



1999-722 Report
Audit of GTIS Costs for PWGSC Server
Infrastructure Management

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Executive Summary

Authority for the Project

The audit was requested by GTIS's Assistant Deputy Minister in order to have an independent review of the annual ongoing and projected pre to post OIR operating costs.

Background

The Office Infrastructure Renewal Project (OIR) was established in March 1997 for the purpose of delivering a new and streamlined department-wide desktop common operating system. After completion of the OIR project, the Network Computer Services sector (NCS) of the Government Telecommunications and Informatics Services (GTIS) Branch assumed the management and operational responsibilities of the Office System Infrastructure (OSI) used in the Department. No incremental funding was allocated to discharge this function. GTIS is projecting a cost overrun for managing the OSI of \$10.2 million for the period of July 1999 to March 2000 and an estimated amount of \$23.2 million for the next fiscal year. GTIS has requested an independent review of the annual ongoing and projected pre-OIR to post-OIR operating costs in order to determine an appropriate division of costs among stakeholders.

Objectives and Scope

The objectives of this audit were to:

- review and validate projected annual costs incurred by GTIS to manage Public Works and Government Services Canada (PWGSC) Information Technology (IT) Office System Infrastructure. This review included a validation of: 1999-2000 actual and forecasted costs for OSI activities at GTIS; projected costs for the next fiscal year for the same activities at GTIS; and, incremental costs incurred by GTIS to manage these activities;
- review and determine which of the above costs were previously incurred by PWGSC branches and regional offices in order to attempt to establish any savings that may have accrued within these branches and regional offices as a result of GTIS assuming the ownership and control of the OSI for the department.

The audit did not assess the efficiency and effectiveness of GTIS NCS operations.

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Approach and Methodology

In order to review and validate actual OSI costs incurred and expenditures committed from July to December 1999 and forecasted costs for the fiscal years 1999/2000, 2000/2001 and 2001/2002, supporting documentation was reviewed and analyzed and interviews were conducted with relevant personnel from GTIS NCS operations. The forecast preparation processes, assumptions and linkage of expenditures to OSI were challenged.

In order to attempt to establish savings to PWGSC Branches and Regional Offices as a result of the OIR implementation; data from two PWGSC financial systems was reviewed; costing information received directly from PWGSC Branches and Regional offices was reviewed; interviews with GTIS and client personnel were conducted; and, relevant documentation was reviewed.

To explore possible funding mechanisms for OSI, finance and IT officers from four Other Government Departments (OGDs) and one private sector company were interviewed for benchmarking purposes.

Summary of Key Findings and Conclusions

We found that there is confusion among GTIS clients as to the scope of GTIS office systems and workstation management services that were delivered in the pre-OSI environment and the scope of services delivered in the new OSI environment. GTIS NCS is in the process of developing a new business framework which will include service level agreements to define the scope of services provided to all clients under the new OSI environment.

The direct costs recorded for the OSI for the period July 1999 to December 1999 amount to \$8.3 million comprising payments of \$ 5.7 million and outstanding commitments of \$ 2.6 million. No overhead or indirect costs have been applied to OSI. The \$ 8.3 million in direct costs has been appropriately applied to the OSI for the period July 1999 to December 1999.

The forecasted OSI expenditures prepared by GTIS NCS as at January 24, 2000 are summarized as follows:

	<u>July/99-Mar/00</u>	<u>2000/2001</u>	<u>2001/2002</u>
Ongoing Support for Projects Initiated Under OIR	\$ 10,190,346	\$ 14,213,557	\$ 12,943,037
Completion Activities to Improve Or Evolve the Environment	-	890,000	436,500
Evergreen (replacement of hardware and software)	-	<u>8,100,000</u>	<u>8,100,000</u>
	<u>\$ 10,190,346</u>	<u>\$ 23,203,557</u>	<u>\$ 21,479,537</u>

Notwithstanding the \$8.1 million evergreening costs which are a best estimate provided by GTIS NCS management and are not yet supported by a detailed capital asset plan, our review of the

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forecasted expenditures confirmed that costs are OSI related and consistent with what was proposed in the OIR strategy. The forecasts reflect the consistent application of management assumptions which we have determined to be reasonable under the circumstances. The process of developing the forecasts included adequate challenge role from GTIS finance officers and NCS senior management. The audit also provided an independent challenge role of the forecasts and underlying assumptions.

