit criteria. The sample of software license transactions covered the following: Defence Software Baseline (DSB), the National Capital Region (NCR) software baseline, and some Level 1/Level 2 (L1/L2)-specific baseline software.

AUDIT PROFILE

In fiscal year (FY) 2003/04, software acquisition and maintenance expenditures totaled $78M, including $38M for the procurement of COTS and $40M for software maintenance. Additionally, $41M was expended on software-related professional services. Additional details are provided in the following report annexes: Annex C – Expenditures by L1, and Annex D – Expenditures by General Ledger (GL) Code.

The procurement process for software licenses and maintenance is relatively complex. Purchase requests can either be processed through the Materiel Group/Director Common Procurement and Supply (DCPS) services or be submitted directly to Public Works and Government Services Canada (PWGSC), the contracting authority. Major changes occurred in FY 2001/02, as National Master Standing Offers (NMSOs) expired and were replaced by Departmental Individual Standing Offers (DISOs). Only PWGSC contracting officers can issue call-ups under DISOs on behalf of DND. Transactions are either classified as Class 1 or Class 2. Class 1 transactions are for purchases under $25K, and they provide the option to sole-source the requirement. Class 2 transactions are for purchases over $25K, and they require competitive tendering. Additional information on the procurement process is included in Annex E.

Based on DCPS contract records, there were approximately 540 procurements in FY 2003/04. The average value of software license and maintenance procurements was $16,429, with a range between $36 - $7,253,263. Statistics on contracts could not be provided given the lack of a DND software contract database.

Statistics on software license and maintenance procurement expenditures are included in Annex F. The audit team noted that only 6 per cent of procurements have a value that exceeds $25K. Detailed statistics on DND software license assets are not available. Software license purchases range from a few licenses for specialized software to 50–80,000 copies for some of the DND baseline software.

DETAILED OBSERVATIONS AND RECOMMENDATIONS

SOFTWARE ASSET MANAGEMENT

Over the past five years, several DND studies have documented and examined the lack of asset records for software. At the time of the audit, DND asset records remained unavailable and the implementation of an automated software management tool had been postponed. As a result, there are foregone cost saving opportunities (5–30 per cent) for both the acquisition of licenses and for related maintenance. Accurate software records are an important tool for contract negotiation without which, there are increased risks of non-compliance to contract terms and conditions.

Asset Records

DND records of software assets and licenses are not adequate. While some L1s maintain partial software asset records, there is no Department-wide repository of software licenses. None of the license acquisitions selected in our sample were included in asset records, and there are no central records that link DND Information Management (IM) applications to their supporting software (e.g., Army has about 650 applications).

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In 2002, PWGSC offered to increase the DND procurement purchasing authority (for software licenses and maintenance) from the current $5K to $25K. DND was unable to respond positively to this offer …… ……

IM/Information Technology (IT) asset management, including software licensing, has been examined on several occasions in the past five years.

- A 1999 DCPS memorandum[3] indicated that "DCPS has been working with Materiel's (MAT's) staff to ensure the identification of a project to introduce asset management. Although progress has been made, the implementation has been delayed due to the near-term department capital affordability problems."

[3] Draft Briefing Note for ADM(Mat) – DCPS 6 to DGEPS, 29 September 1997; DCPS 6 Minute Sheet to DGEPS through DCPS, Software Hardware Asset Management.

- A review by Deloitte Touche was conducted in 1999 on behalf of Microsoft Canada. The report documents DND's inability to track and report software license usage and includes several recommendations.

- In July 2000, DCPS initiated a study to examine IT asset management requirements within DND. The study identified the Department's inability to provide information with respect to software assets, usage, contracting and renewal decisions.

- In 2003, the report on the Minister's Study on Administrative Efficiencies[4] recommended increased visibility of departmental assets for software and computer hardware. Also recommended was that Assistant Deputy Minister (Information Management) (ADM(IM)) should work with Assistant Deputy Minister (Materiel) (ADM(Mat)) procurement authorities and other L1 staff to create and maintain inventories of software.

IM/IT asset management should begin with an enterprise-wide database that can capture hardware and software inventories, including each procurement, transfer and disposal. This would enhance electronic communication with affected organizations to increase accuracy and eliminate duplicate paper trails.

Best Practices

- A centralized inventory system helps to identify existing assets and future needs.[5]

- The USA Business Software Alliance indicates that: "Properly managing your company's software as a valuable asset has many advantages, the most significant being cost control."[6]

- "Capturing and understanding existing Oracle data base license holdings is a critical aspect of creating an effective Oracle contract. Oracle customers must be armed with accurate information to reduce Oracle costs. Sales reps have demonstrated a reluctance to adjust support fees."[7]

[4] MDN, Comité Consultatif du Ministère sur l'efficacité administrative: Réaliser l'efficacité administrative, le 21 août 2003.
[5] Gartner Inc., "Asset management: Tune Up for Increased Activity", Jack Heine, 10 June 2004.
[6] Business Software Alliance, "The Benefits of Effective Software Management Through Cost Control", Andrew Lindstro, 14 November 2003.
[7] An Appergy Intelligence Support, "Twelve Steps to Reducing Oracle License and Support Costs", Anthony Bradley.

Automated Software Management Tools

System Management Server (SMS) has been selected by ADM(IM) as the automated tool to track software. At the time of the audit, the implementation had been delayed; however, ADM(IM)'s 76 Communications Group (76 Com Gp) plans to continue using a manual process until SMS is installed and can provide some level of automation.

Once implemented, the system will provide tools for the management of licenses inventory and assets. It will also facilitate the distribution of software and security patches.

Best Practices

- "Automated desktop inventory applications have an accuracy in the 85 per cent range. Cingular Wireless has more than 700 licenses and 42,000 users. They implemented an automated tool for software management and saved millions of dollars on licenses and reduced potential liability."[8]

Risks Resulting from the Lack of Asset Management

With the exception of a few software products, very little information is available respecting the COTS inventory or applications inventories within DND. This is a major departure from IM/IT asset management best practices/trends. Managing software without an asset management system brings several important risks, as outlined in this sub-section.

- The absence of an asset management system results in a missed opportunity to realize cost savings. Gartner Inc.[9] estimates that organizations that pursue robust IM/IT asset management save as much as 30 per cent during the first year, and between 5-10 per cent during the next fives years (80 per cent probability). If DND were to realize a 10 per cent savings on its total license and maintenance expenditures, those savings could amount to approximately $7.2M. Furthermore, vendor fees may apply for asset management support services. …… ……... Without a centralized asset management system, …… ……

Severed under Sections 20(1)(b) (c) Third party information & 21(1)(b) Advice, etc. of the AIA

[8] Info World, "Are you paying too much for software licenses?" Dan Tynan , 12 March 2004.
[9] Gartner, Inc. "Life Cycle Management Underpins IT Asset Management", F. O'Brien, 6 August 2004.

Effective software procurement negotiations are difficult to achieve unless accurate information about existing licences and users is available. Improved information would support procurement and may also improve the DND/PWGSC negotiating position with vendors.

