REPORT BY THE STATE AUDITOR

OF CALIFORNIA

THE STATE NEEDS TO REENGINEER ITS MANAGEMENT OF INFORMATION TECHNOLOGY

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The State Needs To Reengineer Its
Management of Information Technology

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Summary

Results in Brief
The State's use of information technology has increased steadily over the years and now must be considered one of the State's most critical investments. The State currently spends an estimated $1.3 billion annually on information technology. The Office of Information Technology (OIT) within the Department of Finance is the office that has overall responsibility for the State's information technology investment.

The State's current model for managing statewide information technology does not work. The OIT has not provided the statewide leadership and coordination for information technology as intended by the 1983 legislation that established the office. Additionally, the

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OIT's oversight of information technology projects is limited and does not ensure that state departments implement projects successfully. Specifically, we noted the following:

- The OIT has been ineffective in its role of providing statewide leadership. Statewide leadership, which includes coordination activities, is critical as California significantly expands its investment and reliance on information technology. The OIT has not provided sufficient guidance for the State's decentralized information technology environment, it has provided only limited assistance in designing and implementing information technology projects, and it has provided limited leadership for personnel and training matters. Additionally, the OIT has failed to effectively coordinate multi-agency projects and data center activities and is not currently ensuring that the State's information technology community is involved in developing policy.

  These problems have occurred because the OIT has narrowly interpreted its enabling legislation in such a way that it effectively limited its authority over information technology matters. Additionally, the OIT's resources have not kept pace with the growth in the State's information technology, and the OIT has chosen to focus these limited resources on budgetary oversight rather than statewide leadership.

- The OIT's oversight of projects is limited to reviewing documents that it requires departments sponsoring the projects to submit. However, the OIT does not verify the accuracy of the information in the reports it receives. Additionally, the scope of the OIT's document review is limited. It views itself as an "investment committee" to ensure that proposed projects are reasonable investments of public funds. The OIT does not do an in-depth technical review of a project's viability, nor does it assess the individual qualifications of key staff members assigned to projects to ensure that they have the appropriate skills and experience for the particular project. Further, the OIT does not ensure that departments adhere to the conditions it believes are essential to the success of projects. It has further limited its review by relying on an exception reporting system as the primary mechanism for the ongoing oversight. Finally, the OIT is most effective before the funding for the project is approved. Once a project is underway, and problems begin to surface, it is difficult for the OIT to successfully intervene on the project.

The State's Information Technology Program Needs To Be Reengineered

Because of these deficiencies, the State must reengineer the entire statewide information technology program to ensure that the State's interests and assets are protected and used to their maximum potential. To initiate the reengineering process, the State should establish a statewide chief information officer (CIO) position. The CIO should serve as a member of the governor's cabinet and head a new statewide information resources office.

The CIO and the information resources office should be given the powers, duties, and responsibilities to develop and implement a statewide plan for information technology. They should provide leadership and guidance to departments, manage and coordinate statewide resources, and monitor and oversee projects based on a risk assessment. In addition, the State should reevaluate the commitment of resources for managing its information technology. Finally, the State will need to address the statutory changes necessary to complete the reengineering process, and the proposed CIO will need to implement appropriate procedural changes.

Agency Comments

In its response, the Department of Finance (DOF) states that there are many issues throughout the audit report with which it agrees. However, the DOF also responds that it has a number of fundamental, philosophical differences with us on how to manage information technology in the State as well as a few specific disagreements. In particular, the DOF is concerned about the balance between centralized versus decentralized control of information technology projects.

Although the DOF believes that it is now appropriate to reconsider how the State manages its computer and telecommunications technologies, it also believes that the OIT has met its assigned responsibilities and made substantial contributions to the State's successes in using information technology.   Our comments follow the response from the DOF.

Introduction

The State's use of information technology has increased steadily over the years and now must be considered one of the State's most critical investments.   The State currently spends an estimated $1.3 billion annually on information technology.   The California Government Code, Section 11702, defines information technology as all computerized and auxiliary automated information handling, including such items as systems design and analysis, conversion of data, computer programming, and related communications.   Information technology is pervasive throughout state government, with some departments totally dependent on automated systems to perform their fundamental responsibilities.   The use of information technology in the State will increase as departments continue to identify more efficient and effective ways of providing services using limited resources.

Currently, information technology management in the State is highly decentralized.   Generally, departments determine their needs and the means of fulfilling those needs.   Individual departments manage projects to develop new information systems.   However, certain entities have statewide information technology responsibilities.   The Office of Information Technology (OIT) has statewide authority and responsibility for the leadership and oversight of information technology management, and the Department of General Services has oversight responsibility for procuring any goods and services acquired as part of an information technology project.

The information technology environment within the State is diverse because of the different computing systems among departments. Additionally, over the years, departments have moved from centralized computing on large mainframes for many of their applications to smaller, yet powerful, computers within departments.   A significant volume of the State's computer use is now decentralized through the use of microcomputers including personal computers and local area networks managed by individual departments.

Furthermore, various data centers provide processing services within the State; however, only two are very large general purpose centers

serving multiple clients.   These data centers are the Stephen P. Teale Data Center and the Health and Welfare Agency Data Center.

The OIT's Responsibilities

The OIT is the office that has overall responsibility for the State's information technology program.   The Government Code provides the OIT with broad statutory responsibility and authority to guide the State's use of information technology.   Its responsibilities encompass three areas: leadership, coordination, and oversight.

The OIT was created in 1983 as an office within the Department of Finance.   Previously, the State Office of Information Technology, with different overall authority and responsibilities, existed within the Department of Finance.   The Government Code, Section 11700, which expresses the legislative intent for the OIT, states that a need existed to consolidate and integrate the State's policy and planning for information technology to ensure coordination of the State's needs. The purpose of the OIT, as defined by the statute, is to identify new applications for information technology, improve productivity and services to clients, and assist agencies in designing and implementing the use of information technology.

The statutes require the OIT to have various leadership and coordination responsibilities, including developing plans and policies to support and promote the use of innovative information technologies. The Legislature's intent was that there be specific objectives and definitive policies to guide the development of information technology systems, procedures, and techniques.   It was also legislative intent that the plans encompass such objectives as providing for the optimum use of equipment and the maximum practical integration of systems. Additionally, the plans are to address the objective of ensuring appropriate compatibility of systems and interchange of data and information.   Further, the Government Code specifically requires the OIT to develop coordinated plans and policies for the state data centers; information management personnel, including the training and qualifications of such personnel; and office automation, including the use of personal computing and electronic mail.   The statutes also state that it is the Legislature's intent that the OIT director be the State's advocate for information technology to increase the effectiveness and efficiency of government services.

Additionally, the statutes require the OIT to have oversight responsibilities.   The Government Code requires the OIT to adopt policies to carry out budgeting and expenditure control responsibilities. These policies must be published in the State Administrative Manual. The OIT is to approve proposed expenditures only if these policies and procedures have been followed.

The OIT's responsibility for information technology extends to most state departments.   However, the statutes exclude several entities,

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including the University of California, the California State University, and the Legislature, from the OIT's oversight.

The OIT's Resources

According to the Government Code, Section 11710, the director of the OIT is appointed by the governor and reports to the director of the Department of Finance. The OIT has had one director since the inception of the office in 1983. An acting director was in charge of the OIT from September 1989 through March 1991, at which time the former director returned.

The OIT currently has 16 staff members. In addition to the director, the staff consists of one deputy director, nine analysts who oversee department plans and projects, two staff members in a planning and policy unit, one office automation specialist, and two administrative staff members. The OIT's budget for fiscal year 1994-95 is $1.96 million.

Recent Concerns Regarding the State's Management of Its Information Technology Projects

Recent events have generated concern over the State's management and use of information technology. For example, in 1994, the Department of Motor Vehicles (DMV) terminated its database redevelopment project because of significant unresolved problems and deficiencies after spending more than $49 million. Additionally, a consultant for the California Student Aid Commission (commission) issued a report in June 1994 that evaluated the commission's financial aid processing system implemented in 1993 and concluded that the $50.9 million system was flawed and would not meet the commission's needs. Finally, several of the State's major information technology projects currently under development have experienced significant schedule delays and cost increases, indicating that there may be more trouble in the future. These problems have raised concerns regarding the management of these projects as well as the effectiveness of the OIT.

In August 1994, we issued a report on our audit of the DMV's database redevelopment project. The following are several problems we noted:

- The DMV continued to implement the project despite significant unresolved problems and deficiencies that led to the project's ultimate failure.

- The DMV spent $34.6 million on the project unnecessarily because it progressed beyond the developmental stages of the project without accomplishing the objectives of each stage and resolving significant technical problems.

- The OIT continued to recommend additional funding for the project even though the DMV had not followed approved policies and plans to minimize financial risk to the State.

In May and June 1994, the legislative analyst issued two reports critical of the OIT. In one of these reports, the legislative analyst recommended that legislation be enacted to transfer responsibility for statewide information technology leadership and oversight to a new office reporting to the governor. Additionally, in the other report, the legislative analyst made various recommendations to improve oversight and coordination of information technology projects and to enable departments to use information technology more effectively.

In response to problems identified at the DMV and other departments, the governor created a Task Force on Government Technology Policy and Procurement made up of individuals from the private sector with management expertise in technology and information systems. The governor directed the task force to review the State's information and technology procurement practices and the manner in which the State plans for, manages, and oversees the development of information systems. In September 1994, the task force issued its report after a 60-day review. In its report, the task force concluded that major reforms were needed to the processes by which the State purchases and manages information technology. Among the task force's recommendations were the elimination of the OIT and the creation of a new chief information officer, who would report directly to the governor to develop and oversee a statewide information technology infrastructure.

Scope and Methodology

The Budget Act of 1994 (budget act) requires the Bureau of State Audits to conduct a management review of the OIT. Specifically, the budget act requires us to review and evaluate the processes used by the OIT for reviewing information technology projects and purchases and to evaluate the degree to which the OIT provides statewide oversight, coordination, and leadership, as well as effective uses of information technology. Further, the budget act requires us to make recommendations for necessary statutory and procedural changes.

Our review is limited to the OIT and its role, responsibilities, and authority over the State's information technology operations. Accordingly, we did not review the Department of General Services'

role in managing procurements, nor did we review information maintained at departments related to projects under the oversight of the OIT.

To determine whether the OIT has established policies and procedures that are in accordance with statutory requirements, we reviewed the California Government Code, the State Administrative Manual, and OIT publications. Additionally, we interviewed the director, the deputy director, and current and former OIT staff members. Further, we interviewed officials at various departments that interact with the OIT.

To determine whether the OIT has consistently followed its established policies and procedures and to assess the extent to which the OIT's current policies and procedures have allowed problems to continue, we reviewed project files that the OIT maintained for some of the State's largest information technology projects. A project file contains documents required by the OIT, such as the feasibility study report, subsequent reports submitted by the department related to the progress of a project, and budget change proposals. Additionally, a project file contains the OIT's analyses of these documents as well as any correspondence.

We interviewed officials from other states to compare their approach toward managing their states' information technology needs with the approach used by California. Additionally, we reviewed publications issued by the U.S. General Accounting Office on managing information technology.

Chapter 1   The Office of Information Technology's Statewide Leadership Is Ineffective

Chapter Summary

Statewide leadership is critical as California significantly expands its investment and reliance on information technology. This leadership is needed to ensure that the State's information technology interests and assets are protected and used to their maximum potential.

However, the Office of Information Technology (OIT), the office responsible for this leadership, has been ineffective in this role. The OIT has not provided sufficient guidance for the State's decentralized information technology environment, it has provided only limited assistance in designing and implementing information technology projects, and it has provided limited leadership for personnel and training matters. Additionally, the OIT has failed to effectively coordinate multi-agency projects and data center activities, and it is not currently ensuring that the State's information technology community is involved in developing policy.