The savings to be achieved from the implementation of OIR were expected to be in the end-user operations in the form of productivity improvements and cost avoidance rather than by direct budgetary reductions. The reliability of the information we received from the clients and that which we were able to obtain ourselves in our review of the financial information systems was insufficient to allow us to make any meaningful quantitative observations on the magnitude of savings achieved by GTIS and its clients. The two departmental financial accounting systems did not capture office systems cost information in a manner which would lend itself to cost effective data extraction.

GTIS NCS assumed OSI responsibilities in June 1999 without receiving any additional funds to execute their expanded mandate to provide hardware and software maintenance, operational support and technical support of the OSI. Some clients believe that the funding covered by a previous permanent budget transfer to GTIS that paid for services rendered in the pre-OIR environment should also cover the services rendered and the costs of supporting the new infrastructure in the post-OIR environment. GTIS clients' lack of access to OSI cost information coupled with the confusion about the definition of and funding for services provided has weakened client relationships with GTIS. GTIS NCS is in the process of addressing this issue with the development of a business framework for the OSI. We support the approach adopted by GTIS NCS because it will increase the transparency of the costs to operate the new platform and provide senior management with necessary information to allow them to resolve the funding issue on an informed basis. In addition, this approach paired with a clear definition of services should lead to better relationships with clients.

The benchmarking interviews we conducted revealed that office system costs are typically funded in other organizations on a corporate basis.

1 Introduction

1.1 Authority for the Project

The audit was requested by GTIS's Assistant Deputy Minister in order to have an independent review of the annual ongoing and projected pre to post OIR operating costs.

1.2 Background

On April 25, 1996, the Information Management Committee (IMC) approved the initiation of the Public Works and Government Services Canada (PWGSC) Network Operating System Rationalization Project. As a strategic implementation of this direction, the Office Infrastructure Renewal Project (OIR) was established in March 1997 with an initial IMC approved funding of \$4.5 million for the purpose of delivering a new and streamlined department-wide desktop common operating system. By the time the OIR project was complete in June 1999, the implementation had received approved funding of \$ 34 million from IMC and PWGSC Branches had contributed an additional \$7 million towards the project.

After completion of the OIR project, the Network Computer Services (NCS) sector of the Government Telecommunications and Informatics Services (GTIS) Branch assumed the management and operational responsibilities of the Office System Infrastructure (OSI) used in the Department. The new post-OIR common office system infrastructure environment which was created by the OIR project is now known as the OSI.

Prior to OIR, the management and operational responsibilities and associated budgets were held by the various branches and regions for office system management, maintenance and support. When the management and operational responsibilities of the OSI activities were transferred to NCS, no incremental funding was allocated to discharge this function. GTIS is projecting a cost overrun for managing the OSI of \$10.2 million for the period July 1999 to March 2000 and an estimated amount of \$23.2 million for the next fiscal year.

GTIS has requested an independent review of the annual ongoing and projected pre-OIR to post-OIR operating costs in order to determine an appropriate division of costs among stakeholders.

1.3 Objectives and Scope

The objectives of the audit are to:

- Review and validate the projected annual costs incurred by GTIS to manage PWGSC. IT Office Infrastructure. This review included a validation of:
 - the 1999-2000 actual and forecasted costs for these activities at GTIS
 - the projected costs for the next fiscal year for the same activities at GTIS
 - the incremental costs incurred by GTIS to manage these activities.

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- Review and determine which of the above costs were previously incurred by PWGSC Branches and Regional offices in order to attempt to establish any savings that may have accrued within these Branches as a result of GTIS assuming this responsibility for the Department.

The audit covered the 1999-2000 actual and projected 2000-2001 costs as well as the incremental costs incurred by GTIS to manage PWGSC IT Office Infrastructure as compiled and submitted by the Network and Computer Services Sector.

The audit did not assess the efficiency and effectiveness of GTIS NCS operations. The audit also conducted benchmarking interviews with four Other Government Departments (OGDs) and one private sector firm to explore their approach to funding IT infrastructure.