Monitoring of contracts and ensuring compliance is difficult in the absence of license records. DND may be at risk of not being in full compliance with all software vendor contract Terms and Conditions (T&C). License record-keeping, including periodic reviews, are essential to determine illegal, unauthorized and unused software on desktops or servers. Vendors are increasingly monitoring their clients and could block access to software in cases of non-compliance or impose financial penalties for not complying with contractual obligations. Although DND/PWGSC contracts often prevent vendor access to DND computers, ……..[10] …… Without an asset management system in place, software release management becomes less efficient and more difficult to manage. In addition, releases are delayed because the impact on unidentified related applications is unknown.

Severed under Section 21(1)(b) of the AIA Advice, etc.

In short, it is important that an organization knows what software it owns – and, in particular, what versions – and where that software is located within the organization in order to effectively manage the software life cycle.

In addition, requirements under the new fixed asset and amortization policy[11] may not be met as DND is unable to determine the total value of its software licenses.

Best Practices

- "IT Audit, Audit and Control" provided 10 tips to mitigate software licensing risks. Three of those tips are the following: "Tightly control software purchases and installations; record all software purchases; and develop a software repository."[12]
- "More Procurement or Management": "The big challenge is management of the software – who has a license for what, does maintenance have to be paid/renewed, who has surplus software that could be used by others, who needs to be notified if a product is being discontinued or changed."[13]

[10] Letter from Deloitte Touche/Microsoft Canada to DCPS 6, 13 August 1999 re: One-Day ACE Review.
[11] Memorandum 7356-1 (DFPP), 7 December 2003, Recording and Reporting of Fixed Assets Acquired during FY 2003/04; DND Accrual Accounting Handbook Ref to Capitalization policy.
[12] IT Audit, "Audit and Control: Ten Tips to Mitigate Software License Risks", Tim Grant, 1 April 2004.
[13] More Procurement or Management Forum: SIMAP Discussion Forum, 17 June 2002.

Roles, Responsibilities and Processes

Software asset management roles and responsibilities have not been clearly established. No organization within DND has been given the mandate for the overall DND COTS IM/IT asset management responsibility. A 1999 memorandum from a DCPS staff member to Director General Equipment Program Services (DGEPS) indicates there is no strong central mandate. DCPS staff confirmed during the audit that the Materiel Group does not have responsibility for software license control.

In addition, despite the Information Management Strategic Review (IMSR) initiatives to revise authority, responsibility and accountability for IM/IT, the audit team did not find documented evidence that the Information Management Group has been assigned full responsibility and authority for overall software asset management in DND.

DND has not established or documented software asset management policies and procedures. There has been no communication to provide direction on what information has to be captured, who should be responsible for capturing the data and who should receive the information. Currently IM/IT asset data is produced and stored in financial, procurement, inventory and other systems. The identification of roles and responsibilities for the documentation of processes must recognize that software asset management is a system of complex processes that must link to several information systems.

Recommendations

A single L1 (ADM(IM) or ADM(Mat)) should be assigned full corporate responsibility, authority and accountability for the overall management asset management for software within DND.

Further, the assigned Group should proceed with the timely selection and implementation of an automated software asset management system for all DND software baselines (e.g., NCR, National, L1s).

All relevant policies and processes should be documented and communicated to L1s, with a plan for the ongoing conduct of periodic software asset inventory taking and compliance reviews.

IDENTIFICATION OF SOFTWARE LICENSES, MAINTENANCE AND PROFESSIONAL SERVICES NEEDS

There is not an adequate planning and policy framework to support and coordinate the identification of overall requirements for software licenses, maintenance and professional services. Standards have not been fully defined and there is insufficient documentation to support informed decision-making. The current decentralized framework for software management is characterized by a silo approach to the identification of needs.

Strategy for Procurement

There is currently no overall DND strategy for the procurement of software, other than some elements such as the NCR software baseline. Concerns about the absence of a sound process to determine software needs were initially raised in August 1997 to DGEPS by a DCPS manager. It was stated that "Funding of software is unpredictable; we tend to buy what we can afford (often at year-end) as opposed to what we need." Despite such efforts to create an awareness of the problem, we have not found evidence that substantial change resulted.

The 2003 report on the Minister's Study on Administrative Efficiencies recommended that ADM(IM), as part of its central role, forecast departmental software requirements in order to consolidate purchases to the extent possible. The report also recommended that DND create a tighter, more disciplined review process for software license inventory and acquisition in order to enhance its negotiating position and to minimize costs. ADM(IM) subsequently indicated in the Management Action Plan that Network Operating System rationalization, IT Enterprise Service Provider and a Desktop Operating System were some of the current initiatives and that DND would explore where potential savings exist.

Recent efforts to start defining some elements of a strategy were included in the IMSR Report and included the creation of the ADM(IM) Defence Software Baseline (DSB)[14]. The DSB will eventually consolidate several existing baselines into one Department-wide configuration. It will also provide the ability to capitalize on economies of scale in desktop support/maintenance, software integration, interoperability testing, software distribution and licensing.

[14] DND Information Management Software Baseline Concept (Revision D, 15 April 2002).

Best Practices

- "Asset inventory is only part of the process; managing the asset portfolio is the key to success. One example relates to inventory-to-plan comparisons – that is, an ongoing need to match current inventory with the three-to-five-year strategic plan to ensure alignment. Comparisons should not only include a spending reconciliation, but a technical match of installed product versions with the withdrawal of planned support by the vendor and the new release availability."[15]

Software Standards to Support the Identification of Needs

Several Group Chief Information Officers (CIOs) interviewed indicated that there are insufficient DND software standards to support planning, needs identification and decision making. The audit sample supports this position. DND software standards did not exist for a total of 18 of the 20 transactions examined in our software license and maintenance procurement sample.

The following are some examples:

- A survey done in 1999 indicated that there were 151 different Oracle products within DND. Based on records gathered for this current audit, there are 143 different Oracle products. A software standard is not available for relational databases and, as a result, there are many database products (e.g., Oracle, MS Access) within the Department.

- One type of management tool that is commonly used to track project requirements is DOORS by Telelogic. Based on ADM(Mat) information as of December 2002, there were 196 DOORS licenses, of which 42 had expired. At the time of our audit conduct, the issue of establishing a standard management tool for requirements and selecting a vendor was still being addressed by the Materiel and IM Groups.

[15] Gartner Inc., "Asset Management: Tune-Up for Increased Activity", Jack Heine, 10 June 2004.

The audit team also noted that DND software replacement standards are not defined. This assessment is based on the following:

- E-mail correspondence between DCPS and one L1/Group indicates that there is no documented definition of what constitutes a standard. One tentative definition is that a DND software standard is established only subsequent to the issuance of a DISO by PWGSC.

- An April 2004 e-mail in which one ADM(IM) manager stated: "This standard is based on an asset renewal rate of four to six years. As some of you have indicated, this is not what you have been doing and would prefer a renewal rate and methodology for funding."

- For 90 per cent of transactions selected for the audit, CRS was unable to find or identify a link to an established software standard.

DND has an opportunity to formulate software standards for many types of applications, such as database software, backup and virus protection. Software standards can facilitate the process of determining specific software requirements.

