

Secretary of State AUDIT REPORT

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Department of Administrative Services: Statewide Systems Development Review



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Summary

PURPOSE

The purpose of this audit was to follow up on a prior audit that found that the Department of Administrative Services did not provide state agencies adequate policies and procedures to govern use of Information Technology. Specifically, this audit examined whether state agencies had independently adopted formal policies and procedures governing the development and maintenance of information technology (IT) systems. To do so, we reviewed the policies and procedures governing IT system development and maintenance at six state agencies.

RESULTS IN BRIEF

Four of the six agencies we reviewed had no formal policies and procedures governing IT system development and maintenance. Rather, those agencies used *ad hoc* or unwritten processes for developing and maintaining IT systems. Without formal policies and procedures to control system development and maintenance tasks, agencies increase their risk of project or system failure. Lack of

discipline in managing software development and maintenance processes results in increased risk that systems will not meet users' business needs, requirements and expectations.

RECOMMENDATIONS

We recommend that the Department of Administrative Services guide and assist state agencies' efforts to develop and implement policies and procedures to govern system development and maintenance processes.

In addition, we provided specific recommendations to the management of the six agencies that we tested. Those recommendations and the results of our agency reviews are included in the six management letters that we referenced in the recommendations section of this report.

AGENCY RESPONSE

The Department of Administrative Services generally agrees with the recommendations.

Introduction

In August 2001, the Audits Division issued report No. 2001-33, *Department of Administrative Services Information Resources Management Division Review*. That report included an evaluation of the Department of Administrative Services' (department) efforts to provide statewide policies, procedures, standards, and guidelines to govern the state's information technology resources.

That report indicated that the department lacked a cohesive framework of strategies, policies, and procedures to govern the state's use of Information Technology (IT) resources. It further indicated that the department struggled with its own IT system development projects.

The purpose of this audit was to determine the extent that state agencies have independently adopted formal (written) policies and procedures to manage and control IT system development and maintenance.

Audit Results

The Capability Maturity Model Describes Critical Success Factors

The Information Systems Audit and Control Foundation has developed maturity models for system development processes based on the Software Engineering Institute's Capability Maturity Model. The Software Engineering Institute is part of Carnegie Mellon University.

The maturity model categorizes and describes controls over the processes of acquiring and maintaining application software. Some of the model's critical success factors include the following:

- Presence of a formal, accepted, understood and enforced system development and maintenance methodologies.
- System development and maintenance methodologies are strongly supported by senior management.
- IT acquisition practices are clear, understood and accepted.

System development and maintenance is a continuous process. To be effective, policies and procedures to control the various phases of system development and maintenance must be implemented

before decisions are made to build, acquire, or maintain a system.

The initial planning and organizing phases of system development are critical because they identify the precise needs to be met and determine the boundaries, feasibility and direction of the project. However, policies and procedures governing system maintenance activities are critical to ensure systems remain reliable and meet business needs.

Most Agencies Reviewed Lacked Formal System Development Methodologies

Of the six state agencies we reviewed, four had no formal (written, adopted, understood and monitored) system development and maintenance policies and procedures. These four relied on less formal or *ad hoc* processes to govern IT system development and maintenance processes.

The table below summarizes our evaluation of the six agencies' policies and procedures governing system development and maintenance. It also depicts approximately how many dollars were associated with those agencies' new system development projects.

Lack of Formal Policies and Procedures Increases Risk

There are specific risks associated with the various phases of system development and maintenance. The most serious is that the completed system may not meet the users' business needs, user requirements and expectations. In addition, projects may be delayed or cost more than was anticipated.

Without formal controls over system development and maintenance, organizations may exclude business needs or overlook more cost-effective alternatives. In addition, developers may not

adequately address critical components such as security, system documentation, audit trails or automated controls to ensure data integrity. Generally, the lack of formal system development policies and procedures increases the risk of project or system failure.

Although the Department of Administrative Services is responsible for establishing state-wide policies, procedures, standards and guidelines to governing IT, each agency that develops and maintains IT systems is ultimately responsible for controlling and managing those activities.

Without centralized direction from the department, however, state agencies are less likely to develop and adopt adequate policies and procedures governing IT system development and maintenance.

Recommendations

We recommend that the Department of Administrative Services guide and assist state agencies' efforts to develop and implement policies and procedures to govern system development and maintenance activities. Those policies and procedures should be congruent with generally accepted industry standards for control.

We communicated specific findings and recommendations to each of the six agencies that we tested in separate management letters as follows:

- Oregon Judicial Department, management letter no. 107-2001-10-01.
- Department of Human Services, management letter no. 107-2001-10-02.
- Employment Department, management letter no. 107-2001-10-03.
- Department of Transportation, management letter no. 107-2001-10-04.