1.4 Approach and Methodology

1.4.1 Analysis and Validation of 1999-2000 Actual Costs

In order to review and validate actual OSI costs incurred and expenditures committed from July to December 1999 and to verify that costs were for OSI purposes, substantive audit work was performed. More specifically, interviews were conducted with appropriate officers and relevant supporting documents such as contracts, invoices and purchase requisitions were examined.

During this time period, actual costs of \$5.7 million and outstanding commitments of \$2.6 million were subject to review and validation. These costs represent financial information recorded in the departmental financial accounting system up to December 31, 1999.

1.4.2 Analysis and Validation of Forecasts for the Fiscal Years 1999-2000, 2000-2001 and 2001-2002

In order to review and validate forecasted costs for the fiscal years 1999/2000, 2000/2001 and the 2001/2002, forecasted expenditures prepared by GTIS NCS operations directors were obtained and analysed by comparing these forecasts to actual/projected fiscal 1999/2000 expenditures. All significant variances were investigated. Interviews were conducted with GTIS NCS operations directors and former OIR project management personnel. The forecast preparation processes, assumptions and linkage of expenditures to OSI were challenged. Interviews were also conducted with GTIS finance officers to assess their roles and the processes followed.

1.4.3 OSI Savings

In order to attempt to establish savings to PWGSC Branches and Regional Offices as a result of the OIR implementation and assumption of OSI management by GTIS NCS, a four-step approach was followed consisting of:

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- Review of data from two PWGSC Financial systems: Common Departmental Financial System (CDFS); and FMS 28;
- Review of costing information for three years received directly from PWGSC branches and regional offices;
- Interviews with personnel from GTIS NCS, GTIS Telecom, Supply Operations Services Branch (SOSB), Audit and Review Branch (ARB), Government Operational Service (GOS), Real Property Services Branch (RPS), Translation Bureau, Human Resources, Minister's Regional Office (MRO), Pacific Region and Western Region; and
- Review of the original Business Case OIR prepared in March 1997 and revised Business Case Presentation prepared in February 1999.

1.4.4 Funding for OSI

To explore possible funding mechanisms for OSI, finance and IT officers from four OGDs and one private sector company were interviewed for benchmarking purposes. In addition, a GTIS financial advisor, a corporate financial officer in GOS and officers involved in GTIS operations were interviewed.

2 Findings and Conclusions

2.1 Understanding of Pre-OIR and OSI Environments

We found that there is confusion among GTIS clients as to the scope of GTIS office systems and workstation management services that were delivered in the pre-OSI environment and the scope of services delivered in the new OSI environment. We are outlining below a description of:

- the pre-OIR environment;
- the implementation of OIR;
- transfer of responsibility for OIR/OSI;
- infrastructure changes from pre-OIR to OSI environment; and
- the new OSI environment.

2.1.1 Pre-OIR

Prior to the implementation of OIR, GTIS negotiated with clients to provide the following types of services including:

- Provide User Support Officers to perform the role of first level support for all IM/IT related activities
- Provide the second and third level support and contacts for all subsequent activities identified by the first level support
- Ensure that client support and users are appropriately trained in all IM/IT activities
- Ensure performance, security and disaster recovery processes are effective
- Ensure that the network operates to prescribed standards and requirements
- Provide standards and ensure workstation resources are optimally configured
- Maintain the operational environment which includes hardware/software upgrades and installation (Office Automation (OA), End Users and groupware and application software support)

These services were funded in part by permanent budget transfers from clients to GTIS.

2.1.2 Implementation Of OIR

The implementation of OIR resulted in the renewal and simplification of the office system infrastructure in PWGSC as well as the centralization of the responsibility for the

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Office System Infrastructure to GTIS. The scope of the OIR project encompassed five main components or objectives as follows:

- Upgrade/Standardize from Windows 3.1 to Windows 95 and Windows NT
- Office Automation Products (OAP) - Identify, and provide central delivery and support for Corporate and Business OAP
- Implement Virtual Local Area Networks (VLAN) and Increase Bandwidth for the Enterprise
- Upgrade and Rationalize Office Automation Servers and Standardize Network Operating System (NOS) to Novell 4.11
- Standardize and Consolidate to Corporate Mail and Messaging Software and Hardware

2.1.3 Transfer of Responsibility for OIR/OSI

Prior to the OIR, office systems infrastructure responsibility was held by PWGSC Branches and Regions. GTIS now has national accountability for the office systems infrastructure at PWGSC. With the assumption of this responsibility, a number of office system functions was transferred to GTIS. The following table outlines the functions transferred to GTIS.

