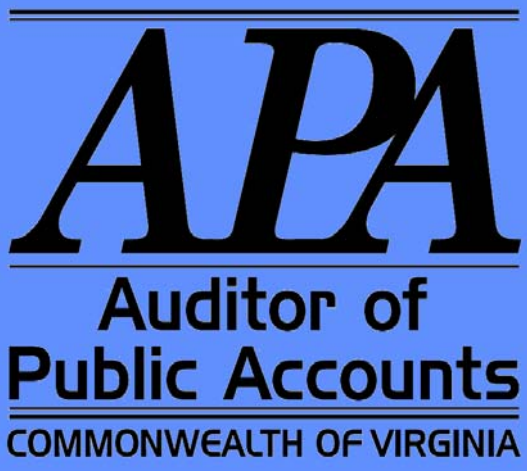
INFORMATION TECHNOLOGY GOVERNANCE

DECEMBER 2007



– T A B L E O F C O N T E N T S –

OVERVIEW

The Commonwealth's information technology (IT) governance has undergone significant changes in the last five years. These changes have fundamentally altered and strengthened the Commonwealth's infrastructure and new systems development process. At the same time, these changes have highlighted some flaws with systems development and shown that the Commonwealth could further improve the management of its information technology resources.

The Commonwealth, excluding institutions of higher education, spends approximately $607 million annually on IT, and of this amount, about 64 percent relates to infrastructure and new systems development. The remaining amount, about $219 million, is used by agencies to pay for staff salaries, consultants, and other costs related to the maintenance and operations of agency-based systems.

Who Has Control?

One of the most difficult challenges with understanding the Commonwealth's IT governance is answering the question, "Who has control?" Regrettably, there is no simple answer to this question because no one has the authority to exercise control over all areas where agencies spend on IT. The Virginia Information Technologies Agency (VITA) controls the infrastructure, the Chief Information Officer (CIO) and the Information Technology Investment Board (Board) control new systems development recommendations and oversight, and the individual agencies control their maintenance and operations of legacy applications.

Other issues further complicate the question such as different groups influencing the budget process, agency responsibility being unclear, and resources not existing to do the job properly. As an example, the CIO's responsibilities far exceed those of VITA, which as an agency, has responsibility for infrastructure and purchasing. The CIO's responsibilities include project management oversight, standard setting, and budget resource recommendations that go beyond VITA's core infrastructure mission and available resources.

However, because the CIO is also the agency head of VITA, many assume that the CIO's Commonwealth-wide responsibilities for oversight, standard setting, and IT budget reviews should be funded using a rate structure model similar to how agencies pay VITA for providing the infrastructure. Additionally, while the CIO and Board must develop and report on agency IT strategic plans, neither has the ability to influence the process since the Governor controls the budget process independently, and the process currently emphasizes a biennial budget approach rather than long-term system planning approach.

While the Commonwealth has partnered with Northup Grumman (NG) to consolidate its infrastructure, telecommunications, and other hardware related operations, the CIO's other duties have not diminished. However, his ability to perform these other duties is limited because agencies retain significant budgets for maintenance and operations of existing systems and only the agencies have information on how they will use their budgets and whether opportunities exist to improve the Commonwealth's effective use of these funds. This approach places the Commonwealth at risk since many of the smaller agencies have neither the expertise nor the funding to maintain and properly operate systems.

The Answer to "Who Has Control?"

Ultimately, the answer to the question, "who has control?" is nobody. Everyone has some small piece of control with no one determining direction or overseeing spending. The Commonwealth has left these responsibilities divided among many entities at many levels with no one entity having control or authority to make decisions.

Effects of Lack of Control

IT operations within the Commonwealth are complex, and management and oversight responsibilities for these operations are fragmented and diffused. The Commonwealth has always approached its IT management and oversight this way. The consolidation of IT operations has historically involved consolidating the existing infrastructure but not system applications or security.

No one determines if agency spending on maintenance and operations of legacy systems constitutes an efficient use of resources and minimizes the use of funds for duplicative systems. Individual agency needs and not the Commonwealth's priorities receive funding, and there is no incentive to cooperate and share resources among state agencies.

Following are several examples of how a lack of sound governance over all components of information technology has created duplication, lack of sound investment, and systems development projects that do not support the Commonwealth's business plan.

Failure to Understand the Commonwealth's Business Model

In 2006, the Commonwealth outsourced its IT infrastructure and its operation to Northrop Grumman (NG) under a 10-year partnership agreement valued at almost $240 million annually. Under the partnership, the Commonwealth committed that its agencies would use Northrop Grumman as its primary infrastructure service provider. However, a recent draft proposal for a new agency system included language that bidders consider a hosted infrastructure arrangement outside of the existing NG partnership. The agency did not originally include the language but it was added later by a state official during his review of the proposal. When VITA reviewed the draft proposal they discovered the added language and removed it before it was finally released.

Going outside of NG would have significantly increased the monthly rates other agencies pay because the Commonwealth is obligated to pay NG a guaranteed amount so they can recover their investment in the new infrastructure they are installing. Having fewer hardware components to divide into the guaranteed amount would have resulted in higher monthly service rates to other agencies.

Inadequate Maintenance Planning

Two agencies with mission critical systems used databases and application languages that the vendor had ceased supporting. These systems ran on computer equipment that was becoming obsolete and costly to maintain. Neither agency believed the Governor nor the General Assembly would invest in new technology, and therefore, did not ask for additional resources to replace the unsupported systems. Instead, agency staff believed that they could continue to maintain these systems internally.

Recently, both agencies have had to undertake expensive, short-term conversions of their databases and application language since the equipment supporting these systems was becoming expensive, and it was increasingly difficult to find staff with knowledge to support the antiquated programming language. This emergency conversion will not provide either agency with a more modern or efficient system. The emergency transfer of the system and data from one machine to another only postponed the continuing need for an altogether new application.

Failure to Work Jointly to Implement an Enterprise System

In 2001, an agency began considering a project to replace their legacy licensing systems with a commercially-available, off-the-shelf (COTS) licensing application. In 2005, the CIO determined that rather

than having the one agency pursue a licensing system, the Commonwealth could benefit from an enterprise licensing solution since there are 32 regulatory entities tasked with providing professional and occupational licensing, permitting, certification, and/or registration services to approximately 1.5 million customers.

