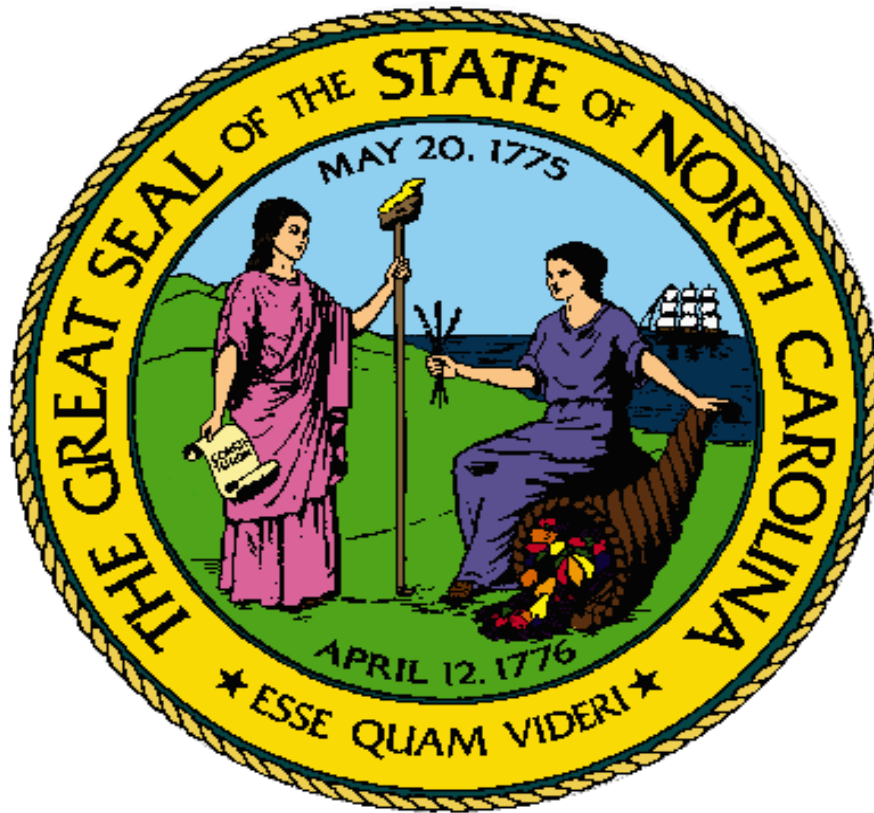# State Information Technology Consolidation

Report by the Office of State Chief Information Officer

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March 2012

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Contents

Executive Summary

Consolidation of information technology reduces risk of failures and lowers overall operating costs by creating economies of scale and driving standardization. Budget constraints and the push for increased efficiency are prompting governments and the private sector to pursue consolidation more aggressively.

North Carolina has been consolidating information technology for many years. It was one of the first states to consolidate its mainframe computers in the 1980s. Recently, the Office of Information Technology Services and the Office of State Budget and Management led an effort that consolidated the IT infrastructure—such as networks and personal computers—at the agency level.

This report outlines a high-level approach for a new consolidation strategy. There are two major recommendations:

Consolidate infrastructure and applications across agencies	*The state must emphasize horizontal consolidation of infrastructure and applications—the programs that run government and provide services. Consolidating the foundational elements of IT across all Executive Branch agencies will mitigate risk, reduce overall costs and achieve a level of standardization and stability that will speed future consolidation efforts. At the same time, the state must recognize that some agency business processes are unique, and require unique solutions.*
Provide service management instead of services	*The state should refocus its centralized IT management from the current, service-provider structure to one of service management. The state should retain core IT functions and outsource others, with the central service management organization managing the relationships with customers and between the state and vendors.*

To be sustainable, any consolidation effort requires general consensus from the IT community and broad support.

Introduction

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"Throughout the world, thousands of governments perform essentially the same functions. Yet, for many reasons, primarily concerns about turf and politics, governments are unable or unwilling to share basic infrastructure and applications that could dramatically reduce operating costs." –Gartner, 2010

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Information technology is an indispensable tool in the operation of state government or any other organization. Because it is so widespread, IT offers many opportunities to combine common functions and reduce operating costs:

- As a basic technical component of nearly every business, IT can be treated as we treat electricity, namely a utility infrastructure that can take advantage of the large-volume, lower-unit-cost model.

- As a facilitator of business function, IT is positioned to create common, shared services.

- As a digital representation of business functions, IT allows businesses to rethink and perhaps redesign their business processes.

The deep and prolonged economic downturn is driving state government – indeed all levels of government and the private sector – to become more aggressive in lowering operating costs while improving the efficiency, effectiveness, and quality of services. The frequent practice of supporting duplicative infrastructure, applications and services within lines of business is neither cost effective nor sustainable. In addition, this model cannot provide the agility required to respond to new or changing business needs in a consistent, timely manner.

To address these issues, governments and private sector organizations are pursuing consolidation with even more vigor. The goal is to lower the cost of operating and of delivering services through economies of scale and standardization, while mitigating risk.

Consolidation efforts in other states

Consolidation was the top priority of state chief information officers in the 2011 State CIO Survey conducted by the National Association of State Chief Information Officers (NASCIO).[1]

"CIOs are consolidating state IT services at an accelerating rate," the survey report said. "The search for cost savings drives some consolidation activity, and some is driven by efforts to improve the effectiveness of enterprise IT services."

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[1] *The 2011 State CIO Survey*, National Association of State Chief Information Officers, October 2011.

This *State Information Technology Consolidation* plan provides some history on North Carolina's consolidation efforts and makes recommendations for the future. It is not a detailed, tactical plan, as envisioned by the 2011 Budget Bill. Staff from the State CIO's office, the Office of State Budget and Management and the Fiscal Research Division agreed after adjournment of the General Assembly that a high-level strategic plan was preferable for a number of reasons. The Infrastructure Study and Assessment (INSA) conducted by the State CIO in late 2010 and 2011 provided detailed information about the cost of IT in Cabinet agencies. The General Assembly's IT study proposed in the budget bill is expected to provide additional information for making tactical decisions.

This plan focuses on consolidation of information technology, but consolidation must be considered within the larger context of IT management and general agency organization across all of state government.

What is consolidation?

Generally, consolidation means combining common facilities and functions into shared services for use by multiple agencies or constituencies. The goal is to strike a balance between a decentralized IT organization that is redundant and expensive, and a centralized one that is unresponsive and inflexible.

Under a decentralized, or distributed system, agencies and at times even divisions within agencies operate their own stand-alone IT shops. There are no economies of scale or efficiencies from standardization. IT operations resemble silos, as shown in this diagram.