This has occurred because the OIT has narrowly interpreted its enabling legislation in such a way that it effectively limited its authority over information technology matters. Additionally, the OIT's resources have not kept pace with the growth in the State's information technology, and the OIT has chosen to focus these limited resources on budgetary oversight rather than on statewide leadership.

As a result, the State has not benefited from a coordinated approach to managing information technology; departments have not received sufficient support and guidance in the design, implementation, and operation of information technology projects; and multi-agency information technology projects and data center activities are left without statewide direction and collaboration.

This lack of information technology leadership has left California without an effective statewide direction to promote needed innovation, advocacy, and use of information technology resources.

The OIT Provides Limited Statewide Leadership

The Government Code assigns the director of the OIT responsibility for leadership of information technology in the State. These statutes provide the OIT with broad statutory responsibility and authority for a comprehensive range of leadership activities, including coordination. The OIT is responsible for developing plans and policies to support and promote the use of innovative information technologies, and for guiding the development of information technology systems and procedures. The plans are to address such objectives as ensuring that equipment is used optimally, systems are integrated to the maximum practical extent, and systems and interchange of data are appropriately compatible.

Additionally, the Government Code specifically requires the OIT to develop coordinated plans and policies for the state data centers; information management personnel, including the training and qualifications of such personnel; and office automation, including the use of personal computing and electronic mail. Further, the statutes state that the Legislature intends the director of the OIT to be the State's advocate for information technology to increase the effectiveness and efficiency of government services.

It is essential that the State have effective statewide leadership as it significantly expands its investment and reliance on information technology. This leadership is needed to ensure that the State's interests and assets are protected and used to their maximum potential.

Insufficient Guidance

The OIT has limited its direction of information technology to establishing broad policies and has not provided the guidance necessary to ensure that statewide interests are met. State law grants the OIT the authority for overall leadership of the State's information technology program. However, under the OIT, the State's information technology program has become highly decentralized, lacking a coordinated approach to managing its information technology needs. Because OIT chose not to exercise strong leadership and guidance, California's information technology program reflects the direction of individual departments rather than the State as a whole. Without sufficient state-level guidance in a decentralized environment, the State lacks assurance that it is implementing information technology in the most cost-beneficial manner. For example, departments may be using

resources to solve problems that other departments have already solved. Additionally, the State lacks assurance that it delivers necessary services in the most effective way.

The OIT considers the management of information technology in the State to be primarily the responsibility of individual departments. In developing statewide policy, one of the OIT's considerations has been to respect the management authority of the departments. Thus, by design, the OIT has limited its direction to establishing broad policies, rather than specifically directing departments to manage their information technology operations in a particular manner.

The OIT views its role as providing a policy structure that helps departments effectively use information technology, yet allows enough flexibility for departments to develop the management they need. Through its policies established in the State Administrative Manual, the OIT intends that departments follow proven management practices in planning, developing, acquiring, and using applications of information technology. However, although the departments are required to follow certain policies, the existing policy structure allows departments a significant amount of discretion with regard to how they manage their information technology needs without considering the State's overall program. For example, as the OIT noted in its publication entitled "Managing Information in California State Government," it imposes few constraints on how departments determine their needs or fulfill them.

The OIT allows even more flexibility in the area of personal computers. The OIT views personal computers and related networks as commodities to be controlled by rules that differ from the rules applied to larger systems or systems requiring moderate to extensive development. The OIT delegates full authority to departments to acquire and oversee the use of personal computers and related networks as long as the department adopts a policy that is in accordance with the model policy established by the OIT. Such an approach allows significant diversity within and among state departments and provides limited assurance that such diversity is cost beneficial.

Generally, the OIT has provided high-level guidance on how departments should manage their information technology projects. For example, from October 1987 through May 1989, the OIT issued a series of guideline publications on topics ranging from how to conduct a feasibility study to how to manage an information technology project. The OIT also periodically issues a newsletter that provides general information for the State's information technology personnel. Additionally, the office periodically issues state-level planning documents. The OIT's most recent planning document, issued in 1993, summarizes general visions for information technology uses in

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the State over the next six years and general strategies to improve the use of information technology in the State.   However, the planning document does not contain an implementation component regarding how certain strategies should be implemented, including assignments of responsibility and measurements for successful implementation.

We spoke to information technology officials at several departments and found general agreement at the larger departments that the current guidance provided by the OIT was not meeting their needs.   For example, officials at some of the larger departments found the OIT's publications to be so general that they were of limited value.   However, it appears that these publications may be more useful to smaller departments that do not have considerable information technology and management expertise.

The OIT has recently advocated a strategic planning emphasis and has required departments to develop strategic plans for information technology.   Strategic planning emphasizes the development of business strategies to support a department's mission and a plan for information technology to support these business strategies.   Generally, the departments we spoke to like the strategic planning emphasis.   For example, according to an official at one department, the OIT's requirement that its information technology plan be based on a strategic business plan was the best advocacy the OIT had done to help that department with its information technology.   However, other officials thought that the six-year statewide plan that presented the State's strategic direction contained good general information but did not go far enough.   For example, one official commented that without an implementation plan, the document lacked a working solution to the State's information technology problems.

The OIT also has been reluctant to provide specific direction, such as state-level standards.   Generally, the OIT has preferred to let the vendor marketplace determine standards.   According to the director of the OIT, it adopted this philosophy to avoid overregulation of information technology in the State based on the goal of not falling behind new technologies.

As an alternative to formal standards, the OIT in 1991 planned to issue a series of guideline publications, known as preferred practices, to assist departments in making informed choices about key technologies and management practices.   The preferred practice publications were to document recommended professional practices for a single aspect of information management or the application of a specific information technology.   The OIT envisioned the preferred practices as benchmarks against which state agencies could assess and plan their own management practices.   Additionally, the OIT planned to consider the extent to which departments adopted these practices or their

equivalent as one factor in determining the nature and level of delegation of approval authority that it granted the departments.

However, the OIT was unsuccessful in implementing its preferred practice program. After issuing one publication on computer-aided systems engineering in June 1992, the OIT discontinued the preferred practice program in fiscal year 1992-93 because of funding reductions.

The OIT's position on standards can also be illustrated by how it has approached the State's electronic mail needs over the years. The Government Code, Section 11712, requires that the State develop plans and policies for electronic mail; however, the OIT has not provided specific direction in this area. In March 1986, the OIT reported that a cost and benefit analysis supported the creation of a statewide electronic mail system and that the implementation plan would be completed during 1986. The OIT hired an outside consultant who prepared a feasibility study; however, the system was not implemented. In 1992, the subject of electronic mail came up again when a subcommittee for the California Forum on Information Technology, an advisory group for the OIT, planned to establish standards and guidelines for acquiring electronic mail systems for the State. However, the subcommittee did not carry out its plan, and as discussed later, the State subsequently eliminated the California Forum on Information Technology. The OIT now believes that a statewide standard is unnecessary because many of the state departments use one system and vendors of other systems have developed "gateways" that allow these systems to communicate with the system most in use. Thus, the OIT believes that an appropriate de facto, or informal, standard evolved from the marketplace without OIT intervention. However, although this flexibility may satisfy a department's internal electronic mail needs, a process dependent on gateways may not be the most efficient and effective method for communications and document transfer between departments.

In its 1993 six-year statewide plan, the OIT acknowledges that adopting statewide standards may now be in the State's interest in certain functions and technologies. For example, the OIT points to imaging as an emerging technology that will have a substantial impact on government operations. The OIT further states that the State has a one-time opportunity to establish a standard that will ensure interagency compatibility and assist individual agencies in adopting an approach to imaging that will meet their long-term needs. However, the OIT sees its role in this area as being limited primarily to monitoring the standards as they emerge and supporting the successful adoption of standards rather than setting the standards.

Generally, officials we spoke to at various departments thought that the OIT should provide more specific direction and, in some instances,

standards.   A few officials commented that the lack of an electronic mail standard hinders departments from efficiently and effectively communicating with each other.   Another official stated that the OIT should at least advocate a few standard methodologies for project and system development with explanations of the types of environments in which each methodology is best applied.

Limited Assistance to Departments

According to the legislative intent stated in the Government Code, Section 11700, one of the purposes of the OIT was to assist agencies in designing and implementing the use of information technology. However, the assistance that the OIT provides in the design and implementation of information technology is very limited.   Because the OIT has focused its limited resources on reviewing required documents, such as feasibility study reports and budget change proposals, the OIT's assistance is limited primarily to guidance related to specific documents it reviews.   Staff members do not spend the time at an agency that would enable them to thoroughly understand an agency's business needs and operations, and even though they can provide some assistance on the projects they review, it is limited.

In the first few years of its existence, the OIT had a small consulting unit.   The purpose of the consulting unit was to directly assist state agencies with information technology management issues, complex procurement issues, and vendor negotiation strategies.   Additionally, the unit was to assist department management in analyzing feasibility and evaluating   alternatives for highly complex or sensitive projects.

However, in November 1985, the OIT eliminated this consulting unit because it believed it needed to redirect its resources to its ongoing analysis and oversight of projects proposed by state agencies, a workload that had increased significantly.   After that time, the OIT no longer dedicated specific staff members to provide consulting support. Instead, the analysts reviewing documents submitted by the departments provided informal assistance to the departments on those projects.   The OIT's ability to provide useful assistance was affected further by staff reductions during early fiscal year 1992-93.   According to the director of the OIT, after the staff cuts, the remaining staff members focused their efforts primarily on processing required documents.   He stated that any existing consulting or advocacy programs and any proactive involvement with departments by the OIT took on secondary importance, and thus these efforts were cut back.

Another purpose of the OIT, as defined by the legislative intent contained in the Government Code, Section 11700, was to identify new

applications for information technology.   However, the OIT sees its role as supporting effective new applications for information technology rather than identifying them as they are required to do. According to the OIT's deputy director, the identification of new applications is primarily the departments' responsibility because the OIT believes technology decisions should be made as they relate to the departments' business needs, not for technology's sake alone.   He added, however, that the OIT has encouraged departments in a number of ways to explore the opportunities with new technologies and pointed to presentations by the OIT's director.   Additionally, one of the ways in which the OIT believes that it has supported new applications is through its sponsorship of legislation for advanced technology projects in 1988.   This legislation authorizes the State to participate with private industry and other government organizations in developing promising new technologies and requires the OIT to establish policy for these advanced technology projects.

However, even the OIT's ability to effectively support new applications for information technology is limited.   The OIT's ability to provide meaningful guidance regarding the use of new technologies is questionable considering the office's inability to effectively keep abreast of emerging technologies.   Although OIT staff members may try to stay current with developments in technology through publications and other means, the formal training that is provided to them is minimal.   The OIT currently does not have a formal training plan, and its training budget for fiscal year 1994-95 is $4,000 with some additional funds for conferences available from the Department of Finance's budget.

**Multi-Agency Projects Are Not
Effectively Coordinated**

One of the reasons that the Legislature created the OIT was to ensure coordination of the State's information technology needs.   The OIT has been unable to successfully coordinate multi-agency projects.   Further, the high-level group that the governor formed two years ago to provide the coordination that the OIT believed it was unable to provide, has been ineffective.

Multi-agency projects are of critical importance because opportunities exist for reducing costs and improving services through applications of information technology that can be successfully addressed only through the combined efforts of multiple agencies.   In a memorandum on the topic, the OIT director recognized the importance of multi-agency projects, citing the State's need to maximize return on investment by reducing duplication of effort and realizing savings through economies of scale, as well as the need to create statewide shared databases, consolidated communications networks, and standard user interfaces.

