

State of Washington
Joint Legislative Audit and Review Committee (JLARC)



Evaluation of Budget Process for Information Technology Projects

Report 06-4

February 16, 2006

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The Joint Legislative Audit and Review Committee (JLARC) carries out oversight, review, and evaluation of state-funded programs and activities on behalf of the Legislature and the citizens of Washington State. This joint, bipartisan committee consists of eight senators and eight representatives, equally divided between the two major political parties. Its statutory authority is established in RCW 44.28.

JLARC staff, under the direction of the Committee and the Legislative Auditor, conduct performance audits, program evaluations, sunset reviews, and other policy and fiscal studies. These studies assess the efficiency and effectiveness of agency operations, impacts and outcomes of state programs, and levels of compliance with legislative direction and intent. The Committee makes recommendations to improve state government performance and to correct problems it identifies. The Committee also follows up on these recommendations to determine how they have been implemented. JLARC has, in recent years, received national recognition for a number of its major studies.

**EVALUATION OF
BUDGET PROCESS
FOR INFORMATION
TECHNOLOGY
PROJECTS**

REPORT 06-4

REPORT DIGEST

FEBRUARY 16, 2006



STATE OF WASHINGTON

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STUDY BACKGROUND

In the 2005 Operating Budget, the Legislature directed JLARC to evaluate the review and funding processes for state agency information technology (IT) projects. Our assignment has three major parts: (1) a report on IT funding and expenditures across state agencies; (2) an appraisal of the state's current processes for review and funding of state agency IT projects; and (3) a look at the practices of private firms and other governments to see if there are lessons to be learned that could improve Washington's IT processes.

To complete this study, we examined applicable technology laws and policies, and we conducted focus groups and individual interviews with current or former process participants. We also hired an IT consulting firm to support this work and to research industry best management practices.

Information on State Agency IT Expenditures

Within state statute, there is a structure in place that calls for regular reporting of state agency IT expenses and budgets to the Department of Information Services (DIS). It also calls for regular DIS reporting of aggregated IT information to the Legislature and the Governor. However, this reporting is not taking place as envisioned by statute.

Using incomplete information, state agency direct technology program expenses and IT contracts total more than \$1.4 billion for Fiscal Year 2004 and projected for Fiscal Year 2005. Without greater compliance and consistency in state agency and DIS reporting, the state does not have the information to assemble a more reliable estimate.

The State's IT Project Review and Budget Processes

State agencies work through a project review process designed by DIS and the Information Services Board (ISB). Under this process, higher risk project proposals undergo additional scrutiny by DIS and the ISB, while lower risk projects may often proceed at the agency's discretion.

As a result of the overlay of the legislative budget process with the project review process, the Legislature may be asked to make significant funding commitments for IT projects at a time when the uncertainty about IT project cost and time estimates are the highest. Agencies may be asking the Legislature for IT project funding before the agency has prepared a detailed investment plan and before the project proposal has received a rigorous evaluation by DIS staff.

This study identifies two shortcomings with the current IT review and funding processes: (1) a need for improved coordination of IT project reviews, especially with regard to the timing of the Legislature's evaluation and funding of state agency IT projects, and (2) a need for greater reliability in the first planning estimates that come forward about IT projects. An additional concern is the ability of the DIS staff unit that supports these processes to meet all of its obligations at its current level of staffing.

Lessons from Others' Approaches

It is difficult to conclude whether private companies perform better than state governments with managing IT initiatives. Our consultant contacted several large private corporations, but found them reluctant to disclose details on their specific IT practices. Comparisons of Washington's performance to that of other jurisdictions should be viewed with some caution; only a higher-risk subset of Washington's state agency IT projects is being included in national benchmarking studies.

Other states provided some alternative processes Washington may wish to consider. Some other states, such as Illinois, New York, and Pennsylvania, structure the timing of their IT project review and funding decisions to maintain a closer link between financial decisions and technical evaluations. The state of Tennessee also has this closer link, and has a more coordinated review between its equivalent of Washington's Office of Financial Management (OFM) and DIS as well. The state of Victoria, Australia, offers a contract model including hired "scope managers" to help estimate budgets, monitor performance, and arbitrate contract disputes for agency IT projects. Washington's own capital budget processes provide lessons that could carry over to IT projects, such as phased funding, earlier introduction of the project architect, and additional guidance to agencies as they prepare their early cost estimates.

Recommendations

1. The Information Services Board should require all agencies to submit IT project expenses and budgets in complete and consistent portfolio reports.
2. The Department of Information Services should resume submitting a statewide IT performance report biennially to the Governor and to the Legislature, engaging the Office of Financial Management and lawmakers in a review of the content and basis for analysis.
3. The Department of Information Services should undertake a workload study to identify potential gaps in its ability to provide adequate decision support for its various IT project review, funding, and oversight responsibilities, as well as for the state's biennial budget process.
4. The Legislature should consider ways to time funding actions so that they are closer to when the cost and time estimates for IT projects are more reliable.
5. The Information Services Board should investigate other methods to help agencies improve their early IT project cost estimates.

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CHAPTER ONE – INTRODUCTION

State agencies use information technology (IT) to accomplish a variety of tasks. Information technology projects typically assume one of the following five forms:

- Development of a new software product for a business need that did not previously exist or that was not previously met using software;
- Redevelopment of an existing software product using the latest technology to meet newer business needs;
- Purchase of a software package and the subsequent development work to customize it for the agency's business;
- Enhancement of an existing system an agency owns to meet new or expanded business needs through additional functionality; and
- Adaptation of an existing system an agency owns to changing environments without adding significant new functionality.¹

In the 2005 Operating Budget, the Legislature directed the Joint Legislative Audit and Review Committee (JLARC) to evaluate the review and funding processes for state IT projects. The assignment has three major parts:

1. A report on IT funding across state agencies;
2. An appraisal of the state's current processes for reviewing and funding IT projects; and
3. A look at practices that other organizations use to see if there are lessons to be learned that could improve Washington's processes.

OUR APPROACH TO UNDERSTANDING THE STATE'S CURRENT PROCESSES

Consistent with the study's scope, we focused our attention on understanding the process itself rather than reviewing specific IT project proposals. To aid in our understanding of the current IT project review and budget processes, we conducted focus groups or individual interview sessions with the following:

- Major IT project managers for the state;
- Agency and Higher Education chief technology officers;
- Agency and Higher Education directors and deputies;
- Office of Financial Management (OFM) and legislative budget analysts;

¹ Government of Victoria, Australia, [Southern SCOPE Reference Manual](#) Version 1.0, September 2000.

- Department of Information Services (DIS) management and oversight technology consultants;
- Members of the Information Services Board (ISB) and one of its working groups; and
- Members of the DIS Customer Advisory Board.

We also interviewed a number of current and former legislators who have an interest or experience in IT processes. JLARC contracted with an information technology consulting firm, Sterling Associates, LLP, to facilitate interviews and focus groups and to develop a best practices review. The results of their review are contained in Appendix 5.

ORGANIZATION OF THE REPORT

- Chapter 2 addresses our assignment from the Legislature to report on current IT funding and expenditures across state agencies;
- Chapter 3 describes the processes the state currently uses to evaluate and make funding decisions about state agency IT project proposals. This chapter also identifies two shortcomings and one “decision support” concern about the existing processes;
- Chapter 4 summarizes promising practices gleaned from our review of others’ IT project evaluation and funding processes; and
- Chapter 5 ends the report with conclusions and recommendations.

This first chapter concludes with background information about the players involved in the current process, with particular emphasis on the Information Services Board and a staff unit within the Department of Information Services.

BACKGROUND ABOUT PROMINENT PLAYERS IN THE STATE’S CURRENT PROCESSES

The current IT project review and funding processes involve state agencies and their directors, the staff of DIS, ISB, OFM, and the Legislature. Their various roles are discussed in more detail in Chapter 3. Because of their prominent role in the process and in this report, it is useful background to understand more about the ISB and DIS staff who are specifically involved in the review steps with agencies. Below, we provide some additional information on these particular process participants.

The Information Services Board

The Information Services Board is comprised of 15 members who represent the legislative, judicial, and executive branches of government, higher education institutions, and the private sector.² The ISB serves a regulatory function for technology. Board policies and action influence how state agencies proceed with IT projects. Created in 1987, state law directs the ISB to:

² RCWs 43.105.032 and 43.105.041 describe the composition, powers, and duties of the Information Services Board.

- Adopt standards to govern the acquisition or disposition of technology equipment, software, and related services for government;
- Approve specific investments before IT products or services are acquired and to set rules about when this delegated authority passes to the DIS director or agency head;
- Oversee significant major IT projects being planned or executed;
- Set rules and monitor the technology contracts appeals process;
- Develop interagency or statewide policies of a technical nature; and
- Review and approve strategic IT plans prepared by DIS.

ISB members select the chair of the board who has typically been the Governor's chief of staff. The ISB convenes on a 45- to 60-day cycle to conduct the state's IT business.

DIS Management and Oversight of Strategic Technologies (MOST) Staff

There is a staff unit within DIS that advises the ISB and that provides support in the state's current processes for IT project review and funding decisions. This DIS unit is called "MOST," which is shorthand for the Management and Oversight of Strategic Technologies Division.

In total, the MOST-D is comprised of 22 staff serving in a variety of roles. Seven of these 22 positions presently attend to state agency technology programs, investment activities, portfolios and advancing IT projects.³ Of these positions, only **4.7 Full-Time Equivalent (FTE) of MOST staff are performing IT project oversight duties for all of state government.** Responsibilities and workload for these 4.7 FTE MOST staff include:

- 96 large and small state agency technology programs and portfolios;
- 11 high-risk, multi-million dollar IT project investments under ISB oversight;⁴
- 26 medium-risk, million dollar IT project investments under DIS oversight; and
- 53 new IT project proposals.⁵

Other workload drivers for this DIS staff unit consist of agency or vendor information requests and consultations, input on biennial budget packages, bill analysis and fiscal note requests, and other assignments that come from OFM, the Governor, the Cabinet, the Legislature, and the ISB itself.

With this additional background about the ISB and MOST staff, we now move on to a discussion on state agency IT expenditures.

³ The remaining FTEs are responsible for policy development and committee program areas such as interoperability, justice information, enterprise architecture, geographic information technology, and the digital academy.

⁴ Chapter 3 of this report provides more information on what constitutes high-risk and medium-risk IT projects; this count is of "active" projects this fiscal year.

⁵ Approximation based on the number of investment plans agencies filed with DIS since July 2004 (FY05), at an associated cost of \$421.7 million to make these proposed investments operational.

CHAPTER TWO – REPORTING STATE AGENCY IT FUNDING AND EXPENDITURES

One of our assignments from the Legislature is to report on information technology funding and expenditures across state agencies. This chapter describes the structure that is in place in statute regarding the reporting of this information, as well as the guidance the ISB provides to agencies on the reporting of their IT portfolios. The chapter reports the information that is available on current state agency IT expenditures, and then details concerns over the accuracy of this reporting. **Without greater compliance and consistency in state agency and DIS reporting, the state does not have the information to assemble a more reliable estimate.**

STATUTES REQUIRE REGULAR IT SPENDING REPORTS

Per state statute, state agencies must develop “information technology portfolios.” Each agency’s portfolio is to include:

- A baseline assessment of the agency’s information technology resources and capabilities;
- Projects and resources required to meet the objectives of the agency’s portfolio; and
- Where feasible, estimated schedules and funding required to implement the agency’s identified projects.⁶

Statute directs state agencies to report to DIS on progress with their portfolios. Per ISB policy, agencies are to provide this report to DIS no later than August 31 of each year.

The ISB provides a format for state agencies to use in constructing their IT portfolios. The ISB has also defined ten categories to guide state agency reporting on their IT project expenses and budgets. Categories 8-10 may not be completely discrete from categories 1-7. This information by spending category is one section of the portfolio each agency is to update and file with DIS along with the portfolio by August 31 of each year.

The ten reporting categories are:

1. Hardware purchase and/or lease;
2. Software purchase and/or lease;
3. Hardware repairs and maintenance;
4. Software enhancements and maintenance;
5. Telecommunications;
6. Data processing services;
7. Other major IT expenses;
8. Total agency IT salaries and budgets;
9. Total agency IT staff professional development; and
10. Total agency IT personal and purchased services.

⁶ Information about state agency portfolio requirements may be found in RCW 43.105.170.

Statute also directs the DIS to provide “a biennial state performance report” on information technology to the Governor and the Legislature. This biennial report is to include:

- An analysis, based upon the agency portfolios, of the state’s information technology infrastructure, including its value, condition, and capacity; and
- An analysis of the success or failure, feasibility, progress, costs, and timeliness of implementation of major information technology projects.⁷

DATA IS COMPROMISED FOR THE STATE’S IT REPORTING

As described above, the Legislature enacted statutes providing for a routine reporting on IT expenditures by state agencies to DIS, followed by a routine aggregation and reporting of that information by DIS to the Legislature and Governor. This responsibility for regular reporting is supported by ISB policies. However, our review of recent reporting casts doubt that this reporting system is working as envisioned.

The last time DIS published the required biennial performance report was August 2001. In that report:

- Not all state agencies filed their portfolios or filled them out completely; and
- Agencies who did submit portfolios used different timeframes in their reporting.

DIS did not publish the biennial performance report in 2003 or 2005. The agency indicates that it does plan to publish a report for the 2003-05 Biennium in early 2006.

For the 2003-05 Biennium, we reviewed 20 state agencies’ IT portfolios and asked to look at DIS unpublished information. This review sustained our concerns. We found that:

- Agencies are not allocating projects or funding in a consistent manner among the ten ISB categories; and
- Portfolio information, in general, is self-reported by agencies and not validated by DIS. Additionally, IT portfolio information cannot be readily verified by turning to the state’s accounting and financial reporting system (AFRS).⁸

MORE ABOUT STATE IT SPENDING INFORMATION THAT IS AVAILABLE

Figure 1 on the following page aggregates state IT expenditures reported for FY 2004 and projected for FY 2005 based on the information in the agency portfolios. The information is organized into the ten categories identified by the ISB. Total biennial spending planned by those agencies who reported to DIS exceeds \$1.4 billion.⁹

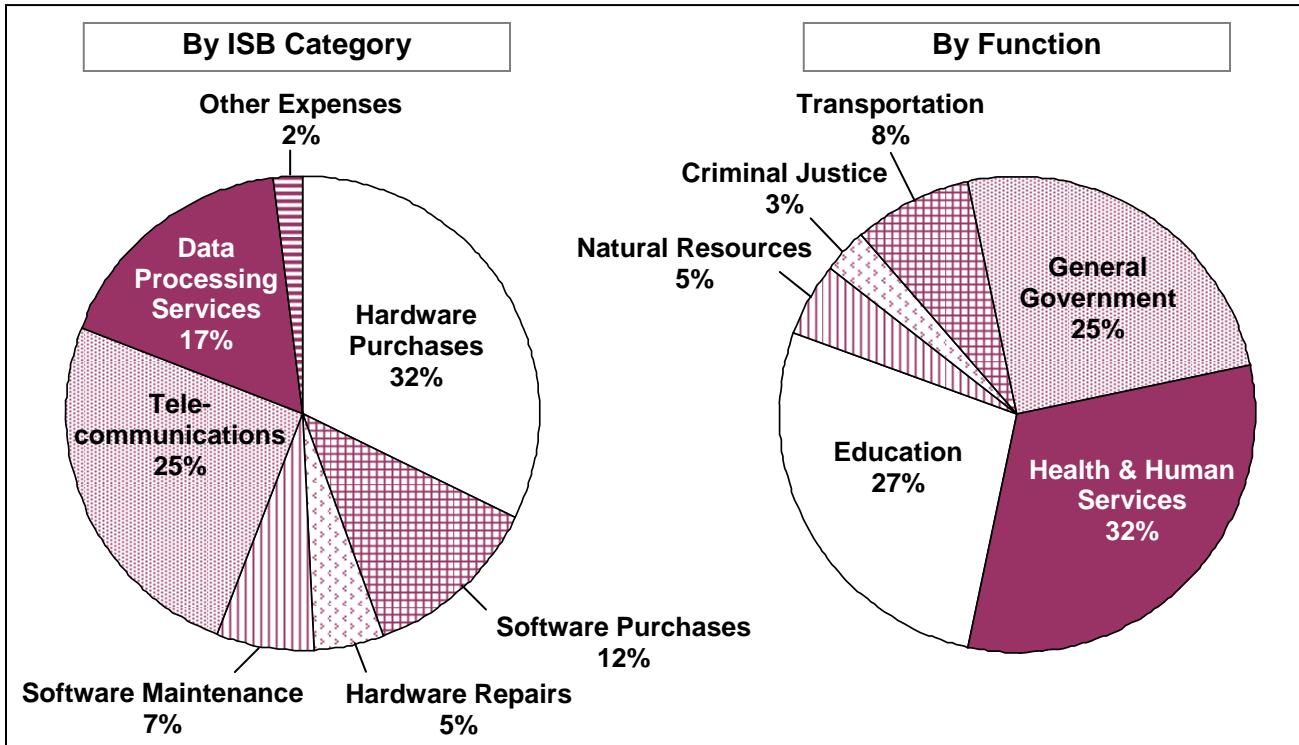
⁷ Requirements for DIS’ statewide performance review are described in RCW 43.105.160.