The CIO authorized VITA to enter into a statewide contract with a vendor to provide the COTS licensing solution that VITA would host. The CIO got together several licensing agencies to champion a collaborative system by setting common data standards for license information. By 2006, it was apparent that the agencies could not reach a consensus on uniform data standards, therefore ending this collaborative approach.

Since the CIO cannot force agencies to work collaboratively, his only alternative was to terminate the collaborative effort. In a presentation to the Board, the CIO reported the impasse and noted that without consensus, obtaining a common system for professional and occupational licensing activity could not occur.

Lack of Data Standards Results in Disparate Systems

In 2000, an agency awarded a contract to provide the Commonwealth with an electronic procurement system. Agencies must use the system to initiate and process purchase requests. The system uses look-up tables that contain data such as vendor information and commodity codes; however, some of this data such as vendor information does not conform to the existing vendor table used by the Commonwealth's statewide accounting system. In Spring 2007, Forrester Consulting reviewed the system and their report noted the Commonwealth's failure to agree on data standards for information common among its applications has led to disparate systems that cannot exchange information or be useful in performing analysis.

Avoiding IT Governance by Developing Projects Using Maintenance and Operating Budgets

In 1998, an agency acquired a system and has continued to make modifications to it to support Federal government initiatives. In 2005, the agency stopped making modifications to the system and began rewriting it into a web-based application. Since the web-based application will replace the current system, Commonwealth standards require the project receive the CIO and Board's approval through the IT governance structure for new systems projects.

However, the agency has been developing the system since 2005 without the CIO and Board's approval and without VITA's Project Management Division's (PMD) oversight. They have been paying for the system through existing maintenance and operating funds. When the CIO discovered this discrepancy in July 2007, he suspended the project pending a PMD review of the project's health and status. The agency's system replacement effort has resulted in missed deadlines and the filing of inaccurate status reports with the federal government.

Lack of a Sound Return on Investment for New System Development Projects

At the Board's July 2007 Commonwealth IT Solutions Committee meeting, PMD provided a briefing on the Commonwealth's information technology portfolio (Portfolio). The briefing included PMD's analysis of Portfolio data that agencies submitted to request new systems development funding as part of their annual budget request to the Governor.

PMD's analysis of the Portfolio showed that on average, agency provided data yielded a 1.97 percent return on investment (ROI). The rate of return is a simple computation that shows how quickly the benefits of investing in a new system will outweigh its cost. The diagram below shows excerpts from the PMD briefing.

Analysis of Current Portfolio Rate of Return

Secretariat	4 Yr Total Costs	Gross Benefits	ROI by Secretariat
Total Administration	2,700,000	3,200,000	18.52%
Total Agriculture & Forestry	1,632,735	858,184	-47.44%
Total Commerce & Trade	7,411,900	5,016,552	-32.32%
Total Education	108,772,514	81,537,849	-25.04%
Total Finance	3,403,501	3,403,501	0.00%
Total Health & Human Services	39,433,204	38,897,055	-1.36%
Total Natural Resources	655,336	4,354,000	564.39%
Total Public Safety	381,748,680	372,138,072	-2.52%
Total Technology	668,831	668,831	0.00%
Total Transportation	61,260,116	109,571,231	78.86%
Grand Totals	607,686,817	619,645,275	1.97%

Breakdown of Rate of Return by Major and Non-Major Project Type

	4 Yr Total Costs	Gross Benefits	ROI by Category
Total Major Projects	597,335,288	602,954,474	1%
Total Non-Major Projects	10,351,529	16,690,801	61%

Committee members expressed concern over the low rate of return and PMD staff explained that there may be several technical reasons for it. One of the fundamental reasons for keeping the return low is agencies may be apprehensive to show a high rate of return for fear that the Governor or General Assembly may reduce their operating budget by the expected savings.

The Committee members discussed that currently there is no financial incentive for agencies to demonstrate a high rate of return. The Committee discussed concerns about the data's accuracy and completeness and noted that the information only includes current and planned systems development projects representing only about small portion of overall agency IT spending.

PMD staff stated that they had a long-term desire to gather information on all of agency IT spending, which includes not only new systems development projects but also the cost of their hardware infrastructure and existing systems maintenance and operations. However, VITA did not have authority to gather the data or the staff necessary to verify its accuracy, and obtaining it would require the cooperation of many entities at many levels.

The Committee discussed that the Board's authority only extends to approving, disapproving, or suspending new projects and recommending projects for funding. The Board does not actually fund projects nor does the Board have the ability to affect the overall funding needs that agencies report. Agency funding depends on the individual agency's ability to make their case to the Governor and the General Assembly.

The Committee had concerns that without some process or oversight improvement, the Commonwealth was at risk that agencies will use resources on IT without matching it to the Commonwealth business goals. Also, the process does not create an environment in which agencies can create efficiency in how they spend Commonwealth resources on IT and make decisions to better invest in IT for the entire enterprise's benefit.

SCOPE, OBJECTIVES AND METHODOLOGY OF THE REVIEW

This Office and the Joint Legislative Audit and Review Commission (JLARC) have issued a number of reports which have dealt with IT governance issues within the Commonwealth. Our most recent reports include a December 2006 report on the Commonwealth's information security and an April 2006 report on the Virginia Information Technologies Agency's IT governance over new systems development projects and IT strategic planning. The General Assembly, Governor and CIO have implemented a number of the recommendations included in these reports. Many of the issues raised in the overview to this report deal with the fragmented approach to IT governance.

The Commonwealth's method for funding IT complicates IT governance. The funding model, which empowers agencies to control resources, assumes that they have enough resources as well as the technical expertise to use and manage the resources. The funding assumption of both sufficient resources and knowledge may not be accurate based on the need for the Commonwealth to partner with Northrop Grumman to provide a modern infrastructure and our previous review of the Commonwealth's information security.

As the Commonwealth begins implementing enterprise applications, the need to understand the relationship of the various parties and their responsibility in IT governance becomes important to ensure success. Understanding relationships and responsibility also ensures that the Commonwealth properly deploys its resources, eliminates any duplicative efforts, and that future new systems do not undo the benefits of an enterprise approach.

Enterprise approaches will require the Commonwealth to examine how it manages and implements IT resources throughout the agencies. Currently, each agency tries to manage and control its spending on IT. Our report on information security and the experience of the VITA infrastructure partnership have indicated that this approach has created an uneven distribution of resources. Specifically, large agencies tend to have more IT staff and funds available than small agencies.