Business Cases

Software often supports specific programs, applications or special needs. For the 20 software licenses and maintenance acquisitions selected in the audit sample, business cases/justifications (that emphasize the cost-benefit of the application) were most often missing or incomplete. A few of the licenses and acquisitions examined had elements of a business case; however, the analysis tended to be poorly documented. For example, there was minimal justification for the number of licenses being purchased or for the choice of the software and its costs/benefits including all relevant costs, such as training, etc.

In addition, PWGSC operating instructions for the acquisition of software solutions indicate that the cost of maintenance to identify and fix errors in software, help desk support, training of employees, deployment costs, and system conversion are factors that should be considered when acquiring software. Such costs are relevant, given that the cost of a software license is minimal compared to the significant total costs associated with ownership. These costs were omitted from the analysis.

As part of the review of one major software license and maintenance acquisition contract, the CRS audit team noted the following:

- License and maintenance purchasing decisions did not include an analysis of alternatives, such as not accepting the vendor's offer of a new contract or purchasing a smaller number of licenses and gradually increasing the number to avoid over-purchasing.

- The supporting figures included in the analysis were not always complete or fully supported. For example, present-value calculations were not provided and there was insufficient justification of the number of licenses selected.

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The audit team also reviewed eight professional service consulting contracts and found that there was an overall lack of justification for the use of consultants. Alternatives to hiring consultants, including using DND staff, were not considered or evaluated. Most likely, cost reductions could be achieved by in-sourcing some of the work currently assigned to consultants. For example, the team noted in its sample of contracts, that some tasks, such as administrative or system work, could be performed by DND staff. For one Materiel Group contract, consultant tasks included providing maintenance (fixing bugs, problems), help desk support and some operating support. The CRS report on the Review of IM Professional Services Contracting provides additional examples.

There are no existing guidelines or instructions that describe business case requirements for either software licenses or maintenance. While there are some guidelines with respect to hiring consultants, it would appear that it is not mandatory to follow these guidelines. ADM(IM) staff have indicated that the process for business cases needs to be defined for future acquisitions. Without business cases supported by a framework for planning of software business needs and software standards, software decisions may not be consistent with IM strategic objectives. As well, the number of licenses purchased may exceed requirements or the nature of software acquired or developed may not be consistent with future DND-supported IM/IT capabilities.

Best Practices

- "We advise clients never to buy more software than you can implement within a 12-month period."[16] Consideration should also be given to purchasing only the test licenses immediately and an option to purchase the balance in the future. Options to purchase additional software at fixed prices should be included in your negotiations.

- "An Enterprise License Agreement requires the State to enter into a contract that will obligate large amounts of funds over multiple years for one specific product. If the State fails to properly assess its current and future software needs the State could be in a contractual agreement that does not meet its needs and yet still requires large annual payments."[17]

[16] Info World, "Are you paying too much for software licences?", Dan Tynan, 12 March 2004.
[17] US Federal Government 2002/03 Legislative Bill., Legislative Analyst's Office.

Organizational Framework for Corporate Needs Identification and Decision-Making

DND has not sufficiently centralized responsibilities under one organization, despite the Information Management Group having been assigned overall responsibility to provide corporate leadership in the areas of IM/IT. The Group's involvement is focused primarily on ERP software, while the Materiel Group has historically fulfilled a procurement role in IM/IT as well as managing a significant part of the IM/IT funding through the National Procurement (NP) budget. Other L1s/Groups have the option to determine their own needs, use their Operations & Maintenance (O&M) budget and purchase software directly through PWGSC (rather than using DCPS services). The absence of clearly defined roles and responsibilities within the overall organizational framework means that it is difficult to systematically determine needs and to make strategic decisions.

Severed under Section 21(1)(b) (c) of the AIA Advice, etc.

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IM/IT decision-making is further complicated by a complex IM/IT committee structure that sees different committees with overlapping responsibilities. Current committees include the IM Strategic Review Steering Committee (IMSRSC), the IM Oversight Committee (IMOC), the IM Requirements Committee (IMRC), the IM Configuration Control Board (IMCCB) and the CIO Committee. There are also additional committees in some Groups/L1s, such as the Information Management Working Group (IMWG) in Maritime Forces Pacific (MARPAC).

The 2002 IMSR report recommends that DND adjust the authority and responsibilities, including those of various departmental-level committees. Specific planned action was identified in the Information Management Review Implementation Plan. However, the role of committees to determine DND software needs is still not sufficiently defined.

Although software procurement is partly centralized, the audit team noted that it is not mandatory to use DCPS services. When ADM(Mat)/DCPS is involved, they act as an intermediary on behalf of L1s/Groups. DCPS staff indicated that their goal is to bundle purchases as much as possible, but that they have no control over the timing and nature of requisition requests received from other L1s. PWGSC and DCPS staff indicated to DND CIOs in February 2003 that they would like to further consolidate and compete individual software product purchases. Some examples for consolidated acquisition opportunities identified during the audit include DOORS, VISIO, MS Project and Web site creation and management software. When reviewing the listing of procurement transactions, the audit team noted that 95 per cent of transactions had a value of less than $25,000 (Annex F) and that similar software purchases occurred at different intervals throughout the year. For example, Intergraph and DOORS software were each purchased at least five times in the same year, while Adobe Acrobat was purchased nine times.

Best Practices

- "Developing and implementing an effective software acquisition framework to support the information technology program is a well-recognized government and industry best practice. The framework should consist of standards governing the acquisition of computer software and enterprise-wide contracts negotiated in support of such standards. A recent best practices study commissioned by the [US] Department of Defence (DOD), recognized that enterprise-wide software agreements reduce acquisition and support costs and should support an agency's software standards. Often cited advantages include: reduced computer training costs, reduced administrative costs-acquiring and administering, enhancing data compatibility between computer systems." The US Department of Energy devotes about $1.6B or almost 9 per cent of its budget to IM/IT and includes 130,000 personal computers.[18]

Recommendations

- ADM(IM) should make effective use of the IM Requirements Committee to obtain input from all L1s to identify DND software needs and to develop standards and options for procurement strategies.

- ADM(IM) and ADM(Mat) should develop guidelines that define when business cases are needed and the required content (e.g., cost of testing, training).

[18] US Department of Energy audit report, Commercial Off-the-Shelf Software Acquisition Framework March 2000, Office of Inspector General-Audit Services.

FINANCIAL MANAGEMENT OF SOFTWARE RESOURCES

DND IM/IT managers currently do not have the required financial information to cost-effectively manage resources for software licenses, maintenance and professional services. Despite recent changes to the FMAS IM/IT GL coding structure, reliable and complete financial information is not yet available. Additionally, the audit identified ……... ……

Severed under Section 21(1)(b) of the AIA Advice, etc.

Availability and Completeness of Financial Information

The Information Management Review Implementation Plan indicates that a process will be implemented to produce full year-to-year IM cost visibility/reporting. The audit did note some improvements in software financial information for FY 2003/04. ADM(IM) started to track costs centrally, and estimated IM/IT expenditures at approximately $1B per year. Improvements were made to the FMAS IM/IT GL structure; however, additional refinements are still needed. At the time of the audit, complete and reliable financial information was not available to manage the software life cycle for all DND software licenses. Staff interviewed indicated that …. ……...

Severed under Section 21(1)(b) of the AIA Advice, etc.