Although the OIT recognizes the coordination of multi-agency projects as one of its responsibilities authorized by statute, the director acknowledged that the OIT has never been able to successfully coordinate multi-agency projects.   He stated that he believes the OIT lacks sufficient statutory authority to coordinate the projects. Additionally, the OIT's deputy director stated that the OIT has no authority to mandate coordination and that the OIT cannot carry out this role without the cooperation of department directors and cabinet secretaries. In the absence of such coordination, specific legislation has been required to achieve commitment from various departments.   For example, the electronic funds transfer project arose out of legislation that required the Board of Equalization, the Franchise Tax Board, and the Employment Development Department to study the feasibility of electronic funds transfer and report to the Legislature.

Because the OIT did not believe that it could successfully coordinate multi-agency projects, it recommended that the governor designate responsibility for coordinating   multi-agency projects to a cabinet-level committee consisting of agency undersecretaries.   In October 1992, the governor issued an executive order that established the Multi-Agency Information Management Authority (MAIMA), comprising the undersecretaries of all cabinet-level agencies and the chief deputy director of the Governor's Office of Planning and Research.   The MAIMA was to provide continuing leadership within state government for the identification, initiation, and implementation of multi-agency projects and was to report on its status in October 1993.

However, the MAIMA has not proven to be an effective mechanism for coordinating these projects. According to the chief deputy director of the Office of Planning and Research, MAIMA meetings were held in conjunction with the regular weekly undersecretaries' meetings. Over several months, the group received roughly a dozen presentations about information technology issues. He further stated that the group was an experimental attempt to develop a strategic vision for the State's information technology. However, the group concluded after several discussions that it lacked the expertise for setting high-level information technology policy. In the opinion of the chief deputy director, more experienced specialists with strategic, not technical, information technology achievements were needed, particularly from the private sector. As a result of this decision and because of other problems in the State's management of information technology, the governor created the Task Force on Government Technology Policy and Procurement (task force). The chief deputy director stated that the MAIMA report called for in the October 1992 executive order was deemed to add little value and was canceled.

According to the May 1994 executive order that created it, the governor directed the task force to review the State's information and technology procurement practices and the manner in which the State plans for, manages, and oversees the development of information systems. In September 1994, the task force issued its report. As part of the restructuring it recommended, the task force advocated the creation of a new chief information officer whose responsibilities would include coordinating multi-agency projects. However, the task force, which was a one-time effort, does not by itself represent an ongoing mechanism for coordinating multi-agency projects and thus was not an effective replacement for the MAIMA in this regard.

As a result of the OIT's and the MAIMA's ineffectiveness, the State continues to have a leadership void with regard to coordinating multi-agency projects. Therefore, the State is not managing multi-agency projects in the most effective manner. Additionally, other opportunities for effective multi-agency projects may exist that are not recognized.

Data Center Activities Are Not
Effectively Coordinated

The data centers represent a significant information technology resource that is not being effectively coordinated at the state level. Instead, the State's two primary data centers, the Stephen P. Teale Data Center (Teale) and the Health and Welfare Agency Data Center (HWDC) are generally allowed to operate as independent entities without overall coordination by the OIT. Further, the State continues to have data centers in individual departments. No overall analysis has been done regarding the degree to which the existing data centers should be consolidated or coordinated or the degree to which the State would be better off using private data center services.

The Government Code, Section 11712, requires the OIT to develop coordinated plans and policies for the state data centers; however, the OIT's involvement with the State's two primary data centers is limited. The OIT has established broad guidelines in the State Administrative Manual, Section 4982.2, with regard to data center management, such as the requirement that the data centers operate on a break-even cost basis, charging its users based on a published rate schedule. Further, in the State Administrative Manual, Section 4982.1, the OIT has provided guidelines as to the data center that departments can use unless otherwise approved by the OIT. However, beyond these policies, the OIT's involvement with the data centers generally relates to feasibility study reports and other documents that departments and the data centers submit when departments are using data center services.

The OIT's director believes that the OIT does not have sufficient authority to coordinate data center projects or assist in the planning for the data centers; thus, it assisted only in developing broad policy for the data centers. Further, he stated that both the Teale and the HWDC tended to be very independent and not open to the OIT's involvement or the OIT's review of documents submitted by the data centers.

The OIT acknowledges that there are issues regarding the data centers that need to be addressed. The OIT's deputy director stated that the OIT believes a study of the merits of consolidating the data centers and sending some of their workload to private data centers should be conducted, although the OIT does not believe that savings from consolidating the State's two primary data centers would be substantial. However, the deputy director believes that consolidation of data centers other than Teale and HWDC would be beneficial. According to the deputy director, the OIT believes that significant economies of scale could be achieved by eliminating the separate mainframe operations from departments such as the Department of Transportation, the Board

of Equalization, the State Treasurer, and the Public Employees' Retirement System.

In addition to these issues, other items warrant attention. According to the OIT's deputy director, the data centers often wish to have complete service offerings, although it would be less expensive to offer a particular service at only one data center. He stated, however, that the OIT's ability to determine which services the data centers offer is limited to its influence during the budget process. Additionally, although the OIT outlined a policy in the State Administrative Manual requiring the data centers to charge for their services based on published rate schedules, there is no assurance that the data centers do so.

For example, during previous audits of Teale, the Bureau of State Audits and the Office of the Auditor General reported that Teale did not always charge state agencies for services provided based on its published rate schedule. Specifically, for fiscal year 1991-92, we reported that Teale had made an arrangement with the Governor's Office to charge a rate of $250 per telecommunication line, as opposed to the published rate of $905 per line. As a result of the decreased rate, we estimated in June 1994 that Teale undercharged the Governor's Office approximately $94,300 during fiscal years 1991-92 through 1993-94. Additionally, for fiscal years 1987-88 through 1990-91, the Office of the Auditor General reported that Teale undercharged the Department of Motor Vehicles for conversion processing and database redevelopment services by approximately $14 million. To the extent that certain agencies are undercharged for services, other agencies are overcharged for services because all costs are borne by the agencies for which Teale provides services. During its audit of Teale for fiscal year 1992-93, the Bureau of State Audits found that Teale had not made any attempts to collect the amounts undercharged in previous years or refund amounts overcharged to other agencies, although the data center significantly reduced its published rates twice during fiscal year 1993-94.

**Limited Leadership for Personnel
and Training Matters**

The State's ability to respond to new opportunities in information technology depends on the capabilities of its employees.   As a result, it is critical that the State have the necessary leadership in the areas of training and qualifications of information technology personnel. However, the OIT has provided limited leadership for personnel and training matters.

The   OIT   shares   its   responsibility   for   these   issues with   other departments.   For example, the Department of Personnel Administration (DPA) and the State Personnel Board have primary responsibilities for personnel matters.   Additionally, the State EDP Education Program within the Department of General Services conducts classes on information management software and issues. However, the OIT's enabling legislation clearly intended for the OIT to provide leadership in these areas.   The Government Code, Section 11712, requires the OIT director to develop coordinated plans and policies regarding information management personnel, including the training and qualifications of such personnel.

The OIT has provided only limited input in these areas.   In the State Administrative Manual, Sections 4852 and 4854, the OIT states its belief that training and personnel development are primarily the responsibility of line management and that each department is responsible for identifying needs, establishing priorities, and implementing training.   The OIT's policy is to provide guidance for the identification of needed skills and the development of a training plan. The OIT will assist departments in determining their staffing or training needs.   However, this assistance is provided only if requested by the departments.

Additionally, the OIT's guidance for personnel control agencies is limited.   For example, according to a senior manager within the DPA, the DPA consults with the OIT approximately once a month about high-level position classification issues as they relate to the complexity of the information technology environment; the DPA does not discuss recruitment or retention issues with the OIT.   Additionally, the chief of the Departmental Services Division of the State Personnel Board indicated that the board has not had any interaction with the OIT on matters relating to the State's personnel system for information technology for at least four years.   At that time, the OIT and the State Personnel Board addressed personnel classifications and examinations. The OIT also provides only limited guidance on training issues to the Department of General Services.   The Information Technology and Education Center (ITEC) is the office within the Department of

General Services that oversees the State EDP Education Program. According to the general manager of the ITEC, the OIT has informal discussions with the ITEC approximately every few months that are usually of a general nature and focus on state personnel training needs relative to the OIT's observations. The general manager of the ITEC stated that the OIT worked more closely with the ITEC when the OIT recently revised the planning process to emphasize strategic planning. During this effort, the OIT assisted the ITEC in implementing the master service agreements with planning consultants so that expertise would be available if departments needed assistance with strategic planning. Additionally, the OIT states that its staff members periodically teach classes. This typically occurs after the OIT has revised policy.

In the past, the OIT was more involved with personnel and training matters through its advisory group, the California Forum on Information Technology (CFIT). For example, in 1989, a CFIT subcommittee conducted a study on various issues within data processing management development and made recommendations, including the creation of a data processing manager's training academy that was implemented subsequently. Additionally, the CFIT drafted allocation guidelines to determine the appropriate level for proposed data processing positions. These guidelines were implemented in 1988. However, as discussed later, the CFIT was eliminated, and thus the OIT no longer has this group as a resource to address personnel and training matters.

The OIT has recognized that there are personnel and training needs to be addressed. For example, in 1991, the OIT planned to work on a project to refine staffing guidelines for information technology classifications based on their contribution to departmental productivity. However, according to the OIT's chief of strategic planning and education, this effort was postponed because neither the OIT nor the DPA had the resources to undertake a project of this magnitude. Further, in its statewide planning document issued in July 1993, the OIT identified five different tasks it should work on with other departments during the subsequent six-year period. The list includes conducting a review of the recruitment and retention of information technology personnel and developing a program to broaden training opportunities available to information technology staff.

**State's Information Technology Community
Not Currently Involved in Policy Development**

The OIT currently does not have an effective mechanism for involving the State's information technology community in developing policy. The State eliminated an advisory group that previously existed, and neither the OIT nor any other group has been able to fill the void.

As part of the legislation that created the OIT in 1983, the Legislature authorized the creation of a user committee consisting of representatives from various departments who were knowledgeable about information technology.   The purpose of the user committee was to provide guidance and input to the OIT's director and other state officials, to identify barriers preventing the optimum use of information technology and management techniques, and to recommend necessary changes in policy.   In 1983, the director of the OIT recommended that the CFIT be created and invited representatives from all state departments to participate.   An executive group of 20 to 25 members met more often than the entire CFIT and was the actual working group. The OIT's director was the permanent, nonvoting chairman of the CFIT and its executive committee.

The CFIT fulfilled various roles.   In addition to providing advice on policy to the OIT's director, the CFIT meetings also provided an opportunity for state information technology personnel to communicate on issues and thus provided a level of coordination within the State's information technology community that did not otherwise exist. Additionally, the CFIT represented a pool of information technology expertise that could be used to study issues of importance to the State's information technology personnel.

Although the OIT considered the CFIT to be a valuable resource for achieving its objectives, the CFIT was eliminated in 1993.   In response to legislation, the Department of Finance conducted a review of boards, commissions, and similar bodies existing within the State to determine whether the State could eliminate these entities.   The Department of Finance concluded that the CFIT was one of the entities that could be eliminated because other groups provided advice. According to the director of the OIT, the Department of General Services' Information Technology Customer Council and MAIMA were left in place, thereby justifying the elimination of the CFIT. According to its statement of purpose, the Information Technology Customer Council advises the Department of General Services concerning opportunities for improving its information technology, programs, policies, and procedures.   Additionally, an annual Executive Institute Seminar is held to address challenges facing information technology executives.   However, neither of these groups serves as an advisory group to the OIT.   Further, as discussed previously, the MAIMA has not been effective.   Generally, there is agreement among the information technology personnel we spoke to, including the director of the OIT, that a group similar to the CFIT is needed.