While the uneven distribution of resources is typical in any organization, the issue facing the Commonwealth is the risk that this distribution creates. Our report on information security found that the current level of risk may not be acceptable and that the distribution model does not provide some agencies with the resources to address and mitigate this risk.

We examined IT governance practices as of October 2007 and have set our work scope to understand the current practices for the purpose of addressing three primary objectives.

(1) To determine whether effective IT governance exists for all areas where the Commonwealth spends money on information technology.

(2) To determine whether the Commonwealth's current IT governance follows industry best practices.

(3) To determine whether risks exist within the Commonwealth as a result of the current IT governance structure.

We reviewed minutes of Board meetings and statutes governing the roles and responsibilities for the CIO, Board, VITA, PMD, and the Secretary of Technology. We reviewed a variety of websites, including VITA's, to gain an understanding of standards and policies in effect and the processes followed by the Commonwealth. We queried financial information contained in the Commonwealth's central accounting and payroll systems to calculate estimated IT spending and also reviewed various PMD reports to estimate

amounts spent on new projects annually. We also reviewed reports issued by both JLARC and the APA and determined where information in those reports had changed since originally issued. Finally, we performed extensive research on IT governance best practices.

We determined that two sources on IT governance best practices provide a sufficiently broad scope to deal with the complexity of the Commonwealth's management structure and organization. One source is Federal government guidance on the governance of IT resources, which is effective for the review of large agencies but does not address the governance as fully as the Commonwealth would need.

The second major source of information on IT governance comes from the IT Governance Institute, whose research resulted in the Control Objectives for Information and related Technology (COBIT) guide. We will describe this guidance in more detail later. This guidance is regularly used by public accounting firms when reviewing internal controls of public corporations required by Sarbanes-Oxley. COBIT provides a mechanism to review IT governance and is a scalable model which examines strategic plans, policies, processes, and procedures.

IT GOVERNANCE IN THE COMMONWEALTH

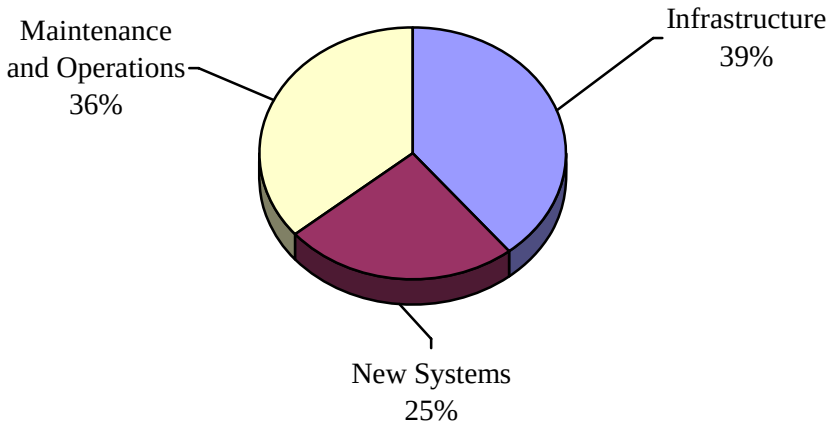
In the 1970's, the Commonwealth consolidated its primary data centers from six to one. System applications remained the responsibility of the individual agencies, but a central agency assisted the various agencies with systems planning and procurement. Use of this planning and procurement function was voluntary and most agencies did not use it and instead performed these activities internally.

In July 2003, the Commonwealth transferred the ownership and responsibility for the executive branch agency IT infrastructure, excluding institutions of higher education, from individual agencies and consolidated ownership with VITA. Before this consolidation of the infrastructure, individual agencies purchased and maintained items such as laptops, desktops, servers, data centers, and networks.

By July 2006, the Commonwealth, with VITA as its contract manager, outsourced the IT infrastructure and transferred its ownership and operation to Northrop Grumman. VITA continues to retain the statutory responsibilities given to them in July 2003 and closely monitors Northrop Grumman to ensure they deliver the infrastructure that the Commonwealth requires. Although infrastructure responsibilities have changed, agencies retain responsibility for the IT applications that run on the infrastructure, the people that support those applications, the information those systems capture, and the security surrounding those systems.

As shown in the chart below, we estimate that excluding higher education institutions, agencies spent a total of $607 million in fiscal year 2007 on information technology.

Breakdown of Annual Spending on Information Technology



Source: CARS and CIPPS

About $238 million (39 percent) represents payments to VITA for providing the IT infrastructure, about $219 million (36 percent) to maintain and operate existing agency systems, and about $150 million (25 percent) on new systems development projects. How much agencies pay for their infrastructure is the result of the equipment they need from Northrop Grumman multiplied by a monthly service rate for the use of that equipment. The rates for like equipment are the same across all agencies and ultimately generate sufficient amounts for the Commonwealth to meet their contractual obligation with Northrop Grumman.

What agencies spend on existing systems maintenance and operations is under the control and oversight of individual agency management. There is no formal process to evaluate if these amounts are necessary or that the way they choose to maintain and operate these systems is cost beneficial. Some agencies choose to have full-time staff maintain the systems while others may hire technical experts on a contractual

basis. Some agencies may purchase commercial software packages while others maintain custom-designed systems, some of which may be written in older programming languages.

Agencies include their new projects in the Commonwealth's Portfolio and the projects then go through the Commonwealth's formal IT governance processes for approval and monitoring. The IT governance structure over new systems development has been evolving since 2003 when the Code of Virginia established a CIO, Board and PMD with responsibilities for IT governance over new systems development projects. Since that time the PMD, Board, and CIO have set governance oversight in place including:

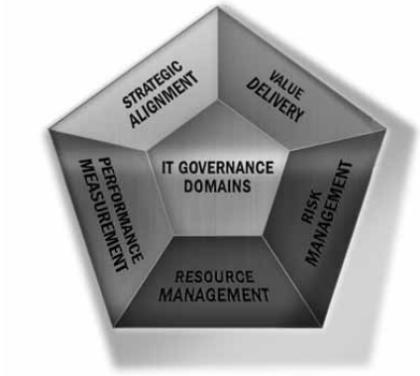
- creating an IT enterprise architecture;
- developing and communicating a Commonwealth IT strategic plan;
- implementing an automated Portfolio system to capture requests and information about new systems development projects;
- establishing a process to score, rank, and recommend projects for funding;
- instituting a formal training and accreditation program for project managers; and
- developing a monitoring and oversight function include independent project reviews.

