1. Introduction to the Research

Purpose

In 1995 the California Department of Information Technology (DOIT) was created to provide leadership, guidance, and oversight for Information Technology (IT) initiatives and projects throughout the state. By 2002, DOIT would cease operation, but the need for what DOIT was chartered to do would continue. The overall goal of the research reported here is to advise state policymakers on how California can fulfill the as yet unmet need for effective IT governance in the service of state missions.

Overview

RAND, as an independent nonprofit public policy research institution, responded to a request for proposals to conduct a study of California’s information technology governance structures and strategies for the Bureau of State Audits. The request for proposals resulted from legislation aimed at determining whether California’s IT program complied with best practice, identifying any reforms needed, and reporting back to the Legislature by the end of February 2003.

Between the time of the original legislative request and the awarding of the study contract to RAND, DOIT’s sunset clause took effect and it ceased operation. The orientation of the present study was therefore refined to emphasize how California could best take advantage of prior experience, both in this state and elsewhere, to inform the next steps to take in IT governance.

Objectives

The study reported here is organized around three key objectives:

- obtain an understanding of how California’s IT governance structure worked to coordinate, evaluate, oversee, and exploit as fully as possible the state’s investment in IT;
- determine what lessons can be learned from states with exemplary practices in IT governance; and
• make recommendations for future directions in California’s IT program to support the state’s missions in the years ahead.

To achieve these objectives, the study relied on a replicated case study design that has guided successful RAND research on factors that influence the effective implementation of information technology in varied public and private sector organizational settings. Cases, for purposes of this research, comprise the entities, structures, and processes that make up state-level IT governance. They can be regarded as “replications” because similar criteria were used to select participating sites and stakeholders in IT governance, and because common data gathering procedures were employed across the sites to pursue the key research questions.

Methods

IT Governance

In order to get a picture of IT governance, for replicated case study purposes, we began by identifying three types of state agency functions according to their involvement with the technology:

• control agencies: entities with authority for state-level IT policymaking, technical or financial approval of IT initiatives, or procurement approval (e.g., departments of information technology, departments of finance, general services departments);

• client agencies: entities that are major users of IT in the course of carrying out their missions (e.g., motor vehicle departments, health or social service departments, employment departments); and

• technical agencies: entities providing IT operations or services to other agencies (e.g., data centers offering hosting services, or e-government offices supporting enterprise-wide government portals).

All such entities are assumed to be significant stakeholders in IT governance at the state level, regardless of where they are housed structurally. In some states, for instance, technical services are operated by a central IT department while in

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1See for example, Botterman et al., 2000; Bikson, 1998; Bikson and Eveland, 1996; Bikson and Frinking, 1993; Stasz et al., 1991, 1990; Bikson et al., 1987; Bikson, 1986. We view case study as the most appropriate method for examining and interpreting ongoing processes in real world contexts—especially when the processes to be studied (approaches to IT governance) are not sharply separable from their contexts (e.g., the broader state government environment) and when the variables of interest are likely to outnumber the potential units of study. (For further discussion of this type of research design, see Yin, 1994; Hersen and Barlow, 1976; and Campbell, 1975.)
others they report to client agencies. Likewise, in some states, the highest-level IT office constitutes a cabinet-level department, while in others it is housed within some other entity. In this research, we sought to study representative agencies of each type, learning where they are located structurally and how they interact to carry out the varied processes (e.g., planning, approval, implementation, and the like) required to accomplish IT initiatives of significance. The case studies we conducted therefore focus on the roles and relationships among control, client, and technical entities with respect to IT governance structures and strategies.

**Site Selection**

California was the initial site of study, in order to satisfy the first key objective of the research. In California, a considerable number of stakeholder entities in each of the three categories took part in the study. To fulfill the study’s second key research objective—learning lessons about successful IT governance from which California might benefit—we sought to select four to six other states. We relied on three criteria to make the selection.

- **population size**: Participating states should be large enough that they have to cope with problems of scale, scope, and complexity reasonably similar to those that face California in its efforts to deploy IT effectively to serve state missions. To meet this criterion, we considered for inclusion only the states ranking in the top population quartile (or, excluding California, 12 states).
- **maturity of the state-level IT agency**: States selected should have had a state-level IT governance structure in place long enough to yield lessons based on experience with implementation of significant technology initiatives. For this purpose, we limited our case studies to sites whose state-level IT office had been established prior to 2000 (or 7 of the 12 size-eligible states).
- **exemplary practices**: States should be eligible for selection only if there is evidence that their IT implementation practices have yielded successes worth emulating. We operationalized exemplary status in two ways: reputation for excellence among peers (by soliciting nominations from interviewees); and evidence of significant IT achievements (e.g., by reviewing state web sites for documentation of IT initiatives accomplished and IT awards received).