⁸ DIS reports that the statewide accounting systems could be set up to capture IT costs. It would require agencies to record their IT expenditures and transactions differently. Without greater compliance and consistency in current IT reporting to the ISB, no reliable picture can be assembled on what technology is costing the state of Washington.

⁹ Amounts to “IT budget” categories depicted in Figure 1 above plus three additional “expenses” of interest to the ISB: what agencies spent for 1) salaries and benefits, 2) professional development of IT staff, and 3) the value of IT services agencies acquire under contract.

In viewing Figure 1, readers should be aware that 29 state agencies and boards did not file 2004 portfolio data, including the Office of Superintendent of Public Instruction for K-12 Education. In the remaining 67 portfolios, data for some ISB categories are missing.

Figure 1 – Agency Reported Biennial IT Expenditures, 2004



Source: JLARC used data from DIS for FY04 and projected for FY05 (1-7 categories only) by 67 agencies.

CHAPTER FINDINGS IN REVIEW

Within state statute, and supported by ISB guidelines, there is a structure in place that anticipates regular reporting of state agency IT expenses and budgets to DIS, and regular DIS reporting of state aggregate information to the Legislature and Governor. Our review of the implementation of these statutes finds that this reporting is not taking place as envisioned.

Chapter 3 now moves on to the second major part in JLARC’s assignment—an appraisal of the current processes used to review and fund state agency IT projects.

CHAPTER THREE – THE CURRENT PROCESSES FOR REVIEWING AND FUNDING STATE AGENCY IT PROJECTS: TWO SHORTCOMINGS AND A “DECISION SUPPORT” CONCERN

The Legislature asked JLARC to review the current processes by which IT projects are evaluated and funded. This chapter begins with a description of the current project review process. We then show how budget decisions overlay this review process. The chapter also provides information on very recent changes the ISB has made to the project review process.

The chapter then moves into a discussion of **two shortcomings** that JLARC identified in the course of this budget process study. The first is a need to better coordinate IT project reviews, especially with regard to the timing for the Legislature’s own evaluation and funding decisions for IT projects. A second shortcoming is the need for greater reliability in first planning estimates that come forward about IT projects. An additional concern is the ability of the DIS staff unit that supports these processes to meet all of its obligations at its current level of staffing.

THE STATE’S IT PROJECT REVIEW PROCESS

This section provides a high-level overview of the steps taken by state agencies and DIS to advance from a business concept of an IT project through project execution. Figure 2 on the following page illustrates these steps. Agencies must convince DIS and/or ISB before they can exit this process with approval to solicit bids for their higher-risk IT projects.¹⁰

Step A: Concept

The process begins when agencies individually determine the need for an IT project. They define its parameters, conduct research, and propose budgets. This is an executive prerogative that is codified. The head of an agency is the officer with primary responsibility and accountability for the “use and management” of information, information systems and related technology.¹¹

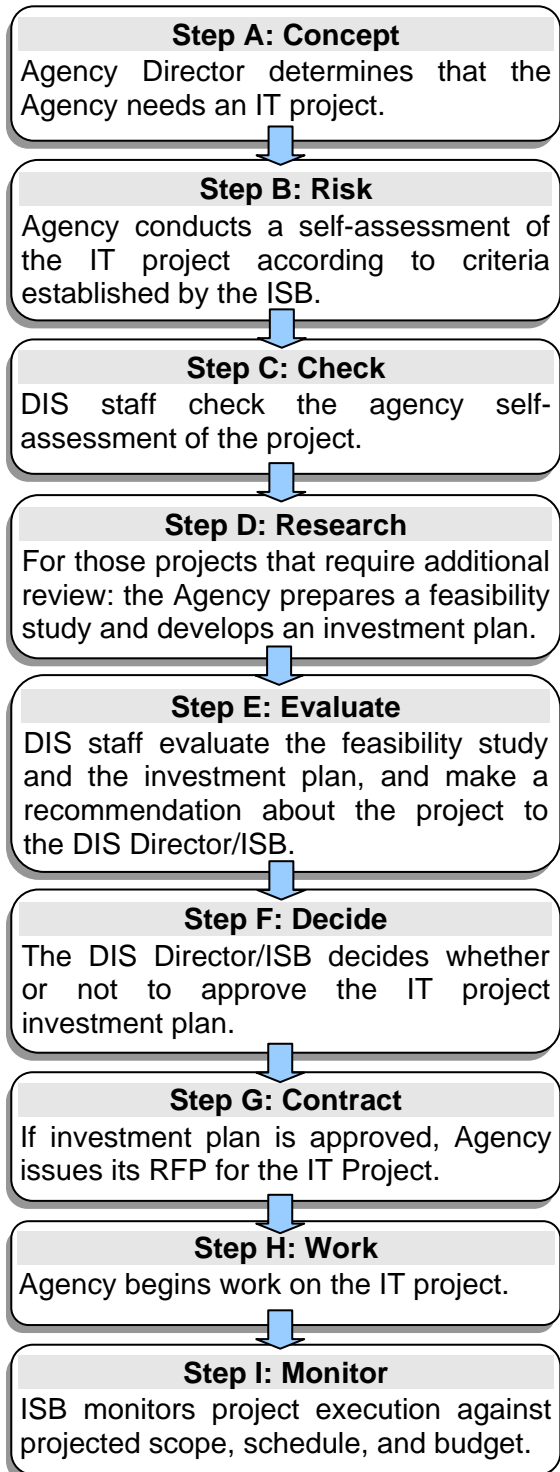
The agency must decide how to scale its proposed IT project. Statutes make clear this state’s preference for agencies to approach major IT projects incrementally, scaling down business objectives into workable segments so as to start and finish within a 2-year, biennial time frame.¹²

¹⁰ RCW 43.105.041(b).

¹¹ RCW 43.105.017(3).

¹² RCW 43.105.017(7).

Figure 2 – Review Process



Step B: Risk

The agency wanting the IT project conducts a self-assessment of the risks and other aspects of the project, using a set of criteria developed by the ISB. Risk criteria are used to rank projects along four dimensions: organizational impact, organizational capability, development effort required, and the technology itself. Similarly, there are “severity” measures used to rank projects based on four other dimensions: impact on citizens, visibility to the public and to the Legislature, impact on state operations, and the consequence of doing nothing.

The results of the self-assessment yield a classification of the project as a Level 1, Level 2, or Level 3. As illustrated in Figure 3 below, DIS and the ISB use these results to determine the amount of oversight the IT project requires. Level 1 projects may proceed at the agency’s sole discretion. Level 2 projects require prior approval from the DIS Director to proceed. Level 3 projects require prior approval from the ISB to proceed. In practice, this means that lower-cost, lower-risk IT project proposals are not subjected to the same rigorous review as higher-cost, higher-risk endeavors.

Figure 3 – Project Classification Results

High Severity	Level 2	Level 2	Level 3
Medium Severity	Level 1	Level 2	Level 2
Low Severity	Level 1	Level 1	Level 1
	Low Risk	Medium Risk	High Risk

Source: Extracted from “Information Technology Portfolio Management Standards, prepared by DIS.

Step C: Check

The next step is accomplished by the DIS MOST staff introduced in the first chapter. The DIS staff checks the agency's self-assessment and explores any concerns or differences related to identified risks. If necessary, disputes between the agency and the MOST staff regarding the assessment can be elevated to the DIS Director or ISB itself.

Step D: Research

For Level 2 and Level 3 projects, the next step is for agencies to conduct necessary research and prepare **feasibility studies** and **investment plans**. (Recall that Level 1 projects do not require these additional steps and can instead proceed with soliciting for a contract at the agency's discretion.) Generally speaking, a feasibility study documents "alternatives analysis," whereas the investment plan is a more complete record from the proposing agency, stating the business problem to be solved; offering cost-benefit analysis tables; identifying risks and agency strategies for mitigation; and declaring a director's intent to govern the project and manage change as they work with vendors to acquire necessary hardware, software and services.¹³

Agencies get a lot of help in this step from MOST staff, who try to make sure proposals that come before the ISB or the DIS Director are technically sound and complete. Standards from the ISB guide preparation of these technical project documents.

Step E: Evaluate

In this step, DIS staff evaluate the feasibility study and the agency's investment plan, then the staff make a recommendation about the project to either the ISB (for Level 3 projects) or the DIS Director (for Level 2 projects). The MOST staff perform this project evaluation activity, switching "hats" to act as independent reviewers of the IT proposal rather than acting as customer service agents for the agency that is requesting approval for the project.

Step F: Decide

Based on the information provided by the agency and the MOST staff recommendation, the ISB or the DIS Director decides whether or not to approve the agency's IT project investment plan. The decision makers have the option of putting conditions on their approval, for example, requiring the agency to develop the project in phases.¹⁴ Project oversight is not limited to approval, but includes the level of status reporting and therefore, the level of guidance the project will receive throughout its life. For more details, see Appendix 3.

Step G: Contract

If the investment plan for the project is approved, the agency may then issue its Request for Proposals (RFP) for the project. This formal approval of the investment plan is the legal threshold the agency needs to meet before it can issue an RFP. The agency also has to have the financial resources and spending authority to proceed. Statutes limit the ISB in one respect; the approval they grant an agency for

¹³ The ISB expects to see a total cost estimate, which the Board defines as including system maintenance for five years or the expected life of the IT resource to the agency, whichever is shorter. The ISB also recognizes that feasibility studies are "conceptual" and may require that directors engage a vendor to prototype the business process first as a test.

¹⁴ Conditions for investment can include ISB or the DIS Director's review and comment on the agency's acquisition documents (RFP, RFQ) prior to release; approval of a negotiated contract before it is signed by the parties; and review of the IT project work plan once developed.

its investment plan should be within “available funding.”¹⁵ We elaborate on how the funding decision process overlays this project review process later in this chapter.

Step H: Work

At this step, the agency actually begins work on executing its IT project. Once the project design architect begins work, the cost and time estimates for completing the IT project become more firm. Experience shows that an agency often does not really know how much an IT project is going to cost or how long it will really take to have it operational until the vendor is actually working on the project.¹⁶

Step I: Monitor

The ISB and MOST staff monitors the agency’s execution of its IT project, assessing the agency’s performance against the proposal’s projected scope, schedule, and budget.

HOW THE BUDGET PROCESS OVERLAYS THIS PROJECT REVIEW PROCESS

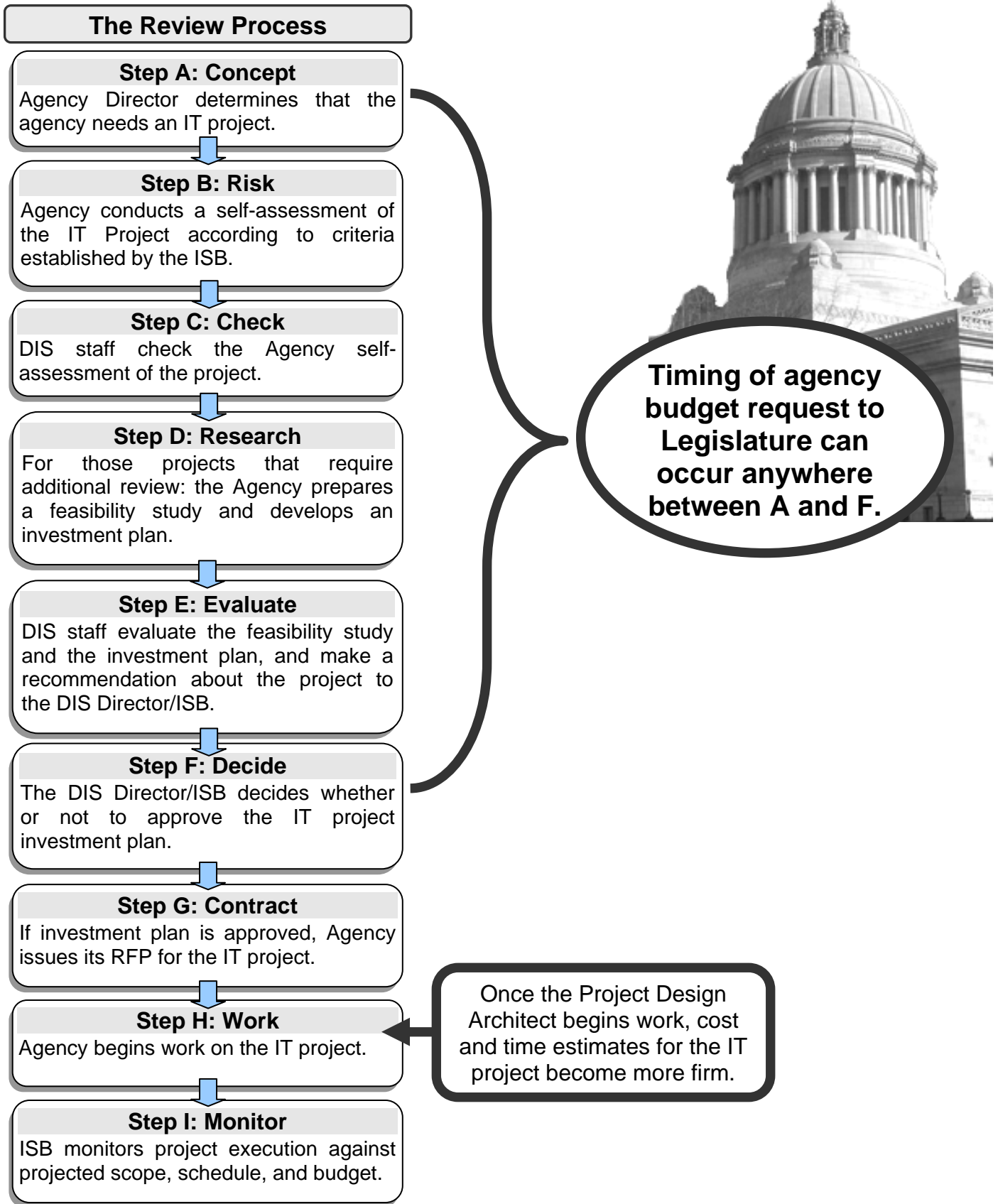
As discussed in Step H, the time and cost estimates for an agency IT project do not begin to really firm up until the project design architect begins work. However, as Figure 4 on the following page illustrates, agencies may be approaching the Legislature with a funding request well before this step. **Agencies may be asking for IT project funding even before the agency has prepared a feasibility study or detailed investment plan and before the project proposal has received a rigorous evaluation by DIS’ MOST staff.** The current overlay of the project review and project funding processes is what is contributing to legislators’ frustrations with IT project “scope creep” and project cost changes. It is highly likely that IT project time and cost estimates at these earlier steps in the review process will be significantly different than those toward the end of the review process and in the project execution phase.