IT GOVERNANCE BEST PRACTICES

Background

The IT Governance Institute, established in 1998 by the Information Systems Audit and Control Association, is an industry leader in defining IT governance best practices. The Institute defines IT governance as the leadership, organizational structures, and processes that ensure the organization's IT sustains and extends the organization's strategies and objectives. The diagram below shows the five domains of IT governance recognized by the Institute: strategic alignment, value delivery, risk management, resource management, and performance measures.

IT Governance Domains Recognized by COBIT



Source: COBIT 4.1

The IT Governance Institute has performed extensive research and published several documents that provide frameworks and guidance to support these domains. One well-recognized guide is the Control Objectives for Information and related Technology (COBIT). COBIT provides for the management and delivery of high quality information technology services using infrastructure, personnel, applications, and resources. COBIT focuses largely on the execution of IT governance, addressing are we doing things the right way, and are we getting them done well.

This Office has used the COBIT framework in several previous governance reports such as our review of the Commonwealth's information security and our review of IT governance for new systems development projects. Although this specific review takes a more global view of governance beyond security and new systems projects, we again rely on COBIT.

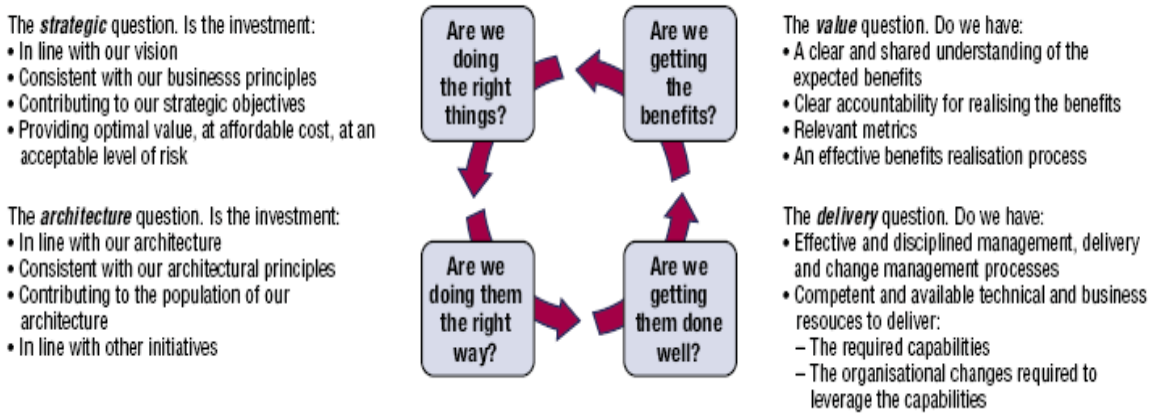
A complementary guide within the COBIT frame work is Val IT, which sets best practices for realizing business value from investment in IT. The Val IT framework appears most relevant for purposes of this report in that it defines industry best practices to address the Commonwealth's entire IT use of resources. Industry refers to this as IT investment.

IT Investment Decision Process

As shown in the diagram below, Val IT focuses on the IT investment decision process and makes the organization answer questions such as, are we doing the right things and are we realizing benefits. Val IT recognizes that investing in IT is no longer only about implementing IT solutions, such as new systems, but is also about implementing IT-enabled change to sustain, grow, and transform the business. IT-enabled

business investments can bring huge rewards, but only with the right governance and management processes and full commitment and engagement from all management levels.

IT Governance Investment Decision Process



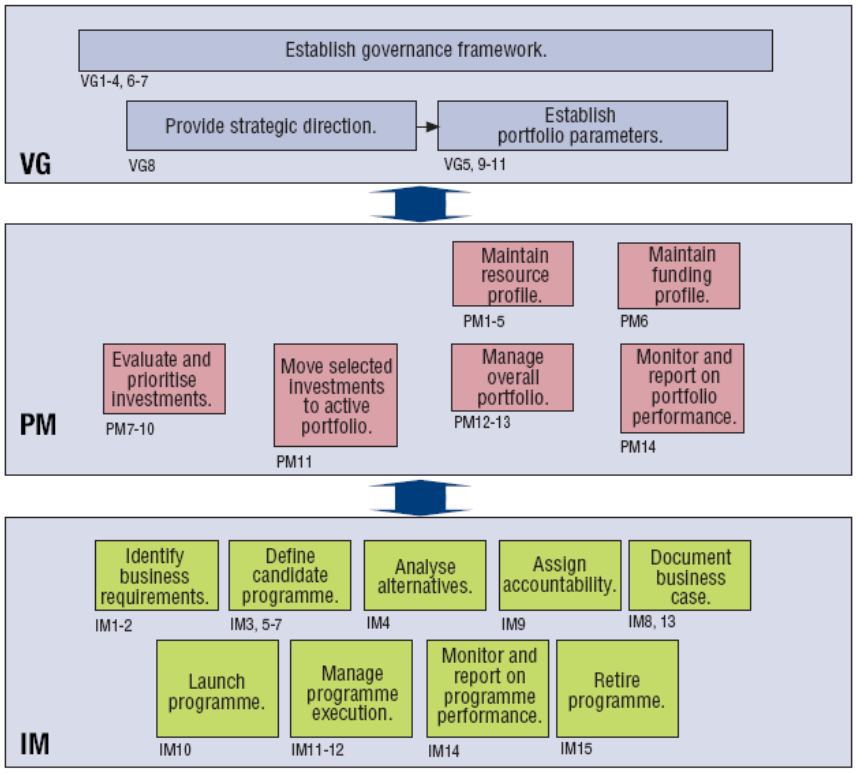
Source: Val IT

The Val IT process shown above suggests that all IT spending, including maintenance and operations of legacy systems, the infrastructure, and new systems, is subject to the IT investment decision making process, instead of only making investment decisions relative to new systems development projects. In fact, Val IT is about planning and implementing IT investment decisions to optimize the value to the enterprise, i.e. the Commonwealth as a whole.

The diagram below shows how three processes provided by Val IT should be applied to realize a return on IT investment.

- **Value Governance (VG)** includes establishing a broad governance, monitoring and control framework that provides for clear and active linkage between the enterprise strategy and the portfolio of IT-enabled investment programs that execute the strategy.
- **Portfolio Management (PM)** involves managing the overall portfolio to optimize value to the enterprise.
- **Investment Management (IM)** includes managing the results of individual investment programs, including business, process, people, technology and organizational change, and IT projects that make up the programs.