Software resources are not clearly identified in IM/IT business plans and budgets. Software Acquisition and Maintenance is currently funded from several budgets (e.g., NP, O&M, Capital). There is no integration of all sources of software funding due to DND's current business planning and resource allocation structure. As depicted in Annex C, the two L1s that have incurred the most software licensing expenditures in FY 2003/04 are ADM(IM) and ADM(Mat). Expenditures for these two L1s amount to $53M or 73 per cent of total expenditures. However it should be noted that ADM(IM) and ADM(Mat) have both incurred expenditures on behalf of other L1s. FMAS internal codes are not used to report expenditures as consumed by the specific L1/Group "users".

The criteria to decide which source(s) of funding to use is not sufficiently defined. For example, at the time of the audit, the National Procurement Oversight Committee (NPOC) was reviewing NP funding requirements and noted that some of the software requirements included were Miscellaneous Requirements (MRs) (small Vote 5 activities and not NP-type activities). Assistant Deputy Minister (Finance and Corporate Services) (ADM(Fin CS)) indicated to the Vice Chief Defence Staff (VCDS) CIO that there are no clear restrictions as to what can be charged against the NP account for software purchases.

Another document from ADM(IM) indicates that greater cost visibility of all IM/IT activities is essential for sound management of the IT infrastructure. This is especially important due to current financial constraints. The IMOC minutes of January 2004 state that the IM/IT corporate account is under pressure and that greater cost visibility will not be achieved unless software license and maintenance expenditures can be fully identified. A comprehensive view of all software resources, irrespective of the source of funding (e.g., O&M, Capital, corporate account – centrally managed or devolved), is essential to have complete and reliable financial information for decision making and monitoring.

Financial Data Integrity

Some improvements contributing to the enhancement of data integrity have already been made. Revisions were made to the FMAS GL structure (for both IM/IT Vote 1 – O&M and Vote 5 – Capital)[19] to segregate hardware and software expenditures and to provide other detailed information. Details of expenditures by GL account for FY 2003/04 are provided in Annex D. For prior years, financial data on software expenditures was unavailable. For this reason, expenditure trend analysis information could not be provided in this audit.

Despite the recent changes made to the GL account codes, the quality of the financial data in FMAS needs further improvement. The audit team identified several errors in the recording of transactions, as follows:

- In 2002/03, software and hardware were both coded to GL account 9242. In 2003/04 this account was replaced by three new accounts that segregated software and hardware expenditures. A total of $19M hardware and software transactions continued to be recorded in the old GL account in FY 2003/04. The audit team was unable to determine the share of software in this amount.

- The audit team selected 34 transactions from FY 2003/04 for review. These transactions totaled $11 million, of which 6 per cent ($772K) were incorrectly recorded in the GL. Some coding errors have been made for several years, including Oracle maintenance contract payments that were incorrectly coded for four consecutive years.

- Vendor descriptions are sometimes not provided or they are incomplete. In addition, the audit team encountered duplication of vendor names.

Some of the reasons that may explain the issues around the quality of data are as follows:

- Insufficient ongoing monitoring and oversight of financial coding.

[19] 7001 (DGLS) January 2004, Implementation of Financial Accounting Procedures for IM/IT Expenditures; Annex A – GL Coding Guiding Guide to 7000-1 (DGLS).

- Lack clear definitions for types of software and software GL code descriptions, leaving correct recording subject to interpretation by the large number of financial clerks and managers involved in the coding of payments.

- The conversion to the new IM/IT GL codes was not sufficiently monitored. GL account 9242 had not been closed by the Finance and Corporate Services Group.

Best Practices

- "A recent CIO survey of 103 IT executives shows that 79 per cent of respondents audited their IT costs, 72 per cent calculated their total cost of ownership of IT systems and 66 per cent benchmarked their organizations against best-in-class IT organizations."[20]

Control Over Invoice Payments

There is a risk that software license and maintenance invoice payments processed through DCPS could be made without goods being received or services being fully delivered. The relevant policies and procedures described in Defence Administrative Orders and Directives (DAOD) 1016,[21] and the Delegation of Authorities for Financial Management,[22] indicate that no payment shall be made unless (in the case of a payment for the performance of work, the supply of goods or the rendering of services) the work has been performed, the goods supplied or the services rendered, and that the price charged is in accordance with the contract or, if not specified by the contract, that the price is reasonable.

For most transactions reviewed, Section 34 FAA certification was based on either a signature, an invoice or an e-mail message received from other L1s/Groups to confirm that the goods and services had been received. Most often, the employee signing under Section 34 did not have all the required information, such as proof of receipt of goods and services (e.g., software compact disk, bills of lading, other documentation, etc.). All transactions processed through DCPS followed this approach. It should be noted that subsequent to the audit's conduct, changes to the internal controls over IM/IT invoice processing were being made by ADM(Mat) and ADM(IM).

[20] CIO The Resource for Information Executives, Special Issue, Fall/Winter 2004 – The Money Issue, Inside an IT Audit indicates that: "If you don't measure it, you can't manage it."
[21] DAOD 1016-0, Expenditure Management (FAA Section 32, Section 33 and Section 34).
[22] A-FM-100-002/AG-006 Finance & Corporate Services: Delegation of Authorities for Financial Administration for DND and the CF, 12 August 2002.

The same risk that exists for software license and maintenance invoice payments applies to professional service contracts. For some contracts, it is difficult to find a clear link between targeted contract deliverables, milestones, actual deliverables and vendor invoices. For example, for one contract reviewed, consultants were working in two offices and no time sheet or e-mail was available on file to confirm that services had been rendered. The Technical Authority (TA) works in one building and the project offices are in two other buildings. The TA signs invoices without having all the required information to confirm receipt of services. When time sheets are available, they are not complemented with information that links services rendered to contract deliverables and milestones. For consultants, time sheets alone are most often not sufficient to confirm receipt of goods and services.

The responsibility to approve the receipt of IM/IT goods and services under Section 34 for IM/IT has historically been assigned primarily to ADM(Mat). ADM(Mat) has been managing the NP budget on behalf of other Groups/L1s and has been recording expenditure data into FMAS. In April 2003, part of the NP budget related to IM/IT was devolved to ADM(IM). However, ADM(Mat) retained responsibility for both Section 34 and the recording of transactions in FMAS.

It has not been possible to fully verify the annual maintenance invoices of the last five years for one major software license vendor. Since 1999, a total of $15.4M in maintenance payments has been made, based in most instances on asset listings provided by the vendor. There is no supporting asset management system to confirm either the quantity of the maintenance invoiced or compliance with the contracts.

Software Capitalization and Amortization Policy

ADM(Fin CS) issued documentation[23] that describes requirements for the recording and reporting of fixed capital assets acquired in FY 2003/04 (e.g., capitalization threshold of $30,000). The DND document provides limited information about rules over capitalization of software. The CRS audit team was advised that more details about software would be added to the current policy.

The DND Accrual Accounting Policy Handbook states that software amortization must occur over seven years. CRS observed during interviews with some L1 Comptrollers that there was minimal awareness of the new policy and its potential impact on the reporting of software expenditures. The audit team noted that ADM(IM) has recently made an important software acquisition decision based on a four-year, instead of seven-year, life cycle.