While legislators have expressed frustration, it is important to remember the perspective of the agency as well. The ISB meets every 45 to 60 days, whereas the Legislature convenes for business once a year beginning in January. To cue up to request money to execute an IT project, agencies may have prepared the budget decision paperwork six months or more prior to the legislative session. Agencies may wait another three to five months before appropriation authority is “certain,” and then agencies follow-up with OFM to itemize an allotment plan that estimates detailed spending for authorized projects. A year or more in time may now have passed. Time particularly erodes the reliability of planning estimates when it comes to budgeting for information technology.

¹⁵ RCW 43.105.190(3).

¹⁶ Focus group research and case study literature support this observation about IT projects.

Figure 4 – How the Budget Process Overlays this Review Process



RECENT AND PENDING CHANGES TO THE PROJECT REVIEW PROCESS

In November 2005, the ISB adopted several modifications to the workings of the IT project review process described above. This section briefly outlines those changes:¹⁷

Adoption of New “Success Factors”

The ISB adopted a set of what DIS calls “success factors.” Examples include having an experienced project manager, clear business objectives, and skilled staff. Ten of the factors are adopted from work conducted by the Standish Group on successful and unsuccessful IT projects.¹⁸ Lessons learned from DIS projects were comparable to the factors identified in the Standish Group’s findings. Two additional success factors were adopted recognizing their significance based on Washington’s own IT experiences. The ISB and MOST staff plan to evaluate project investment plans as well as projects underway using these success factors, beginning in January 2006. The “success factor” evaluations will apply to those projects at the higher risk level that must come before the ISB for approval.

Clarification of Project Review Criteria

The ISB has adopted clarifications to the criteria by which agency IT project proposals are evaluated by the Board and by MOST staff. These clarifications respond to requests from the ISB itself, the Governor, and others to ensure less subjective and more consistent assessments of IT project scopes, schedules, and budgets.

These changes have just been adopted and have yet to be implemented. It will be some time before the state can evaluate the impacts of these modifications.

As part of Washington State’s Accountability and Performance (GMAP) forums, the DIS Director has also reported to the Governor on additional efforts being undertaken by MOST staff. These efforts include looking into the methods agencies are relying on to estimate project benefits, and looking for evidence that project system requirements are being documented completely. DIS is also presently evaluating the merits of having a statewide IT project management office.

¹⁷ For additional detail, see the DIS staff proposal titled “Draft Stoplight Criteria” presented to the ISB at its meeting on November 10, 2005.

¹⁸ DIS cites the report by the Standish Group entitled “Recipe for Project Success: the Chaos Ten,” as a source of ten of the “success factors.”

Enterprise Architecture in the State's Future?

Another change that could impact the review of state IT project proposals in the near future would be the state's adoption of enterprise-wide architectural standards. Enterprise Architecture refers to a framework that organizations—and governments—can choose to adopt to guide technology investment toward “optimal” business routines, application systems, or technology platforms.

At the federal level, the Government Accountability Office and the Office of Management and Budget have both stated that lacking a common architecture means that Congress and the President run a great risk that federal agencies will buy and build IT systems that are duplicative, incompatible, and unnecessarily costly to maintain.

The ISB established a working group considering the adoption of strategic Enterprise Architecture infrastructure standards for Washington State agencies.

TWO SHORTCOMINGS AND A STAFFING CONCERN ABOUT THE CURRENT PROCESSES

In the course of this study, we identified two shortcomings with the processes the state currently uses to evaluate and make funding decisions about state agency IT projects. These two shortcomings are discussed below. This chapter closes by raising a concern about the current process, in particular with the ability of DIS' MOST staff to address all of its responsibilities at its current staffing levels.

Shortcoming 1: A Need for Improved Coordination of IT Project Reviews, Especially with Regard to the Timing of the Legislature's Evaluation and Funding of IT Projects

This shortcoming was readily apparent once the legislative funding process was overlaid on the IT project review process (see Figure 4 on page 13). Under the current approach, the Legislature may be asked to make significant funding commitments when uncertainty about IT project cost and time estimates are the highest.

Another area for potential improvements in coordination is the coordination between OFM and DIS on the review of IT project budget proposals. OFM's budget instructions indicate that DIS will provide formal written evaluations of the budget proposals for the higher risk IT projects (Level 2 and Level 3). However, the first—and to the best of our knowledge, only—coordinated budget review of IT projects between OFM and DIS occurred in August 2002.

Shortcoming 2: A Need for Greater Reliability in the First Planning Estimates That Come Forward About IT Projects

It is not well understood in the current process that the first IT project planning estimates are crude at best until the IT architect/builder is hired and on board. Agencies are largely on their own to pay for the kind of technology research or analysis that would help size projects and validate “first” planning estimates. The state does not guide agencies about cost and time

resource projections. There have been no DIS standards for this stage to better qualify assumptions as a matter of protocol for the review and budget process.

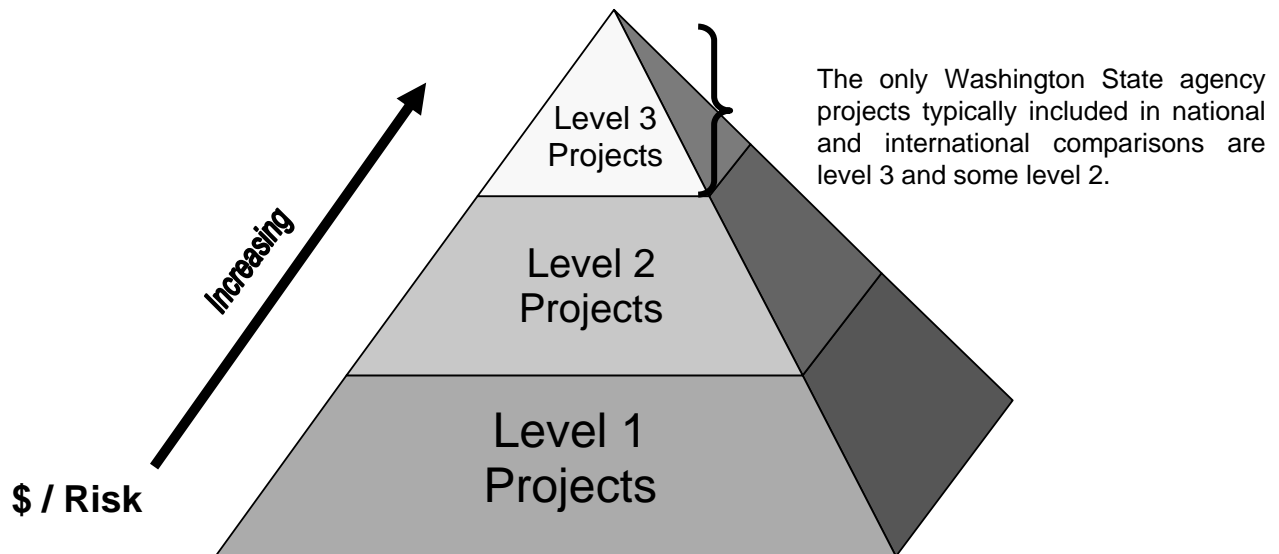
A Concern About Available Levels of DIS Staff Support

Chapter 1 of this report introduced the DIS MOST staff and provided some statistics on their current workload of supporting agencies, the ISB, OFM, and the Legislature. Resolving the shortcomings in the current processes that we have identified above may add responsibilities to the MOST staff, as will the changes to the IT project review process that the ISB just adopted. As noted earlier, only 4.7 FTEs of MOST staff are supporting these project evaluations and funding processes. Our concern is about the ability of the DIS MOST staff to meet its current and important pending responsibilities at this level of staffing.

CHAPTER FOUR – LESSONS LEARNED FROM OTHER USERS OF IT PROJECT REVIEW AND FUNDING PROCESSES

Our final assignment from the Legislature is to investigate IT project reviews and budget processes of private firms, other states, and other governmental entities in search of practices that could improve Washington’s processes. The first part of this chapter describes our efforts to extract such information from private firms. The second part highlights how a few comparable governments deal with the same shortcomings that challenge Washington: coordinating project reviews with funding actions and project estimates in early stages.

Figure 5 – Rate of IT Success Reports Depends Upon Which Part of the Pyramid is Assessed



Source: JLARC.

Multi-State Comparisons of IT Performance

National and internationally-based consulting organizations research factors that contribute or hamper the successful delivery of IT projects by government and private enterprise. The Standish Group produces a well-known, widely-used industry benchmark. The firm stratifies IT project outcomes between “failed, challenged, and successful” on the basis of the investor’s original scope, schedule and cost parameters. Some caution is advised when interpreting results. The Washington information will only be for the higher-cost/higher-risk state agency projects moving through the DIS/ISB process. In reviewing any performance comparisons, readers would need to know whether governments and companies are being compared to Washington based on similar “top” of their pyramids or on their pyramids as a whole.

PRACTICES IN THE PRIVATE SECTOR

Our consultant spoke with several large corporations in Washington State, but was unable to obtain details on specific practices. Executives were reluctant to disclose IT information that

might reflect negatively on company performance or advantage a competitor. Without specific details, it is difficult for JLARC to contrast approaches in the private sector with Washington State government.

Without specific details, it is also difficult to conclude whether private companies perform better than state government with managing their IT initiatives. The Gartner Group recently stated that 75 percent of businesses have ineffective IT governance.¹⁹ Also, a few limited case studies point to instances of significant IT project failures at private companies, such as the recent abandonment of a \$442 million investment in a patient record system for a large managed health care organization.²⁰ It is hard to ascertain how representative these challenges are for the entire private sector. However, they provide pause about whether one should necessarily conclude that the private sector provides better models for managing IT decisions.

While unable to consider business techniques employed by individual private firms, our consultant found several studies regarding the characteristics of successful IT decision-making processes.²¹ Cross-cutting themes, echoed also by the study's focus groups, include:

1. Attending to staff skills and capacity to evaluate proposals recognizing the significance of close links between financial decisions and technical evaluations for IT projects;
2. Taking an enterprise-wide approach to making new investment in technology for business purposes; and
3. Limiting (by whatever means) the scope of individual IT projects.

A longer discussion of these considerations and other factors is provided in the consultant's practices review reprinted in Appendix 5.

PRACTICES IN THE GOVERNMENT SECTOR

As explained in Chapter 3, the advance work required for budgeting presents unavoidable challenges to technology investment. Assumptions change rapidly regarding available technology, costs of hardware and software, and requirements to be met.

1. Ways to Better Coordinate Project Reviews with Funding Actions

To deal with technology circumstances, some legislatures opt to control investment levels in the aggregate, minimizing the need to coordinate funding actions with their appropriation cycles.²² Certain project decisions are delegated to an executive officer or technology agency. This section discusses how some other governments are dealing with those challenges.

- The state of Illinois's Director of Technology administers a \$29 million Project Revolving Fund for initiatives that "improve customer service, or increase the state's efficiency or economy." The Strategic Planning Office and the Office of Performance Review in the Bureau of the Budget (OFM equivalent) approve applications. Some IT

¹⁹ Susan Dallas, "IT Governance: Who's in Charge Here?" Presentation at Gartner Spring Symposium, March 2004.

²⁰ Jeffrey Rothfeder, "Pulling Kaiser's IT Out of Intensive Care" *CIO Insight* (October 15, 2005).

²¹ Among them the Standish Group, Robert Frances Group, Gartner Research Group, National Association of State Chief Information Officers (NASCIO); National Governors' Association (NGA), and U.S. Government Accountability Office (GAO).

²² This section draws upon information technology practice research (February 2003) conducted by the Rand Corporation for the California State Auditor.

projects receive multi-year appropriations, up-front, once the state’s questions are technically satisfied.

- The state of New York maintains a \$10 million Technology Entrepreneurial Fund from which the Chief Information Officer and the Office for Technology (DIS equivalent) can pay for certain IT projects without going through the formal budget process. Allocations are loans that the borrowing agency has five years to repay.
- The state of Pennsylvania administers a Technology Investment Program that ranges from \$20 million to \$30 million a year, providing agencies seed money to initiate projects (e.g., research or pilots to evaluate the prospect) and support the transition (e.g., capacity training) to new information systems.

The state of Tennessee has an approach that deals with the timing issue and also addresses enhanced coordination. Tennessee has a similar \$55 million revolving fund to pay for system development and equipment when the transaction is appropriate. Tennessee also uses **coordinated evaluations between budget advisors and technology specialists** to produce a **multi-year, statewide investment plan of eligible IT projects** for its decision makers.

Homegrown Lessons Improve Budget Process Uncertainties?