Relationships Among Val IT Processes



Source: Val IT

Comparison of Commonwealth IT Governance to Val IT Best Practices

Val IT describes key management practices for each of the three process areas; value governance, portfolio management, and investment management. We used these practices in the table below to compare to the Commonwealth's existing IT governance practices.

For purposes of this comparison we distinguished between the three main IT spending areas; IT infrastructure, new systems projects, and other agency IT spending, such as maintenance and operations. We believe this distinction is important because the Commonwealth operates and manages these three IT areas differently. We recognize that Val IT does not recommend different processes for various types of IT spending and instead recognizes that the maximum value from IT investment is achieved through management of the complete enterprise portfolio.

The chart below highlights that the Commonwealth does not have effective IT governance in place for all aspects of our IT investment. Through the creation of the CIO, VITA, PMD, and Board, the Commonwealth is following many aspects of IT governance best practices for new systems development projects. The infrastructure governance, as we discuss later, is adequate for the Commonwealth's present needs, but requires enhancement to ensure its adequacy in the future. Finally, the Commonwealth has little to no IT governance best practices in place over agency IT maintenance and operations.

Value Governance (VG)	IT Infra-structure	New IT Systems Projects	Other Agency IT Spending
The reporting line of the CIO should be commensurate with the importance of IT within the enterprise.	✓	✓	✗
The business and IT strategy should be integrated, clearly linking the enterprise goals and IT goals and should be broadly communicated.	✓	✓	✗
Define, implement and consistently follow processes that provide for clear and active linkage among the enterprise business strategy, the portfolio of IT investment programs, and the projects that make up those programs.	△	✓	✗
Establish an appropriate control framework that is consistent with an overall enterprise control framework and provide for unambiguous accountabilities and practices to avoid a breakdown in internal control and oversight.	△	✓	✗
Define a balanced set of performance objectives, measures, targets, and benchmarks and have them approved by the business and other relevant stakeholders.	△	✓	✗
Report relevant portfolio, program, and IT performance to the board and executive management in a timely and accurate manner.	✓	✓	✗
Establish appropriate boards, committees, and support structures including, but not limited to, an IT strategy committee, and IT planning or steering committee, and an IT architecture board.	✓	✓	✗
Make sure the business direction to which expenditures on IT-enabled business investments should be aligned is understood, including the business vision, business principles, strategic goals and objectives, and priorities.	△	✓	✗
The governance process must recognize that there are a variety of investment types that differ in complexity and the degree of freedom in allocating funds. Categorize these different investment types. Categories could include mandatory, sustaining, and discretionary.	✓	✓	✗
Align the portfolio mix with the strategic direction of the enterprise. The mix must achieve the right balance of investments on a number of dimensions. These dimensions could include, but are not limited to, an appropriate balance of categories, short- and long-term returns, financial and non-financial benefits, and high risk versus low risk investments.	△	✗	✗
For each category of investment have evaluation criteria to support fair, transparent, repeatable, and comparable evaluation.	✓	✓	✗

✓ - best practice exists △ - best practice evolving ✗ - best practice does not exist

Portfolio Management (PM)	IT Infra-structure	New IT Systems Projects	Other Agency IT Spending
Create and maintain an inventory of current IT human resources, their competencies, and their current and committed utilization.	△	✗	✗
Understand the current and future demand for IT resources based on the current portfolio and a forward view of the portfolio.	△	✗	✗
Identify shortfalls between current and future IT and business resource demand, and current and planned IT and business resource supply.	△	✗	✗
Create and maintain tactical IT plans for resources that are required to support the portfolio of IT-enabled investment programs and the IT strategic plan.	△	✗	✗
Periodically review the IT function and business organizational structure to adjust staffing requirements and sourcing strategies to meet expected business objectives and respond to changing circumstances.	✓	✗	✗
Determine the overall budget available for the portfolio, the current commitment of that budget, the current approved spending and the actual spending to date.	✓	✗	✗
Perform an initial, high-level assessment of the program concept business case looking at strategic alignment, benefits, overall financial worth and risk, and fit with the overall portfolio.	✓	✓	✗
Perform a detailed assessment of the program business case and assign a relative score to the program based on the evaluation.	✓	✓	✗
Assess the impact on the overall portfolio of adding a candidate program. Determine the impact on the portfolio mix.	△	✓	✗
Determine whether the candidate program should be selected and moved to the active portfolio.	△	✓	✗
Review the portfolio on a regular basis to identify and exploit opportunities for synergies and to identify, mitigate, and minimize risks.	△	✓	✗
When changes occur to the internal or external business environment, re-evaluate, and reprioritize the portfolio.	✓	✓	✗
Provide a succinct, all-round view of the performance of the portfolio to the board and executive management in a timely and accurate fashion.	✓	✓	✗
Recognize opportunities for investment programs to create value in support of business strategy or to address operational or compliance issues.	✓	✓	✗

✓ - best practice exists △ - best practice evolving ✗ - best practice does not exist

Investment Management (IM)	IT Infra-structure	New IT Systems Projects	Other Agency IT Spending
The business case should describe the business outcome to which the potential program will contribute, the nature of the programs contribution, and how that contribution will be measured.	✓	✓	✗
Utilize appropriate methods and techniques, involving all key stakeholders, to develop and document a complete and shared understanding of the expected business outcomes of candidate programs.	△	✓	✗
Identify alternative courses of action to achieve the desired business outcomes.	✓	✗	✗
Define and document all projects, including business, business process, people, technology and organization projects, required to achieve the programs expected business outcomes.	✓	✓	✗
For each key outcome achievement, identify and document baseline and target measurements and the method for measuring each key outcome.	✓	✓	✗
Prepare a program budget that reflects the full economic life cycle costs and financial and non-financial benefits, and submit for review, refinement, and approval by the business sponsor.	✓	✓	✗
Develop a complete and comprehensive business case of the program consistent with the enterprise's standard business case requirements.	✓	✓	✗
Clearly and unambiguously assign and monitor accountability for achieving the benefits, controlling the costs, and managing the risks, and coordinating the activities and interdependencies of multiple projects.	△	✓	✗
Plan, resource, and commission the necessary projects required to achieve the program results.	✓	✓	✗
Management program performance against key criteria such as scope, schedule, quality, costs, and risks.	✓	✓	✗
Implement a benefit monitoring process to ensure that planned benefits are achieved, sustained, and optimized.	✓	✗	✗
Update the business case to reflect the current status of the program.	△	✓	✗
Define and implement enterprise practices to ensure that program performance and IT's contribution to that performance are reported to the board and executive management in a timely and accurate fashion.	✓	✓	✗
Close projects in an orderly manner where there is agreement of the realization of the desired business value.	✓	✓	✗

✓ - best practice exists △ - best practice evolving ✗ - best practice does not exist

Below we provide a more detailed discussion of IT governance over the three areas of IT spending shown in the table above.