Using these criteria, we selected New York, Illinois, Pennsylvania, Virginia, and Massachusetts. All but Massachusetts agreed to participate (Massachusetts agencies indicated that activities associated with the November 2002 election
would make site visits too difficult to schedule but they would have been willing to arrange for telephone interviews). The four states chosen for study range in population size from 3rd (New York) to 12th (Virginia); their highest-level IT agencies range in maturity from three years (Illinois) to six years (Pennsylvania). Systematic case-comparative information about the participating states as well as their exemplary practices is provided in Appendix A (exemplary practices are highlighted as well in Chapter 4).

**Procedures**

Semi-structured interviews with representatives of agencies in the three categories outlined above constituted the primary data gathering method. The interviews were guided by a written protocol to ensure that information relevant to the key research objectives defined above would be systematically collected across states and agencies. While a more detailed protocol was employed in California and more agencies of each type were included, the basic structure of the interview remained the same for all sites and stakeholder organizations. Within selected organizations, we asked to speak with individuals familiar with IT development and deployment from the perspective of that agency’s functions. Substantively, interviews aimed to get a picture of the state’s formal IT governance structure, giving greatest attention to enterprise-wide or otherwise large-scale and significant projects. They also sought to learn about the de facto roles and relationships among control agencies as well as between them and client agencies or technical service entities (or both). Then the interviews turned toward process questions, probing the way typical stages in IT development are carried out—for instance, the planning of IT initiatives, approaches to technical and financial approval, procurement, implementation, and evaluation. The interviews closed with questions about what worked well and badly, what future steps might be taken to improve the way IT initiatives are realized, and what else the responding agency representatives thought we should learn from them.

Information gathered in interviews was supplemented by reviews of related agency documents and web materials. In addition, we reviewed recent published research literature on IT governance to help corroborate and extend findings from the replicated case studies (see Appendix D).

**Analysis Approach**

Replicated case study methods rely chiefly on two types of analyses—within-case and between-case—to generate their findings.
Within-case analyses examine each site separately, systematically documenting the variables of interest defined in the research protocol: where control, client, and technical services agencies are situated in the formal governance structure; how authority for IT initiatives is allocated among them; the processes that typify IT initiatives from initial planning and approval to implementation and evaluation; the outcomes achieved; and the accompanying management style.

The first key research objective is satisfied by findings from the within-case study of California described in Chapter 2 below as well as in Appendix B. Within-case findings from the other states are presented in some detail in Appendix A. For each state, an initial table provides information about the location in the governance structure of the highest-level IT office and summarizes the roles of that and other control agencies in the state’s IT program. Then key observations about typical IT project procedures, management functions, and technology issues are presented. Establishing a common structure for reporting within-case analysis findings is intended to facilitate cross-case comparisons and contrasts (see below).

Between-case analyses next examine each of the main variables of interest across sites, looking first for patterns of similarity and difference among them and then for contextual and other interpretive information to help explain the patterns obtained. Explanatory material is drawn from the research literature as well as data gathered in interviews and from agency documents.

Between-case analyses are used to explore differences among governance structures and processes, generating three alternative models for effective IT programs from the exemplary states studied; these findings are reported in Chapter 3 below. Cross-case analyses also helped to elicit common success themes (see Chapter 4) and common challenges to be addressed in state IT governance (see Chapter 5). Even where marked contrasts emerged between states’ governance structures, we observed shared practices associated with successful IT deployment. On the other hand, we identified a number of recurring challenges that states can address in varying ways to enable IT improvements. Taken together, Chapters 3, 4 and 5 fulfill the second major research objective.

The third key objective—setting out future directions for California’s IT governance—is addressed by comparing and contrasting what was learned from cross-case study of exemplary states with California’s experience during DOIT’s tenure. The resulting conclusions and recommendations are presented in Chapter 6.
Organization of the Report

The remainder of the report is organized as follows. Chapter 2 discusses IT governance in California. After situating DOIT in the governance structure, it describes the specific processes by which IT initiatives were carried out, concluding with key observations about the organizational context. Chapter 3 then presents findings from within-case analyses of four other states from which California could learn lessons about IT governance. In particular, it provides accounts of how control agencies in each state divide but integrate roles and responsibilities both structurally and in process terms, concluding with cross-case comparisons.

Findings from Chapter 3 indicate that control structures are only a part of effective IT governance. Chapter 4 therefore identifies IT governance success themes that recur throughout the exemplary states studied, despite their quite different formal governance patterns. And it provides corroborative evidence from the literature review, lending confidence in the efficacy of the success themes surfaced by our interviews. Similarly, Chapter 5 identifies IT governance challenges that commonly recur and for which there are no single clearly successful responses; here the key to effectiveness is to address them in balanced and situation-appropriate ways. For ease of comparison, we categorize both the success themes (Chapter 4) and the challenges (Chapter 5) in three groups: state governance structure and organization as related to IT; roles and functions of a statewide IT agency; and management style and context.

Finally, Chapter 6 sets out the study’s conclusions and recommendations, ordered into the same three categories. They are based on comparisons between the detailed account of California’s IT governance (Chapter 2) and findings about IT governance drawn from other states and on the research literature (Chapters 3 and 4). To enable linking the conclusions with recommendations, and to show their relationships to findings about success themes and challenges, we have used a common numbering scheme in presenting the main points in Chapters 4–6.