Over time, Washington found different ways to approach capital budgeting that bring technical reviews closer to funding actions. Besides staging spending authority, one funding practice is for OFM to assemble a “**budget evaluation study team.**” Finished designs are examined by an independent, multi-disciplinary panel before appropriations are granted for construction.²³ Another practice is to engage a **general contractor** as **construction manager (GC/CM)** for complex investments early in project design to benefit from the builder’s expertise and help establish a price for “risk” as architectural requirements firm up.²⁴

2. Ways to Deal with Estimates in Early Project Stages

State government in Victoria, Australia, deals with the uncertainties IT projects present for budgeting by hiring estimators called “scope managers” before projects are bid. Their funding processes build on a unit of measurement called a “function point,” whose total count sizes up the functionality of a system irrespective of how system software is produced. It’s a repeatable, predictable way to quantify an investment proposal in executable terms that can be compared across organizations and projects. The method has matured since first introduced by IBM in the 1970s, becoming public intellectual property in the 1980s.²⁵

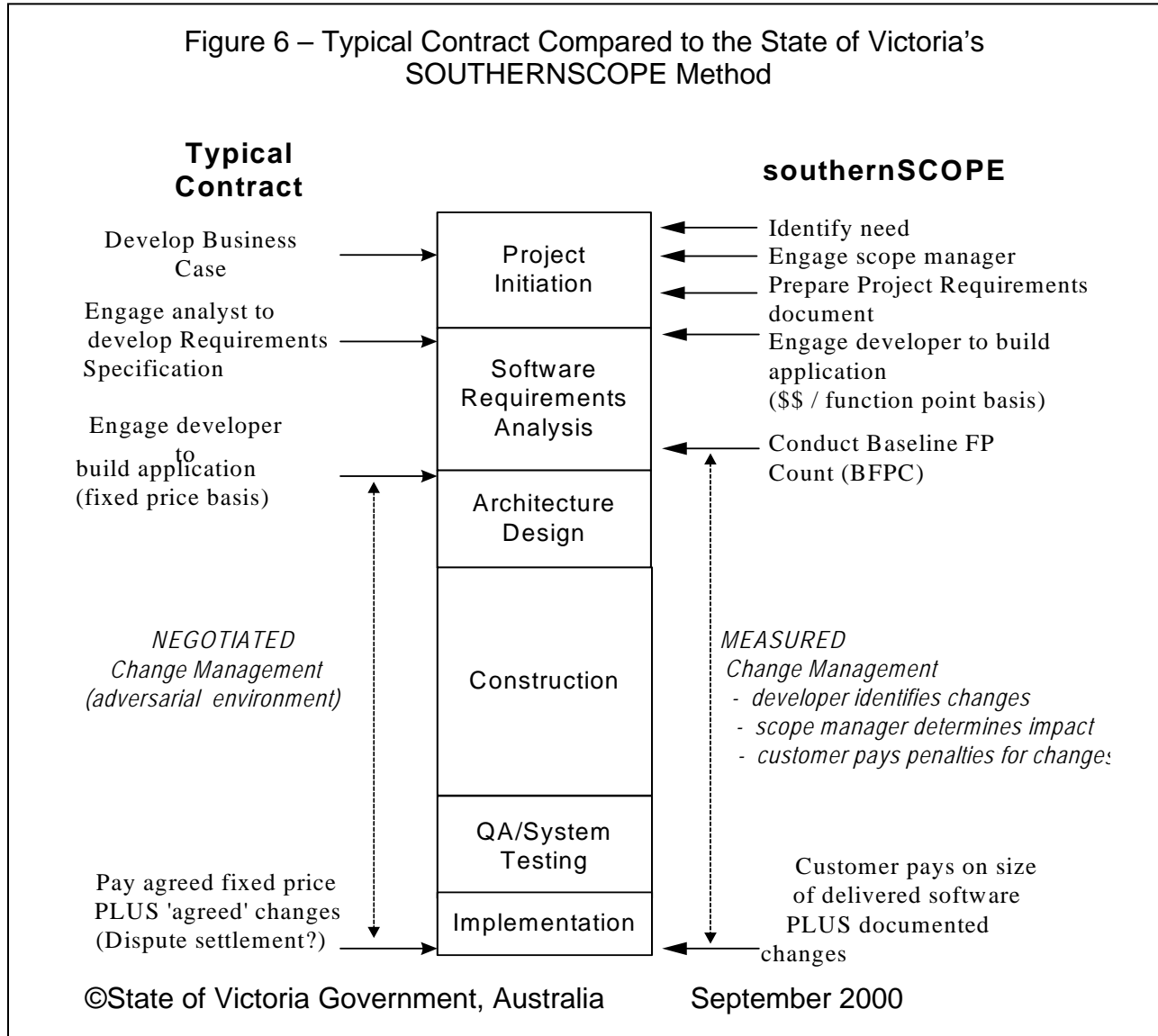
The scope manager is an independent person with credentials in functional point measurement who also has experience in software project management. This professional is the IT equivalent of the engineering “cost” surveyor for bridge, roadway and facility projects. The scope manager

²³ JLARC Report 05-7 “Performance Audit of Capital Budget Processes,” page 22.

²⁴ JLARC Report 05-9 “An Assessment of General Contractor/Construction Manager Contracting Procedures,” pages 6-7.

²⁵ According to the International Software Benchmarking Group’s analogy, the average software project is 300 function points. Function point analysis was used to estimate resources for the Washington State Correction’s OMNI project, which was in the thousands by comparison. Today, the government of the state of Victoria, Australia, is periodically measuring projects, comparing them to the basis first approved.

presents a baseline count to the state, its client, who proceeds with the vendor to negotiate a price per function point. The scope manager periodically recounts the project as it technically unfolds. Figure 5 below illustrates key differences between typical IT processes and the approach used in Victoria, Australia.



Executives everywhere seek ways to be assured their organizations do not pay more than is necessary for software development projects and to ensure systems are delivered according to functionality and timeline requirements. State government in Victoria, Australia, we learned, is using objectively verifiable measures to set IT budgets at the concept stage with its agencies, then makes use of function point analysis to check performance and arbitrate contract disputes as its business divisions work alongside vendor teams to design and deliver IT projects.

CHAPTER FIVE – CONCLUSIONS AND RECOMMENDATIONS

STUDY FINDINGS

The following findings are based on our review of how agencies presently report IT project and budget expenditures, an appraisal of how the budget process overlays the current IT project review process, and research into IT practices other organizations use that may benefit Washington State.

Information on State Agency IT Projects and Spending

- There is a statutory structure supported by ISB guidelines that anticipates regular reporting of IT project expenses and budgets. However, state agencies and DIS are not in full compliance with the reporting envisioned in statute. Without greater compliance and consistency in state agency and DIS reporting, the state does not have the information to assemble a reliable estimate of total IT investment costs.

The State's IT Project Review and Budget Process

- Agencies may ask for IT funding long before they prepare a more detailed investment plan or the proposal has received a rigorous evaluation by DIS. Timely project reviews better coordinated with the Legislature's own evaluation and funding could go a long way to reduce frustration over "scope creep" and project changes for those who write state budgets.
- Estimates for IT projects do not begin to firm up until the design architect work begins. Agencies are largely on their own to pay for the kind of technology research or analysis that would help size IT projects and validate initial cost planning for budgeting. More could be done centrally to guide and support agencies making projections.
- The ISB recently approved new standards for how higher risk projects are reviewed and evaluated. These changes are intended to provide lawmakers greater confidence that project proposals will be reviewed and assessed against clear criteria, and approved projects will be monitored consistently against projected scope, schedule and budget.
- In light of the additional requirements, we are concerned about whether DIS staffing is adequate to meet significant current and pending IT duties into the future.

Lessons From Others' Practice and Approach to IT Funding

- It is difficult to conclude whether private companies perform better than state government with managing IT initiatives. Comparisons made to other jurisdictions should be approached cautiously. In national benchmarking studies, Washington State is reporting performance only for a higher-risk subset of all IT projects agencies undertake.

- Some other states structure the timing of IT project review and funding to maintain a closer link between financial decisions and technical evaluations. Tennessee also offers a more coordinated review between their equivalents of OFM and DIS. There is a measurement technique and performance contract model at work in Victoria, Australia, to consider; and capital practices closer to home might carryover to improve Washington's IT evaluation and budget processes.

CONCLUSION

Discussion and work to improve state governments' performance and rate of success planning and executing major information technology projects was well underway before this 2005 assignment. Our report endeavors to provide lawmakers insights and a process foundation so members can participate with the Governor, OFM, ISB, and DIS to guide future evaluations and funding of agency IT investment proposals.

In light of the study findings cited above, JLARC recommends the following:

Recommendation 1

The Information Services Board should require all agencies to submit IT project expenses and budgets in complete and consistent portfolio reports.

Legislation Required:	None
Fiscal Impact:	JLARC assumes this can be completed with existing resources.
Reporting Date:	August 2006

Recommendation 2

The Department of Information Services should resume submitting a statewide IT performance report biennially to the Governor and Legislature, engaging the Office of Financial Management and lawmakers in a review of the content and basis for analysis.

Legislation Required:	None
Fiscal Impact:	As a result of this analysis, there may be additional resources needed.
Reporting Date:	December 2006

Recommendation 3

The Department of Information Services should undertake a workload study to identify potential gaps in its ability to provide adequate decision support for its various IT project review, funding, and oversight responsibility as well as for the state's biennial budget process.

Legislation Required:	None
Fiscal Impact:	As a result of this analysis, there may be additional resources needed.
Reporting Date:	September 2006

Recommendation 4

The Legislature should consider ways to time funding actions so that they are closer to when the cost and time estimates for IT projects are more reliable.

Legislation Required:	Yes, depending on options pursued.
Fiscal Impact:	JLARC assumes this can be done within existing resources.
Reporting Date:	JLARC will monitor.

There are several coordination options available to the Legislature, none of which are mutually exclusive. The options come from our own state’s capital budget experience and from practices used by others:

- Adopt a two-stage (design then build) funding process.
- Engage the project IT architect/engineer earlier (like GC/CM).
- Have OFM/DIS hold and stage the release of funds.
- Create a revolving fund with the ISB/OFM making decisions about the amount of money and the timing on releases.

Recommendation 5

The Information Services Board should investigate methods to help agencies improve their early IT project cost estimates.

Legislation Required:	None
Fiscal Impact:	There may be additional costs to the state to implement new practices.
Reporting Date:	JLARC will monitor.

There are practices available to DIS and the ISB that could be adopted as estimating standards for Washington agencies. One possibility comes from our own capital budget experience, to research and publish a “pre-design” guide with planning ranges defined for IT project budgets. A second possibility comes from the state of Victoria, Australia whose business divisions develop budgets with “scope” estimators certified in function-point measurement and analysis. Likely, there are additional options that could be explored.

AGENCY RESPONSES

We shared the report with the Washington State Department of Information Services (DIS) and the Office of Financial Management (OFM), and provided them an opportunity to submit written comments. Their written responses are included as Appendix 2.

ACKNOWLEDGEMENTS

We would like to thank those agencies who made full access to information technology portfolios possible for this research assignment. We also gratefully acknowledge the assistance provided by those agencies' project managers, technology officers, deputy directors, business officers, analysts, and board members who shared time and insight about IT funding practices and what it takes to be successful.

We would also like to thank DIS staff and directors for their assistance with the study.

Finally, we appreciate the assistance provided by Kathleen Nolte, Julie Boyer, and Catherine Suter from Sterling Associates, LLP.

Ruta Fanning
Legislative Auditor

On February 16, 2006, this report was approved for distribution by the Joint Legislative Audit and Review Committee.

Representative Ross Hunter
Chair

APPENDIX 1 – SCOPE AND OBJECTIVES

Evaluation of Budget Process for Information Technology Projects

SCOPE AND OBJECTIVES

SEPTEMBER 2005



STATE OF WASHINGTON

JOINT LEGISLATIVE AUDIT AND
REVIEW COMMITTEE

STUDY TEAM

KAREN BARRETT

LEGISLATIVE AUDITOR

RUTA FANNING

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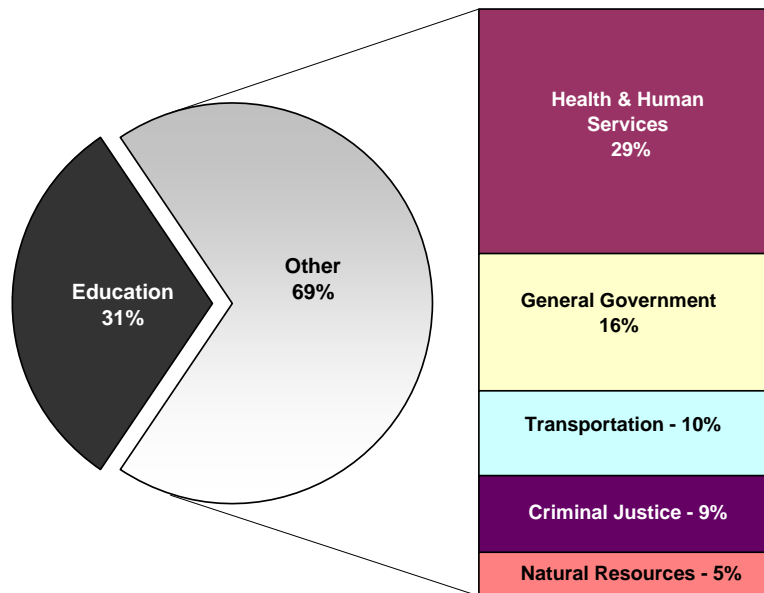
WHY A STUDY OF THE IT FUNDING PROCESS?

The 2005-07 Operating Budget directs JLARC to conduct an evaluation of the processes used for funding information technology (IT) projects. JLARC is instructed to identify total cost information, analyze ways funding is requested, examine how funding proposals are evaluated, and compare the state's funding practices to private firms and other states.

BACKGROUND

Getting a handle on exactly how much is spent on information systems by Washington State government is difficult. Information technology is present across all large agencies, and is directly involved in how agencies operate programs, deliver services, and pay benefits. However, the expense of technology is not consistently isolated on the state's accounting system, complicating the ability to analyze technology investments. The Department of Information Services (DIS) conducts an annual survey, and conservatively estimates that state IT expenses total at least \$1.3 billion per biennium. The exhibit below provides a snapshot of where IT resources concentrate for computing, telecommunications and related services, including operational support. Excluding universities, colleges, and K-12 schools, technology costs center on information systems used by 20 state agencies and departments.

Currently, IT development projects are divided between low and high risks and dollars, with the dollar definition of what makes the IT investment small or large changing by agency. For most boards and commissions, a system costing over \$50,000 constitutes a project of major significance; whereas for



Source: The 2001 (Biennial) Washington State Information Technology Performance Report

large agencies or educational institutions, a project may not be classified as such until costs exceed \$1 million or more. Project size and risk are important, as they establish which standards are used by the state for project assessment, management, oversight review, and approval.

SCOPE

For this study, JLARC will focus primarily on what happens when a major (high-risk/high-dollar) technology project is proposed by agencies to acquire, develop, or replace a mission-critical information system. We will examine how state government approaches decisions for this kind of investment, contrasting those practices with models at work in other settings.

OBJECTIVES

The study objective is to consider current practice and alternatives to improve the state's IT funding process. To that end, JLARC seeks to identify how agency business practices, investment policies, state funding requirements, and legislative-executive review presently influence the delivery of information technology projects. JLARC will also identify key factors from the funding and management processes that contribute to successful system development outcomes for agencies. The review will be guided by the following study questions:

Itemize total costs for information technology funding across state agencies:

1. What information is available about what the state spends? Where does it reside? How reliable is this data for purposes of analysis?
2. What is known about total cost to support technology over time and the business case agencies make at critical decision points when funding information systems?

Analyze current processes by which IT funding is requested and evaluated:

3. What requirements drive steps in the process to secure information technology funding and what strategies do agencies follow to fulfill them?
4. What standards are established and communicated to agencies about development (and subsequent execution) of IT projects? How is performance by agencies gauged?
5. How do agencies demonstrate they have met the criteria required to move forward with a major system development project? In instances where decision makers were not satisfied with agency justification, what additional steps or information have they required?
6. How do officers, analysts, and lawmakers with central oversight responsibilities (Office of Financial Management, Department of Information Services, Information Services Board, and the Legislature) consider or validate scope, schedule, budget, risk and management precautions taken by agencies for IT projects?
7. What most concerns stakeholders about IT planning, management or execution capability within state government? Are there lessons to be learned based on recent project experiences?

Analyze processes used in the private sector and other states:

8. Does Washington's IT investment decision-making process differ in significant ways from practices of private firms or other states?

Timeframe for the Study

Staff will present a preliminary report to JLARC when it convenes in January 2006.

JLARC Staff Contact for the Study

Karen Barrett (360) 786-5181 Barrett.Karen@leg.wa.gov

APPENDIX 2 – AGENCY RESPONSES

- Department of Information Services
- Office of Financial Management




STATE OF WASHINGTON
DEPARTMENT OF INFORMATION SERVICES
Olympia, Washington 98504-2445

January 20, 2006

TO: Ruta Fanning, Legislative Auditor
Joint Legislative Audit Review Committee

RECEIVED

JAN 25 2006

FROM: Gary Robinson, Director 
Department of Information Services

JLARC

SUBJECT: EVALUATION OF BUDGET PROCESS FOR IT PROJECTS

Below are the Department of Information Services formal responses to JLARC's preliminary report recommendations for inclusion in the final report. I will be present at the February JLARC meeting should the Chair request further comments on behalf of the Department.