OFFICE SYSTEM INFRASTRUCTURE COMPONENTS	NEW INITIATIVES
120 Office Automation Servers	Server Operations - 1st & 2nd Level 3rd Level Engineering Ongoing Maintenance Infrastructure Renewal
2 Network Operation Systems	3rd Level Engineering Ongoing Maintenance
2 Desktop Operating Systems	3rd Level Engineering Infrastructure Renewal
25 Mail Messaging Servers	Server Operations - 1st & 2nd Level 3rd Level Engineering Ongoing Maintenance Infrastructure Renewal

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Mail & Messaging Software	3rd Level Engineering Ongoing Maintenance
528 Commercial Off The Shelf Software (COTS) / Business Applications	3rd Level Engineering Network Application Launching Quality Assurance Maintenance of Corporate COTS
Foundation Software	3rd Level Engineering One Time Licenses Ongoing Maintenance
Switches - Core Sites	3rd Level Engineering Ongoing Maintenance Infrastructure Renewal
Increased Bandwidth	Ongoing Maintenance

2.1.4 Infrastructure Changes from Pre-OIR to OSI Environment

When the OIR project was completed in June 1999, significant technical rationalization had been implemented and Year 2000 readiness was close to completion. However, there were many operational and funding issues which needed to be resolved to stabilize the environment and ensure that the new infrastructure would be appropriately managed in the future.

The following table summarizes the change in the infrastructure as a result of the OIR.

ITEM	PRE-OIR	OSI
Office Automation Servers	427	184
Network Operating System	12	2
Desktop Operating System	5	2
Mail Servers	25	25
Mail Software	3	2

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Commercial Off The Shelf Software / Business Applications	54000	528
Bandwidth	Limited	Increased
Y2K Readiness	40%	100%

2.1.5 New OSI Environment

GTIS NCS is in the process of developing a new business framework which will include service level agreements to define the scope of Standard Services provided to all clients under the new OSI environment in the following areas:

- User Support;
- Server Support;
- Workstation support;
- Install Move Add Changes (IMACS);
- Software Distribution and software product support; and
- Hours of Service and at home support.

Additional Services which are defined as those services which are not provided across the client base will be treated as extra. Accordingly, GTIS NCS is in the process of clearly articulating in the service level agreements the service to be provided related to additional services as well as the cost and related funding requirements of providing these services to the client. The pricing of additional services will be negotiated and recovered directly from the client. The new framework will also address the provision and funding/pricing of Ad hoc Requirements.

This approach GTIS NCS is taking should bring clarity to the definition of services provided under the new OSI.

2.2 Analysis and Validation of Costs

2.2.1 1999-2000 Actual Costs

2.2.1.1 Findings

The direct costs recorded for the OSI in the CDFS for the period July 1999 to December 1999 amount to \$8.3 million comprising payments of \$ 5.7 million and outstanding commitments of \$ 2.6 million. No overhead or indirect costs have been applied to OSI.

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The extent of substantive audit work performed was as follows:

	Actual Costs	Outstanding Commitments	Total
\$ Population	\$ 5.7 M	\$ 2.6 M	\$ 8.3 M
\$ Verified	3.9 M	1.4 M	5.3 M
% Audit Coverage	68 %	54 %	64 %

The nature of these costs are as follows:

	(\$ million)
hardware maintenance	0.7
software maintenance	2.4
professional services (external consultants)	4.1
capital equipment	1.1

2.2.1.2 Conclusion

The recorded amount of \$ 8.3 million has been appropriately applied to the OSI for the period July 1999 to December 1999.

2.2.2 Forecasts for the Fiscal Years 1999-2000, 2000-2001 and 2001-2002

2.2.2.3 Findings

The forecasted OSI expenditures for the fiscal years 1999-2000, 2000-2001 and 2001-2002 were prepared concurrently with the execution of this audit. It should be noted that all fiscal year 1999-2000 figures shown in this Section include \$8.3 million of actual costs and committed expenditures up to December 31, 1999 and forecasted costs from January to March 2000.