Decentralized IT Model

State Agencies
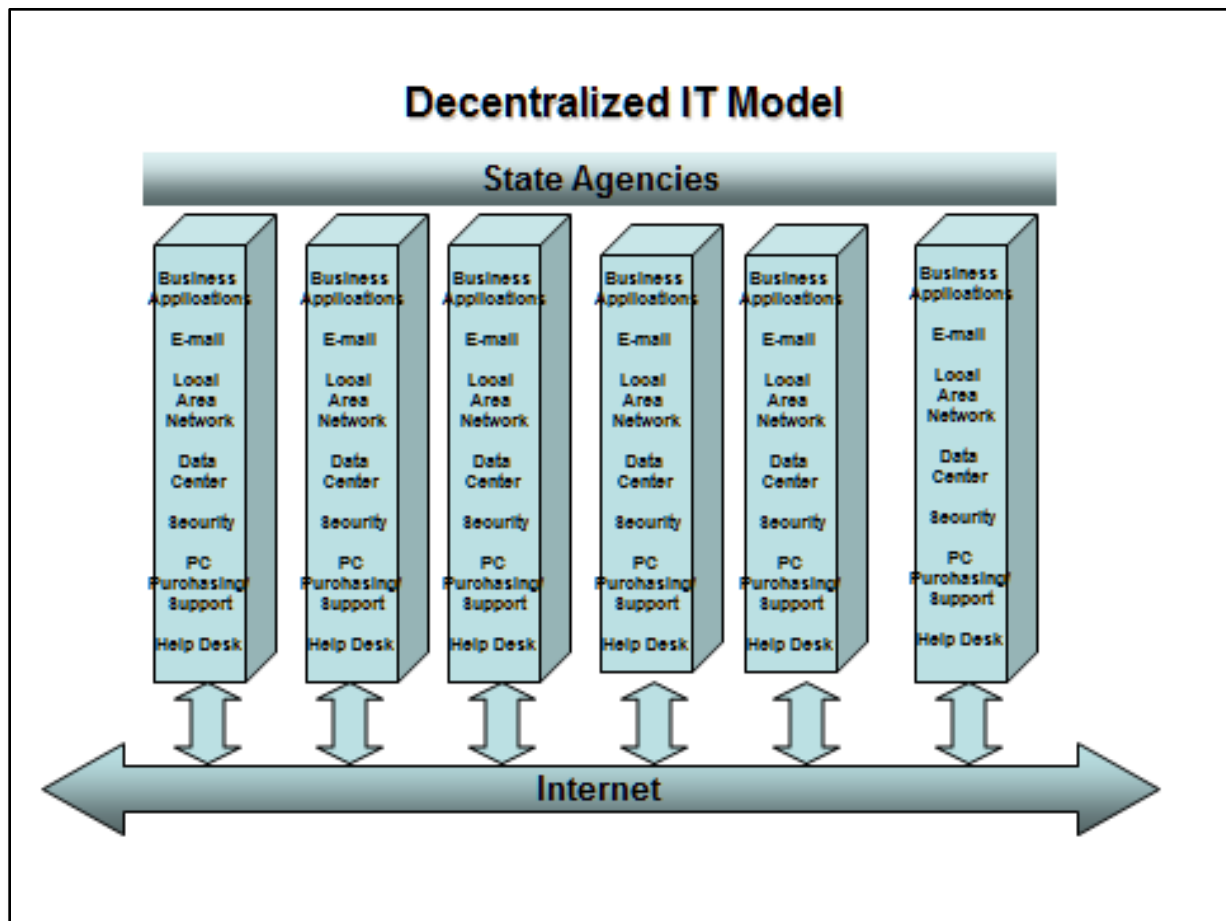
At the other end of the spectrum, a highly centralized system forces a "one-size-fits-all" approach that can be inflexible and unresponsive. The centralized model is shown in this diagram.

Centralized IT Model

State Agencies

Business Applications

E-mail

Local Area Network

Data Center

Security

Personal Computer Purchasing/Support

Help Desk

Internet

Consolidation history in North Carolina

North Carolina has been pursuing consolidation for many years with the firm belief that a shared service approach best serves the state. Consolidation and shared services not only increase efficiency and reduce risk, they free agencies to focus on the unique aspects of their respective business organizations. This concept holds true for infrastructure as well as business processes and the applications that support those business processes.

Economic conditions in recent years have forced the state to modify its consolidation efforts. The Office of Information Technology Services initially consolidated IT infrastructure – personal computers, servers, networks, help desks and security. With few exceptions, agencies were consolidated in a linear approach – complete one, start the next, and so on.

Because of limited resources and funding, the IT Consolidation Program in recent years has targeted agency investments that would mitigate specific risks, reduce costs, or both.

Today, information technology in the Executive Branch looks something like this diagram.

NC IT Today
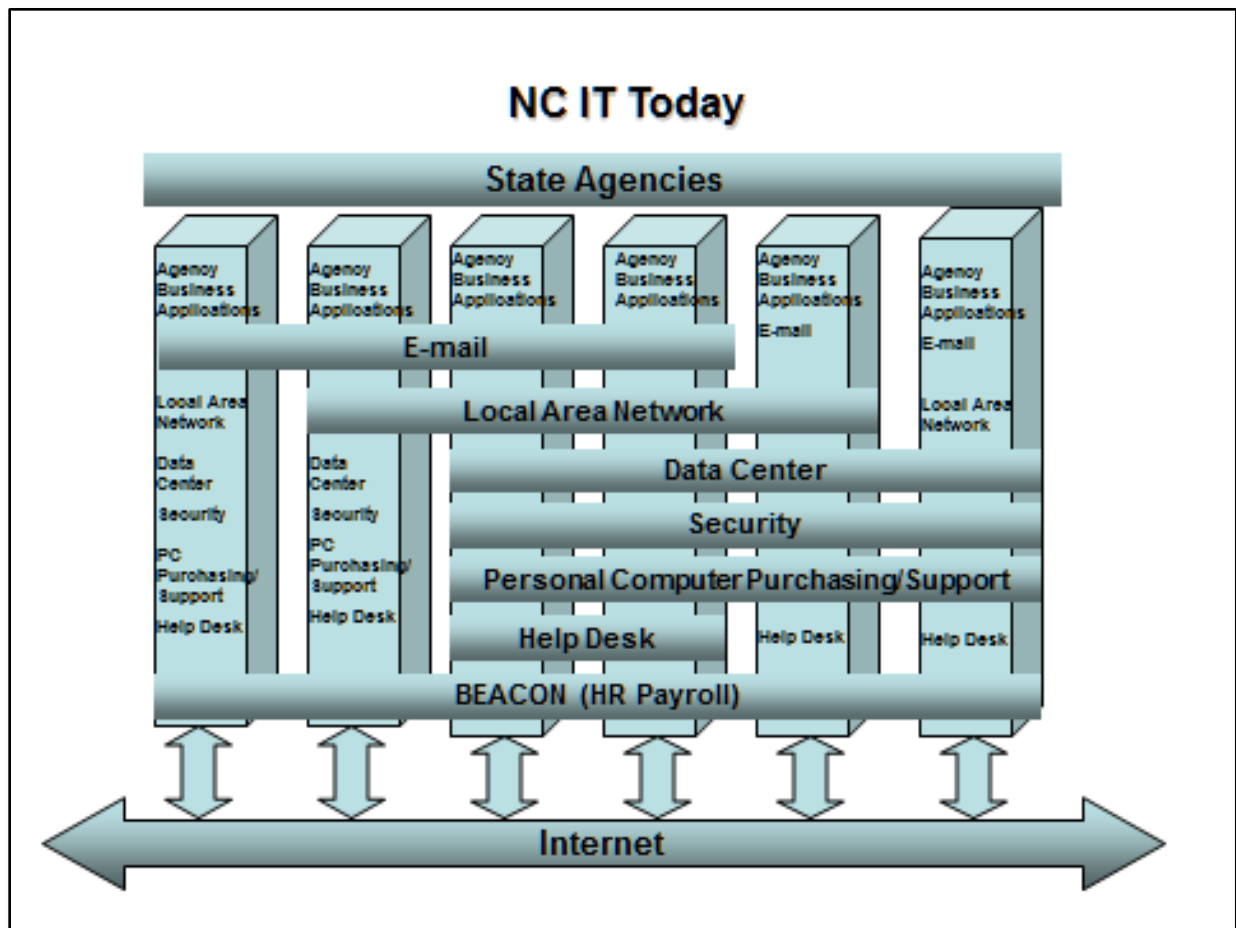
Thanks to previous consolidation efforts, some functions span agency lines. For example, BEACON, the statewide human resources and payroll system, spans state government.