RECOMMENDATION	AGENCY POSITION	COMMENTS
1. The Information Services Board should require all agencies to submit IT project expenses and budgets in complete and consistent portfolio reports.	The Department of Information Services concurs with this recommendation.	Agencies are currently required to submit actual and projected information technology expenditures through the IT Portfolio process. The existing process identifies specific reporting categories which will be reevaluated with a recommendation for action to the Information Services Board in the Spring of 2006. Investment plans provide estimated project expenses for High Risk and High Severity (Level 3) projects while actual expenditures for these projects are reported to the Information Services Board on a



		<p>bimonthly basis.</p> <p>The Information Services Board and Department will reinforce the requirement to submit complete and consistent IT spending information as required by Information Services Board policy.</p> <p>A report identifying actual expenditures by agency and reporting for the 2003-2005 Biennium will be provided to the Information Services Board at the March 2006 meeting.</p>
<p>2. The Department of Information Services should resume submitting a statewide IT performance report biennially to the Governor and Legislature, engaging the Office of Financial Management and lawmakers in a review of the content and basis for analysis.</p>	<p>The Department of Information Services concurs with this recommendation.</p>	<p>The Department will be submitting a statewide IT biennial performance report in April of 2006.</p>
<p>3. The Department of Information Services should undertake a workload study to identify potential gaps in its ability to provide adequate decision support for its various IT project review, funding and oversight responsibilities as well as for the state's biennial budget process.</p>	<p>The Department of Information Services partially concurs with this recommendation.</p>	<p>The Department will conduct an evaluation to identify potential gaps in its ability to conduct oversight responsibilities and to support the state's biennial budget process. Identified gaps will be addressed through the realignment of existing resources or through the biennial budget process.</p>
<p>4. The Legislature should consider ways to time funding actions so that they are close to when the cost</p>	<p>The Department of Information Services concurs with this recommendation.</p>	<p>The Department will work with the Legislature to more closely align project cost estimates and funding</p>

and time estimates for IT projects are more reliable.		actions.
5. The Information Services Board should investigate methods to help agencies improve their early IT project cost estimates.	The Department of Information Services concurs with this recommendation.	<p>Beginning in February of 2005, the Information Services Board and Department began recommending that agencies use Request for Proposals and Request for Quotation processes in advance of submitting Medium Risk, Medium Severity project (Level 2) Investment Plans for approval by the Director of the Department. This approach provides for more accurate IT project cost estimates in advance of the project beginning.</p> <p>The Department will evaluate additional methods that could be adopted to ensure more accurate IT project cost estimates for High Risk, High Severity (Level 3) projects approved by the Information Services Board.</p>

cc: Victor Moore, Director, OFM



STATE OF WASHINGTON
OFFICE OF FINANCIAL MANAGEMENT

Insurance Building, PO Box 43113 • Olympia, Washington 98504-3113 • (360) 902-0555

January 23, 2006

TO: Ruta Fanning, Legislative Auditor
Joint Legislative Audit and Review Committee

FROM: Victor A. Moore, Director 

SUBJECT: PRELIMINARY REPORT – EVALUATION OF BUDGET PROCESS FOR IT PROJECTS

Thank you for giving the Office of Financial Management (OFM) the opportunity to review JLARC's preliminary report on the Evaluation of Budget Process for Information Technology Projects.

OFM concurs with the recommendations in this preliminary report. Our responses are as follows:

Recommendation	Agency Position	Comments
1. The Information Services Board should require all agencies to submit IT project expenses and budgets in complete and consistent portfolio reports.	Concur	Complete and consistent fiscal information on IT projects will improve the information available during the budget process.
2. The Department of Information Services should resume submitting a statewide IT performance report biennially to the Governor and Legislature, engaging the Office of Financial Management and lawmakers in a review of the content and basis for analysis.	Concur	OFM concurs that a statewide IT performance report should be submitted biennially to the Governor and to the Legislature. OFM will review the report.
3. The Department of Information Services should undertake a workload study to identify potential gaps in its ability to provide adequate decision support for its various IT project review, funding, and oversight responsibility, as well as for the state's biennial budget process.	Concur	OFM agrees that DIS should conduct a review of how it analyzes IT projects to ensure that DIS is providing sufficient support.
4. The Legislature should consider ways to time funding actions so that they are closer to when the cost and time estimates for IT projects are more reliable.	Concur	It is important that the Legislature have the best possible cost estimates when considering requests to fund IT projects.
5. The Information Services Board should investigate methods to help agencies improve their early IT project cost estimates.	Concur	More accurate cost estimates will improve the IT project review process.

We look forward to your final report. If you have any questions, contact Theo Yu at (360) 902-0548.



APPENDIX 3 – SEVERITY & RISK LEVEL CRITERIA AND OVERSIGHT

This appendix is excerpted from “Information Technology Portfolio Management Standards,” prepared by the Washington State Department of Information Services for state agencies.

Appendix A - Severity & Risk Level Criteria and Oversight

Severity is rated on four categories: impact on citizens, visibility to the public and Legislature, impact on state operations, and the consequences of doing nothing. The risk criteria measure the impact of the project on the organization, the effort needed to complete the project, the stability of the proposed technology, and the agency preparedness.

The risk and severity criteria summarized in the following pages are general guidelines for assessing IT projects and are not intended to be exhaustive.

How to use the Severity and Risk Matrix

In general, the highest level evaluation in a category determines the severity or risk level for that category. For example, a project or investment that meets one or more of the criteria (bulleted items) within the "high" category results in a high rating for that category, even though it may also meet several in the medium or low categories.

Information Technology Portfolio Management Standards

Prepared by the Washington State Department of Information Services.

Severity Level Criteria

The severity matrix assesses the proposed project's impact on citizens and state operations, its visibility to stakeholders, and the consequences of project failure.

Levels	Categories			
	Impact on Clients	Visibility	Impact on State Operations	Failure or Nil Consequences
High	<ul style="list-style-type: none"> Direct contact with citizens, political subdivisions, and service providers – including benefits payments and transactions. 	<ul style="list-style-type: none"> Highly visible to public, trading partners, political subdivisions and Legislature. Likely subject to hearings. System processes sensitive / confidential data (e.g. medical, SSN, credit card #'s). 	<ul style="list-style-type: none"> Statewide or multiple agency involvement / impact. Initial mainframe acquisitions or network acquisitions. 	<ul style="list-style-type: none"> Inability to meet legislative mandate or agency mission. Loss of significant federal funding.
Medium	<ul style="list-style-type: none"> Indirect impacts on citizens through management systems that support decisions that are viewed as important by the public. Access by citizens for information and research purposes. 	<ul style="list-style-type: none"> Some visibility to the Legislature, trading partners, or public the system / program supports. May be subject to legislative hearing. 	<ul style="list-style-type: none"> Multiple divisions or programs within agency. 	<ul style="list-style-type: none"> Potential failure of aging systems.
Low	<ul style="list-style-type: none"> Agency operations only. 	<ul style="list-style-type: none"> Internal agency only. 	<ul style="list-style-type: none"> Single division. Improve or expand existing networks or mainframes with similar technology. 	<ul style="list-style-type: none"> Loss of opportunity for improved service delivery or efficiency. Failure to resolve customer service complaints or requests.

Information Technology Portfolio Management Standards

Prepared by the Washington State Department of Information Services.

Risk Level Criteria

The risk matrix measures the impact of the project on the organization, the effort needed to complete the project, the stability of the proposed technology, and agency preparedness.

		Categories			
Levels	Functional Impact on Business Processes or Rules	Development Effort & Resources	Technology	Capability & Management	
High	<ul style="list-style-type: none"> Significant change to business rules. Replacement of a mission critical system. Multiple organizations involved. Requires extensive and substantial job training for work groups. 	<ul style="list-style-type: none"> Over \$5 million. Development and implementation exceeds 24 months.* Requires a second decision package. <p>* Clock starts after feasibility study or project approval and release of funding.</p>	<ul style="list-style-type: none"> Emerging. Unproven. Two or more of the following are new for agency technology staff or integrator, or are new to the agency architecture: programming language; operating systems; database products; development tools; data communications technology. Requires PKI certificate. Complex architecture – greater than 2 tier. 	<ul style="list-style-type: none"> Minimal executive sponsorship. Agency uses ad-hoc processes. Agency and/or vendor track record suggests inability to mitigate risk on project requiring a given level of development effort. 	
Medium	<ul style="list-style-type: none"> Moderate change to business rules. Major enhancement or moderate change of mission critical system. Medium complexity business process(es). Requires moderate job training. 	<ul style="list-style-type: none"> Under \$5 million but over agency delegated authority. 12 to 24 months for development and implementation. * <p>* Clock starts after feasibility study or project approval and release of funding.</p>	<ul style="list-style-type: none"> New in agency with 3rd party expertise and knowledge transfer. One of the technologies listed above is new for agency development staff. 	<ul style="list-style-type: none"> Executive sponsor knowledgeable but not actively engaged. System integrator under contract with agency technical participation. Agency and/or vendor record indicates good level of success but without the structure for repeatability. 	

Information Technology Portfolio Management Standards

Prepared by the Washington State Department of Information Services.

Categories				
Levels	Functional Impact on Business Processes or Rules	Development Effort & Resources	Technology	Capability & Management
Low	<ul style="list-style-type: none"> Insignificant or no change to business rules. Low complexity business process(es). Some job training could be required. 	<ul style="list-style-type: none"> Within agency delegated authority. Under 12 months for development and implementation.* <p>* Clock starts after feasibility study or project approval and release of funding.</p>	<ul style="list-style-type: none"> Standard, proven agency technology. 	<ul style="list-style-type: none"> Strong executive sponsorship. Agency and vendor have strong ability to mitigate risk on a development project. Project staff uses documented and repeatable processes for tracking status, problems, and change. Agency or vendor is CMM Level 3 equivalent or above.

Project Approval and Oversight Matrix

The level of approval and oversight required on a given project is determined through an assessment of project risk and severity:

High Severity	Level 2	Level 2	Level 3
Medium Severity	Level 1	Level 2	Level 2
Low Severity	Level 1	Level 1	Level 1
	Low Risk	Medium Risk	High Risk

Level 2 projects may require ISB approval and oversight.

Oversight Definition

Level 1: Investments at this level are overseen by agency management and staff according to the IT policies, procedures, and practices of that agency, consistent with ISB IT investment policies and standards. It is at the agency's discretion whether to invite the DIS MOST consultant to key meetings, whether to provide the consultant with written reports, and whether to include a Level 1 project in the agency's portfolio.

NOTE: Level 1 investments subject to section 902 of the state's biennial budget are treated as Level 3s.

Level 2: DIS oversight of investments at this level is performed by DIS MOST staff, as appropriate. The specific activities required of an agency and the extent of DIS MOST staff involvement under Level 2 oversight is determined collaboratively between the two parties. These typically depend on several factors, including, but not limited to: the experience of the agency with similar investments; the effect of legislative or public opinion in the event of negative media coverage; the interest of specific ISB members (e.g., effect on an ISB legislative member's district); essentially, the criteria contained in the severity/risk matrix.

For all Level 2 investments, the agency shall develop the appropriate type and quality of project management documentation and materials commensurate with the project's severity and risk. Should the agency and DIS MOST staff determine that the project requires DIS oversight, at a minimum; the agency shall provide copies of the project status reports, and key project documents and materials to its MOST consultant and invite the consultant to attend all steering committee and key project status meetings. The agency shall include all Level 2 investments in its IT portfolio, whether or not the projects are under DIS oversight.

NOTE: Level 2 investments subject to section 902 of the state's biennial budget are treated as Level 3s.

Level 3: Investments at this level are subject to full ISB oversight, which includes DIS MOST staff written reports to the ISB, periodic status reports to the ISB by the agency director and staff, and submission of other reports as directed by the ISB.

At this level, the agency shall provide copies of key project documents, including the feasibility study, project external quality assurance reports, project management plans, risk management plans, change management plans, and closeout and evaluation reports to its MOST consultant as staff to the Board. The consultant participates in all steering committee and project status meetings. The agency shall include all Level 3 investments in its IT portfolio.

Oversight Levels

Having determined the risk and severity associated with a proposed project, it will be assigned the appropriate level of approval and oversight with the following general requirements.

	Justification & Approval Decision	Feasibility Study and Project Management Approach/Execution	Oversight
Level 3	<ul style="list-style-type: none"> • Agency director approval. • DIS executive review and comment. • ISB approval. 	<ul style="list-style-type: none"> • Agency presents feasibility study to ISB. • Prototype required at discretion of ISB. • Private sector participation encouraged or required. 	<ul style="list-style-type: none"> • ISB oversight required. • External Quality Assurance (QA) required. • ISB audit as necessary. • Other ISB discretionary actions as needed. • Reported as part of portfolio.
Level 2	<ul style="list-style-type: none"> • Agency executive approval. • DIS Director review and approval. 	<ul style="list-style-type: none"> • Agency executive approval. • DIS consultation. 	<ul style="list-style-type: none"> • Internal or external QA at agency discretion. • DIS and agency determine oversight required • ISB oversight optional. • Reported as part of portfolio.
Level 1	<ul style="list-style-type: none"> • Agency executive approval with option of DIS consultation. 	<ul style="list-style-type: none"> • Agency-defined methods. 	<ul style="list-style-type: none"> • Internal QA at agency determination. • Agency may report project as part of portfolio.

Requirements at Different Levels of Oversight

	Level 1	Level 2	Level 3
Feasibility Study	Agency discretion	Recommended	Required
Approval Level	Agency Internal	DIS Director (may recommend full ISB oversight)	ISB
Investment Plan	Recommended	Required	Required
Quality Assurance	Agency discretion	Internal or external (agency discretion)	External required
In Portfolio	Agency discretion	Required	Required
Oversight	Agency discretion	Level of MOSTD staff involvement dependent on project and consultation with agency	ISB
Project Reporting and Status	Agency discretion	Agency provides copies of key written reports to MOSTD staff	MOSTD staff provides written reports to ISB. Agency sponsor and staff provide periodic status reports to ISB
Key Meeting Participation by MOSTD Staff	Agency discretion	MOSTD staff invited to steering committee and project status meetings	MOSTD staff participates in steering committee and key project status meetings

APPENDIX 4 – TENNESSEE INFORMATION SYSTEMS PLANNING PROCESS

State of Tennessee Information Systems Planning Process follows.



State of Tennessee

Information Systems Planning Process

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A. Introduction

In the early 1980's, the State of Tennessee recognized that the role of government was changing, that the needs for government services would continue to grow, and that resources available to government were decreasing. Effective use of information technology was viewed as a major avenue that could assist government in managing this change. It was also understood that well-defined business and information technology planning processes were critical success factors.

The State of Tennessee has developed a comprehensive technology planning process to enhance technology project initiation, review, and approval. The various players in this process are as follows:

- **Information Systems Council (ISC)**

The ISC is charged with ultimate authority over information technology within State government. The Council is comprised of the following representatives from the legislative, executive, and judicial branches of State government:

- ❖ Three members of the State Senate
- ❖ Three members of the State House of Representatives
- ❖ Comptroller of the Treasury
- ❖ Director of the Administrative Office of the Courts
- ❖ Commissioner of Finance and Administration
- ❖ Commissioner of General Services
- ❖ Commissioner of the Public Service Commission

- **Office of the Budget**

Central budget authority for State government.