The Reasons for the OIT's Ineffectiveness

The OIT has not been effective at providing leadership for information technology in the State for several reasons. Specifically, the OIT has narrowly interpreted its enabling legislation in such a way that it effectively limited its authority over information technology matters. Additionally, the OIT's resources have not kept pace with the State's information technology growth, and the OIT has focused its limited resources on budgetary oversight.

Enabling Legislation Narrowly Interpreted

The OIT's interpretation of the statutes that set forth its responsibilities has played a key role in how the office has carried out its responsibilities. Generally, the OIT has limited its role to the provisions outlining the director's specific responsibilities and not the more broadly focused intent language related to the purpose of the OIT. Specifically, the intended purpose of the OIT, as defined by the statutes, included such responsibilities as identifying new applications for information technology and assisting agencies in designing and implementing the use of information technology. According to the director of the OIT, he believed that the individual statutes addressing the director's responsibilities better outlined the OIT's role than did the broader statute describing the purpose of the OIT. As a result, the OIT focused more on the specific provisions outlining the director's responsibilities.

Additionally, the OIT's interpretation of its ability to carry out its statutory responsibilities influenced how the office operated. Specifically, although the OIT recognizes that the statutes give it certain planning and coordination responsibilities, the OIT does not believe that the statutes give it sufficient authority to mandate the cooperation of other state departments. For example, the Government Code, Section 11712, requires the OIT director to develop coordinated plans and policies for the state data centers. However, the OIT does not believe that it has the authority to be more than minimally involved in planning for the data centers. Additionally, one of the reasons the Legislature created the OIT was to ensure coordination of the State's information technology needs, and statutes gave the director authority to develop necessary plans and policies. However, again, the OIT does not believe it has sufficient authority to coordinate projects involving more than one department. The OIT deputy director stated that the OIT believes it does not have the authority to direct any department to operate in any particular manner.

The OIT considers information technology to be a support function for departments' business decisions.   Thus, according to the director, the OIT interpreted its enabling legislation to favor decentralized responsibility to departments for recognizing and managing projects, but centralized control over decisions to invest state monies in proposed activities.

Although the OIT had the option of recommending changes to the statutes that outlined the office's responsibilities, it has not exercised this option.   The Government Code, Section 11711, requires the director to recommend to the governor, Legislature, Department of General Services, and Department of Finance changes needed in state policies to accomplish the purposes of the law.   The director of the OIT indicated that he did not attempt to change the overall legislation or his interpretation of the legislation over the years because there had not been any indication from external bodies that there was a need to do so.
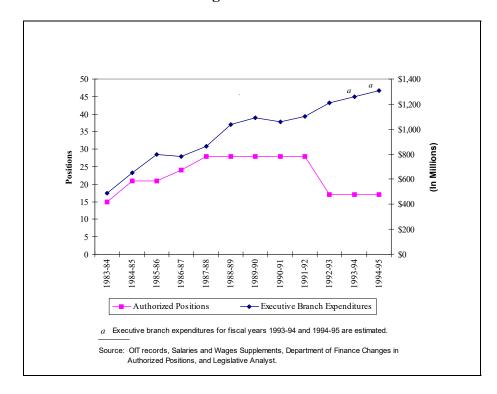
Resources Have Not Kept Pace With Growth

Since the OIT was created in 1983, the amount of money the State has spent on information technology has steadily increased.   According to the OIT's records, in fiscal year 1983-84, the State's executive branch spent almost $490 million on information technology, including telecommunications.   By fiscal year 1992-93, the amount had increased to approximately $1.2 billion and is expected to reach $1.3 billion during fiscal year 1994-95, a growth of approximately 165 percent.   Additionally, the technology itself has grown increasingly more complex over that period.

The OIT's resources have not kept pace with the growth in the State's information technology spending.   In fiscal year 1983-84, the first year after the OIT was created, the office was authorized for 15 positions. Over the ensuing four years, the number of authorized positions increased until it reached 28, a level it maintained from fiscal year 1987-88 through fiscal year 1991-92.   However, during the first few months of fiscal year 1992-93, because of General Fund reductions, the Department of Finance reduced the OIT's authorized positions by 40 percent.   The OIT currently is authorized to be staffed with 17 positions, 16 of which are filled.

Figure 1 presents a comparison of the change in the OIT's authorized positions with the State's executive branch expenditures for the fiscal years 1983-84 though 1994-95.

Figure 1   **Comparison of OIT's Authorized Positions
With Executive Branch Expenditures
for Information Technology for the
Fiscal Years 1983-84 Through 1994-95**

a Executive branch expenditures for fiscal years 1993-94 and 1994-95 are estimated.

Source: OIT records, Salaries and Wages Supplements, Department of Finance Changes in
       Authorized Positions, and Legislative Analyst.

Limited Resources Focused on Budgetary Oversight

Because its resources were limited, the OIT made decisions regarding
its most critical priorities and determined that its role was primarily to
support the State's budget process.   Thus, the OIT considers its most

critical priority to be analyzing department documents that affect the budget process, and the OIT focuses on the oversight tasks associated with review of these documents.

Especially after the OIT's significant staff cuts in fiscal year 1992-93, the remaining staff members primarily focused their efforts on processing required documents, and the OIT cut back its leadership efforts. For example, since the staff cutbacks, the OIT has not issued any more publications or revised any of the existing publications that were designed to provide guidance to departments. It did, however, issue its 1993 state-level planning document and has revised policy in the State Administrative Manual since then.

A review of the existing organization of the OIT also illustrates the secondary role that leadership has in the office. The staff consists primarily of analysts for which analysis of required documents takes the majority of their time. Only two staff members work in its planning and policy unit.

Limited Leadership Has Resulted in Projects Without Statewide Coordination, Support, or Guidance

Because of the OIT's limited leadership, state departments are not receiving the guidance and support they need to effectively manage their information technology projects. Additionally, there is no assurance that departments are implementing information technology in a manner that is in accordance with a state vision and best meets the needs of the State. The extent to which the State benefits from its information technology investment depends on the ability of departments to effectively use information technology. Certain state departments currently have considerable expertise, whereas others do not. However, all departments would benefit from improved leadership at the state level.

Under the current process, the OIT provides high-level guidance but does not get actively involved in the departments' projects beyond the analysis it performs on the documents it reviews. Thus, because staff members do not thoroughly understand the departments' business and operations, the assistance they provide is of limited use. It may not be effective to have each department attempt to implement information technology projects without the appropriate state-level guidance. For example, under the current process, departments may be using resources to solve problems that other departments have already solved. Additionally, departments may continue to use inefficient processes because department management may not be aware of a better methodology. Further, because of the limited leadership, departments

lack an understanding of the State's vision, and the State has limited assurance that the departments' implementation of information technology is consistent with its vision.

In addition to the effect of the OIT's limited leadership on individual departments, the State lacks assurance that it is implementing information technology, when considering the State's resources as a whole, in the most cost-beneficial manner. There is limited assurance that the State does not have duplicative systems, facilities, and equipment. Additionally, because of the limited leadership, the State lacks assurance that it delivers necessary services in the most effective way.

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Chapter 2   The Office of Information Technology's Oversight of Projects Is Limited

Chapter Summary

The failure of the database redevelopment project at the Department of Motor Vehicles (DMV) and the problems that have plagued other information technology projects of state departments have raised questions about the effectiveness of the Office of Information Technology's (OIT) oversight of the State's information technology projects. In our August 1994 report "The Department of Motor Vehicles and the Office of Information Technology Did Not Minimize the State's Financial Risk in the Database Redevelopment Project," we concluded that the OIT should not have recommended continued funding for the database redevelopment project when the DMV did not follow the State's approved policies designed to minimize risk. The DMV ultimately terminated the project because of significant unresolved problems and deficiencies after spending more than $49 million. On another project, the California Student Aid Commission (commission) already faces the need to evaluate alternatives to its $50.9 million financial aid processing system implemented in 1993 in light of its consultant's conclusion that the system is flawed and will not meet the commission's needs.

The effectiveness of the OIT's oversight of information technology projects is hampered by gaps in the oversight system. Also, the design of certain parts of the oversight system is flawed. The OIT's review of projects is limited to the review of the documents that the departments sponsoring the projects are required to submit to the OIT. OIT analysts spend little time at the departments where the projects are being managed. Therefore, the OIT's impact on each project is limited to those points in the process in which it is required to approve a particular document. Even though the OIT's oversight depends so heavily on the review of the documents it receives from the

departments, the OIT does not verify the accuracy of the information in the reports it receives.

Added to these shortcomings is the fact that the scope of the OIT's document review is limited. The OIT views itself as an investment committee to ensure that proposed projects are reasonable investments of public funds. It does not do an in-depth technical review of a project's viability. Also, it does not assess the individual qualifications of the staff members assigned to projects, including the project manager and key technical staff members, to ensure that these individuals have the appropriate skills and experience for the particular project. Further, the OIT has not shown an ability to enforce specific conditions it sometimes imposes on departments at the feasibility report and special project reporting stages of a project.

The OIT has further limited its review by relying on an exception reporting system as the primary mechanism for the ongoing oversight of projects. Specifically, if a project is beginning to experience budget variances or schedule delays, the sponsoring department is required to submit a special project report to the OIT. In our view, this special project reporting process is flawed because the OIT depends on the department's "good faith" to submit the special project report.

The OIT has acknowledged that its oversight role has been most effective at the outset of a project before the funding has been approved. At this stage, the sponsoring department is seeking the OIT's approval of the feasibility study report and is seeking funding approval for the project. Authorization of new funding for a project requires the approval of both the OIT and the Department of Finance's budget unit. However, once a project is underway and problems begin to surface, it is difficult for the OIT to intervene successfully.

The OIT's Oversight Responsibilities

In accordance with Section 11731 of the Government Code, the OIT is responsible for adopting policies and providing guidance to carry out the budgeting and control of expenditures for electronic data processing. This code section also states that the OIT must approve proposed expenditures for electronic data processing only if the departments have followed the established policies and procedures published and maintained in the State Administrative Manual. The State Administrative Manual sets forth guidelines that departments are to follow in identifying the need for information technology projects, as well as assessing the feasibility of such projects. The State Administrative Manual also guides departments in overseeing and evaluating information technology projects.

The departments sponsoring information technology projects are required to submit feasibility study reports, special project reports, and

other reports to the OIT.   The OIT oversees the projects through its review of information included in the various reports, as well as through discussions with departmental staff.   Also, the OIT's role includes recommending budget augmentations to the Department of Finance's budget units.   These recommendations, once approved by the budget units, the governor, and the Legislature, allow departments to obtain the funding necessary to complete their projects.

OIT Project Approval and Review Process

Once a department has identified the need for a new information technology project, it must, except under specified circumstances, complete a feasibility study of the project and document the results of the study in a feasibility study report.   The report must supply enough technical detail to show that the project is workable.   If the OIT is to review a project, the OIT receives the report.   However, the OIT does not review all information technology projects.   In certain instances, the OIT has exercised its discretion to delegate to the department's director the responsibility of reviewing the feasibility study report. Nonetheless, whether it is the OIT or a department director reviewing the report, the information provided is required to identify the reasons for undertaking the project and to analyze its costs and benefits.   For projects in which the OIT retained its responsibility for oversight, if the OIT determines that the department has established a strong business case for investment of state resources in the project, the OIT may approve the project, approve the project on some modified basis, or approve the project subject to conditions.

The OIT's review of a feasibility study report focuses first on the technical viability of the proposed project.   The OIT determines the prudence of spending public funds on the project by questioning whether the proposed technology addresses the department's business needs.   If the OIT concludes that the technology is viable, based on the department's presentation in its report, the OIT then reviews the fiscal viability of the project.   The feasibility study report includes a cost-benefit analysis that compares the project's expected benefits with the costs of implementation and operation.   If the OIT concludes that the project's benefits are sufficient relative to the project's costs, it approves the project.