The forecasted OSI expenditures prepared by GTIS NCS as at January 24, 2000 are summarized as follows:

	<u>July/99-Mar/00</u>	<u>2000/2001</u>	<u>2001/2002</u>
Ongoing Support for Projects Initiated Under OIR	\$ 10,190,346	\$ 14,213,557	\$ 12,943,037
Completion Activities to Improve Or Evolve the Environment	-	890,000	436,500
Evergreen	-	<u>8,100,000</u>	<u>8,100,000</u>
	<u>\$ 10,190,346</u>	<u>\$ 23,203,557</u>	<u>\$ 21,479,537</u>

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A breakdown of OSI forecasted costs by activity is as follows:

	<u>July/99-Mar/00</u>	<u>2000/2001</u>	<u>2001/2002</u>
Evergreen	\$ -	\$ 8,100,000	\$ 8,100,000
Network Application Launching	1,183,600	2,107,600	1,969,600
Office Automation Servers	1,636,872	2,290,758	2,377,916
Mail/Messages		515,509	917,516
			917,516
			6
Virtual Local Area Networks			
/Metropolitan Area Network	2,194,562	3,583,634	3,293,384
Novell Operating System	1,350,383	1,733,000	1,432,500
Corporate Products	1,612,289	1,831,000	1,676,000
Storage/Backups	875,931	1,638,000	568,000
Quality Assurance	400,000	388,299	543,621
Workstation Engineering	304,000	483,000	483,000
Miscellaneous	117,200	130,750	118,000
	<u>\$ 10,190,346</u>	<u>\$ 23,203,557</u>	<u>\$ 21,479,537</u>

Included in the above fiscal year 2000/2001 forecasts are \$8.1 million for "evergreening", which is defined as the replacement of hardware and software. The items which are forecasted to be "evergreened" include office automation servers, mailer servers, virtual local area networks hardware and software upgrades. This \$8.1 million cost is a best estimate provided by GTIS NCS management and is not supported by a detailed capital asset plan at this time. The forecasted costs for evergreening hardware were calculated based on an average asset life cycle of three years. Our benchmarking interviews revealed that an average life cycle of the above mentioned assets is between three to five years. We have been advised that GTIS NCS will be producing a IT capital asset plan which would provide supporting details of proposed IT capital investment.

When the OIR project ended in June 1999, the resultant corporate OSI was not fully stabilized. Therefore, some one-time expenditures are still required to improve the performance and stabilize the OSI environment. Of the above forecasting costs for Ongoing Support for Projects Initiated Under OIR, the amount for these one-time expenditures is \$1,092,491 for the fiscal year 1999-2000 and \$1,400,000 for the fiscal year 2000-2001. Almost all of the one-time completion expenditures are related to storage backup, network monitoring probes and additional storage capacity.

2.2.2.4 Conclusion

Notwithstanding the \$8.1 million evergreening costs which are a best estimate provided by GTIS NCS management and are not yet supported by a detailed capital asset plan, our review of the forecasted expenditures confirmed that costs are OSI related and consistent with what was proposed in the OIR strategy. The forecasts reflect the consistent application of management assumptions which we have determined to be reasonable under the circumstances. The process of developing the forecasts included adequate challenge role from GTIS finance officers and NCS senior management. The audit also provided an independent challenge role of the forecasts and underlying assumptions.

2.3 OSI Savings

2.3.1 Findings

In the original business case prepared by GTIS March 1997, the expected savings identified as a result of the implementation of OIR were based on an analysis of industry benchmarks such as Gartner Group "Best Practices", PWGSC Estimated Costs per Desktop and GTIS Budget extrapolations. At the time of the approval of the OIR initiative, it was stated that there was no "consolidated source of metrics" to accurately measure technology and resource costs of corporate office infrastructure across PWGSC. Therefore, GTIS management used the above information to provide a best estimate of the magnitude of costs within the department and the possible savings that could be achieved with the OIR strategy. From the outset, the savings to be achieved were expected to be in the end-user operations in the form of productivity improvements and cost avoidance rather than by direct budgetary reductions.