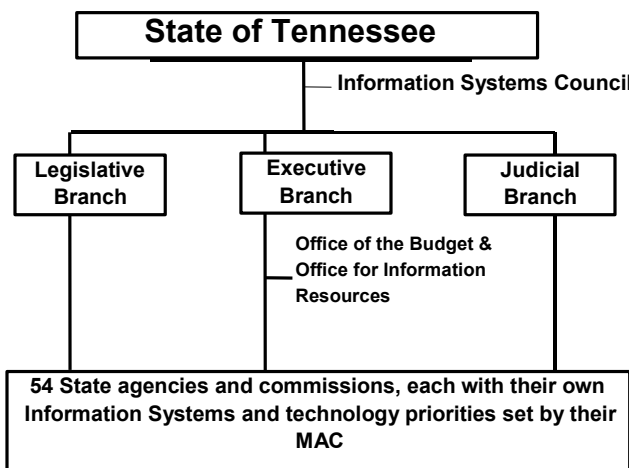
- **Office for Information Resources (OIR)**

Central technology authority for State government.

- **Management Advisory Committee (MAC)**

The Management Advisory Committee was established within each agency as a part of the planning process to enable executive management to more effectively direct information technology activities. The typical MAC is chaired by the Deputy Executive Officer of the agency,

with program/functional area executives as MAC members. Some agencies include their General Council, Chief Financial Officer, or Internal Auditor on the MAC. Agency IS Directors are staff to the MAC. The MAC is accountable directly to the Commissioner or agency head.



The information systems planning process in Tennessee, which has been in operation since 1981, involves the preparation and agency authorization of the Information Systems Plans (ISP), review by the central administrative agency, and final authorization by the major directing body for technology within

Tennessee State government.

B. Strategic Business Planning

In 1997, key leaders in Tennessee State Government, including the Governor and his Senior Staff, the Commissioner of the Department of Finance and Administration, the Comptroller of the Treasury, and the State Treasurer, agreed that the State would greatly benefit from the development and implementation of formal strategic business plans. In August 1997, the Governor's Senior Staff initiated the strategic planning process within the Executive Branch, developing a plan with which each of the 23 Executive Branch departments could align. Each year, the Governor and his Cabinet formulate the overall State Strategic Plan. Each agency in the Executive Branch develops their agency Strategic Business Plan based on the goals and objectives of the State Strategic Plan.

C. Strategic Information Technology Planning

In 1998, the State established a formal Strategic Information Technology Planning Process. Input to this IT planning effort comes from the State Strategic Business Plan, agency Information Systems Plans, and technology trends in the marketplace.

D. Agency Information Systems Planning

Each agency in Tennessee develops an Information Systems Plan (ISP) that is due at the beginning of the fiscal year (July 1) and covers a three-year planning horizon. Year One identifies projects for the current fiscal year for which funding is already in place. Year Two covers the next fiscal year where funding for these initiatives will be requested in the budget submitted in October of the current fiscal year. Year Three covers future projects. Development of the agency's ISP is a cooperative effort between executive management, business staff, and Information Systems staff. Agency executive management and business staff, with Information Systems staff assistance, perform the following activities:

- ❖ Review of the strategic business plan for the agency, including the statement of mission, goals, objectives, and strategies that set business direction.
- ❖ Assessment of the current technological environment within the agency, including evaluation of the primary hardware, application software, and connectivity.
- ❖ Development of an Information Technology Strategy based upon the analysis of the current environment and the business goals to be achieved. This strategy identifies the agency's short and long-range goals related to managing and sharing information and information technology in support of the agency's business strategic plan. The strategy also addresses agency technology weaknesses and needs.

Information technology projects are identified and documented in the ISP in support of the Information Technology Strategy. These projects may include traditional application development or acquisition projects, as well as projects involving specific technologies including voice response systems, geographic information systems, and communication infrastructure projects. Each project with initial costs over \$100,000 is described in a Project Proposal which addresses the business process to be impacted by the project and specifies the business strategy or objectives supported by the project. A Cost Benefit Analysis document is also included to detail the costs, benefits, risks, and funding sources for the project. The Project Proposal and Cost Benefit Analysis provide a framework for an agency's executive management to evaluate and prioritize proposed projects, as well as provide a mechanism to monitor costs and benefits during project implementation. These documents also provide executive management in State government with the information needed to understand the business impact to the State, prioritize projects on a statewide basis, and recommend funding.

The Information Systems Plans are reviewed and authorized by Management Advisory Committees (MACs) within each agency. Management Advisory Committees perform the following functions:

1. Sets the information technology agenda as an adjunct to the development of the business strategy for the agency.
2. Ensures that the agency information technology strategy is carried out and that projects are appropriately targeted to support specific business strategies.
3. Reviews the cost assumptions and benefit estimates in order to approve submission of the project.
4. Sets priorities for a project in relation to other projects within the agency competing for resources.
5. Ensures that authorized projects meet targets established in the project proposal and cost benefit analysis.
6. Ensures that technology projects are in line with business needs and direction.
7. Authorizes the Information Systems Plan and the technology projects contained therein.

E. Information Systems Plan Review

External review of the Information Technology Strategy and supporting projects begins with submission of the Information Systems Plans to the Office for Information Resources. The Tennessee Department of Finance and Administration houses the State Budget Office and the Office for Information Resources (OIR). The State Budget Office oversees development and management of the Budget for all of State government, and the Office for Information Resources (OIR) oversees information technology for all of State government. Representatives from these organizations serve on a review group, the Information Technology Assessment & Budget Review Committee (IT-ABC). They have the responsibility of addressing information systems issues from a statewide (corporate) view, to take a strategic view on major technological issues, and to provide a process for monitoring technology projects. The review of Information Systems Plans is an important step in the accomplishment of these responsibilities. There are multiple purposes for plan review, including:

- Approval or disapproval of current projects based on support of the State and Agency Strategic Plan and resource availability; adherence to the State's information systems architecture, policies and procedures; and contribution to fulfillment of the State's service delivery to its citizens.
- Recommendation of projects for inclusion or exclusion in funding formulas for the next fiscal year.
- Review of future projects in an attempt to identify long-term needs for information technology resources.
- Review of the Information Technology Strategy in an attempt to evaluate the agency's approach in using information technology to enable and enhance service delivery as outlined in its Business Strategy.
- Review of the plan to develop an understanding of the issues related to the effective and efficient use of information technology in the agency and the State as a whole. This information is important to identifying issues that not only affect the agency but also the systems community in the State. In its role as staff to the Information Systems Council, OIR is then better positioned to help pursue strategic initiatives to address major issues.
- Overall view of projects across agencies that may be performing similar functions, generating redundant data, or demonstrating a need for sharing data or resources. This view assists the State in addressing a growing need for sharing data among agencies in order to facilitate better service to the citizens of the State.

The IT-ABC is made up of the following staff:

- Quality, Planning, Performance and Security, Chair
- Data Networking, Telecommunications & Distributed Systems
- Division of Budget
- Technology Financial Management
- Enterprise Computing Support
- Systems Development and Support
- IT Planning and Research

The IT-ABC plan review begins each year when the Information Systems Plans are submitted May 15 for small agencies and July 1st for large agencies. The plans, as well as reviewer comments about the plans and each major project, are shared electronically. Approximately 55 staff members from the various divisions within OIR and Budget read and comment about the plans and/or projects. IT-ABC members complete a review of each ISP, as well as a review of comments provided by other staff. The actions by the agency's Management Advisory Committee in defining and setting project priorities also helps the IT-ABC understand the relative importance of each project in the further prioritization and ranking of all project requests throughout State government.

After the preliminary review, an agenda memo noting issues of concern to individual agencies is prepared. A formal meeting is held by the IT-ABC with each agency's MAC and IS staff to address the issues identified. After the formal meeting, the agency is provided a disposition memo detailing their Plan and each project in the Plan.

Funding considerations based on the IT-ABC disposition of projects are finalized, and the Statewide agency initiatives are presented to the Information Systems Council. The Council makes the final disposition on major projects and initiatives for State government.

After this review and disposition, a Statewide Information Systems Plan is developed based upon individual agency plans. The Statewide Information Systems Plan, which can be viewed at www.state.tn.us/finance/oir/prd/tennplan.html, consists of the following segments:

- Description of the Information Technology Environment on an enterprise basis, including details about planning initiatives and the technical environment.
- Overview of the information technology organizational infrastructure.
- Overview of agency business objectives, technology strategies, and technology projects.

F. Government Operation Improvements

The operation of State government has improved in three general areas directly related to the Information Systems Planning process:

1. improvements in the way agencies determine and direct information technology projects,
2. improvements in the Statewide technology and fiscal review of projects, and
3. significant improvements in overall information technology planning.

➤ Improvements Within Agencies

Individual projects are now more clearly defined due to the standardization of a comprehensive project-planning format as required by the Project Proposal and Cost Benefit Analysis methodology. Anticipated review of these deliverables within the agency and outside the agency increases the accuracy of the descriptions and estimates. Project sponsors, as well as MAC members, are encouraged to be closely involved in the cost benefit analysis process. Their role as the responsible parties has been crucial for ensuring that business objectives are met by projects within the estimated costs and with the specified benefits.

Individual projects are now part of an overall technology strategy that moves the agency toward defined goals. The goals to be supported are part of the agency's business strategy. The closer

link between the technology and the business enhances the visibility of information technology initiatives that are usually costly in dollars and manpower resources.

Management overview and direction of the information technology strategy and supporting projects is emphasized due to the nature of the need for technology strategies to support the business initiatives of the agency. Business management's key role in the development of the information technology strategy aids in ensuring that technology projects are more likely to be supported with the needed resources.

Technology advancement relies on an agency business strategy. The development of agency business strategies has accelerated due to this dependence.

➤ **Statewide Technology and Fiscal Review**

The explicit statement of the business need driving technology projects, as well as the definition of the project and associated costs and benefits, improves the understanding of the need for the project outside of the agency. A more objective review of all information technology projects can take place. Approvals and prioritization are based on more factual data and less on subjective issues.

➤ **Improvements in Overall Technology Planning**

Through the plan review process, an enterprise-wide view is obtained so that initiatives can be viewed as State initiatives rather than agency initiatives. Resource maximization can take place through this view of similar, cooperative projects. Efforts can be more coordinated across agencies. Conformance of information technology initiatives to Statewide architectural standards is more readily encouraged and achieved.

G. Benefits of Information Systems Planning

As the process of initiating, approving, and monitoring projects has been formalized and directly tied to the business strategies of the State, an atmosphere has been fostered to encourage cost effective technology solutions to service delivery challenges for State government. The effective and efficient use of resources expended on technologies, the close management control over the projects, and the benefits in citizen service have fostered the expanded use of information technology. Information technology in all of State government is driven by business goals established by the elected representatives of the citizens of the State. Executive management is accountable for technology initiatives. More realistic technology projects are defined and evaluated on a more objective basis.

The impact of more effective planning is difficult to measure; however, there is no doubt that business and information technology planning has enabled significant progress in the operation of State government. One indicator of that progress and effectiveness is national recognition of our accomplishments. Tennessee has been honored with the following:

- “The Best Managed State in the Country” by one national publication, and “One of the Best Managed States” by another publication, and the only state to make the top five in both,
- “One of the Top 100 organizations among both private and public sector organizations by CIO Magazine”,
- “The first and only state to receive ALL three Government Finance Officers Association (GFOA) awards of excellence and information systems that have been awarded the NASIRE and Smithsonian, and
- One of the top six states in the nation for effective management of information technology. (Study conducted by Syracuse University, “*Governing*” and “*Government Executive*” magazines.)

H. Innovative Funding Mechanisms

As the State has adopted technology to enhance service to citizens, IT projects that require significant investment have increased in number and cost. In support of this effort, the State has established a fund, called the Systems Development Fund, as a mechanism for funding large application development projects and for large equipment purchases. State agencies can request funding from the Systems Development Fund to cover initial investment and pay back the funds over a three to five-year timeframe. Projects approved for expenditure from this fund are determined by the Information Systems Council based on the recommendation of the Commissioner of F & A.

APPENDIX 5 – INFORMATION TECHNOLOGY MANAGEMENT INDUSTRY BEST PRACTICES

Sterling Associates, LLP research on IT management industry best practices follows.

INFORMATION TECHNOLOGY MANAGEMENT

INDUSTRY BEST PRACTICES

Information technology management practices can best be described as diverse. While many states, including Washington, have defined and embraced sound management practices, these practices vary by organization and often what may work well in one state, does not work well in another. Research regarding information technology practices has been conducted to compare, contrast and better understand where Washington falls along this spectrum. This research is meant to complement work being performed by the Joint Legislative Audit and Review Committee (JLARC) in its study on decision-making processes related to information technology investments. Best practices and approaches being used to successfully manage information technology in both the private sector and the public sector have been included. Reputable national and international organizations associated with information technology management were used to highlight various perspectives and to collect and analyze the practices and approaches deemed successful in the industry. Organizations used to highlight best practices and organizational differences include:

1. The Standish Group,
2. The Robert Frances Group,
3. Gartner Research Group,
4. The National Association of State Chief Information Officers (NASCIO),
5. The National Governors' Association (NGA),
6. The General Accountability Office (GAO), and
7. Prominent industry periodicals, such as CIO, CIO Insight, Computer World, PC World, and InfoWorld.

This paper pays particular attention to research that identified specific guidance or advice about information technology investment decisions, organizational standards, project management guidelines, funding strategies, factors contributing to project success or failure, and recommendations regarding technology projects. Further, this paper focuses on two broad aspects affecting the management of information technology investments: *industry best practices* (policies, practices and standards) and *organizational alignment* between funding decisions and project management.

Managing Information Technology Investments – Industry Best Practices

Businesses and public entities are constantly refining their approach to managing investments in information technology in order to improve the services provided and control their costs. Traditionally, private sector organizations focused greater attention on meeting specific cost drivers than government entities. With the increased focus on performance management and



effectiveness of programs, government entities have become more focused on the same drivers. Similar to private sector organizations, government entities are working diligently to improve the efficiency and effectiveness of their information technology investments. Many government organizations, including Washington, are developing a tailored approach for their organization that guides their decisions regarding information technology investments. It is apparent that research in this area supports the notion that information technology investments, regardless of whether they reside in the private or public sector, require management involvement commensurate with the risk involved in the project and the size of the business processes being changed.

The *Gartner Research Group* suggests that information technology investments should be managed like a financial portfolio. Gartner asserts that the portfolio should include both the business projects and the assets controlled and managed by the organization. Utilizing the project portfolio management approach should maximize the return to the organization by understanding investment opportunities, selecting investments with the highest potential value to the organization, and managing those investments through their complete life cycle.