Project Reporting

Until recently, the OIT required sponsoring departments to submit project reports each quarter. The quarterly project report would briefly summarize the status of the project, explaining any minor deviations from the original project plan. The report also would contain an updated project management schedule showing actual completion dates of specific tasks or deliverables. In its 1994 revision to the reporting requirements for information technology projects, the OIT eliminated the requirement for quarterly reports.

Although the requirement to prepare quarterly reports has been eliminated, the OIT continues to require other periodic reports that enable it to monitor the project's progress. For all projects subject to OIT oversight in which the project milestones, costs, or benefits change by 10 percent or more, the department is required to submit a special project report identifying the significant change in the project and the reason for the change. The OIT reviews those projects to determine if the cause of the change appears reasonable.

Additionally, for each project the OIT considers to be major, the OIT requires the sponsoring department to submit an annual status report (special project report), which is a comprehensive assessment of the project's progress. The OIT may designate any large project as a major project, and when it does so it notifies the sponsoring department of the designation. According to the State Administrative Manual, the OIT considers several factors when designating a project as a major project, including risk to the State, implementation costs, and the technology employed. Also, if the project is to be implemented over multiple years it is likely to be considered a major project.

Oversight Limited to Document Review Only

The OIT's review of information technology projects is limited to the documents that the departments sponsoring projects are required to submit. OIT analysts spend little of their time at the departments where the projects are managed. Therefore, the OIT's impact on each project is limited to those points in the process when the OIT is required to approve a specific document.

Also, the OIT's effectiveness is limited by the accuracy of the documents it receives from departments. However, the OIT does not verify the accuracy of the information in the feasibility study reports or the special project reports. These reports, especially the feasibility study reports, describe the business problem the department is attempting to address with information technology, the technology alternative selected to address the problem, an economic analysis of each alternative considered, and the costs and benefits of the

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technology selected over the life of the project.   This information is critical to the OIT's oversight because it is the basis for the OIT's approval of the project and often for the commitment of millions of dollars of state or federal funds.   However, the OIT does not verify the accuracy of this information.   Instead, the OIT may ask for additional information from the department to assess the overall reasonableness of the project.   Beyond that, the OIT relies on the "good faith" of the sponsoring departments to provide accurate data in their reports.   This is a risky approach for the oversight of information technology projects. For example, in a 1990 special project report to the OIT, the DMV, for its database redevelopment project, overestimated the benefits to be derived from software and personnel savings, significantly underestimated computer equipment costs, and incorrectly reported the status of the project.

The deputy director of the OIT told us that some state departments resist the OIT's oversight efforts.   We suggest that because departments could bias the data that they report to the OIT, it is therefore prudent to validate the accuracy of the information in these reports.   The Department of Finance has acknowledged the need to supplement the reviews currently performed by the OIT.   As discussed later in this chapter, in July 1993, the Department of Finance assigned its Office of State Audits and Evaluations the responsibility of conducting in-depth reviews of information technology projects, although only a few of the highest risk projects are being reviewed.

The Scope of the OIT's Document Review Is Limited

In each feasibility study report submitted to the OIT, the department must describe the capabilities of the information technology that it proposes and discuss how this technology will address the department's needs.   At the project's inception, the OIT reviews this information. However, the OIT does not verify the information or ensure compliance with the feasibility study report.

According to the deputy director of the OIT, the role of ensuring a project's success has always belonged to the department's project and executive management.   The OIT has never viewed its role as performing a detailed technical analysis of agency proposals.   The deputy director stated that making this part of OIT's role would duplicate the extensive analyses departments undertake before

beginning information technology projects.   The deputy director also stated that the OIT has never been staffed to perform such analyses, and he does not believe it is necessary to repeat the departments' analyses.

The OIT's deputy director also rejects the notion that it is the OIT's role to ensure that the department's staff is performing the evaluations necessary to ensure that the technical and performance requirements established in the feasibility study reports are satisfied.   According to the deputy director, the OIT has always believed this role belonged to the executive management of the department.

We disagree with the OIT.   We believe that the significance of the State's investment necessitates an independent validation of feasibility data and analyses provided by departments.   Further, because the OIT recommends funding for projects at various points, it is critical that it ensures that the technical and performance requirements of the project are satisfactorily accomplished.   If the OIT approves a feasibility study report based on the projected benefits and conditions that must exist to satisfy each defined objective, it seems that the OIT would find it necessary to ensure that the objectives of the project were being met and that the investment was still sound.

Another way in which the OIT's project reviews are limited has to do with how the OIT attempts to determine whether the department possesses the capability to implement a project successfully.   In the guidelines that OIT analysts use to review feasibility study reports, the OIT has identified one of its critical determinations as being whether the department has acquired, or will be able to acquire, the necessary resources, including project management and technical expertise. The OIT limits its review to an assessment of the types, levels, and quantities of personnel classifications that the department plans to use to accomplish the project.   Additionally, the OIT bases its assessment of the department's ability to implement a project successfully on the outcome of the department's previous information technology endeavors.   The OIT does not, however, assess the individual qualifications of any of the staff members assigned to the project, including the project manager and key technical staff members, to ensure that they possess the appropriate skills and experience for that particular project.

The OIT limits its review because it believes the department is responsible for hiring individuals who can perform the duties assigned to the position and states that it does not have the authority to place a specific individual in a particular job.   Additionally, the OIT does not believe that it is responsible for assessing the competence of specific individuals.   Although we recognize that the OIT does not have authority over hiring decisions made by departments, we believe it is well within the OIT's authority to assess whether a department

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currently has the staff capable of implementing the project successfully or whether the department needs to acquire outside assistance. Unless the OIT reviews individual qualifications of at least the project manager and key technical staff, we question the OIT's ability to make an informed decision regarding the department's ability to implement the project successfully.

When departments attempt to implement projects without the appropriate project management or technical expertise, they risk cost overruns and project delays. This problem surfaced on the DMV's database redevelopment project, where the DMV attributed some of the difficulties that it suffered to the fact that its project staff did not have the appropriate experience. In the project staff's periodic assessments for management, staff members indicated that they lacked knowledge of the computer equipment being purchased and were having difficulty in recruiting staff experienced with that equipment.

Sometimes, departments may initially believe that their existing staff can implement the project, only to find that they unexpectedly have to obtain outside expertise later in the project. For example, in January 1992, when the OIT approved a feasibility study report for the Board of Equalization's (board) Teale Migration Project, the board thought it could implement the project with existing staff although it recognized that it needed to make a significant investment in developing and training staff members. However, in a special project report submitted in September 1993, one year and eight months after the OIT had approved the feasibility study report, the board recognized that its existing staff did not have the specific knowledge and expertise to successfully complete the project and concluded that it needed to contract with a private vendor.

The OIT's Ongoing Oversight Relies on Exception Reporting

The OIT has limited itself to an exception reporting system as the primary mechanism for ongoing oversight. That is, as a project is being implemented and it is beginning to experience budget variances or schedule delays, the sponsoring department is required to submit to the OIT a special project report notifying the OIT of the variance. In our view, this special project reporting process is not an effective oversight mechanism because the OIT depends entirely on the department's willingness to submit the special project report. The weakness in this arrangement is that the OIT relies on the "good faith" of the sponsoring department for the system to be effective. In other words, the OIT is relying on the department to admit that its project is over budget or behind schedule and then to prepare the special project report.

The California Student Aid Commission's (commission) financial aid processing system project illustrates a project with serious difficulties

for which the commission did not always keep the OIT properly informed.   This project was begun in 1987 and fully implemented by January 1993.   During this time, the requirement to submit quarterly project reports to the OIT was still in effect, and in May 1992, the commission submitted a quarterly progress report to the OIT stating that the complete system was to be in production in August 1992.   However, in October 1993, after not having received any updates from the commission for 17 months, the OIT finally sent a letter to the commission asking for an update on the project.   During this 17-month period, there appears to have been no interaction between the commission and the OIT.   In response to the OIT's letter, the commission submitted a special project report to the OIT in February 1994.

At this point, the project was significantly over budget and behind schedule.   Based on the budget approved for the February 1994 special project report, the project was estimated to cost 48 percent beyond its most recently approved budget.   Yet, the commission did not submit the special project report that such variances from the budget require.   Additionally, as of February 1994, the post implementation evaluation report for the project that was scheduled for December 1992 was 14 months overdue.   This is exactly the type of risk the OIT assumes when it relies on the good faith of the sponsoring departments to report when the projects begin to deviate from the established budget and schedule.

The OIT does not have to rely solely on such an exception reporting approach.   It has other choices that would require departments to report regularly during the implementation of projects.   One option is to designate a project as "major," which then requires that the sponsoring department submit annual status reports.   However, for two of the four projects we reviewed, the OIT did not designate the projects as major, even though both involve millions of dollars of expenditures and were to be implemented over several years and are therefore high-risk projects.   For example, the Corrections Management Information System project at the California Department of Corrections began as a $55 million project that was estimated to have a project life of six years, including a system development and installation period of three years.   Additionally, it was considered to be technically complex, and outside expertise, in the form of a contractor, was considered necessary.   But in January 1992, at the outset of the project, the OIT did not designate this project as major.   Not until August 1994, more than two and one-half years later, after the project's budget more than doubled to $118 million, did the OIT designate this project as major.

Another reporting option that the OIT has been able to use in the past, but that it has recently eliminated, is the quarterly project report.   According to the deputy director of the OIT, the quarterly reports were

ineffective.   However, as noted in the OIT's guidelines that the analysts use to review projects, these reports were designed to help the OIT determine if a special project report was warranted.

Recently, the Department of Finance has taken steps that should improve the assessment of some information technology projects.   In July 1993, the Department of Finance assigned its Office of State Audits and Evaluations the responsibility of conducting in-depth reviews of selected projects.   Some of these reviews are to be conducted while these projects are in the midst of being implemented rather than after the projects are fully implemented.   In this way, if the auditors determine that the department is not proceeding in a prudent fashion to implement the project or is not doing the analyses necessary to ensure that the technical and performance requirements established for the project are met, the auditors can immediately bring needed attention to these conditions before the problems become insurmountable.   Although this new function provides a level of assurance that was not present before, the resources that the Department of Finance has allocated to this effort are minimal.   Thus, only a few of the highest risk projects are being reviewed.

One of the OIT's Fiscal Controls Is Flawed

Another flaw in the OIT's oversight of information technology projects involves a specific fiscal control that the OIT requires to gauge how closely project expenditures are tracking with the original budget for the project.   One of the circumstances under which a department must submit a special project report is when the total costs of the project deviate or are expected to deviate by 10 percent from the project's initial budget.   The State Administrative Manual specifies that if the department is required to submit a special project report, the department shall not expend additional funds to implement the proposed change until the OIT approves the special project report.

The OIT uses this fiscal control so that the 10-percent threshold is applied to the total costs of the project rather than strictly to the development costs of the project.   (Development costs are those one-time costs associated with the analysis, design, programming, staff training, data conversion, acquisition, and implementation of information technology projects.)   Applying the 10-percent threshold to the total costs of the project weakens the effect of this fiscal control because the total costs of a project are always greater than the development costs since the total costs include the development costs as well as the cost of operating and maintaining the project throughout its life.   Applying the 10-percent threshold to the total costs of the project allows the sponsoring department a much higher threshold before the department is required to report that the project is exceeding its initial budget.