Other IT functions, such as email, span some agencies, but not all. Some still operate their own email system, for example.

Recommendation: A stronger emphasis on horizontal consolidation, the approach outlined in this plan, will augment the targeted efforts of the past. Consolidating some of the foundational elements of IT across all Executive Branch agencies not only provides risk mitigation, it achieves a level of standardization and stability that will speed consolidation efforts and reduce the cost.

At the same time, this model recognizes that some agency business processes are unique, and a consolidated approach is not always effective from a cost or functionality standpoint. There must be exceptions to meet special needs. The new model would look like the following diagram.

Future NC Model

State Agencies

Agency Business Applications | Agency Business Applications | Agency Business Applications | Agency Business Applications | Agency Business Applications | Agency Business Applications

Common Applications (Licensing, Grants Management)

E-mail

Local Area Network

Data Center

Security

Personal Computer Purchasing/Support

Help Desk

BEACON (HR/Payroll)

Internet

This fundamental shift to an enterprise model is required across all agencies for the state to achieve maximum efficiencies in information technology. The state must consider the agencies' needs to meet specialized business processes. But the approach must be from a statewide perspective first, and from an agency level second. Where the state maximizes expenditures across the Executive Branch, there is less duplication of effort, less overall cost and better utilization of expertise and personnel. In short, overall IT efficiency is improved.

The long-term efficiencies come at some cost. Investments are required to bring all agencies up to the same standards. This, in turn, creates winners and losers. Agencies that under-spend (at the cost of business efficiency or security, or the increased risk of failure) for IT may end up paying more, especially in the short term. Others may pay less. But if done correctly, consolidation leads to overall efficiencies. The key is determining the investments that will pay the best returns while minimizing the risks.

An enterprise model also allows agencies to focus their information technology resources on their unique business needs while the centralized organization handles the nuts-and-bolts of information technology, as shown in the following diagram.
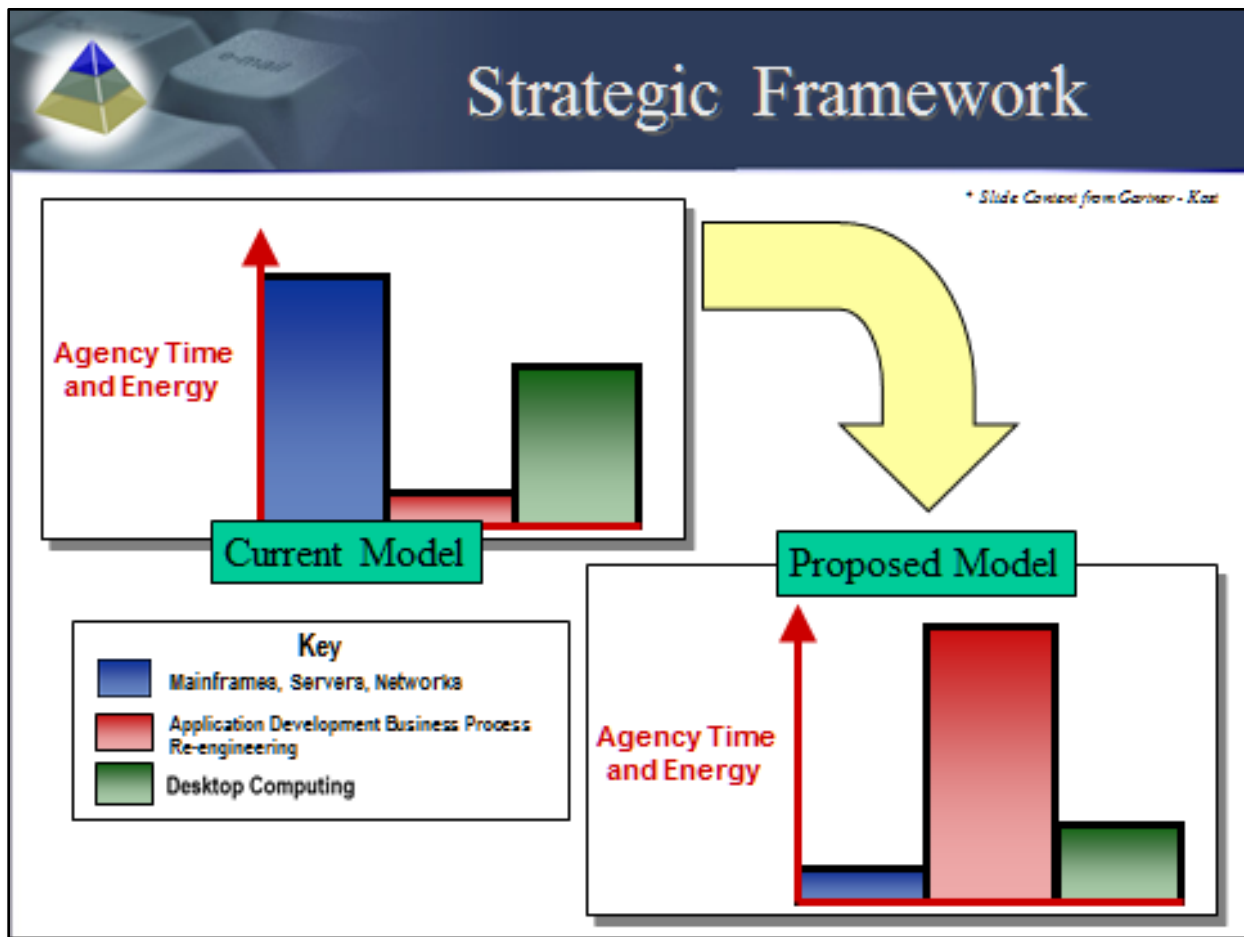
A shift in operational focus

A broader, statewide vision in IT management is only part of the picture. North Carolina also must consider a fundamental shift in management structure and focus of information technology at the statewide level.