This portfolio process is one of the first steps in understanding the importance of a particular project. Because there are usually more projects proposed for funding than can be funded, Gartner recommends that a prioritization process be developed that is objective, consistent, and backed by strong governance that cannot be subverted by vested interests or political influence. This can be accomplished within the enterprise by:

Step 1: Establishing a project portfolio management process

- Define initiatives using a comprehensive, uniform format
- Evaluate initiatives using an objective framework
- Prioritize initiatives and balance the portfolio
- Match prioritized initiatives to resources
- Manage the portfolio activity

Step 2: Developing a prioritization framework

- Define logical investment categories
- Adopt objective evaluation criteria

Step 3: Focusing on critical success factors

- Establish governance and clear accountabilities
- Allocate sufficient resources to support the process
- Ensure the process is disciplined and sustained
- Develop an objective prioritization framework
- Maintain communication and education programs
- Support decision-making with tools

Step 4: Assessing status



- Conduct regular assessments to determine success
- Plan and implement improvements

The portfolio management approach is being utilized by more and more private and public organizations to select and prioritize the best investment opportunities. Washington began its venture into portfolio management in the late 1990's and continues with this approach today.

The **Gartner Group** also emphasizes the growing importance of information technology governance to the success of any organization. Gartner contends that the way information technology has been managed in the past hasn't worked to get the business results desired and that new regulatory requirements demand more transparency about business projects, especially if a major project fails and is considered a "material event" from a fiduciary perspective. Susan Dallas, Gartner Group, declares, ***"Over 75% of businesses today have ineffective IT governance. Most enterprises should "blow up" their current IT governance models and start over."***ⁱ

With growing pressure on organizations to produce fast, flexible, cost-effective, business results, Gartner cites three common pitfalls to avoid when designing information technology governance.

- Inadequate participation by business managers.
- A lack of clearly articulated goals.
- A lack of clearly defined governance processes, roles and responsibilities.

Like the Gartner Group, the **Robert Frances Group** reports that information technology governance has a higher level of significance than ever before given the Sarbanes Oxley Act of 2002. The Act grew out of the Enron scandal, increasing executive fiduciary accountability, and imposing more rigorous requirements for reporting financial activity.

While the information technology governance structure should be tailored to fit the organization's culture, values, and processes, it should also be designed with enough discipline to protect investments and assets from an enterprise perspective. Like the business governance structure, participants in the information technology structure should have the authority to make decisions and allocate resources for investments. Effective governance should require accountability at all levels in order to ensure that information technology investments are providing maximum value to the organization as a whole, and not to just one line of business or department. Some of the best practices reported in successful, more stringent information technology governance models include:

- Extensive involvement of business managers.
- Capability to make decisions rapidly based on well understood processes.
- Centrally managed infrastructure.
- Clear organizational reporting relationships.



- Project life cycle cost estimates, rather than project development cost estimates.
- Exceptional people retained and trained.
- Projects managed as a portfolio.
- Standards enforced consistently.
- Validation of attained benefits after implementation.

The **Robert Frances Group** goes on to report that in some businesses, corporate executives ignore information technology governance processes and direct their own projects. This adds to the pressure on information technology executives to support additional systems, features or unfunded projects after development is complete. Information technology executives are encouraged to utilize the governance process to control these unauthorized projects. Some organizations are establishing information technology auditors to assure the established processes and policies are followed.

Like other recognized industry experts, the **Robert Frances Group** makes several recommendations to assure quality is built into information technology projects. The group's recommendations assert that:

1. Quality assurance, including a structured risk management approach, should be built into the entire process.
2. Incremental review of results and improvements is needed.
3. Consistent, well understood definition of quality should be established during planning.
4. Senior executive buy-in must be apparent.
5. A detailed and robust plan for performance, reliability, and organizational readiness issues must be developed and operationalized.
6. IT executives monitor quality independently at specific stages or gates.
7. A "Postmortem review" – documentation of lessons learned from both successful and unsuccessful projects should be completed and the lessons implemented in subsequent projects.
8. Staff must be trained sufficiently and ensure consistent expectations and focusⁱⁱ.

The **Standish Group** reports on elements for effective project management in a variety of their publications. The table below illustrates the elements it considers as important for successful project management. As you will note, these elements change slightly depending on the publication but are generally consistent with those reported by the Gartner Group and the Robert Frances Group.



Elements of Effective Project Management	“Collaborating on Project Success” The Standish Group ⁱⁱⁱ	“The Seven Keys to Success” The Standish Group ^{iv}	“The Ten Vital Signs of a Project” The Standish Group ^v
Strong executive support	✓	✓	
Committed stakeholders		✓	
Minimized, realistic scope	✓	✓	
Clear business objectives	✓	✓	✓
Firm business requirements	✓		
Effective user involvement	✓		✓
Experienced Project Manager with good communication skills and clearly defined management responsibilities	✓		✓
High-performing team		✓	
Reliable estimates	✓	✓	
Sufficient resources			✓
Standard software infrastructure	✓		
Formal methodology with appropriate detail	✓		✓
Mitigation of risks		✓	✓
Established project controls with scope and change control protocol			✓
Identify business and technical alternatives and be able to justify selection			✓

ComputerWorld magazine has taken a different approach in providing recommendations focusing on the importance of establishing a realistic project schedule. More specifically, *Computerworld* provides the following advice in establishing the schedule.

1. Be certain of scope and requirements.
2. Prototype the biggest technical risks.
3. Create a model of the user interface.
4. Research industry standard estimates for similar projects.
5. Each team member creates an individual estimated task schedule.
6. Accept only observable, measurable status reports.
7. Subdivide all tasks down to a maximum time of two weeks^{vi}.

Other organizations such as the *NASCIO* and *NGA* publish periodic reports on elements they recommend for effective management of information technology. *NGA's* Center for Best Practices reports on elements for effective information technology management through data gleaned from the state CIO's. The following matrix illustrates the recommended elements at the statewide level from each of these three perspectives.



Elements of Effective Information Technology Management	NASCIO - 2004 National Award for IT Management to Tennessee ^{vii}	NGA's Center for Best Practices – Conversations with State CIO's ^{viii}	NGA's Center for Best Practices – The View from the IT Industry ^{ix}
CIO-centered IT management: CIO has enterprise-wide responsibilities and authority	✓	✓	✓
Centralized IT structure with some levels of planning and implementation in agencies		✓	
Governor develops an IT vision and openly supports the CIO		✓	✓
Strong, broad-based buy-in	✓		
CIO must have spending authority and control		✓	
Set up budget request approvals by governing body or senior official before requests go to the legislature			✓
Enterprise model and focus on shared services	✓	✓	✓
Initiatives treated as statewide, not agency specific	✓		
Cyclical, continual planning process	✓		
Planning involves 3 government branches	✓		
Strong technical architecture	✓		
Full review of 3 year IT plan annually	✓		
Innovative funding (e.g. revolving account)	✓		
Plan to complete upgrades state-wide strategically			✓
Use savings to fund applications and upgrades			✓
Start risk assessment program for all budget requests			✓
Implement a total cost of ownership or return on investment program for all IT investments			✓
CIO must have business skills		✓	

Summary

Current Washington state efforts to develop criteria for assessing project status against standardized measures are consistent with industry standards. Factors chosen by the state include ten measures from the Standish Group recommendations and two additional criteria that the state has applied from lessons learned in other Washington projects. The criteria to be used in Washington include:

1. Executive support,
2. User involvement,
3. Experienced project manager,
4. Clear business objectives,
5. Minimized scope,



6. Agile requirements process,
7. Standard infrastructure,
8. Formal methodology,
9. Reliable estimates,
10. Skilled staff,
11. Contract negotiation and management [added by Washington's Department of Information Services (DIS)], and
12. Implementation (added by DIS).

Because these criteria have only recently been defined, there has not been enough experience to evaluate whether they are the right ones, and that they provide value to assessing projects across department lines.

Managing Projects within the Private Sector and Public Sector

While there are often frustrations reported by CIO's and project managers about working in government bureaucracies, recent studies show that there are more similarities between the private and public sector technology managers than differences. *CIO* magazine surveyed public and private sector CIO's to determine how they spend their time. Asked to select the top five things they spent the most time on, the CIO's reported:

	Public Sector	Private Sector
• Strategic planning	66%	58%
• Interacting with other CXO's and business executives	64%	71%
• Managing crises/putting out fires	62%	46%
• Leading projects	59%	48%
• Designing/optimizing business processes	54%	44%
• Interacting w/IT vendors/outsourcers/service providers	54%	54%
• Hiring, developing and managing IT staff	49%	48%
• Learning about technologies/making strategic decisions	46%	53%
• Budgeting	44%	37%
• Interacting w/outside business partners/suppliers/customers	25%	21%

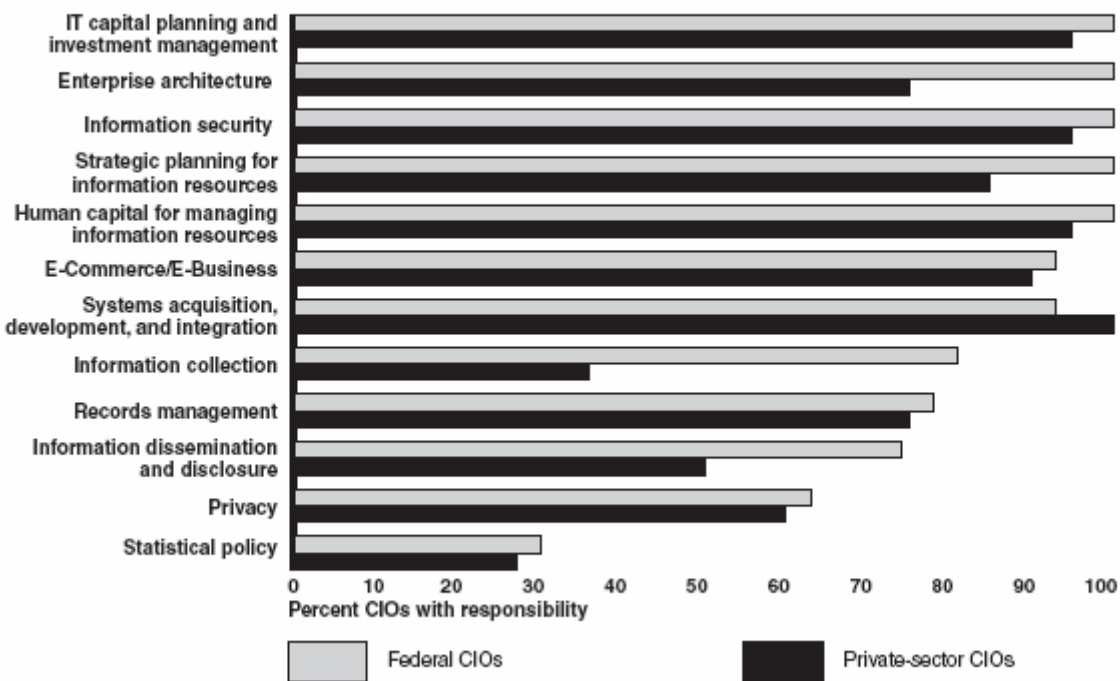
Government CIO's rank the pace of technology change and the lack of key technical skill sets among their biggest challenges. Interestingly, they report spending less time developing staff than managing crises. The private sector CIO's rank the unrealistic expectations from business, inadequate budgets, and a lack of time for strategic thinking and planning among their biggest challenges. Notably, private sector CIO's report spending relatively less time than their public



sector counterparts on strategic planning and relatively more time than their public sector counterparts interacting with CXO's and business executives.

Another survey recently released by the **GAO** compares the responsibilities of private sector CIO's and federal government CIO's. The survey was conducted as part of the *Chief Information Officers Responsibilities and Information and Technology Governance at Leading Private-Sector Companies* study (GAO 05-986). The GAO had already identified the 12 functional areas that are part of a federal CIO's responsibility either by statute or deemed to be critical to effective information and technology management. The study reports on the comparison of the responsibilities between the federal and private sector CIO's. Almost all of the private sector CIO's have responsibility in five of the 12 functional areas including systems acquisition, IT capital planning, information security, IT human capital, and e-commerce. In only three of the functional areas did half or fewer of the private sector CIO's have responsibility for information dissemination and disclosure, information collection, and statistical policy. In fact, most of the functional areas show little difference between the private sector and federal CIO's functional responsibilities.

Comparison of the Extent to Which Private-Sector and Federal CIOs Are Responsible for Each of Twelve Functional Areas



Source: GAO.

The **GAO** study also reported 11 of the private sector CIO's reporting aligning information technology with business goals as their greatest challenge. Other major challenges reported by the private sector CIO's include controlling information technology costs and increasing efficiencies, ensuring data security and integrity, and implementing new enterprise technologies. Private sector CIO's utilize several approaches to governing information technology assets,



including executive level committees with decision authority and establishing cross-organizational teams to drive enterprise business projects. Balancing the centralization and decentralization of information technology decision-making was noted by CIO's as 'continually evolving' within their organizations.

Case Study – Kaiser Permanente^x

A recently released case study illustrates the importance of managing information technology investments in any organization. The case study published in the October 2005 edition of CIO Insight, describes the efforts of *Kaiser Permanente* (Kaiser), a California based health maintenance organization with nearly 9 million members in nine states, to manage its information technology investments. In the late 1990's, Kaiser launched an enterprise-wide effort to install an electronic patient record system that could be used to access patient histories from doctor's offices, pharmacies, emergency rooms, and hospitals anywhere in their eight regions. The new patient record system would allow Kaiser to minimize paperwork, accelerate billing, reduce errors in care and in billing, and treat more people in less time. Kaiser planned to build the new system in-house believing that an off-the-shelf system would not meet their massive information needs.

As system development progressed, disagreements between the regions over the patient record system requirements increased. Kaiser's information technology investments had been managed in a decentralized manner within each of the eight regions and without a direct link to the strategic plan of the company. Progress on the new system slowed to a standstill with no one in the organization able to break through the disagreements.

In 2002, a new CIO, Clifford Dodd, was appointed in Kaiser and the company began a reorganization to eliminate regional control over information technology investment decisions and establish centralized control of decision making for the enterprise. Within months, the system development effort was terminated and Kaiser reported a \$442 million loss on the project.

A new initiative was planned that would be managed centrally and would be directly linked to the Kaiser's strategic direction. The new electronic medical records system would not be built in-house. Instead, Kaiser would procure medical records software from Epic Systems Corporation as part of a \$3.2 billion computerization project. Decisions about the functionality of the new system would be made by corporate executives and would be implemented in all regions and every medical facility. Functionality of the new system would be in alignment with Kaiser's mission and vision, which was to deliver excellent healthcare, provide market flexibility, comply with regulations, and manage the cost.

Reflecting back on the decision to manage the information technology investment centrally instead of regionally, Clifford Dodd said, ***“That was the only way to link the use of technology with the strategic direction of the company. What we were doing before was operating in the dark. Now the CEO is just as involved in the project as the CIO is.”*** The new electronic medical record system, which also handles billing and scheduling, is operating in Washington and some other locations, but won't be fully operational across the enterprise until 2007.



Managing Government Information Technology Investments

At the federal level, the **GAO** has developed and adopted its own framework to manage information technology investments. The Framework is described within *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity (GAO-04-394G)*. It is based on a capability and maturity model with five progressive stages of maturity, each building upon another in a cumulative fashion. The purpose of the Information Technology Investment Management Framework is to:

- Identify critical investment processes,
- Establish the presence or absence of these critical processes in an organization,
- Assess an organization’s information technology investment management capability and maturity, and
- Offer recommendations for improvement.

The GAO uses the Framework to evaluate the capability and maturity of federal agencies in managing technology investments. The Framework also provides an organization with a tool for measuring the maturity of its own investment management processes against a defined standard. Upon analysis of the evaluation, an organization can develop a plan to improve their critical processes and increase their organizational maturity. Periodic re-evaluation will provide a means to assess changes in organizational maturity as critical processes are implemented. Used over a period of time in this way, the Framework can be a valuable self-assessment tool. The “building blocks” forming the **Information Technology Investment Management Framework** is pictured below.