Also, it allows for the possibility that actual overruns in development costs can be masked by estimated savings in the cost of operating and maintaining the project throughout its life.   This is because the department could experience significant overruns in development costs but would not need to submit a special project report if the department also projected a decrease in the operating and maintenance costs that caused the total project costs to change by less than 10 percent. Because many of the operating and maintenance costs are estimated costs over the life of the project that are based on various assumptions that may be optimistic and may not be realized, these costs are subject to uncertainty.   In contrast, the incurred overruns in development costs represent the actual experience with the system to date.   An early warning mechanism to identify projects that may be experiencing problems is most effective if it is triggered by actual variances in the development phase of the project.

For example, suppose that a state department received approval   to undertake a $40 million project that involves $15 million in development costs and $25 million in costs of the ongoing operations and maintenance.   The department experiences overruns of $7.5 million in its development costs.   However, the department believes that it can offset these overruns partially through $4 million of estimated savings in operations and maintenance costs in future years. Thus, the department would estimate an overrun of $3.5 million for the total project costs, and because this is less than 10 percent, would not turn in a special project report to the OIT.   Thus, the OIT would not be aware that the department had already exceeded its development costs by 50 percent.

We spoke to the director of the OIT about why it established its control at the total project level rather than at the component level, such as the development costs.   He stated that until the last few years, the OIT thought that the total project level provided appropriate control. Projects tended to be shorter and less complex.   Also, departments would often request budget augmentations through budget change proposals to continue the funding for a project.   The subsequent review of the budget request would serve as a check on the project's progress. However, in the last few years, projects have become longer and more complicated.   Also, the State's fiscal climate has caused departments to use more of their existing resources for their information technology projects rather than obtain budget augmentations.   When this occurs, the OIT never sees a budget change proposal, because the department is simply redirecting previously budgeted funds to increase the project's budget.   A way in which the OIT has tried to deal with this difficulty is to designate certain large projects as major projects and thus require an annual progress report.   However, the director of the OIT agreed that under current conditions, establishing control at the component level rather than at the total project level would provide the OIT with a better

early warning mechanism for large, multi-year projects.   Another approach that he favors is to break large projects into manageable phases with specific deliverables and to condition future development on satisfactory completion of prior phases.

No Assurance That Critical Issues Are Sufficiently Addressed

Another limitation in the current process for overseeing information technology projects can be seen when the OIT grants approval for a sponsoring department to proceed subject to the department's meeting specific conditions as the project progresses.   According to the OIT's deputy director, the OIT frequently approves projects with stipulations intended to provide reasonable checkpoints or milestones so that the OIT and the management of the sponsoring department can determine that certain critical tasks are completed before the department proceeds to the next step.   For example, the OIT might require that a department successfully complete a pilot project that is a less comprehensive version of the proposed project before it can proceed to the next step in the implementation of the full project.   However, here again, the OIT generally relies on the good faith of the department that it will fulfill the conditions set forth by the OIT.   The OIT does not follow up to ensure that the department has actually fulfilled all the conditions.   Instead, the OIT relies on subsequent reports, such as the special project reports from the department, as an assurance that the department has met the conditions.

A project to expand the central processing capacity of some of the computers at the Franchise Tax Board (board) illustrates the OIT's inability to enforce a department's compliance with conditions that the OIT has set forth for the project.   In January 1992, the board obtained OIT approval for an upgrade of some of the board's computers.   As the project progressed, the board determined that the project as it was originally proposed would not entirely meet its needs.   Therefore, in July 1992, the board submitted a special project report to the OIT in which the board requested approval for an augmentation to the project to provide for additional computer processing capacity.   The OIT approved this special project report in September 1992 but conditioned its approval on the board's conducting studies that would link the growth in its workload to the need for additional computer processing capacity.   The OIT also indicated then that it had requested previously that future feasibility study reports and special project reports for computer upgrades include this type of data.   However, in spite of this requirement, the board did not produce the study.   In January 1994, the OIT approved an emergency request from the board for additional capacity in which, yet again, the OIT admonished the board for the fact that the required capacity study was not completed.   Finally, in June 1994, the OIT concluded that the board was now able to relate workload increases directly to the need for additional computer processing capacity.

The California Student Aid Commission's (commission) project for its financial aid processing system provides another example of how the OIT sometimes appropriately recognizes that there are issues critical to the success of a project but is ineffective at ensuring that those critical issues are addressed.   When the OIT approved the commission's feasibility study report for the project in January 1987, it acknowledged the commission's conclusion that it did not currently have adequate staff expertise for the scope and complexity of this project and planned to use a contractor to develop and implement the system.   The commission intended to increase its staff in the data processing unit and have its staff work closely with the contractor to ensure the staff's familiarity with the system.   Once the system was implemented, the commission was to take over the system operation and support.   The OIT approved the report based on this premise.   Also, the OIT pointed out that it was critical for the commission to plan how it would transfer the contractor's expertise to the commission staff.   However, other than reviewing the commission's request for proposal to ensure that it had the appropriate provisions regarding staff development, there is no indication that the OIT proactively ensured that staff expertise was being developed throughout the project.   Ultimately, the commission was unable to develop the necessary staff expertise.   In October 1991, nearly five years after the OIT approved the feasibility study report, the commission reported to the OIT that it had experienced difficulties in acquiring sufficient qualified data processing personnel and proposed that another contractor assume full responsibility for completing the project and for operating and maintaining the system thereafter.   The OIT approved the commission's proposal, and the commission effectively abandoned its previous intent to operate the system.

On the database redevelopment project, the OIT required that the DMV develop a working model of the project before proceeding to the next phase of the project.   In the feasibility study report and other documents, the DMV agreed to design and implement such a working model.   In fact, the OIT considered the model to be the key step in determining whether the project, as designed, would be successful. However, the DMV failed to develop the planned working model. Instead, it continued its efforts to implement the project despite unresolved technical problems noted when it tried to develop the working model.   The OIT allowed the DMV to continue with the project, spending an additional $34.6 million, and it allowed the DMV to attempt to put the database redevelopment project into operation despite its failure to satisfy the OIT's requirement.   The DMV ultimately terminated the project because of significant unresolved problems and deficiencies after spending over $49 million.

Limited Effectiveness Once Project Funding Has Been Approved

According to the deputy director of the OIT, its oversight of a project is most effective when the feasibility study report is submitted, before funding for the project has been approved. At this stage, the sponsoring department is seeking the OIT's approval of the report and is seeking funding approval from the Department of Finance's budget unit. In addition to approving a department's feasibility study report, the OIT plays a key role in approving the funding for an information technology project, because a project's funding requires the approval of both the OIT and the Department of Finance's budget unit. However, once a project is underway and problems begin to surface, it is difficult for the OIT to stop the project. According to the deputy director of the OIT, its strategy has not been to stop troubled projects, but to get them back on track.

According to the OIT's director, he never saw the OIT as responsible for managing ongoing projects or stopping projects. However, some projects need to be stopped, and steering the project back on track is not necessarily in the State's best interests, as illustrated by the DMV's database redevelopment project. Even though in 1990 the OIT was aware that this project was significantly different from the project previously approved, the OIT continued to recommend approval for additional funding for the project. In our August 1994 report "The Department of Motor Vehicles and the Office of Information Technology Did Not Minimize the State's Financial Risk in the Database Redevelopment Project," we concluded that the OIT should not have recommended continued funding in November 1990, when the DMV requested an additional $3.9 million for fiscal year 1991-92. As of June 30, 1994, the DMV spent an additional $34.6 million on the project, which ultimately failed.

The OIT's Perspective

According to the deputy director of the OIT, the decision to employ information technology is a two-part decision: a business decision and an investment decision. The business decision is a fundamental part of the management responsibilities of the state departments that are sponsoring information technology projects. State departments must develop the business case for the use of information technology. In other words, the state department must show how the proposed technology will enable the department to better perform its mission or better serve its customers. So, for example, in justifying its recent acquisition of a new computer system, the California Student Aid Commission (commission) was required to show that the new system would help the commission improve its processing of student loans and grants. According to the deputy director of the OIT, the OIT's role is to be involved in the investment decision. That is, the OIT views itself as an investment committee that should review the business plans, from both a technical and economic perspective, to determine whether a

proposed project is a good strategic investment of limited public resources.

The OIT has adopted the philosophy that the ultimate responsibility for project success or failure resides with the department sponsoring the project.   According to the director of the OIT, because the ultimate approval of information technology projects requires both OIT and budget staff approval, the OIT's role mainly emphasizes support of the budget process, not independent authoritative oversight.   He stated that the OIT "was not the state information technology watchdog as it now appears was   the expectation of the legislation."

Chapter 3   The State's Current Information Technology Program Does Not Work and Needs To Be Reengineered

Chapter Summary

The State's current model for managing statewide information technology does not work.   The Office of Information Technology (OIT) has not provided the statewide leadership and coordination for information technology in the State as intended by the 1983 legislation that established the OIT.   Additionally, the oversight of information technology projects provided by the OIT is limited and does not ensure that state departments implement projects successfully.

To protect its information technology interests and assets, the State must reengineer the entire program.   To initiate the reengineering process, the State should establish a statewide chief information officer (CIO) position.   The CIO should serve as a member of the governor's cabinet and head a new statewide information resources office.

The CIO and the information resources office should be given the powers, duties, and responsibilities for developing and implementing a statewide plan for information technology, providing leadership and guidance to departments, managing and coordinating statewide information technology resources, and monitoring and overseeing projects based on a risk assessment.   In addition, the State should reevaluate the commitment of resources for managing its information technology resources.   Finally, the State will need to address the statutory changes necessary to complete the reengineering process, and the proposed CIO will need to implement procedural changes.

The Current Model Does Not Work

The State's current model for managing statewide information technology does not work.   The OIT has not provided the statewide leadership and coordination for information technology in the State as intended by the 1983 legislation that established the OIT.   Additionally, the oversight of information technology projects provided by the OIT is limited and does not ensure that state departments implement projects successfully.   Although the current decentralized leadership allows state departments the flexibility to determine and fulfill their own needs, it assumes that the vendor marketplace sets technology standards and that departments possess the expertise to manage information technology projects.   Additionally, the OIT perceives it has minimal statutory authority over data centers and multi-agency projects, resulting in minimal coordination of information technology projects, activities, and services.   Further, the State's information technology managers lack a user committee to communicate technology information, experience, and successes and failures among departments, and to serve as an advisory group to the OIT.   Finally, the OIT's interpretation of its investment committee role with limited authority to stop projects restricts its oversight effectiveness to front-end project analysis without effective ongoing follow-up on the progress of the projects.

The OIT recently became more involved in managing information technology resources by requiring departments to develop strategic plans for the use of information technology.   Strategic planning emphasizes the development of business strategies to support a department's mission and a plan for information technology to support those business strategies.   This approach began to shift the OIT's focus to department strategic planning and management of information technology resources.   However, the State has not committed adequate resources to the overall management of information technology resources in the State, and the OIT focuses most of its minimal resources on oversight.   Although the State's trend has been to increase spending on information technology, the OIT's staff resources have not kept pace with information technology spending.   As a result of budget cuts in fiscal year 1992-93, the OIT's staff was cut by 40 percent, after reaching its peak in fiscal year 1987-88 and maintaining that level through fiscal year 1991-92.   The trend toward increased spending for information technology is expected to increase throughout the 1990s.

Information technology management trends in other states are moving toward better management of a state's overall information technology resources with focused attention on the planning and procurement processes.   This management philosophy incorporates all information and technology resources under one management function, including data processing systems, telecommunication systems, office automation systems, systems development, data administration, data centers,

purchasing, personnel, and other information resources, such as state libraries and records management.   In contrast, California has limited central management because the OIT focuses its resources mainly on the oversight of information technology projects and has minimal involvement in telecommunications, data centers, procurement, personnel, and the other information resources noted.