IT Governance over the Infrastructure is Transforming

The Commonwealth has consolidated and outsourced its IT infrastructure to Northrop Grumman (NG). NG is currently operating the environment they inherited from VITA and that environment continues to have a strong agency by agency infrastructure approach. This consolidation has begun to change how the Commonwealth approaches its current IT needs. However, the Commonwealth will not finalize its IT governance policies and procedures to deal with its future infrastructure and changes until July 2009 when VITA and NG anticipates completing the transformation phase.

As administrators of the contract on behalf of the Commonwealth, VITA created a service management organization (SMO) with general responsibilities to ensure infrastructure services are transformed and deliver an appropriate level of performance to VITA's customers. The SMO is currently working with NG during this transformation phase. Deliverables from this phase include procedures for the continuing operation and management of Commonwealth IT infrastructure and a Procedures Manual.

Since the Commonwealth's infrastructure needs will change over time, it will be critical that the Procedures Manual include IT governance processes to manage this change. It will be important that the Commonwealth's infrastructure needs change to keep in line with its business and IT plans, and that a structure exists to make the best infrastructure investment decisions for the Commonwealth as a whole.

Infrastructure governance depends upon the Commonwealth having sound governance over maintenance and operations and new system development since many times, change in one is a catalyst for change in the other. Without IT governance that encompasses the entire IT environment, agencies will continue to make individualized decisions regarding their infrastructure needs that may not be good investments.

IT Governance over New Systems Development Projects Is Maturing

New systems development is the Commonwealth's most mature governance structure and meets many of the Val IT best practices. For this area of IT spending, we found many established best practices for new project IT governance. There are a few areas where key practices either need improvement or are currently non-existent, but for the most part the CIO, VITA, PMD, and Board have been working towards a maturity level that will eventually include these practices, where possible.

For example, at their July 2007 meeting the Board's IT Solutions Committee began reviewing data in the Commonwealth's Portfolio in an effort to begin addressing what the appropriate IT investment mix should be. The Committee noted that the Portfolio only contained new systems development projects and in order to effectively evaluate and determine the investment mix, the Portfolio should ideally contain reliable information regarding legacy applications and all IT spending.

For some key practices involving new systems development projects, the CIO, VITA, PMD, and Board encounter fundamental problems because they do not have control over executive branch agency IT funding. For example, since the CIO, PMD, and Board have no control over the Commonwealth's budgeting process, they may recommend projects for development, but the determination of whether or not to actually fund the project is the responsibility of the Governor and General Assembly. Also, since there is no pre-established amount available to invest in projects contained in the Portfolio, the CIO, PMD, and Board's recommendations include a prioritized list of all projects that agencies include in the Portfolio. The Governor

and General Assembly then choose which projects they want to fund and may choose to also include additional projects not on the priority list.

It is the agency's responsibility to evaluate alternatives before proposing a new systems development project. Although the PMD reviews project documents, their knowledge of the agency and alternatives available to it are limited, and therefore, they are unable to effectively determine if alternatives exist.

Also, agencies self-report cost-benefit estimates at the beginning stages of a project and again during project close-out. However, there are no consequences for failing to achieve their estimate and no process for evaluating the quality of their self-reported data. At their July 2007 meeting, the IT Solutions Committee noted this as a problem and concern.

We encourage the CIO, PMD and Board to continue their progress in implementing IT governance for new systems development projects. They have made significant improvements in a short period of time and no major project failures have occurred since their oversight began. As they move forward, we encourage the CIO, PMD and Board to carefully consider the potential ramifications to good IT governance if they change or reduce their oversight.

IT Governance over Agency Maintenance and Operations is Non-Existent

IT governance over agency IT maintenance and operations is non-existent. Once an agency receives their appropriation, they decide how to spend their funds on IT maintenance and operations, and there is no required reporting of this activity to others. Consequently, there is no entity examining whether agencies are efficient or considering alternatives.

Summary of Comparison to Val IT Best Practices

As noted earlier, the Commonwealth, excluding institutions of higher education, spends approximately $607 million annually on IT, of which about 64 percent relates to infrastructure and new systems development. Both infrastructure and new systems development projects are working towards incorporating best practices in IT governance. The remaining 36 percent or $219 million of IT spending relates to agency maintenance and operations, which has no IT governance.

Each of these IT spending areas follow different processes for approval and funding and many entities have small pieces of control with no one entity determining the overall direction or overseeing spending. The Commonwealth has left these responsibilities divided among many entities at many levels with no one entity having control or authority to make decisions. The lack of best practices, including an overall view of how the Commonwealth spends money on IT, has created duplication, lack of sound investment, and systems development projects that do not support the Commonwealth's business plan.

This issue has been the source of several discussions by both the Board and CIO. As noted earlier in this report, the July 2007 IT Solutions Committee was concerned about the low rate of return on new projects proposed by agencies. This meeting included ideas on improving visibility over what agencies spend on IT and how to improve technology investments by recommending projects that result in a greater rate of return. The Committee discussed ways to collect accurate and complete IT spending data and ultimately realized that they do not have the authority to require agencies to provide information relative to their maintenance and operations spending. Even if it was provided, the Committee does not have the authority to tell agencies how to manage that activity.

A year earlier, at the Board's July 2006 meeting, there was also a discussion over concerns that agencies were not proposing enterprise projects but instead continued to have an individual agency project

focus. The CIO noted that things will not change unless something significant happens and that having 90 IT executives managing programs independently results in 90 different solutions. He said no agency is willing, for the most part, to step up and be the champion of an enterprise system for multiple agencies.

The CIO suggested that the Commonwealth needs to find ways to break through structural and cultural barriers. He noted that the Commonwealth does not have an IT executive who can look across lines of business and create opportunities to combine dollars and make IT investments to lower costs while increasing customer-facing systems.