Agency SDLC Methodologies

Agency	Estimated Cost of IT Projects	Summary
Department of Human Services	\$154 million	No formally adopted/written SDLC for new system development or maintenance.
Oregon Department of Transportation	\$10.6 million	Policies and procedures governing system development were generally adequate. However, the department lacked formal policies or guidelines governing the use of its automated SDLC package (P+). The agency also has not fully implemented formal policies and procedures governing system maintenance activities.
Oregon Judicial Department	\$8.2 million	No formally adopted/written SDLC for new system development or maintenance.
Oregon Employment Department	\$1.5 million	No formally adopted/written SDLC for new system development or maintenance.
Oregon Liquor Control Commission	\$1.3 million	Policies and procedures governing system development were generally adequate. However, the agency's procedures did not adequately cover all aspects of system development. Areas needing further clarification included provisions for post implementation reviews, consideration of alternatives and development of documentation and training materials.
Department of Corrections	\$600,000	No formally adopted/written SDLC for new system development or maintenance.
Total	\$176 million	

- Department of Corrections, management letter no. 107-2001-10-06.
- Oregon Liquor Control Commission, management letter no. 107-2001-10-07.

Objectives, Scope and Methodology

The objective of our audit was to determine whether state agencies had formal policies and procedures governing the development and maintenance of information technology systems.

To accomplish this, we evaluated the policies and procedures for system development and maintenance at the following state agencies:

- Department of Human Services,
- Department of Transportation,
- Employment Department,
- Department of Corrections,
- Judicial Department,
- Oregon Liquor Control Commission.

During our audit, we interviewed information technology personnel at the selected agencies and examined pertinent policies, procedures and other related agency documentation. Our evaluation was limited to determining whether agencies had formal policies and procedures to govern IT system development and maintenance processes.

We used the Information Systems Audit and Control Foundation's (ISACF) Control Objectives and Management Guidelines for Information and Related Technology (COBIT®) to identify generally accepted and applicable control objectives and practices for information systems. ISACF is a worldwide organization dedicated to researching and promulgating generally accepted information systems control objectives and audit guidelines.

We performed fieldwork between June and September 2001. We conducted our audit according to generally accepted government auditing standards.

Department of Administrative Services' Response:

The Department of Administrative Services (DAS) appreciates the work performed by state auditors in their recent audit of Statewide Systems Development Review. DAS generally agrees with the findings noted in the audit and appreciates your suggestions and recommendations. We have coordinated our response with the agencies listed in the report. Agencies with specific issues of notation are listed in the attachment.

DAS Information Resources Management Division (IRMD) is in the process of developing specific policies and procedures to govern all aspects and phases of the system development life cycle within our own organization. IRMD will work in collaboration with the major state agencies listed in the report to finalize such policies prior to implementing them statewide.

Historically, enterprise leadership provided by (IRMD) has been insufficient. The Department recognizes the need to strengthen its policies, procedures, controls and guidance of state government and has initiated corrective measures. IRMD is developing a strategic plan to guide the organization to provide the enterprise leadership desired by the Governor and by the Legislature. We intend to present this strategic plan at the May Statewide Audit Committee meeting.

Addendum—Agency Specific Comments

Oregon Liquor Control Commission (OLCC)

OLCC comments relate to their Systems Development Life Cycle (SDLC) methodology as needing further clarification. Those items are Post Implementation Review, Consideration of Alternatives, Development of Documentation and Training Materials. OLCC generally agrees with the report, and wants the record to reflect an understanding of the need for these items, as they are included in OLCC systems development. OLCC uses the standard State of Oregon project management methodology and completes these items as part of every project.

Department of Human Services (DHS)

DHS has a draft system maintenance methodology in place as of December 2001. DHS is in the process of piloting the methodology, after which time (approximately 60 days) they will make any necessary refinements and implements the methodology throughout the Information Systems Engineering (applications development) Section of DHS' Office of Information Systems. Staff training will be provided internally.

Department of Administrative Services' Response (continued)

DHS also recognizes the importance of a systems development methodology for all of DHS and has initiated this process as well. However, in order to develop, implement, and train staff, they will need to request additional resources in the 2003-2005 budget process. In the meantime, they will continue their work with internal staff to the extent possible this biennium.

Oregon Judicial Department (OJD)

The Oregon Judicial Department generally agrees with the findings of management letter no. 107-2001-10-01 from the Secretary of State Audits Division and is working to formalize its Software Development Life-Cycle Methodology policy and procedure as soon as possible.

The OJD has a draft systems development methodology in place, and is currently piloting the methodology for refinement and formal adoption. The OJD is in the process of benchmarking operations with the CobiT framework and has some information technology resources dedicated to this. Also, OJD's internal auditing group is assisting with benchmarking efforts by providing professional assurance and consulting services.

We express appreciation for the Audits Division's work as we strive to enhance development efforts to optimally meet business needs.

This report, which is a public record, is intended to promote the best possible management of public resources. Copies may be obtained by mail at Oregon Audits Division, Public Service Building, Salem, Oregon 97310, by phone at 503-986-2255 and 800-336-8218 (hotline), or internet at Audits.Hotline@state.or.us and <http://www.sos.state.or.us/audits/auditthp.htm>.

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The courtesies and cooperation extended by the officials and staff of the Department of Administrative Services, Department of Corrections, Employment Department, Department of Human Services, Judicial Department, Oregon Liquor Control Commission, and Department of Transportation were commendable and much appreciated.

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