In the following sections of this report, we have made several recommendations that should be addressed in the reengineering process.   Certain aspects of these recommendations may to a limited degree exist already under the current model for managing statewide information technology.   For example, we suggest that the CIO implement management practices that require project milestones.   To some extent, the OIT requires project milestones, like the prototype and pilot project requirements for the Department of Motor Vehicles' database redevelopment project.   However, the management model that we have proposed here is intended to be comprehensive.

Reengineer the Statewide Information Technology

In view of the limitations of the current processes, the State must reengineer the entire statewide information technology program to ensure that the State's information technology interests and assets are protected and utilized to their maximum potential.

To initiate the reengineering process, the State should establish a statewide CIO position.   The CIO should serve as a member of the governor's cabinet and head a new statewide information resources office.   The CIO and information resources office should be given the following powers, duties, and responsibilities:

☑ Develop and implement a comprehensive statewide information technology plan that provides the vision and strategy to promote innovation, advocacy, and efficient use of information technology resources;

☑ Provide leadership and guidance to departments developing and implementing information technology projects;

☑ Manage and coordinate statewide information technology resources, such as telecommunications, data center activities, and multi-agency information technology projects; and

☑ Monitor and oversee information technology projects based on a risk assessment.   The CIO should have the power to recommend to the governor whether a project is continued, modified, or canceled.

Establish a CIO in the Governor's Cabinet

Many of the OIT's leadership, coordination, and oversight problems can be attributed to the office's placement within the Department of Finance. The OIT has evolved to serve as a support function for the Department of Finance, reviewing business plans and feasibility studies for information technology. The OIT mainly supports the budget process and is not an independent entity providing authoritative, technical oversight. The director of the OIT states that the Department of Finance's budget staff could be as influential over an information technology project decision as is the OIT. In effect, the OIT's power and authority over department directors is compromised because it is within the Department of Finance and not independent of the budget approval process.

In addition, the OIT has a narrow interpretation of its statutory role, a perceived lack of authority, and limited resources. In view of these considerations, the OIT has not provided sufficient guidance on information technology matters to state departments or effectively coordinated the State's information technology resources. Further, the design and implementation of OIT's oversight of projects have been flawed. To improve the statewide information technology program, the State should eliminate the OIT and establish a new statewide information resources office. The CIO should serve as director of this new independent office and advise the governor on information technology.

The responsibilities of the information resources office should be expanded beyond those of the existing OIT and encompass management or oversight of telecommunications and the State's data centers. The State also should consider what role the information resources office should have in procuring information technology and how the office can help to reform state personnel practices to attract a sufficient number of highly qualified information technology personnel. Both of these issues, which are beyond the scope of our work as it directly relates to the OIT, are discussed at the end of this chapter.

The Department of Finance and its director, who acts as the governor's chief fiscal policy advisor, provide a good organizational model for a new statewide information resources office. The director effectively is the State's chief financial officer, responsible for the fiscal affairs of the State. The director of the proposed new statewide information resources office should act as the State's chief information officer, responsible for the information technology affairs of the State at a level of responsibility equal to that of the State's chief financial officer. In effect, the chief financial officer model provides the appropriate authority, policy setting, and advisor framework that is necessary for the CIO to manage the information technology resources of the State.

Promote Innovation, Advocacy, and Use of Information Technology Resources

The State needs a statewide information technology plan with vision to promote innovation, advocacy, and use of information technology resources. The plan should include strategies for all information technology resources in the State and recommend implementation methods to put the strategies into action. The plan should be based on the State's overall vision, business strategies, and direction for effective government operations and public service. Based on our review of other states, we noted that one large state's information technology plan includes the following:

- An overall plan for information technology resources, based on a vision to empower that state's citizens through direct and easy access to the specific information and services they need, allowing them to fulfill their needs and express their opinions directly, wherever they are, at any time of day;

- Goals supporting the state's vision, which include improving the information technology systems and the personnel developing and operating those systems, efficiently acquiring and implementing the improvements to the information technology systems, and enhancing program effectiveness by basing information technology improvements on an understanding of citizen and user needs;

- Implementation strategies for each of the goals, including measurements for successful implementation of each strategy; and

- The assignment of responsibility to carry out those strategies.

California's CIO should develop a statewide strategic plan for information technology based on the State's vision and business strategies. This plan should then be communicated to all departments and key state personnel to ensure that information technology planning at the department level is consistent with the State's plan.

In addition, the CIO should continue to emphasize and monitor strategic business planning and information technology planning at the department level. This planning approach, encouraged by the OIT, has prompted departments to evaluate and change the way they do business while using information technology to support those changes. According to the U.S. General Accounting Office (GAO) in its "Executive Guide: Improving Mission Performance Through Strategic Information Management and Technology," this approach focuses information technology strategies on addressing external customer needs, attaining the overall department mission, supporting business strategies, and improving the methods of doing business. Further, this approach can lead to the highest potential gains in

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customer satisfaction and cost savings, rather than the marginal efficiency gains normally associated with initiatives that computerize existing procedures.

Develop Preferred Management Practices

The CIO should develop preferred management practices to improve the management of the State's diverse information technology environment.   Such practices should address the need for efficient and effective design, development, implementation, and operation of information systems that are capable of adapting to rapid legislative, program, and information technology changes.   Overall, the statewide information technology program must address the need to lead departments in the direction of building an effective information technology infrastructure, including the hardware, software, communications, personnel, policies, and plans that support the development and operation of information systems.

In addition, the State should evaluate and reconfigure, if necessary, the alignment of program managers with technology managers and the responsibility for the development, operation, and use of information technology.   Because information technology planning should be based on departments' business strategies, management structures must reflect the changing roles of program and information technology managers at all levels.   According to the GAO, program managers must be held accountable for the impact of information management on their program functions.   In addition, the GAO suggests that departments establish chief information officers at the senior executive level rather than at the line manager level.   Both these suggestions address the need to incorporate information technology in all aspects of programs and at all levels of management to ensure that information technology benefits the entire organization as intended by senior decision makers.

Also, the State should consider the use of performance budgeting in the management and delivery of information technology systems throughout all levels of government, including the proposed information resources office.   As noted in the 1994-95 Governor's Budget, the State's Performance Budgeting Pilot Project introduces the concept of changing organizational behavior by rewarding measurable results that are tied directly to the organization's mission and business strategies.   Emphasizing the same approach in the management of information technology allows both program and information technology managers at all levels to measure performance of the information systems development and operations efforts.   With performance measurement tools, the State's managers, project

managers, staff members, and outside contractors should become accountable for results, compared to predefined performance standards. The desired results should be improved customer service based on improved information systems performance, better management of business and information technology risks, and better information systems development.

Further, to introduce performance budgeting in the process for developing information systems, the CIO should adopt formal project management methodologies that focus on evaluating project risk and tracking progress throughout a systems development project. Quantitative tools should be made available with training to state departments. Such tools could include project accounting, which compares budgeted resources to actual resources expended; change management, which tracks requested and unavoidable software changes; and issues management tools, which assess a project manager's ability to identify and resolve business, technical, and contractor problems arising during the development of information systems. Such tools give departments and the statewide information resources office mechanisms to identify early system development problems. According to the GAO, in its "Information Technology: Audit Guide for Assessing Acquisition Risks," management and auditors can use these tools to assess how well a department is managing the systems development process.

Finally, the CIO should implement management practices that reduce the development time for information systems and require project milestones to periodically reassess project feasibility and measure progress. Shorter project development times and project milestones improve the probability of success and reduce the overall risk of system failure. One state department attempts to limit the length of projects or major project sections to one year and individual project tasks to between 40 and 80 hours, which allows it to better manage the project and closely evaluate individual staff performance. Additionally, during our audit of the Department of Motor Vehicles, we found that it bypassed the prototype and pilot project milestones for its database redevelopment project without analyzing project feasibility at either stage. Not adhering to those milestones cost the Department of Motor Vehicles an additional $34.6 million in development costs it might not have spent if it had analyzed the project's technological feasibility before incurring additional costs.

Develop Preferred Technology Practices

The CIO should determine the appropriate level of preferred technology practices, guidelines, and standards for the State. Statewide preferred technology practices and standards should provide overall guidance for moving information systems of state departments

in the same technical direction; however, extensive standardization may have a greater cost than benefit.

As discussed in Chapter 1, the OIT was given the responsibility of developing plans and policies that include the objective of ensuring that systems and the interchange of data are appropriately compatible. However, the OIT believes that establishing standards to accomplish this objective may not always be in the best interests of the State and that reliance on the vendor marketplace for standards is appropriate. We recognize that too much standardization may inhibit the effective implementation of information systems. For example, officials we interviewed in one state attempted to standardize methods for developing information systems that were later determined to be too restrictive and inefficient. They found that these restrictive standards limited the departments and, in some cases, their contractors from using the best methods for particular situations. The state eventually eliminated the strict standards and replaced them with a program to assist and train departments to implement standard methodologies most suited to the departments' situations. The trade-off between no standards and restrictive standards should be analyzed by the CIO in order to adopt the appropriate level of statewide standards.

The CIO should continue the State's effort to explore emerging new technologies and their application to the State's information technology plan. In conjunction with the private sector, the statewide information resources office should identify and coordinate opportunities for new advanced technologies. In the past, the data centers and various departments have independently developed emerging technologies, such as the Info/California kiosks, document imaging, merging of voice and data communications, and new computer operating systems for optimizing mainframe applications. According to the OIT's 1993 strategic direction document, many departments have made several advances in emerging technologies; however, the CIO should centrally manage this effort to ensure that state resources are appropriately allocated only to those projects that meet the State's business strategies and information technology plan.

Relationships with the community of information technology vendors provide the State with additional resources to analyze and apply advanced technologies to state use. In addition, partnerships with the vendor community potentially allow the State to share the risks associated with systems development projects with private industry. Allowing vendors to propose solutions to the State's information technology problems in addition to allowing departments to share the risks and benefits of systems development projects may further improve relationships with information technology vendors while reducing the State's risks. The CIO should centrally manage the State's efforts to develop these relationships to optimize this resource in achieving the State's overall business strategies and information technology plans.

Provide Leadership and Guidance to Departments

The ability of the CIO to communicate with information technology managers, assist with the development of department information technology infrastructure, and provide training to information technology managers and staff in the State will be critical to the leadership role of the information resources office. The statewide information technology plan, programs, and policies developed by the information resources office need to be based on input from various public and private sources and effectively communicated to state departments. In addition, several other leadership and guidance issues that address the development of information technology infrastructure in departments throughout the State should be considered by the State when reengineering the statewide information technology program and by the CIO when establishing the information resources office.

To ensure that the information technology needs of the state departments are met, the State should establish an advisory group or groups that assist the CIO in developing its statewide information technology plans, programs, and policies. In addition, the State must develop well-defined advisory groups and related policies that effectively communicate with the State's information technology community, the Legislature, and the private sector. The State should determine the appropriate group or groups and empower them to perform these tasks.

The California Forum on Information Technology (CFIT) is one example of an advisory group for information technology in the State. As noted in Chapter 1, the OIT's director created the CFIT and served as its chairman. The CFIT consisted of representatives from state departments and served as a liaison between state departments and the OIT. Because of the 1992-93 budget cuts resulting in the elimination of certain boards and commissions, the State eliminated the CFIT. Several information technology managers whom we interviewed expressed the need to create another forum to improve the

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communication of information technology issues, including discussions of the State's information technology successes and failures.

In addition, two information technology advisory groups were recommended by the governor's Task Force on Government Technology Policy and Procurement in its September 1994 report recommending a restructuring of the State's information technology management and oversight. The governor's task force also recommended an internal advisory council, consisting of information technology executives from state departments, which would provide the CIO with advice on policies, standards, major projects, and strategic technologies. In addition, the task force recommended an external commission that would comprise information technology executives from the private sector and possibly individuals from the Legislature to advise the State on the best information technology practices in other organizations; on how to improve relationships with private industry, including participating in joint projects; and on the State's long-term information technology vision and strategies.