This collaboration is a critical IT investment issue and silo thinking for IT projects is not what the Board and VITA are hoping to achieve strategically. The CIO also cited capital issues whereby one agency does not have the capital to span work across agencies when looking at IT projects. The Commonwealth has recently undertaken the following two initiatives that will require these barriers to be broken if they are to be successful.

First, the Appropriations Act established the Virginia Enterprise Applications Project (VEAP) office in July 2006 and provided $11 million for planning costs for replacing several statewide administrative systems with a modern enterprise system. The Act provides for a VEAP Project Director and agencies are required to comply with directives and requirements that she establishes; however, she does not control the agencies budgets and does not have a long-range funding source available to sustain the implementation of an enterprise system. Additionally, VITA and the Board are statutorily responsible for setting Commonwealth data standards, but to be successful, the VEAP Project Director needs some authority to affect data standards for the enterprise system.

Second, the Secretary of Technology created the Enterprise Solutions Group (Group) as a collaborative effort of the Secretaries of Administration, Finance, and Technology. The Group has an oversight board made up of the three Secretaries, the CIO, and the directors of the Departments of Human Resource Management, Planning and Budget, and the Council on Virginia's Future. The Group's mission is to partner with agencies to identify, catalyze, and implement solutions which enable a simpler and more effective government. Agencies bring their ideas to the Group and the oversight board reviews and approves projects for funding from a Productivity Investment Fund. As with the VEAP, the Group does not control the agencies' budgets and does not actively look for opportunities but instead relies on agencies to voluntarily bring ideas forward.

CONCLUSION

The Commonwealth's continued success over controlling, developing, and positioning its IT infrastructure depends on its governance over new systems projects and having realistic oversight of its on-going maintenance and operating needs. New system development governance success depends on understanding the status of existing systems and the Commonwealth's plans to manage risk through their replacement. Having little to no governance over IT maintenance and operations impairs our infrastructure and new system development achievements.

In summary, the Commonwealth's IT governance does not meet best practices in all areas and needs improvement. Opportunities exist to increase the Commonwealth's return on its IT investment by providing visibility across all areas of IT spending and reducing the current silo approach. Many of the Commonwealth's IT governance problems result from disparate processes used to provide governance over information technology and the lack of a central planning, investment, control, and monitoring. Below are our recommendations to improve the Commonwealth's IT governance and provide for better conformity to best practices.

RECOMMENDATIONS

It is not realistic to expect the Commonwealth will achieve 100 percent compliance with IT governance best practices. However, improvements can result in better visibility of how the Commonwealth invests in information technology and increase its rate of return.

Recommendation 1

Improve Agency IT Budget Request Detail and Provide Authority for Oversight

The Governor and General Assembly may wish to require agencies to identify all of their information technology budget needs separate from their operating budgets in their submissions to Planning and Budget. Currently agencies must only separately identify their new systems needs, while they commingle their on-going information technology maintenance and infrastructure needs with their overall operating budget. Providing the IT needs separately would allow the CIO and Board to have better visibility over how much agencies spend on technology and what activities it supports.

Currently, the CIO is responsible for reviewing agency IT budget requests but his review is limited to new systems budget needs since IT maintenance and infrastructure are part of the operating budget. Further, his authority extends only to reviewing the budget request and he has no authority to require agencies to change their request or the way they perform their work. The Governor and General Assembly may wish to provide authority to the CIO to include in his review all IT operational budget needs and provide both the Governor and the agencies with funding recommendations including how current resources can support statewide initiatives.

The Commonwealth's budget process results in agency-based budgets that support agency-based initiatives. Efficiencies may exist by examining processes such as systems maintenance and operations across agencies. For example, it may be more efficient and cost effective to create service centers that support similar agency applications rather than each agency having their own staff.

Recommendation 2

Collect Information in the Commonwealth Portfolio

Accounting standards require the Commonwealth to accumulate and capitalize the cost associated with both new and legacy computer systems similar to the accounting for buildings and other structures. PMD has a computerized tool, known as the Portfolio, which they use to track new systems development efforts. Fully implemented, the Portfolio has the capability to gather and analyze information on our systems necessary to comply with the accounting standards. However, in order to achieve budget reduction targets for fiscal 2009-2010, VITA suspended implementation of these capabilities until funding is restored.

The Governor and General Assembly may wish to require the State Comptroller and PMD to jointly implement the Portfolio cost accumulation capabilities to ensure it gathers accurate and complete cost information to comply with the accounting standard. Further, the Comptroller and PMD should develop data exchange standards so the Comptroller's accounting system can provide accurate and complete actual IT spending information for each agency in the Commonwealth's Portfolio system. For agencies that only submit summary data to the Comptroller, agencies must be required to provide the Portfolio with IT spending data consistent with the data standards developed by the Comptroller and PMD.

With the Portfolio fully implemented, the Commonwealth will have an official repository of its IT investment data and the Comptroller will have the information for the Commonwealth's annual financial report. The Portfolio data would provide a good analysis tool on the cost of maintaining various systems and provide information to avoid allowing the continued maintenance and operations of critical systems that are becoming obsolete and expensive to maintain.

Recommendation 3

Provide for an Office of the Chief Information Officer or Funding for Information Technology Investment Board Activities

The CIO is the agency head for VITA and VITA's responsibilities primarily involve managing the Commonwealth's infrastructure and assisting agencies with procurement. However, the CIO also has responsibilities that extend well beyond those of VITA and include areas such as Commonwealth strategic planning, budgeting, enterprise projects, and developing statewide policies for managing information technology and its security. The Board has responsibilities for reviewing and approving many of the actions of the CIO and recommending and overseeing new systems development. To fulfill their responsibilities, both the Board and the CIO depend on VITA staff that perform the day-to-day responsibilities envisioned by statutes.

VITA's funding is based on the internal service fund model that requires they charge service rates to agencies for all services. Therefore, governance costs such as those performed on behalf of the Board and CIO, become an overhead charge that increases the cost of its services. Since both the CIO and Board are mindful that providing governance increases service rates, they limit their oversight to the areas they directly control. This limitation results in some of the governance issues contained in this report.

Agencies are aware of the CIO and Board's desire to keep overhead costs low, and agencies object to VITA's attempts to increase governance, citing their budgets cannot absorb higher service rates. Essentially, agencies can suppress the CIO and Board's governance efforts and avoid providing information on how they manage their IT maintenance and operations by complaining about VITA's service rates. This situation increases risk to the Commonwealth's IT environment as it reduces efforts to improve governance and controls, particularly in critical areas such as information security.