The state can manage centralized services in several ways. Those include:

- A central service management organization, such as the Office of Information Technology Services (ITS), could provide core IT services and oversee vendors providing other services. Currently, ITS mostly is a service provider. It provides services to state agencies and charges rates approved by the Office of State Budget and Management.
- The state should leverage significant investments individual agencies have made where they can be used to serve the entire (or almost all of) state government. DOT has invested in a commercial grade Grants Management System (discussed in more detail later in this report) that is designed to handle the volume of grant making transacted by the entire state and automates the entire grants process from application, to award, to monitoring, to disbursements. While many other state agencies have grant

management systems that only automate part of the process or do not have a system at all.

- The state could also create one or more centers of excellence utilizing highly technical job skills across agency boundaries for complex information technology, such as SAS data analytics or SAP, the platform for much of the state's enterprise human resources and payroll systems as well as all of the Department of Transportation major business systems.

  Management of IT projects could also benefit from the centers of excellence concept. Currently, agencies are responsible for projects, with the state CIO's Enterprise Project Management Office providing oversight. A centralized project management office would provide the necessary project management skills and expertise needed for better management of projects while still recognizing and planning for agency business needs.

Recommendation: The state should refocus the current, service-provider structure to one of service management. Sourcing management—determining the proper mix of services provided in house, and those outsourced—is a necessary component of this approach.

The state should retain core IT functions. Others should be outsourced, with the central service management organization (SMO) managing the full end-to-end relationship with customers and between the state and vendors. The staff of this unit would require extensive contract experience, including technical, procurement, legal, negotiation and financial skills.

The state should leverage existing agency applications that could be used across multiple agencies.

How do we get there?

The consolidation strategies discussed in this plan represent a two-step, methodical approach. The state could mitigate risk and capture early savings in the first step, while achieving the maximum economies of scale in the second step. Given the state's budget outlook for the near future, this plan envisions limited, targeted investments.

Consolidation is just one activity that the state must continue in order to achieve the overriding business objective of delivering quality government services in the most effective way at the lowest possible cost. To maximize efficiencies, the state should undertake a more expansive effort to examine IT and business initiatives from an investment portfolio perspective and directly tie budget and expenditures to measured service delivery.

Any effort to improve the efficiency and effectiveness of IT will require a close look at the overall governance structure. Currently, the State CIO, who is responsible for a biennial IT plan

that lays out the state's IT strategy, has no statutory authority over the university system or the courts, which represented almost half of the state's total IT spend of $1.3 billion in 2010-2011. Spending by Executive Branch agencies, excluding the N.C. Education Lottery, totaled 602.7 million, according to the 2011 IT Expenditure Report by the Office of State Controller. University spending for IT totaled $552.3 million, and Court IT spending totaled $49.7 million.

Current governance proposals

Several proposals for restructuring the management and oversight of IT have surfaced in recent years. The Governor's Budget Reform Advisory Committee (BRAC) recommended an IT governance structure with an Information Technology Policy Council responsible for IT strategic planning and investment priorities in the Executive Branch. The commission also recommended that the State CIO have more control over IT spending across Executive Branch agencies and have authority over agency CIOs relating to IT planning and operations.

Executive Order No. 85, issued by Governor Bev Perdue, proposed merging the Office of Information Technology Services into a new Department of Management and Administration to, in part, add leverage amongst the three merged agencies to manage state government. The order also would move agency CIOs under the supervision of the centralized department.
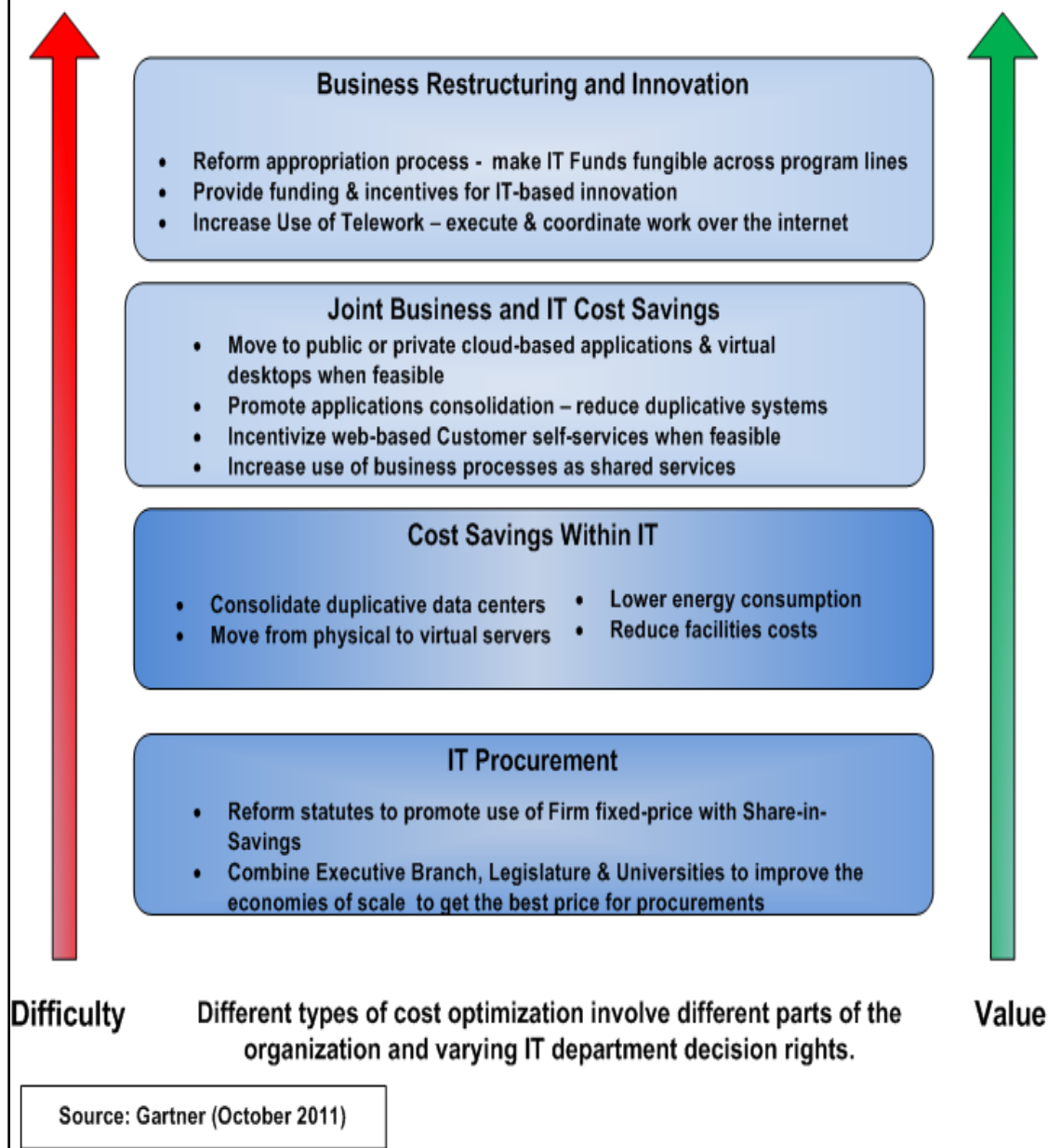
The discussion of IT governance should include project management. Currently, the State CIO has the statutory authority to approve and monitor agency IT projects. Agencies are responsible for carrying out projects. They sign the contracts and receive the funding.