[23] Memorandum 7356-1 (DFPP), 7 December 2003, Recording and Reporting of Fixed Assets Acquired during FY 2003/04; DND Accrual Accounting Handbook.

Recommendations

- ADM(IM) and ADM(Mat) (Comptrollers), in consultation with ADM(Fin CS), should review internal controls over invoice payment verification and the delegation of authority under Section 34 for software licenses, software maintenance and professional services. This should include clearly determining responsibilities and the information required to confirm receipt of goods and services.

- VCDS/ADM(Fin CS), in consultation with ADM(IM) and ADM(Mat), should determine if the current IM/IT resource allocation structure – which includes several IM/IT funds – is the most appropriate to ensure financial cost visibility and an effective and efficient use of software financial resources. Consideration should be given to the relevant IMSR report recommendations in its implementation plan.

- (Note: a specific review of Professional Services contracting within the IM Group, has recommended that ADM(IM) request that ADM(Fin CS) lead a comptrollership review within the IM Group.)

ACQUISITION AND CONTRACTING

Opportunities exist to improve some licence, maintenance and professional service contract clauses to more fully protect DND's interests. More information regarding industry, vendors and expenditures is needed to establish a procurement strategy that will facilitate the preparation of contracts. Risks associated with contracting were observed, including extensive use of sole-sourcing, non-compliance to contract terms and conditions, and lack of price moderation. Performance indicators required to measure the quality of the centralized procurement services are not defined in Service Level Agreements.

Software License and Maintenance Contract Terms and Conditions

While the audit team noted that several industry-recommended T&C best practices have been incorporated into current DND/PWGSC contracts, there are still opportunities for improvement – from the need for clearly articulated levels of maintenance and support, to price protection for the Department.

Clearly defined contract terms and conditions (T&C) – particularly in terms of level of support and cancellation requirements – are vital to ensure value for money throughout the software life cycle.

Nine software licences and maintenance contracts were reviewed to assess the adequacy of contract T&C. Most of the criteria used for the assessment were gathered from literature searches on optimal contract software license and maintenance contract T&C. The nine contracts reviewed for the quality of their T&C were standard contracts. Five of the nine contracts were non-competitive using the Advanced Contract Award Notice (ACAN), two used standing offers and the remaining two were competed through a Request for Proposal (RFP).

The audit team found that only two of the nine contracts included information with respect to required levels of maintenance and support. In most cases, the contract terms were vague and did not identify requirements with respect to resolving issues, levels of support and support for upgrades. One of the nine contracts referred to a level of support "as defined by the vendor, i.e., silver support program." Under such conditions, the vendor could subsequently change the level of support. In addition, one of the nine contracts included details of level of support for previous versions of software. If such information is omitted, a vendor could decide to discontinue providing software support.

The CRS audit team also noted that vendors are given license support cancellation privileges, but not necessarily combined with restrictions to protect DND. DND requires a sufficiently long-notice period to allow time to find alternate vendor support solutions. One major software vendor contract reviewed states that DND cannot cancel the contract. For other contracts reviewed, DND has the option to cancel the contract with a 30-day notice period.

Prices for a significant part of the software licenses purchased are established by PWGSC through DISOs. Additional information about DISOs is provided in Annex E. DISO prices are considered as the maximum price to be paid by departments. Only two of the nine contracts reviewed included a cap on fees and a link between maintenance fees and an inflation factor. For other contracts, the fees were established for the first year or two and were subsequently left to market rate adjustments afterwards. Price protection in contracts is prudent.

Establishing optimal contract terms and conditions must take into consideration the different licensing options (i.e., per user, per seat, concurrent user, per server, per processor, per user connected). Best practices literature indicates that this analysis is important for negotiating contracts.

Best Practices

- "Enterprises that are successful in negotiating effective terms and conditions will achieve savings that far exceed savings through reduced per-desktop fees."[24]

Software Professional Services Contracts

Difficulties observed in the professional services contracts reviewed by the CRS audit team may mean that DND is not receiving deliverables when and as needed to support its operations on a timely basis.

Eight professional service contracts were reviewed and the audit team found that the contract work delivered was not always consistent with the contract's Statement of Work (SOW). For one of the contracts selected for review, the Work Order Requests (WORs), rather than an approved work order, were being used to initiate and approve work. The SOW required that the WOR had to be reviewed and evaluated by the project authority to determine if it should proceed to a work order. The WOR did not include detailed information such as details of work activity, description of deliverables, schedule indicating completion dates and estimated number of days.

[24] "Gartner Management Update: Tips on How to Negotiate Contracts with Vendors and Service Providers", Jack Heine and Alvin Park, 24 September 2003.

For four of the eight contracts in the sample, the CRS audit team noted the existence of conditions that create an employer-employee relationship. For example, consultants were working at DND offices and DND was providing office supplies, computers, e-mail access, etc. There was also evidence of a supervisory relationship. As a result, there are legal risks being created for DND.

The audit team also noted that some difficulties were encountered in setting the correct value of consultant contracts and in monitoring contracts to avoid cost overruns. Five of eight contracts examined experienced cost overruns. For example, one contract was approved at $274K and an amendment subsequently increased its value to $571K. For another contract, the contract manager had documented on file a request to increase project funding by 50 per cent. However, the team was unable to find status/progress reports on file that provided an indication of financial difficulties.

The team noted either unclear roles, responsibilities and accountability for application development projects or an allocation of responsibilities that may not be conducive to effective contract management. For example, for two of the contracts examined, the role of the Technical Authority (TA) was not clear and, in some instances, the assigned TA did not have the required information. For another contract, both the Project Manager (PM) and the Project Director (PD) were responsible for project timelines and deliverables, but not for managing the allocated financial resources.

Several of the recommendations included in the CRS Contracting for Professional Services Audit[25] have not been implemented. They include capturing automated information (e.g., vendor, delegated authority), defining procedures for monitoring contracting activities, linking FMAS expenditure information to related contracts, developing and implementing additional contracting guidance and training, and monitoring the rationale for, and frequency of use of, professional help brokers.

A recent CRS audit of Contracting for Professional Services[26] within ADM(IM) presents additional information on issues regarding professional services contracting.

Best Practices

- "By 2004, 75 per cent of IS organizations will refocus their role on brokering resources and facilitating business-driven demands. IT managers will be working through external organizations to fulfill the Information Systems (IS) organization's responsibilities. Many of those same IT managers however are ill-equipped to take on contract management responsibilities."[27]

[25] CRS Audit of Contracting for Professional and Technical Services, July 2001, Ref 5050-9-4-4.
[26] CRS Audit of Contracting for Professional Services within IM, November 2004.
[27] "Gartner Management Update: Tips on How to Negotiate Contracts with Vendors and Service Providers", Jack Heine and Alvin Park, 24 September 2003.

Information about the Software Industry

Having access to sufficient market intelligence/vendor information is essential to develop a procurement strategy and to prepare for contract negotiations. For example, the software industry is being rationalized and concentrated. Industry experts predicted that there are still many software companies that could go out of business or be acquired in the near future. Determining how such changes may impact DND is necessary to establish an overall software procurement strategy.

Information on pricing trends is also necessary to establish an effective procurement strategy. This information – or lack thereof – could have an impact on DND/PWGSC's ability to negotiate the best possible prices through volume purchases or other means.