The General Assembly may wish to establish and provide funding for an Office of the Chief Information Officer or provide a funding source for the Information Technology Investment Board to operate separate from the internal service fund model. Providing sound oversight of the over $600 million spent on IT requires resources and having funding that does not rely on agency service rates.

Recommendation 4

Review IT Funding and Budget Model for Smaller and Medium Size Agencies

Funding for information technology is provided to agencies based on their request to Planning and Budget and it does not consider the agency's level of technical expertise. As demonstrated by the Commonwealth's infrastructure partnership and as discussed in our December 2006 report on information security, many of the small to medium-sized agencies do not properly direct resources into IT, leaving their data and systems vulnerable to threats. Additionally, these agencies' budgets are often insufficient to afford them to hire technical experts to implement IT security programs or new systems to automate manual processes.

The Governor and General Assembly may wish to provide small to medium-sized agencies with a mechanism to use pooled resources to properly manage their IT needs and address information security. These agencies have an opportunity to realize increased efficiencies by having access to systems and expertise that would allow them to do more work through using technology.

Recommendation 5

Delegate Data Standard Responsibilities and Require New Systems to Conform

We recommend that the CIO consider delegating a portion of his responsibility for data standards relative to administrative systems to the Virginia Enterprise Applications Project (VEAP) Director. The VEAP Director is the most qualified individual to design and mandate administrative systems data standards. The Director's work will require the identification of the data owner and involve the owner in making data standard decisions for whatever enterprise software the Commonwealth selects.

As the Director develops data standards, both the CIO and Board could then approve the standards in accordance with their Code of Virginia mandate. Additionally, the Board should set a deadline for developing these data standards and refrain from approving new agency system development requests until adoption of the data standards. Once set, we recommend the Board only approve new systems development requests that conform to the adopted data standards.

Recommendation 6

Provide New Systems Development Budgets in a Manner Similar to Capital Outlay

The Governor and General Assembly may wish to budget new systems development projects in a manner similar to budgeting for capital outlay projects. Currently, agencies pay for systems development projects from their operating budget appropriations. Blending operations and new projects reduces the visibility of how much agencies spend on new projects and whether alternatives exist to create efficiencies.

Systems development projects may take several years to complete. Isolating project costs from operating expenses would reduce the likelihood that future operating budget reductions or other changes would force the agency to significantly alter the scope of their projects. Additionally, funding projects as capital outlay would create opportunities to analyze data and possibly combine projects and reduce overall costs.

Recommendation 7

Provide General Fund Moneys for Project Management Policy

The Governor and General Assembly may wish to provide some general fund support to the PMD. Currently, the PMD is funded as an internal service fund operating on service fees they charge agencies.

For some PMD activities, such as monitoring agency systems development projects, recovering their operating costs through service fees is appropriate and agencies should build those costs into their project cost. For other PMD activities, such as developing automated tools to collect statewide project data, analyzing project priorities to support the CIO and Board, and developing statewide policies and standards, a

general fund approach is more appropriate. As currently structured, the PMD's ability to hire and pay people to accomplish these activities is dependent on agencies involving the PMD in their projects.

Recommendation 8

Finalize Northrop Grumman Procedures Manual to Include On-Going Governance

Northrop Grumman and VITA's Service Management Organization must work to finalize their Procedures Manual which will provide for ongoing infrastructure governance processes. As agencies change their systems and the Commonwealth implements enterprise systems, there will be different infrastructure requirements. An IT governance process needs to exist whereby agencies can make their requirements known and the Commonwealth has the information to make the best decision on how to fulfill their infrastructure needs.

Commonwealth of Virginia

Walter J. Kucharski, Auditor

Auditor of Public Accounts
P.O. Box 1295
Richmond, Virginia 23218

December 18, 2007

The Honorable Timothy M. Kaine
Governor of Virginia
State Capital
Richmond, Virginia

The Honorable Thomas K. Norment, Jr.
Chairman, Joint Legislative Audit
and Review Commission
General Assembly Building
Richmond, Virginia

We have reviewed the Commonwealth's information technology governance structure and processes and are pleased to submit our report entitled "**Information Technology Governance**".

The Commonwealth, excluding institutions of higher education, spends approximately $607 million annually on information technology of which about 64 percent relates to infrastructure and new systems development. Generally, we found that governance over this portion is transforming and maturing to a level consistent with best practices. The remaining amount, about $219 million, is used by agencies to pay for staff salaries, consultants, and other costs related to the maintenance and operations of existing agency-based systems. For this area of technology spending, we found that governance is nearly non-existent and can be improved.

Our report includes recommendations to improve visibility over the Commonwealth's technology investment so that the best investment decisions can result. Specific recommendations are described in detail within the report and include improving how agencies budget for technology and providing resources to allow the Commonwealth's Chief Information Officer to exercise more governance over technology.

We conducted an exit conference with the Secretary of Technology on December 11, 2007 and have included his response in this report. We invited the Chief Information Officer and the Information Technology Investment Board Chairman to respond and each determined that no response was necessary.

AUDITOR OF PUBLIC ACCOUNTS

KKH/wdh

COMMONWEALTH of VIRGINIA
Office of the Governor

Aneesh P. Chopra
Secretary of Technology

December 18, 2007

Mr. Walter J. Kucharski
Auditor of Public Accounts
Post Office Box 1295
Richmond, Virginia 23218

Dear Mr. Kucharski:

Thank you for the opportunity to review and respond to the Auditor of Public Accounts' report entitled "Information Technology Governance."

Since the Commonwealth's Information Technology (IT) transformation began five years ago, much progress has been made. Our goal remains to transform the IT environment of all Executive Branch agencies from multiple, incompatible systems, inconsistent standards, aged equipment, and gaps in security into a modern, robust, and secure architecture that can facilitate effective and efficient government operations. An effort of this size presents new challenges but with a strong team, we are confident in our ability to overcome them.

Recognizing that there is still much to accomplish, the Kaine Administration is in the process of implementing changes in areas that many of your findings address. We look forward to working with Commonwealth leadership to address these and other issues as we continue to "lead the way" in delivering the best that government can offer its citizens.

Sincerely,

Aneesh P. Chopra

C: Wayne Turnage, Chief of Staff

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