The Enterprise Project Management Office (EPMO) serves as the State CIO's eyes and ears on IT projects, providing regular reports on the status of agency projects. In January 2011, the EPMO was monitoring 129 projects with a total cost of ownership of almost $1.5 billion.

The budget bill provision calling for this study suggested a statewide project management office to handle all IT projects. As mentioned previously, a project management center of excellence that operated across agency lines is one approach.

A strong governance structure, horizontal approach and shift to service management would enable the state to undertake the initiatives that would lead to the greatest IT efficiencies over time. The following diagram shows some possible initiatives, along with the difficulty and value. It is based on the Cost Optimization Model developed by Gartner, a leading IT research and consulting organization.

Figure 1: Gartner Cost-Optimization Model with Strategies and Example Tactical Actions

Business Restructuring and Innovation

- Reform appropriation process - make IT Funds fungible across program lines
- Provide funding & incentives for IT-based innovation
- Increase Use of Telework – execute & coordinate work over the internet

Joint Business and IT Cost Savings

- Move to public or private cloud-based applications & virtual desktops when feasible
- Promote applications consolidation – reduce duplicative systems
- Incentivize web-based Customer self-services when feasible
- Increase use of business processes as shared services

Cost Savings Within IT

- Consolidate duplicative data centers
- Move from physical to virtual servers
- Lower energy consumption
- Reduce facilities costs

IT Procurement

- Reform statutes to promote use of Firm fixed-price with Share-in-Savings
- Combine Executive Branch, Legislature & Universities to improve the economies of scale to get the best price for procurements

Difficulty

Value

Different types of cost optimization involve different parts of the organization and varying IT department decision rights.

Source: Gartner (October 2011)

Finally, this strategic *IT Consolidation Plan* cannot be read in isolation. It is but one component of several ongoing efforts and initiatives. The Infrastructure Study and Assessment (INSA) is one of those initiatives.

Infrastructure Study and Assessment (INSA)

The State CIO awarded a contract to Technology Partners International (TPI) in 2010 to conduct an outside assessment of IT infrastructure costs in Cabinet agencies. TPI made four

major recommendations and estimated the cost savings at $76.1 million over five years. TPI estimated transition and implementation costs of $18.5 million.

 The recommendations were:

- Outsource mainframe services, including all hardware, software, associated support functions and disaster recovery.
- Outsource Wide Area Network (WAN) services, including network monitoring and management, planning and design services, network connectivity and operations and network provisioning management.
- Consolidate IT service desks at five state agencies into the Office of Information Technology Services (ITS).
- Consolidate servers from five agencies into ITS.

As a result of the INSA study, ITS Statewide IT Procurement has developed an enterprise managed print service and made it available to all state agencies. If any privatization of the "towers" identified in the INSA study is pursued, ITS must prepare and present to the General Assembly a plan for privatizing any IT services pursuant to Section 6A.9 of Session Law 2011-145. Any plan to outsource must include cost estimates and weigh the benefits of outsourcing against the high risk to critical applications used every day by government and citizens. In addition, any plan should be implemented only after ITS completes the aggressive cost reduction program recommended by the INSA project team and executive business sponsors.

Present State of IT Consolidation

Actions by the General Assembly and the administration increased consolidation activity in recent years. Senate Bill 991 in 2004 required OSBM and ITS to develop a plan to consolidate IT infrastructure, staffing, and expenditures in Executive Branch departments where a statewide approach would be more economical. ITS, with the approval of OSBM, has consolidated thirteen individual state agencies, departments and institutions.

Initially, ITS focused on five core areas of IT infrastructure: the network that links state departments to each other and to the rest of the world; security; data centers; end user computing, such as desktops and laptop computers; and the management of intra-department networks that link department employees with each other. Phase I started in 2005 and consisted of smaller agencies. They were the "government" within state government and were located close to each other physically—most of them in the same building.

Phase I – (2005 – 2006)

- Governor's Office
- Lt. Governor's Office
- Department of Administration (DOA)
- Office of State Budget and Management (OSBM)

- Office of State Personnel (OSP)

Phase II, which included larger agencies, began in 2007 and was completed in 2009. During that phase, 5,600 personal computers, 251 servers, and the local area network infrastructure located at 219 sites in four agencies, six offices, and three commissions were placed under ITS management. ITS bills agencies monthly for the services associated with infrastructure.

Phase II – (2007 – 2009)

- Industrial Commission (NCIC)

- Office of Administrative Hearings (OAH)

- Department of Cultural Resources (DCR)

- Department of Juvenile Justice and Delinquency Prevention (DJJDP)

- Alcoholic Beverage Control Commission (ABC)

- NC Commissioner of Banks (COB)

- Department of Commerce

- Office of the State Controller (OSC)

Session Law 2008-107 (2008) required the State CIO to develop a plan to transition all State agencies, departments and institutions (outside of the General Assembly, Judicial Department and the University of North Carolina) to a single statewide electronic mail system.

In July 2009, Governor Perdue issued Executive Order No. 18, "Email Retention and Archiving Policy." One of the provisions directed ITS to maintain backups for a longer period and to procure an email archive system as soon as practical. That archiving system is now in place for users of the centralized email system. The system receives and archives more than one million emails each day.

As of today, about 85 percent of the state employees in the Executive Branch utilize the state's enterprise email system. Eight agencies continue to use their own systems. One of those – the Department of Public Instruction – is considering the centralized system.

Phase III (2009-present)

Senate Bill 202, passed by the General Assembly in August 2009, directed the Office of State Budget and Management, in conjunction with the State Chief Information Officer, to continue to consolidate state government's IT infrastructure where a statewide approach would be more economical, reduce security risks, or minimize potential disruption to service. In setting consolidation priorities, it told OSBM and the State CIO to target IT infrastructure issues that

posed significant risk to agency operations or data, or that provide opportunities for immediate cost savings to the State.