Maturity stages	Critical processes
Stage 5: Leveraging IT for strategic outcomes	<ul style="list-style-type: none"> - Optimizing the investment process - Using IT to drive strategic business change
Stage 4: Improving the investment process	<ul style="list-style-type: none"> - Improving the portfolio's performance - Managing the succession of information systems
Stage 3: Developing a complete investment portfolio	<ul style="list-style-type: none"> - Defining the portfolio criteria - Creating the portfolio - Evaluating the portfolio - Conducting postimplementation reviews
Stage 2: Building the investment foundation	<ul style="list-style-type: none"> - Instituting the investment board - Meeting business needs - Selecting an investment - Providing investment oversight - Capturing investment information
Stage 1: Creating investment awareness	<ul style="list-style-type: none"> - IT spending without disciplined investment processes

(Source: Government Accountability Office (GAO))



It is important to note that the Framework is built upon another GAO guide that documented private sector best practices for information technology management and lessons learned from their own practical experience. The *Improving Mission Performance Through Strategic Information Management and Technology – Learning from Leading Organizations (GAO/AIMD-94-115)* guide acknowledged that a serious problem existed in the management of information technology and the identified resolution was to address problems as they had been in the private sector. The GAO determined that an organization could improve management of IT investments by making a serious commitment to change by embracing three broad principles.

- Deciding to change,
- Directing change, and
- Supporting change.

The guide went on to describe eleven fundamental practices gleaned from the private sector that are critical to successfully managing information technology.

Decide to Change	<ol style="list-style-type: none"> 1. Recognize and communicate the urgency to change information management practices. 2. Get line management involved and create ownership. 3. Take action and maintain momentum.
Direct Change	<ol style="list-style-type: none"> 4. Anchor strategic planning in customer needs and mission goals. 5. Measure the performance of key mission delivery processes. 6. Focus on process improvement in the context of an architecture. 7. Manage information systems projects as investments. 8. Integrate the planning, budgeting, and evaluation processes.
Support Change	<ol style="list-style-type: none"> 9. Establish customer/supplier relationships between line and information management professionals. 10. Position a Chief Information Officer as a senior management partner. 11. Upgrade skills and knowledge of line and information management professionals.

Similar standards have been adopted at the state and local government level as well. States have embraced various aspects of IT management standards. In practice, these policies, standards and decision-making structures can lie on a continuum somewhere in between a decentralized or centralized management model. States vary greatly in how they operationalize the principles and best practices identified in the literature, and the decision to decentralize control of IT assets may be based on a specific project outcome. For example, when a state is successfully managing IT investments and is confident in its ability to manage projects, it may be more likely to decentralize a greater portion of the technology decision-making responsibilities to the agency



level. Conversely, a significant failure may provide justification to increase the controls surrounding the IT decision-making process and move to a more centralized model. The following summaries provide a cross-section of other government entities and demonstrate some of the decision-making models and organizational structures in place at the state and local level.

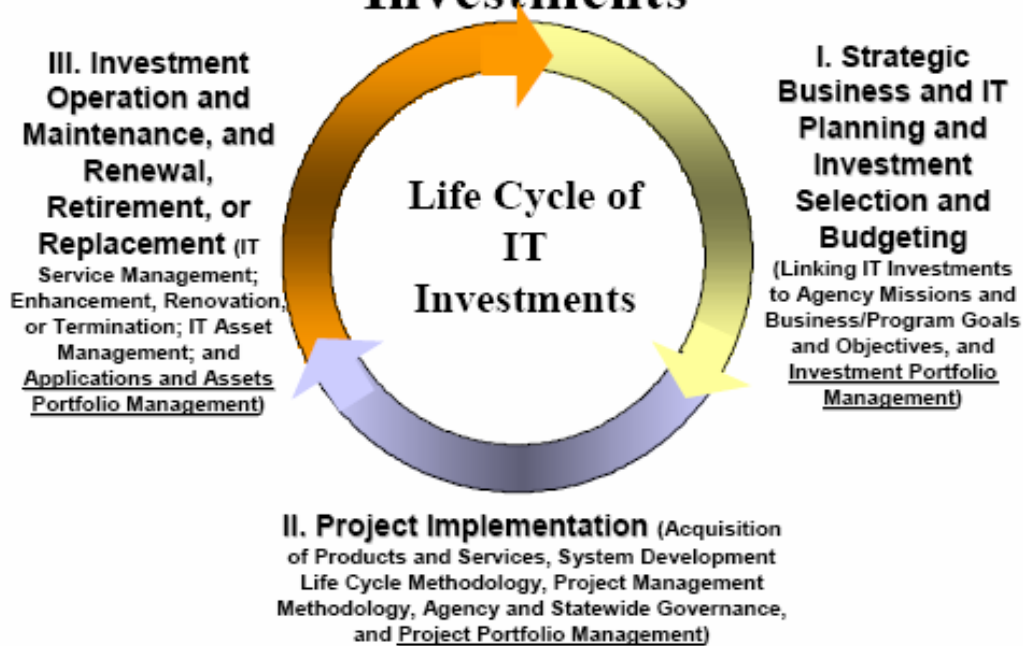
North Carolina has developed and adopted a framework for managing information technology investments more efficiently and cost effectively within the state. The Framework is meant to improve management of technology investments by helping state managers:

- Keep track of technology assets;
- Plan goals for using technology to meet business/program requirements;
- Determine when and how best to acquire and implement new technology;
- Develop approaches and performance measures for maintaining and operating in-place technology; and
- Decide when to discard, replace, or renovate duplicative, insecure, risky, or inefficient technology.

The Framework is part of the North Carolina Statewide Information Technology Plan that describes an overarching strategy and approach to managing technology resources for the state. The plan acknowledges the state's responsibility to better plan, budget and manage information technology assets at an enterprise level. Statewide technology initiatives, assumptions, expectations, and challenges are defined along with identification of those responsible to address certain issues. The North Carolina **Framework for Managing Information Technology Investments** is pictured below.



Framework for Managing IT Investments



(Source: North Carolina Office of Information Technology Services.)

Tennessee won NASCIO's 2004 National Recognition Award for State Information Technology Management Initiatives with its information services planning process. The funding and funding decision-making aspects of the process include using an alternative funding method, namely a revolving Systems Development Fund. When an agency needed funds to cover the cost of initial technology investments, it may request funding out of the Systems Development Fund. The agency then pays back the loan to the Systems Development Fund over the next three to five years. In terms of decision-making, each agency produces an annual Information Systems Plan with a three-year horizon that describes the proposed investments and business needs. These agency plans are then collected by the central Information Technology Assessment and Budget Committee, comprising both Budget and Office for Information Resources personnel, who review the plans and make recommendations for changes. This initiates an iterative process with the agencies that culminates a few months later in the legislature passing the state budget with funds to support the approved Information Systems Plans^{xi}. Some of the notable aspects of this approach include:

- Ability to request and receive funds for information technology investments on a continual basis.
- After allocating sufficient seed money to establish the development fund, funding for technology investments no longer competes with program initiatives in the budget process.
- Ability to fund a variety of requests from large applications development projects to small equipment leases from the investment fund.



- Standardized processes, methodologies, and tools are used by all agencies for planning as well as funding requests, making enterprise-wide coordination of efforts and prioritization and approval of investments easier.
- Enterprise level processes exist to identify gaps in enterprise architecture, products, and technologies that need to be replaced or eliminated.

In 2002, *California* closed its Department of Information Technology, making individual agencies responsible for oversight of their own information technology assets and divisions. Funding decisions are made within each department according to that department's chosen process and within the authorized budget. California has assigned the Department of Finance some oversight responsibility for information technology projects, including setting technology standards for statewide use and assessing all current departmental and agency project management and oversight practices^{xii}.

In *Michigan*, agencies request funding needed for information technology projects from the legislature. The legislature approves each state agency budget including any approved agency projects. The Department of Information Technology is then responsible for spending the money to implement the projects^{xiii}.

Pennsylvania embarked on an ambitious Enterprise Resource Planning (ERP) project in 1999 to improve state business practices by establishing *one* enterprise-wide system for procurement, human resources, budgeting, financial management, and payroll. Of particular note is that all decision-making for the project and project ownership belong to the functional business owners. While the CIO and the Department of Information Services are deeply involved in the project, they are not the decision-makers. It is also significant to note that the project enjoys a lot of top-level support. Without this support the seemingly simple and even mundane goal of improving business practices would never have garnered the resources necessary to embark on such an ambitious project^{xiv}. Some of the notable aspects of this approach include:

- Executives from administrative and finance agencies met weekly to expedite decisions and eliminate obstacles at an enterprise level.
- The ERP project began when state resources were plentiful and the initiative could be fully funded.
- Primary goals of the ERP project were to improve internal business processes and customer service, thus improving the effectiveness of government.
- Individual business process owners worked closely with the project management office to ensure best practices were adopted enterprise-wide as the solution was implemented.

In fiscal year 2003, *King County's* information technology operating costs were \$66 million of the County's \$3 billion annual budget. As information technology began to be utilized by the County over recent decades, it grew in a decentralized way, with few universal standards^{xv}. The County's 2005 Strategic Technology Plan identifies as its first principle that there be central review and coordination of information technology, moving toward a more centralized model. Several governance bodies are involved in the County's decision-making process for information technology investments. In addition to the County Executive and Council who approve the County budgets, the Business Management Council and the Office of Information Resource Management both make recommendations for funding of proposals. The Project Review Board,



with four top-level executives, must approve the release of funds for on-going projects after approval within the county budget^{xvi}.

In fiscal year 2004, the *City of Seattle* reportedly spent \$103 million on information technology. Like King County, the City is moving from a decentralized information technology structure to a more centralized structure for both technology systems and project management. The level of review and authorization needed for funding and implementing a project depends on its size. If it is a small project, such as a new software application, it is managed entirely within the department. Large projects are assigned a steering committee that includes the information technology and finance directors. One department takes the lead and the project goes through the entire budget process with mayoral and budget office scrutiny, followed by council review and approval^{xvii}.

In addition to these summaries, specific comparisons regarding information technology between the states are published by *NASCIO*. In the *2004-2005 Compendium of Digital Government in the States*, NASCIO reports on funding and management of information technology nationwide. Analysis of this information shows that Washington is similar to the majority of states in its approach to information technology.

- Washington’s establishing authority is legislative, along with 33 other states.
- Washington’s Governor appoints the CIO, as in 23 other states.
- Washington’s CIO and IT management resides in its own department, as in 15 other states.
- Washington includes its IT employees in its civil service or merit classification, as in 31 other states.
- Washington utilizes several multiple funding models, as do 26 other states.

As part of this compendium study, NASCIO detailed which funding mechanisms states employ for their IT investments. The following table provides some insight into the various types of funding mechanisms currently used by other states. Although Washington was not part of the survey, we have added it for comparison purposes. Washington uses a number of various mechanisms for funding IT investments. Opportunities for using additional alternative funding methods seem to exist. It is likely that the process for how these are implemented may be more relevant than the mechanism itself. Ultimately any mechanism chosen must align the request and distribution for funds with the system development lifecycle.

Information Technology Funding Mechanisms									
State	Leasing / Financing	Bonds	Certificates of Participation	Performance-Based Contracting	Outsourcing / Managed Services	Investment Funds**	Benefits Funding	Budgeting / Appropriation Strategies***	Purchasing / Procurement Strategies
AL					✓				
AK	✓				✓				
AR	✓				✓		✓	✓	✓
CT	✓	✓						✓	



DC								✓	
GA		✓						✓	✓
HI	✓			✓	✓			✓	✓
IA	✓			✓	✓			✓	✓
KS								✓	✓
KY	✓				✓			✓	✓
MN	✓	✓		✓			✓	✓	✓
NV	✓	✓			✓				
NJ								✓	
NC								✓	
OH	✓		✓	✓	✓		✓	✓	✓
PA								✓	✓
SC	✓				✓	✓		✓	✓
SD	✓			✓	✓	✓		✓	✓
TN	✓	✓			✓	✓	✓		✓
TX	✓			✓	✓			✓	✓
UT	✓			✓	✓	✓		✓	
VA	✓	✓			✓				✓
WA*	✓	✓	✓		✓	✓		✓	✓
WY					✓			✓	✓

This review suggests that organizations, whether public or private, apply the same industry standards and best practices in order to manage information technology investments. Variations exist in the organizational placement of the CIO, the amount of centralized or decentralized decision making within an organization, the type of funding mechanisms employed, and the level of maturity exhibited in managing the organizations technology portfolio. Some differences also exist between the public and private sector based on procurement requirements or the length of time needed to obtain approval from decision makers. Industry trends suggest that organizations are moving rapidly to:

- Manage information technology from an enterprise level to obtain the greatest return on their investments,
- Better align business functions with information technology investments to avoid spending resources on systems that don't meet their strategic business needs, and
- Increase centralization of enterprise systems to avoid duplication of common functions and business data.

Current challenges surrounding information technology investments, oversight, management, and funding are not unique to Washington. Washington's method of choosing, funding, and managing information technology is certainly comparable to other public and private sector organizations. Improvements made in managing information technology investments in



Washington should be based on industry best practices, lessons learned from past experience, and the maturity and capability of the organizations involved in order to be successful.



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- ⁱ Susan Dallas, "IT Governance: Who's in Charge Here?" Presentation at Gartner Spring Symposium, March 2004
- ⁱⁱ "Best Practices for Managing Project Quality," Robert Frances Group, Inc., September 2005.
- ⁱⁱⁱ "Inventory Guidelines" State of Arizona, Government Information Technology Agency, FY 2005.
- ^{iv} William G. Smillie, "The Seven Keys to Success: How to Alter the Course of Your Project's History," The Standish Group, 2005.
- ^v Danek Bienkowski, "The Ten Vital Signs of a Project," The Standish Group, 2005.
- ^{vi} Mitch Betts, "Sidebar: Reality Check," ComputerWorld, 25 August 2003.
- ^{vii} NASCIO, "State of Tennessee: Information Systems Planning Process," accessed September 2005, <<http://www.nascio.org/scoring/files/State-TN-InfoSystems1.pdf>>.
- ^{viii} Erin Lee, "Managing the IT Investment: Conversations with State Chief Information Officers," National Governors Association Center for Best Practices, July 5, 2005.
- ^{ix} Madeleine Bayard, "The View from the IT Industry: What States Can Do to Improve Government Efficiency and Service Delivery," National Governors Association Center for Best Practices, July 12, 2005.
- ^x CIO Insight, Pulling Kaiser's IT Out of Intensive Care, Jeffrey Rothfeder, October 15, 2005
- ^{xi} NASCIO, "State of Tennessee: Information Systems Planning Process."
- ^{xii} "Information Technology Project Oversight Framework," California Department of Finance, [no date].
- ^{xiii} Lee.
- ^{xiv} John Kost and Ruth Steinberg, "Pennsylvania: Creating an Enterprise Application," Gartner Research Group, CS-18-2219, October 2002.
- ^{xv} "King County Total Operating Cost of Technology Final Report," PTI Consulting, May 2004.
- ^{xvi} "IT Governance," King County, accessed September 2005, <<http://www.metrokc.gov/oirm/governance.aspx>>.
- ^{xvii} Dwight Divley and Dianna Hanna, City of Seattle, email and telephone correspondence, September 2005.