There are no DND statistics or other data collected and reported, including expenditures by software vendors. The CRS audit team gathered information and observed that six license vendors accounted for 27 per cent of the annual expenditures. For software maintenance, the top six vendors accounted for 57 per cent of the annual expenditures. Statistics could fluctuate from year-to-year, depending on changes to major software contracts. In addition, trend analysis could not be done due to the unavailability of any valid expenditure data prior to FY 2003/04.

Macro-level procurement and expenditure data is not available from PWGSC. PWGSC personnel indicated that this data could be gathered but that they would require time, given the extensive amount of work that would be involved.

Sole-Sourcing

Information about PWGSC/DND Software procurement policies and instructions is provided in Annex E. The audit team noted that statistics on the use of different procurement methods (e.g., competitive, sole-sourcing) are currently not collected. Such data would help to define some elements of the procurement strategy and to establish an acceptable level of sole-sourcing. Based on our software license and maintenance population, 14 of the 21 transactions selected (66 per cent) were sole-sourced.

The Office of the Auditor General (OAG) has reported on the risks of extensive software contract sole-sourcing, including the possibility of appeals by competitors to the Canadian International Trade Tribunal (CITT). This audit confirms that such risks still exist, although there is currently more scrutiny by DCPS. Despite some of the benefits of reducing sole-sourcing, there are also risks of procurement delays and some incremental costs (e.g., conversion costs, training, testing). It would be important to incorporate those factors in the business case analysis and the justification for sole-sourcing.

There may also be an excessive use of sole-sourcing for professional service contracting. Some consultant contracts remain active for a long period of time without being competed. For example, one contract, which was initially competed in 1995, has remained with the same contractor without subsequently having been competed. The team also encountered two other similar situations in the sample.

DCPS/PWGSC Procurement Services Performance Measurement

DCPS does not fully measure the performance of the procurement support services. The only statistical indicator that is monitored by DCPS is the number of acquisition transactions processed. There are no indicators or statistics collected, such as the size of procurement transactions to whom those services are provided, the time required for processing transactions or client satisfaction. It is difficult to measure quality of services if no benchmarks have been established. The audit team noted that there are no established Service Level Agreements (SLAs) between procurement agencies including DCPS and PWGSC and their clients that define service standards.

Several L1 representatives interviewed were less than satisfied with the quality and efficiency of the services and software procurement process. Based on discussions with PWGSC, the average time to process a transaction at DND is longer than in most other government departments. In addition, several CIOs and other DND staff interviewed raised some concerns about the quality of services received and, more specifically, about the fact that some staff have insufficient IM/IT knowledge.

Recommendations

- ADM(Mat) and ADM(IM), in collaboration with PWGSC, should identify what information should be gathered to support the formulation of a DND software procurement strategy and ensure that contract terms and conditions fully protect DND's interests.
- ADM(Mat), with the support of L1s (clients), should develop SLAs and software procurement performance indicators. PWGSC procurement support service standards should be incorporated, given PWGSC's involvement in the process.
- ADM(Mat), in collaboration with ADM(IM) and other L1s/Groups, should review existing financial and contract management policies and guidelines applicable to software professional services contracts. This should include requirements for documenting the justification for using consultants, reducing the risk of non-compliance, and more clearly defining roles and responsibilities.

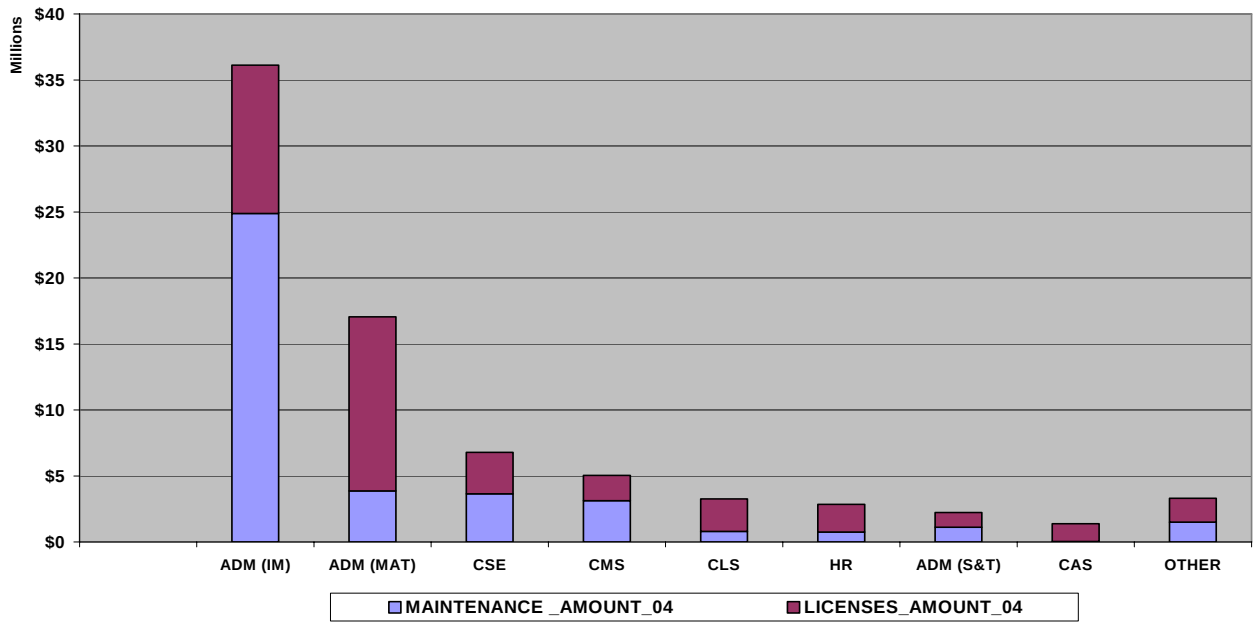
ANNEX A – LIST OF ACRONYMS

76 Com Gp	76 Communications Group
ADM(Fin CS)	Assistant Deputy Minister (Finance and Corporate Services)
ADM(IM)	Assistant Deputy Minister (Information Management)
ADM(Mat)	Assistant Deputy Minister (Materiel)
CIO	Chief Information Officer
CITT	Canadian International Trade Tribunal
COTS	Commercial Off-The-Shelf
CRS	Chief Review Services
DAOD	Defence Administrative Orders and Directives
DCPS	Director Common Procurement and Supply
DGEPS	Director General Equipment Program Services
DISO	Departmental Individual Standing Offer
DND	Department of National Defence
DOD	Department of Defence
DSB	Defence Software Baseline
ERPs	Enterprise Resource Planning systems
FAA	Financial Administration Act
FMAS	Financial and Managerial Accounting System
FY	Fiscal Year
GL	General Ledger
IM	Information Management
IM/IT	Information Management/Information Technology
IMCCB	IM Configuration Control Board
IMOC	IM Oversight Committee
IMRC	IM Requirements Committee
IMSR	IM Strategic Review
IMSRSC	IM Strategic Review Steering Committee
IMWG	Information Management Working Group (MARPAC)
IS	Information Systems
IT	Information Technology
L1	Level 1
MARPAC	Maritime Forces Pacific
MAT	Materiel
MR	Miscellaneous Requirement
NCR	National Capital Region
NMSO	National Master Standing Offer
NP	National Procurement
NPOC	National Procurement Oversight Committee
O&M	Operations and Maintenance
OAG	Office of the Auditor General
OPI	Office of Primary Interest
PD	Project Director
PM	Project Manager
PWGSC	Public Works and Government Services Canada
RFP	Request for Proposal
SMS	System Management Server
SLA	Service Level Agreement
SOW	Statement of Work
TA	Technical Authority
T&C	Terms and Conditions
VCDS	Vice Chief Defence Staff
WOR	Work Order Request