Economic and budget conditions forced ITS and the agencies to approach Phase III and subsequent consolidation activities differently than previous efforts. Instead of using the agency-wide approach of the first two phases, the current consolidation effort focuses on IT infrastructure issues that pose significant risk to agency operations or data, and opportunities that provide early cost savings to the state, at minimal cost. Those opportunities may include infrastructure or the greater use of shared services. For example, Phase III began with an inventory assessment at the Department of Transportation to identify consolidation opportunities. ITS conducted assessments at 37 representative DOT sites to determine the cost of raising them to best-practice standards. Based on that assessment, ITS determined that the cost of upgrading all DOT sites far exceeded the available budget.

The Department of Environment and Natural Resources approached OSBM and ITS to consolidate its downtown Raleigh server farms that would move to the agency's new building, Green Square. The project, which included the design and implementation of network and phone services by ITS, was completed on schedule. The number of servers was reduced from 240 to 69. A more detailed discussion of the project is under the Data Centers and Servers section of this report.

Governance

In the 2011 survey of state CIOs across the country, 51 percent said governance issues present the biggest challenges in consolidation efforts. Obtaining the up-front capital to fund consolidation finished second, at 45 percent.

Why is governance so important? Consolidation and shared services require many decisions related to scope, timing, change management, resource commitment and other vital issues. These issues must be addressed at the right level, with strong management support, and in a timely manner.

"Consolidation of services naturally creates governance issues because decision rights will have to be shared or allocated among the participants," the 2011 NASCIO survey report said. "Shared decisions provide an additional degree of difficulty and the allocation of decision rights often involves new decision processes and new roles for the executives and entities involved."

This section addresses four aspects of IT Governance: Strategic Planning, Service Delivery and Management, and Standards and Architecture. While these concepts are being discussed here in the context of consolidation, they apply to overall IT governance.

Strategic Planning

The first and most important element of a successful governance approach is a formalized strategic planning process. Strategic planning is simply the identification and clarification of an organization's purpose, desired results, and methods for achieving those results. In the information technology arena, the practice also includes the development of technology plans and is a subservient process to overall strategic planning for the business itself.

Current State of Planning: Currently, North Carolina Cabinet Agencies are required to develop an agency level strategic plan under [Executive Order No. 3](). Feeding from strategic plans, Executive Branch agencies are required to produce biennial IT plans and submit them to the Office of the State CIO, which prepares a statewide plan. The agency plans generally reflect the outcome of independent planning processes within each agency. As such, the projects identified in each plan are often approved and funded at the agency level without regard to statewide needs and available resources.

Current Impact on Consolidation: The lack of a statewide approach has hampered IT consolidation activities and minimized efficiencies. New enterprise investment strategies reuse opportunities, shared services, and economies of scale should be considered *before* agencies are well down the road of developing their own projects.

North Carolina must reconsider the overall approach and sequence of activities involved in strategic planning of statewide IT initiatives and consolidation efforts. This includes an early engagement model, which encourages agencies to collaborate on IT plans and explore enterprise opportunities before projects become too advanced.

Service Delivery and Management Framework

The central service management organization (SMO) would be responsible for the delivery of core IT services, and oversight of those services that are outsourced. As mentioned previously, the SMO would manage the relationship with customers and between the state and vendors. The skills needed will differ from those utilized in the current ITS, which is a service delivery organization. Staff of the SMO will require extensive contract experience, including technical, procurement, legal, negotiation and financial skills. As a result, a greater focus on service management would require training.

The diagram below shows one possible governance framework.
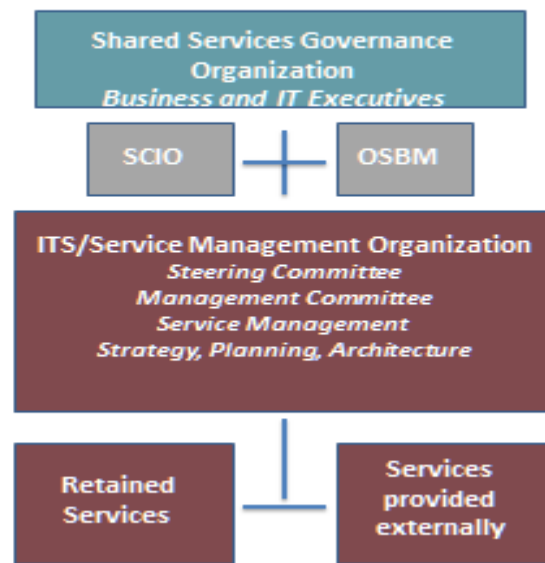
The design and implementation of the SMO should parallel the procurement process. The best current example of the SMO model is in the way the state handles telecommunications. Clearly, the state has no interest in laying cable in the ground; rather, the basic communications infrastructure is acquired from a few large telecom providers. The state utilizes the infrastructure already in place, managed by a contract and managed by the state's own telecommunication staff.

Standards and Architecture

The management of IT assets is a challenging undertaking. Most private and public sector enterprises have established standards, practices, policies and functions to address the life cycle of IT assets. This more structured approach to planning is sometimes referred to as architecture. The architecture helps organizations clearly align IT initiatives with the business needs and deliver effective IT solutions.

Maturity

Architecture functions vary in size and capability. Early implementations are typically limited to project oversight and standards, and policy management. As architecture functions mature, they may take a more active role in extending the knowledge and understanding of the enterprise, extending to a shared understanding of application systems, data, business functions and business processes. In this way, organizations are better positioned to make more informed business decisions about IT consolidation and sourcing options.

The state has many years of experience applying architectural principles to technical IT aspects of projects and is in a position to move to the next level of architecture oversight.

Strategy for Information Technology Consolidation

IT Infrastructure

As discussed previously, adopting an enterprise approach and service management organization will require a dramatic transformation and corporate culture change, including business processes, policies, organizational structure, personnel management and technology.

The first step includes work at both the agency and statewide levels. At the statewide, or enterprise level, the focus should be on the deployment of key enabling technologies and processes, mitigation of specific infrastructure risks and the design and implementation of a governance model.

The agency focus includes the identification and communication of specific risks to agency operations or data, participation in applications assessments, and internal consolidation to achieve early cost savings.

Staff within the State CIO's office, in conjunction with the Office of State Budget and Management, could continue managing the state's consolidation effort, but involvement and participation from all agencies within the Executive Branch will be crucial. All of those involved must remain mindful of agency business needs, which are sometimes unique, while maintaining an enterprise focus.

The benefits of this two-step approach include:

- Early identification of specific IT infrastructure risks and targeted mitigation of those risks, based on priority and funding
- Early capture of savings at an agency level, related to internal consolidations
- Adoption and deployment of key horizontal improvements and technologies, benefitting all of the Executive Branch
- Agency involvement in capturing early savings, mitigating targeted risk and implementing the broader, enterprise approach and service management organization.