We requested stakeholders, including internal GTIS clients such as NCS, Telecom and AMS, to provide us with an analysis of office systems costs they incurred for the following three fiscal years: 1997/98; 1998/99; and, 1999/2000. More specifically, we requested they report these costs in the following categories broken down by salary, O&M, and capital:

- Maintenance costs for networks and servers;
- Maintenance costs for operating systems, application software and e-mail; and
- Capital acquisition costs for OA server hardware and office software.

We received eight responses from the twenty-six stakeholders contacted. From the stakeholders who responded, several had difficulty in extracting financial information from the departmental financial information systems. We also experienced difficulty in our own attempts to acquire information for analytical review purposes from the departmental financial accounting systems. The reliability of the information we received

from the clients and that which we were able to obtain ourselves in our review of the financial information systems was insufficient to allow us to make any meaningful quantitative observations on the magnitude of savings achieved by GTIS and its clients as a result of OSI.

A number of clients indicated that there were no savings as a result of the OSI. These clients believed that costs had increased and that the performance of the OSI platform was inferior to the pre-OIR environment. Some clients interviewed agreed that centralization of ownership and responsibility for evergreening servers and software licencing will result in expenditure reductions to them. Some clients qualified this comment by stating funds for IT hardware and software acquisitions is not always specifically budgeted for and is procured with dollars generated by savings from other program areas.

Our review of the two departmental financial accounting systems have confirmed that the systems did not capture office systems cost information in a manner which would lend itself to cost effective data extraction. To generate this information after the fact would require a detailed review of all expenditures at the voucher level. The size and effort required to make a meaningful analysis in our opinion out weigh the benefits to be achieved.

2.3.2 Conclusion

While it was reasonable to expect, at the outset of the audit, that stakeholders savings due to the OIR\OSI implementation were readily quantifiable, our research as outlined in our findings above has shown, that this is difficult and not feasible in a cost-effective manner.

2.4 Funding for OSI

2.4.1 Findings

In the original business case prepared by GTIS in March 1997, it was stated that funding for capital items and associated ongoing lease and maintenance expenses related to OIR should be provided by the department to GTIS.

GTIS NCS took on the OSI responsibilities without receiving any additional funds to execute their expanded mandate. GTIS NCS management have indicated that there is an urgent need for a funding solution to provide adequate operational funding for hardware maintenance, software maintenance, operational support and technical support of the OSI.

Some clients believe that the funding covered by a previous permanent budget transfer to GTIS that paid for services rendered in the pre-OIR environment should also cover the services rendered and the costs of supporting the new infrastructure in the post-OIR

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environment. Clients do not have access to information about the costs of operating the OSI. GTIS could be more open and transparent with OSI costs and demonstrate to clients where funds are being spent. Clients have indicated a willingness to pay a "fair share". The clients' lack of access to OSI cost information coupled with the confusion about the definition of and funding for services provided has weakened client relationships with GTIS.

GTIS NCS is in the process of addressing this issue with the development of a business framework for the OSI. From discussions with GTIS NCS management and review of documentation provided, we have learned that GTIS NCS is developing a costing model to clearly identify the costs of managing the OSI. The intention is to define the operating and overhead costs of the Office System Operations Directorate (OSOD) which must be recovered as well as the recoverable costs of the Office System Engineering Directorate (OSED). This model will be used to provide a pricing methodology or be the basis for a formal request for corporate funding.

The benchmarking interviews we conducted with four OGDs revealed that office system platform and backbone infrastructure are typically funded on a corporate basis by means of corporate budget or funding allocation to IM/IT Directorate and that Service Level Agreements are used to define service expectations and special requirements with clients. The private sector firm contacted said that the desktop platform and backbone infrastructure in their organization is funded and managed at a corporate level as a corporate asset. Funding for support, maintenance and capital upgrades is approved at the senior management table and is given to the IM/IT group directly. This organization also used service level agreements to define service standards.

2.4.2 Conclusion

We support the approach adopted by GTIS NCS because it will increase the transparency of the costs to operate the new platform and provide senior management with necessary information to allow them to resolve the funding issue on an informed basis. In addition, this approach paired with a clear definition of services should lead to better relationships with clients.