ANNEX B – KEY AUDIT CRITERIA

ASSET MANAGEMENT	➢ An asset management framework, including automated tools, is in place ➢ Adequate software license/asset inventory records
IDENTIFICATION OF LICENSE AND MAINTENANCE NEEDS	➢ A business case or analysis is conducted to justify the acquisition ➢ A framework exists to plan and coordinate software requirements
FINANCIAL MANAGEMENT OF SOFTWARE RESOURCES	➢ FAA requirements (Sections 32 and 34) are met ➢ Payments are accurate and appropriately coded ➢ Adequate financial information to cost-effectively manage software resources
ACQUISITION AND CONTRACTING	➢ Effective and efficient procurement support function is in place ➢ Contract terms and conditions with software suppliers are optimal ➢ Procurement policies and processes are consistent with best practices ➢ Roles and responsibilities are clearly defined

ANNEX C – SOFTWARE LICENSE AND MAINTENANCE EXPENDITURES BY LEVEL ONE ORGANIZATIONS FY 2003/04



SOURCE: FMAS

ANNEX D – SOFTWARE EXPENDITURES BY GL ACCOUNT FY 2003/04

	SOFTWARE LICENSES	
GL ACCOUNT	ACCOUNT DESCRIPTION	AMOUNT
5306	V1 RENTAL OF SOFTWARE & COMPUTING TIME	$8,879,101.88
5356	V5 RENTAL OF SOFTWARE & COMPUTING TIME	$221,050.46
9140	SOFTWARE PURCHASES INCLUDING UPGRADES	$18,973,799.46
9190	V5 SOFTWARE PURCHASES INCLUDING UPGRADES	$10,186,803.00
57222	V5 LEASE PAYMENT EXPENSE: INFORMATICS	$0.00
TOTAL		$38,260,754.80

	SOFTWARE MAINTENANCE & SUPPORT	
GL ACCOUNT	ACCOUNT DESCRIPTION	AMOUNT
6247	V1 SOFTWARE MAINTENANCE & SUPPORT	$38,811,093.30
6297	V5 SOFTWARE MAINTENANCE & SUPPPORT	$983,754.17
TOTAL		$39,794,847.47

	SOFTWARE PROFESSIONAL SERVICES	
GL ACCOUNT	ACCOUNT DESCRIPTION	AMOUNT
4542	V1 SOFTWARE SVC / IN SERVICE APPLICATION	$30,217,760.12
4545	V1 SOFTWARE SVCS / NEW APPLICATION DEVELOPMENT	$9,679,907.66
4592	V5 SOFTWARE SVC / IN SERVICE APPLICATION DEVELOPMENT	$374,465.34
4595	V5 SOFTWARE SVCS / NEW APPLICATION DEVELOPMENT	$843,696.68
TOTAL		$41,115,829.80

SOURCE: FMAS

ANNEX E – POLICIES/INSTRUCTIONS[28]

- Since the 1980s, COTS software products have been procured through a number of methods of supply including standing offers, local purchase order (LPOs), credit card purchases or individual contracts following limited or competitive tendering processes. The bulk of products and related services have been acquired through National Master Standing Offers (NMSOs), which were issued to all major software suppliers, for administrative convenience. Departmental authority to call up goods under NMSOs was limited to 10 licenses. The use of NMSOs was discontinued in August 1999.
- The use of Departmental Individual Standing Offers (DISOs) was implemented in FY 2001/02. The key differences between NMSOs and DISOs are that only PWGSC Contracting Officers are authorized to issue Call-Ups under DISOS on behalf of the client departments. In addition, for DISO orders, departments now have to provide either: a completed form 942, Call-up Against a Standing Offer, for requirements valued at less than $25K; and for related professional services valued at less than $80,900, a completed Task Authorization form signed by the client's project authority and submitted to PWGSC for the PWGSC Contracting Authority approval and signature.
- Software solutions are classified into Class 1-3. The methods to obtain software solutions are dictated by the type of requirement: Class 1 (sole source or limited tendering), Class 2 (competitive tendering requirements); Class 3 (transfer of surplus Crown-owned software licenses).
    - Under class 1, software that is for amounts less than $25K can be acquired on a sole source basis. For amounts exceeding $25K another form must be completed and approved to justify the sole-source acquisition where applicable. One method of procurement is the DISO – Departmental Individual Standing Offers, that have been negotiated by PWGSC with several software vendors for the acquisition of Class 1, sole source and limited tendering software requirements. PWGSC processes all orders made against these offers, unless a Department has obtained procurement authority for up to $40K per call-up and up to $100K per call-up for services. Procurement other than through DISOs can be made for other sole-source and limited tendering requirements. In such instances, PWGSC will negotiate individual contracts, standing offer arrangements or supply arrangements for limited or multi-year terms for software requirements not covered under DISOs, or for requirements valued at greater than $2M where a DISO exists.
    - Class 2 Competitive Tendering methods are to be used to acquire new software solutions where sole source or limited tendering provisions are not applicable. PWGSC will acquire software solutions through conventional procurement methods, through either competitive request for Standing offers/Proposals/Supply Arrangements or through competitive Requests for Proposals (RFPs) for complex or high dollar value solutions.

[28] PWGSC Software Acquisition Reference Centre: Operating Instructions for the Acquisition of Software Solutions; Current Awarded and Proposed DISOs; Sole Source and Limited Tendering Certification; Standing Offer Index; PWGSC Web site.

ANNEX F – STATISTICS ON SOFTWARE LICENSE AND MAINTENANCE PROCUREMENTS FY 2003/04

STATISTICS FY 2003/04		RATIOS
MEDIAN VALUE OF PROCUREMENT TRANSACTIONS TO VENDORS	$1,868.58	
AVERAGE VALUE OF PROCUREMENT TRANSACTIONS TO VENDORS	$16,429.33	
# OF PROCUREMENT TRANSACTIONS WITH TOTALS <= 5K	4137	39.19%
# OF PROCUREMENT TRANSACTIONS WITH TOTALS >5K and <= 25K	5,791	54.85%
# OF PROCUREMENT TRANSACTIONS WITH TOTALS > 25K	629	5.96%
TOTAL # of PROCUREMENT TRANSACTIONS	10557	100%

Note: These statistics were compiled using data from an ADM(Mat)/DCPS IM/IT procurement database, and the totals exclude GST.