Value Propositions

Risk mitigation, efficiencies and lower overall costs are the primary drivers behind IT consolidation generally.

A consolidated IT infrastructure drives a level of standardization that allows agencies to use common technologies within a standardized, predictable IT infrastructure with staff specifically trained to centrally manage and monitor the system

Moving to an enterprise shared-services model would provide for increased economies of scale because many of the larger agencies were not part of previous consolidation efforts.

Many components of the IT Infrastructure are candidates for a greater enterprise focus. Data centers, email and identity management are three that provide great opportunities.

Data Centers

Almost one-third of the states responding to the NASCIO survey reported that they have completed consolidating their data centers. Another 48 percent said that effort is under way, and 20 percent said they are planning to consolidate data centers.

In North Carolina, the INSA study found that Cabinet agencies have 46 data centers, or sites with servers and other IT equipment needed to host computer applications, in 15 cities. Raleigh alone had 31 sites.

Consolidating the servers and other equipment in the ITS data centers would reduce the costs of hardware, licensing and support. It would also reduce the chance of catastrophic failure, lower energy consumption and free up space for other uses or return to the rental market.

Server consolidation is not new in North Carolina. The Department of Environment and Natural Resources, for example, reduced its server inventory by 72 percent, from 240 to 69. More than 200 of the servers retired were old, out of support, and experiencing a steady increase in the failure rate. In addition to upgrading the equipment, the department laid the groundwork for being able to recover from a catastrophic failure.

Consolidating the servers at the Employment Security Commission, the former Department of Crime Control and Public Safety, the Department of Health and Human Services, the Department of Transportation and the Wildlife Resources Commission would save the state $23.7 million over five years, according to INSA.

Email

Email is an area where the state has made considerable progress in adopting an enterprise approach. Through the end of 2011, almost 50,000 employees of state and local governments were using the centralized email service offered by ITS. An estimated 8,500 state employees in the Executive Branch continued to use separate email systems. Increasing the number of customers on the centralized email system is a primary goal of ITS management.

A secondary goal in this area is development of a statewide strategy for unified communications, an industry term for the integration of real-time services, such as instant messaging and video conferencing, with email, voice mail and other non-real-time communications. Greater use of all communications technology provides more than the usual benefits of economies of scale and standardization. Used correctly, the tools increase

employee productivity and benefit the environment through greater use of telecommuting. In addition, today's increasingly connected workforce demands these tools.

Identity Management

The state has made significant improvements in ensuring that state systems properly identify and authenticate users. In other words, the users are who they say they are. The NCID common service provides a provisioning environment for managing application access. The service infrastructure provides a unified platform for e-business authentication and authorization. As the standard identity management and access service provided to State, local, business, and citizen users by the Office of Information Technology Services, NCID enables its customers to achieve an elevated degree of security and access control for real-time resources such as customer based applications and information retrieval. NCID has registered over 200,000 individuals and businesses statewide and manages the credentials of those users in a consistent, repeatable and secure manner.

Applications

As mentioned previously, several efforts are under way to bring an enterprise approach to applications, or programs that perform a specific function or deliver a service. Those include grants management, case management, licensing and permitting, and electronic forms. In addition, there are numerous opportunities for consolidation of IT tools and processes used across state government.

The Application Portfolio Management software utilized by the State CIO's Enterprise Project Management Office monitors projects and provides valuable information about the applications currently used by state government.

Value Propositions

As with infrastructure consolidation, an enterprise approach to the state applications would drive standardized, best-practice processes and reduce operating costs by eliminating duplication and creating economies of scale. When done in conjunction with development of a true state portal, consolidation also would provide a centralized source for citizens to access and transact business with state government.

Application consolidation would also provide consistent data across agency lines that would increase accountability and provide analysis for policy makers and budget writers. It would also provide the foundation for business analytics and intelligence for data analysis if implemented with an enterprise data architecture.

Here is a brief summary of some current consolidation activities and opportunities for a greater use of an enterprise approach in applications.

Grants Management

Section 6A.7(b) of Session Law 2011-145 directed the State CIO to plan and implement an enterprise level grants management system.

In response to the legislation, State CIO staff collected data on grants management applications being used or in development by Executive Branch agencies. Using information from a variety of sources, this survey estimated that:

- 700+ grants programs are being administered across (26) agencies and/or divisions within agencies.
- Grant funding to private, non-profit organizations totaled almost $700 million in 2007-2008, according to a 2009 report by the General Assembly's Program Evaluation Division.
- Hundreds of state employees and thousands of grant recipients and third parties are involved in processing grants.
- There are 25 existing grants applications in that cost the state approximately $700,000 per year to maintain.
- Fewer than 25 FTEs support all of the IT applications for grants in the Executive Branch.
- Business process standardization for grants management and automation of manual processes at many agencies represents the largest cost-reduction opportunity.

State CIO staff assessed existing agency systems for opportunities to use the state's current technology for an enterprise system. The SAP grants management platform operated and maintained by the Department of Transportation was identified as a viable candidate for a shared-services based Grants Management application. The criteria used to make this determination included the long-term viability of the solution, technical currency, supportability, scalability, sunk costs, feature/function set, security, and its ability to be configured, deployed, and utilized in a Software-as-a-Service (SaaS) business model serving many Executive Branch agencies. The State CIO, OSBM, and DOT are initiating a pilot project to demonstrate the SAP system's ability to meet business requirements of other agencies, identify risks and begin developing an implementation plan for phasing in all agency grant programs.

Licensing and Permitting

Numerous agencies, boards and commissions enforce professional standards and training requirements through licenses. All teachers and school administrators in the public schools must have professional educator's licenses. Medical professionals must have a license to

practice. In addition to individuals, a wide range of businesses, from restaurants to day care centers, must maintain certification or licenses. Numerous permits are required for construction.

Although each individual license is specific to a line of business, the back office process of managing a licensure application has several common steps. Some of these steps include an application for license, validating credentials, issuing a license, maintaining records of ongoing training, revocation, reinstatement, and renewal. This commonality presents an opportunity to standardize the business process, eliminate paper handling, automate processes by using workflow and self-service, and provide a higher level of service to the citizens.

The same applies to permits issued by state agencies. The process of receiving an application, reviewing it, issuing a permit and then keeping records has similarities across all state agencies.

Workflow Automation and Digital Signatures

Many state government and private sector entities use paper documents or forms as the primary tool to collect information from individuals and businesses and to perform government functions. The process often involves individuals filling out, signing and submitting paper forms for processing. In processing, the form may go through a series of steps such as review, updates, and multiple approvals, and final storage. Processing these forms is expensive – from printing physical paper to keying data from paper into computers and ultimately storing the paper. In addition, incomplete forms, incorrect data, unreadable handwriting can cause delays and further increase the total cost of forms processing.

The advent of electronic forms (e-forms) and digital signature e-commerce makes it possible to reduce or even eliminate paperwork, increase accuracy and efficiency and lower the cost of doing business. It is no surprise that private sector and governments alike are looking for ways to reduce use of paper and mandate use of electronic forms and digital signatures.

Enterprise Data Integration for Fraud Detection

The ability to identify, resolve and prevent incidents of fraud, waste and improper payment is critical to managing public funds and gaining the trust of the state's citizens. Unfortunately, fraud, waste and abuse occur across all government lines of business, from health and human services, tax collection and disbursement, unemployment insurance, workers' compensation, retirement benefits, insurance fraud and more.

A review of the literature, including industry white papers, suggests that fraud, waste and improper payment represent between 7 percent and 17 percent of all government spending. However, measuring fraud, waste and abuse is a difficult task. No single agency collects and reports comprehensive fraud statistics.

One way to detect fraud is to analyze organizational data. For the state of North Carolina, the data is stored in disparate systems built to meet the business needs of individual agencies. Gathering and analyzing data from different lines of business can be time consuming and difficult when data is stored in varying formats on different technical platforms. The process of data integration provides the ability to merge and reconcile this disparate data into common, consistent formats, for analytical and reporting purposes.

Case Management

Case management plays an integral role in state government's interaction with the citizens because much of the state's business involves providing services.

Cases can be as simple and straightforward as an inquiry for information or as complex as providing a range of social services to needy families. Sometimes, a caseworker may need to collaborate and co-ordinate meetings with an applicant and other staff in the organization to arrive at a decision. Some of the cases may be knowledge-intensive and require an intervention of skilled and knowledgeable personnel. Most of the cases might follow a general pattern, but each particular case would take its own unique path from initiation to resolution depending on the circumstances of the individual involved in the case.

The business process for case management varies from agency to agency because of the diverse nature of agencies' services. Over the years, each agency has either procured or developed its own case management system to address its business needs. Some of the case management solutions are manual and some are automated.

In spite of this variability, most case management shares several common characteristics such as case creation or intake, assessment, planning, approval or denial, appeal, closure, and archiving. These common processes provide an opportunity to selectively consolidate case management systems within a business area to achieve economies of scale, standardize and automate business processes, and provide a higher level of service to citizens.

IT Tools and Processes

There are numerous consolidation opportunities in the area of IT tools and processes used in the management of information technology. Two of the tools and processes include IT service/help desks and asset management.

As in other areas, some preliminary work has been done to consolidate tools and processes. ITS offers a comprehensive service that includes a ticketing system for handling and tracking problems and service requests, and for helping manage assets. Not all Executive Branch agencies utilize the service.

One INSA recommendation was the consolidation of service desks at the Department of Revenue, the Employment Security Commission, the Department of Environment and Natural Resources, the Wildlife Resources Commission and the Department of Crime Control and Public Safety, which has since been consolidated with others under the Department of Public Safety.

Risks, Issues, Uncertainties and Remediation

John Kost, the former state CIO in Michigan, and Richard Harris identified many risks in consolidating and implementing shared services in their Gartner Research paper published in 2008[2]. Some of them are listed below, along with others gathered from experience.

- **Funding for investment:** Consolidation and enterprise-wide shared services can reduce costs, but the state must invest in additional capacity to achieve economies of scale. Savings will be achieved only if unnecessary head count is reduced. The Office of Information Technology Services is receipts based and operates on a not-for-profit basis. As a result, it has a limited ability to generate the funds needed for any extensive consolidation effort.
- **Cultural resistance to change:** The biggest hurdle relates to politics and turf — the unwillingness to cede control to a central authority. Political leadership must hold all agency heads jointly accountable for success. Shared-service initiatives involving a cluster or subset of agencies that join voluntarily (as opposed to being forced by a mandate) have a greater chance to succeed.
- **Ineffective management:** Consolidation and shared services require many decisions related to scope, timing, resource commitment and other vital issues. These issues must be addressed at the right level and in a timely manner. If not, those asked to carry out the initiative will not have the power to get the job done. Good project planning alone cannot overcome this limitation.
- **Broad commitment to achieve end state:** The consolidation of major NC departments (Public Safety and ESC-Commerce) taking place this fiscal year has generally been successful. These consolidations are more complicated that what would often be seen in an IT application or IT infrastructure consolidation. This success is due, in large part, to the broad agreement across the leadership organizations of the state that these changes were necessary in tight budgetary circumstances and were desirable for policy reasons. When any consolidation has such broad support, bureaucratic barriers are more easily lifted and individuals work to the end goal.

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[2] John Kost, Richard G. Harris, Gartner Industry Research, *Government Consolidation and Shared-Service Efforts Will Continue to Struggle*, January 2, 2008.

- **Continued drain of staff creating increasing contract cost:** Many governments lack "extra" resources to do more than maintain what they currently have. Thus, there may be insufficient talent and resources to actually manage and execute. Increasing budget pressure has made it increasingly difficult to fill vacancies as the need arises.

Funding for supplemental management and technical staff will be required upfront to provide the extra resources that will be required to implement the recommended IT Infrastructure and Application consolidation opportunities.

Legislation and Background

Section 6A.7 of Session Law 2011-145 directed the State CIO to prepare a plan to consolidate IT infrastructure and applications.

STATE INFORMATION TECHNOLOGY CONSOLIDATION

SECTION 6A.7.(a) By February 1, 2012, the State Chief Information Officer (State CIO), in conjunction with the Office of State Budget and Management (OSBM), shall develop a detailed plan for consolidating the information technology infrastructure and applications of all State agencies, departments, and institutions in the executive branch. Information technology infrastructure includes personal computers, hosting and network environments, the help desk, call centers, and information technology security. Applications include enterprise software, on-demand software, and customized software. At a minimum, the consolidation plan shall include the following:

(1) Defined targets and priorities with a detailed timeline for the implementation of consolidation,

(2) The costs of consolidation by fiscal year and agency,

(3) The anticipated savings to result from consolidation and a timeline for actual achievement of those savings,

(4) Technical, policy, or other issues associated with achieving a timely and effective consolidation,

(5) A process to transfer all information technology hardware and software funding to the Office of the State CIO,

(6) Creation of a project management organization to manage all information technology projects,

(7) Review of agency, Office of Information Technology Services, and Office of the State CIO to identify redundant personnel positions.

When setting consolidation targets, the State CIO shall give high priority to infrastructure issues that pose significant risk to agency operations or data, that provide opportunities for immediate cost savings, and where a statewide approach would minimize disruption of services. In carrying out the consolidation, the Office of Information Technology Services shall utilize the authority set out in G.S. 147-33.83.

During discussions in August 2011, staff of the State CIO, the Office of State Budget and Management and the Fiscal Research Division of the General Assembly agreed that this *IT Consolidation Plan* should be a high-level, strategic plan and not a detailed tactical plan. Data collection to achieve the level of specific information called for in the budget provision would have required a prolonged and detailed effort and would likely duplicate any data collection conducted under Section 6A.19.(a) of Session Law 2011-145.