ANNEX G – MANAGEMENT ACTION PLAN

Ser	CRS Recommendation	OPI	Management Action
1	**Responsibility, Authority and Accountability:** A single organization should be designated as having lead responsibility and authority to direct overall software asset management. Consideration should be given to other changes being made as a result of the IMSR and the Minister's Report on Administrative Efficiencies. Further, the assigned L1 Group should proceed with the timely selection and implementation of an automated software asset management system for all DND software baselines (e.g., NCR, National, L1s). All relevant policies and processes should be documented and communicated to L1s, with a plan for the ongoing conduct of periodic software asset inventory taking and compliance audits.	VCDS	VCDS: ADM(IM), using the Information Management Oversight Committee, is tasked to take the lead in reviewing and revising, as appropriate, the DND software asset management governance structure and associated policies. ADM(IM) notes that the deployment and management of application software across the Integrated Defence Information Environment falls squarely within the ADM(IM)'s functional authority for Information Management. The IM Group action to be taken should include the acquisition of a software asset management system, consolidation of DND software baselines and implementation of release management, control and coordination of software licensing and procurement. ADM(Mat) supports this recommendation.
2	**Needs, Standards and Procurement Strategies:** ADM(IM) should make effective use of the IM Requirements Committee to obtain input from all L1s to identify DND software needs, develop standards and provide options for procurement strategies.	ADM(IM)	ADM(IM): The IMRC mandate and structure is being re-worked with a view to satisfying departmental software and standards requirements in a more structured fashion.
3	**Business Cases:** ADM(IM) and ADM(Mat) should develop guidelines that define when business cases are needed and the required content of business cases (e.g., cost of testing, training).	ADM(IM)/ ADM(Mat)	ADM(IM): The processes and guidelines governing the management of the IM Program will detail the IM Group contribution to software procurement/development thresholds & define the type of business cases required for inclusion in either the SCIP, business planning or in- year management cycles. Specific thresholds will be developed in consultation with ADM(Mat). ADM(Mat): Guidelines will be established to define under what circumstances business cases should be presented to justify software license acquisition or software development initiatives.

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Ser	CRS Recommendation	OPI	Management Action
4	**Control Over Invoice Payments:** ADM(IM) and ADM(Mat), in consultation with ADM(Fin CS), should review internal controls over invoice payment verification and the delegation of authority under Section 34 for software licenses, software maintenance and professional services. This should include clearly determining responsibilities and the information required to confirm receipt of goods and services.	ADM(IM), ADM(Mat) and ADM(Fin CS)	ADM(Fin CS): The responsibilities and information required for the certification of receipt of goods and services, and the compliance with the established contract, are outlined within FAM Chapter 1016 – 3, Account Verification – FAA Section 34. Further, the ADM(IM) Comptroller discussed these procedures with the Director Financial Policies and Procedures (DFPP) during the development of the above-mentioned procedures (reference the comments from ADM(IM). ADM(IM): The recent IM/IT Corporate Account procedures, developed jointly by ADM(IM) and ADM(Mat) staff, detail specific responsibilities and accountabilities with respect to resources/activities funded from the IM/IT Corporate Account. These procedures will be reviewed in the Fall 05 timeframe and adjustments made to address more specific issues of concern, including those pertaining to software maintenance and licenses. ADM(Mat): Recommendation is supported. Internal controls have been reviewed and management action has been taken to strengthen financial accountability. Continuing attention is warranted to improve the framework within which financial authorities are delegated and exercised.
5	**Resource Allocation Structure:** VCDS/ADM(Fin CS), in consultation with ADM(IM) and ADM(Mat), should determine if the current IM/IT resource allocation structure – which includes several IM/IT funds – is the most appropriate to ensure financial cost visibility and an effective and efficient use of software financial resources. Consideration should be given to the relevant IMSR report recommendations in its implementation plan.	VCDS/ ADM(Fin CS)	VCDS: The revised DND software asset management governance structure established will address the issues of cost visibility and effective and efficient use of software resources. ADM(Fin CS): The revised DND software asset management governance structure, established through the Information Management Oversite Committee, will address the issues of resource allocation structure, cost visibility and effective and efficient use of software resources.

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Ser	CRS Recommendation	OPI	Management Action
			ADM(IM): ADM(IM) is taking steps through the IM Programme and IM Functional Guidance to support this effort and improve cost visibility. The IM Programme (IM Strategic Plan) will associate scope, time and cost constraints to proposed IM projects with a view to measuring project performance and determining how future management controls and projects can be improved. The IM Functional Guidance is intended to expose IM functional priorities and plans to L1s and provide direction on reporting and planning of IM resources. The IM Programme, Functional Guidance and a planned performance measurement process should provide better visibility of IM related expenditures. Beginning Fall 2005. ADM(Mat): Strongly support the recommendation.
6	**Professional Services:** ADM(Fin CS), with the support of L1 Comptrollers, should take corrective action to identify and reduce the identified risks related to professional services invoice processing and the monitoring of consultant contract budgets for software support and maintenance services. **Note:** that a separate report is being completed on contracting for Professional Services within the Information Management Group. It recommends that ADM(IM) request ADM(Fin CS) to conduct a Comptrollership Review of the IM Group.	ADM(Fin CS)	The procedures for Section 34 certification have been set out in FAM Chapter 1016-3, Account Verification – FAA Section 34. Further, RDAOs (Regional Departmental Accounting Offices) have in some instances, issued additional guidelines regarding invoice processing and the documentation required therein. Statistical sampling could be used to identify these types of payments as high risk, thus resulting in additional pre-payment review.
7	**Software Procurement Strategy:** ADM(Mat) and ADM(IM), in collaboration with PWGSC, should identify what information should be gathered to support the formulation of a DND software procurement strategy and ensure that contract terms and conditions fully protect DND's interests.	ADM(Mat)/ ADM(IM)	ADM(IM): ADM(IM) endorses the need for a comprehensive and effective departmental software procurement strategy and is committed to working with ADM(Mat) and PWGSC to implement. The way ahead should include the following: identifying current software holdings; promoting a common master software inventory tracking system; taking advantage of opportunities to combine current contracts; and developing new contracting tools. Work to commence Fall 2005.

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Ser	CRS Recommendation	OPI	Management Action
			ADM(Mat): Recommendation fully supported. PWGSC establishes vehicles utilized extensively by the Department of National Defence and other government departments and agencies. As such PWGSC has a mandate to protect the government's interests in a more general sense. DND does likely have some particular and unique requirements but a multi-department wide initiative may be more appropriate and valuable.
8	**SLAs and Performance Indicators:** ADM(Mat), with the support of L1s (clients), should develop SLAs and software procurement performance indicators. PWGSC procurement support service standards should be incorporated, given PWGSC's involvement in the process.	ADM(Mat)	ADM(Mat): This recommendation is supported. ADM(Mat) provides support to dozens of clients, both for software and other requirements. While service level indicators and standards should be developed, they should be established as an element of a larger performance management system which can be applied across the spectrum of Material Group services and clients.
9	**Financial and Contract Management Policies and Guidelines:** ADM(Mat), in collaboration with ADM(IM) and other L1s/Groups, should review existing financial and contract management policies and guidelines applicable for software professional services contracts. This should include requirements for documenting the justification for using consultants, reducing the risk of non-compliance, and more clearly defining roles and responsibilities. The document should also identify existing obstacles to effective contracting.	ADM(Mat)	The policies and guidelines relative to engaging professional consultant services will be reviewed.