When creating advisory groups, the State should exercise care in determining the appropriate group members and establishing the groups' purposes. The effort to establish advisory groups should focus on the need to address the State's highest risks and highest rewards. Consistent with the risk management approach discussed in the section on monitoring and oversight on page 53, the State needs to focus its limited resources on those issues that lead to minimizing risks and maximizing benefits to the State rather than to individual departments.

In addition to improving its communications, the CIO should establish programs to help departments implement preferred management and information technology practices. Consistent with the trend of information resources offices in other states, the State should take a proactive approach to improve information technology infrastructure in departments throughout the State by focusing on the ability of state departments to develop and manage information technology. Such an approach should include assistance in department information technology planning, project management and implementation, systems development methodologies, and information technology training and staff development.

The CIO also should be involved in analyzing and justifying resources for developing the information technology infrastructures of departments. To the extent that certain departments require additional resources to improve methods and procedures for developing information systems, the CIO should be actively providing guidance. For example, according to the Department of Social Services' deputy director of the Information Technology Division, this department needs to allocate significant resources to implement project management and systems development methodologies and tools for its information technology systems, including the State's largest information technology project, the Statewide Automated Welfare System. Developing an infrastructure capable of managing major projects is imperative to the State's information technology program success. The CIO needs to ensure that adequate resources are allocated to departments to develop this infrastructure.

Furthermore, the State should allocate more resources to training program and information technology managers and staff members as part of its effort to improve the information technology infrastructure of departments. Training should focus on both information technology and administrative topics, including project management and contract management for contracts with information technology vendors. In addition, the State should consider moving the statewide training programs for information technology into the information resources office. The CIO could then match the training curriculum with statewide information technology issues and problems experienced by departments. Further, the State should consider the continued support of the Data Processing Managers Academy, which provides advanced training to junior-level data processing managers. A similar organization for project managers also should be established.

Manage and Coordinate Statewide Information Technology Resources

Management of the State's information technology resources is the basic theme of the proposed reengineering process. The State should consider moving the management of various resources into the information resources office to coordinate all the State's related information technology resources. Coordination of resources at the project level among various departments and the federal and other local governments also should result in a more efficient use of the State's resources.

The State should move its telecommunications division out of the Department of General Services and into the information resources office under the management of the CIO. Many of the State's information technology systems involve telecommunications. For example, the Department of Motor Vehicles, the California Department of Corrections, and the Department of Social Services all have telecommunication systems that link field operation computers to the

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main data processing center. Because the relationship between the information technology systems and telecommunication systems is close and will be even closer in the future, the State could benefit by combining the management and coordination of these resources into the information resources office.

In addition to managing both information technology and telecommunications, the CIO also could identify potential consolidation opportunities for various telecommunications networks and promote a statewide telecommunications network to improve efficiency and minimize duplicated systems in the State. For example, the OIT has stated its concern that the State continues to develop telecommunications networks that duplicate existing facilities, with the result that costs increase and service levels do not reach levels that could be attained. In addition, according to one department we interviewed, due to the lack of standards and insufficient infrastructure development, departments such as theirs must undertake complex technical tasks and assume considerable risk in accomplishing the data communications function. If the State provided an appropriate telecommunications network, the department believes it could more cost effectively solve its data communication problems.

The State should provide the CIO with the appropriate authority to plan, coordinate, and oversee the activities of data center management to ensure that statewide interests are met. The coordination of these data processing resources should improve use and efficiency while providing more cost-competitive services. A centralized approach to managing the State's data center resources would provide the State the opportunity to review data center consolidation as well as other options, such as the use of private companies, that could result in decreased data processing costs to the State.

The statutes establishing the CIO should clearly provide the CIO with the appropriate authority to identify, coordinate, and ensure the implementation of information technology projects that affect multiple departments of the State. Such multi-agency projects can potentially reduce government operating costs resulting from improved program efficiencies that cross departmental lines. The CIO should have the responsibility to promote and coordinate such governmental reengineering projects. For example, in 1990, the Legislature mandated the Franchise Tax Board, the Employment Development Department, and the Board of Equalization to explore electronic funds transfer as a means of collecting tax payments. According to the chief of the Information Management Division at the Board of Equalization, the State Controller's Office facilitated the development of this project with some assistance from the OIT. However, as noted in Chapter 1, the OIT does not believe it has the authority to coordinate these types of projects.

The statutes establishing the CIO also should clearly provide the CIO with the appropriate authority to coordinate certain information technology projects with various departments of the federal and local governments affected by such projects.   For example, according to the chief of information technology at the California Department of Corrections (CDC), the Legislature mandated the CDC to make corrections information available to local police departments. However, the Department of Justice system, which gives local law enforcement agencies access to computerized state and federal information, is the logical conduit for information from the CDC.   This is an example of a project that could benefit from the CIO's coordination of the project implementation between departments.

Monitor and Oversee Information Technology Projects Based on Risk Assessment

The planning, leadership, and resource management sections above emphasize the information resources office and the CIO's role in proactively assisting in the development and management of the State's information technology resources.   The State should also place the oversight emphasis of the CIO and the information resources office on analyzing and assessing each department's ability to develop and manage information systems that support the department's business strategies.   In addition, the oversight effort of the information resources office should be based on the CIO's active involvement with departments and some form of independent review of major information technology projects.

The CIO should apportion its oversight effort based on the existing information technology infrastructure at the department, the magnitude of the project, and the overall risk to the State.   For example, the Department of Social Services and its Statewide Automated Welfare System, with estimated development and operating costs of approximately $800 million over the expected 12-year life of the project, would consume more oversight resources than many information technology projects in smaller departments.   Since these smaller projects would generally pose minimal financial or technical risk to the State, the CIO could provide consulting assistance and ensure that a good information technology infrastructure existed.   A risk management approach allocates more resources to the oversight of larger departments that have significant information technology budgets or projects and that have neither an adequate infrastructure in place nor a successful track record in developing and managing information technology projects.

For high risk projects, the CIO should monitor the progress of projects identified for oversight by being directly involved in the development process throughout the life of the projects.   To augment the CIO's oversight, the State should consider requiring an independent review of

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projects by personnel not involved in the project's development. Before approving a project or completing major project milestones, this independent review could validate the cost and benefit estimates and the technical feasibility of the State's higher risk projects. An independent review process could provide department management and the CIO with a summary of project issues and status reports developed by experienced information technology personnel not directly involved with the project.

For lower risk or smaller projects, the CIO should analyze project risk as part of the overall oversight of information technology plans for departments. If departments in this category cannot demonstrate the ability to develop information systems, the information resources office should provide the department with consulting services to improve the information technology infrastructure in accordance with the State's preferred practices and to help ensure the success of a project. The CIO also may need to recommend other resources, such as an independent review, if critical to project success.

In addition to adopting a risk assessment approach to oversight, the State should provide the CIO with the appropriate authority to independently recommend to the governor whether a project should be continued, modified, or canceled. The CIO should monitor projects and, at key, predetermined milestones, assess the feasibility and progress of the projects. In addition, the CIO should be empowered to recommend that funding be withheld, reduced, or suspended or that other actions be taken when a project is not meeting expectations. The CIO should ensure that information technology projects that are not consistent with state and department information technology plans, do not meet state criteria, or have not met project milestones are not funded or supported for continued funding. The OIT currently has the ability to affect funding decisions; however, authority for project funding approval is shared jointly between the OIT and the budget units of the Department of Finance.

Because adequate planning is the key to successful development and implementation of information technology projects, the CIO should evaluate the existing level of documentation necessary to approve information technology plans and projects. The new oversight process should be adapted to the statutes, policies, and procedures adopted as a result of reengineering the State's current information technology program. Moreover, rather than create additional documentation and unnecessary bureaucracy, the CIO's monitoring and oversight should be based on periodic key site visits and information-gathering meetings at the department under review. This process should not burden the project but should provide the CIO and department officials with an independent assessment of the project to allow timely decisions.

Other Issues Affecting Information Technology Systems

Other functions of the State's operations affect the development and management of information technology. Because these areas are outside the scope of our audit, we have limited our discussion here to general areas that the State should evaluate and consider changing to minimize any potential negative effect on the development and management of information technology systems.

Evaluate Practices for Procuring Information Technology

The State should evaluate procurement practices for information technology to reduce the time required to approve and develop information technology systems and limit the State's risk from slow project implementation. As noted in the 1994-95 Governor's Budget, the existing procurement and contracting procedures incorrectly emphasize process rather than results, low price rather than value, and detailed specifications rather than functional requirements. In response, the Department of General Services, at the direction of the governor, has initiated a procurement reform effort. In addition, we noted certain issues regarding information technology procurement that were brought to our attention while performing our review. We feel that the following issues should be considered as part of the overall procurement reform effort and the reengineering effort that we have suggested:

- The State should consider whether the information resources office should manage information technology procurement and how much of the procurement oversight should be delegated to departments.

- In conjunction with potential changes in the delegation of procurement oversight to departments, the State should ensure that it properly trains department staff in procurement and contract management.

- The information resources office should encourage departments to write requests for proposals that define information technology problems for contractors to solve instead of specifying solutions.

- Departments should develop information technology approaches that share more risk with contractors and hold contractors more accountable for results.

- The State should improve its vendor protest rules to minimize project delays that result when unsuccessful bidders submit protests after contracts have been awarded.

**Evaluate and Change Information
Technology Personnel Practices**

The State should evaluate and change personnel practices for information technology personnel as needed to improve information technology expertise in the State. As noted in the 1994-95 Governor's Budget, the State is considering reforming state personnel practices to address this need. In our interviews with various state departments, information technology managers consistently expressed their concern about attracting experienced project managers and technical staff into state service.

**An Increase
Needed in
Resources**

The State needs to increase its commitment of resources to the statewide management of information technology. Also, the State should consider appropriate funding sources to expand the scope of the statewide information resources program. One potential funding method would be to consider the CIO and the information resources office as a service agency in which billings for services could offset all costs of the information resources office. Oversight costs could be charged to projects requiring direct oversight from the CIO. Costs for independent review of information technology projects could be built into the cost of the projects. Training, consulting, and other services provided by the information resources office could be billed to departments based on services provided.

**Required
Statutory and
Procedural
Changes**

The recommendations to establish a new statewide information technology program and to reevaluate the commitment of resources to this program will require significant statutory and procedural changes. The issues we have identified and developed in this chapter should be considered and included in legislation to reengineer the State's information technology program.

Conclusion

The State's current model for managing statewide information technology does not work. The State must reengineer the entire statewide information technology program to ensure that the State's information technology interests and assets are protected and used to their maximum potential.

The State should consider our proposed recommendations when reengineering the statewide information technology program. The most important reengineering decision should be to establish a statewide CIO position. The CIO should serve as a member of the

governor's cabinet and head a new statewide information resources office responsible for managing and developing the State's information technology resources.

Overall, information technology provides the State with an opportunity to improve public service while increasing program efficiency. Unfortunately, state departments find it difficult to keep pace with evolving management practices and skills necessary to precisely define critical information needs and to select, apply, and control changing information technologies.   As the Legislature, the federal government, and local governments continue to add program changes, the information technology infrastructures of state departments continue to fall further behind.

The proposed recommendations provide the State with a framework to create effective leadership for the State's departments, program managers, and information technology managers, as well as effective management for the State's information technology resources.   With the responsibility of managing and developing the State's information technology resources, the CIO's efforts must result in the development of dynamic information technology systems and infrastructure that can readily adapt to change.

We conducted this review under the authority vested in the state auditor by Section 8543 et seq. of the California Government Code and according to generally accepted governmental auditing standards.   We limited our review to those areas specified in the audit scope of this report.

Respectfully submitted,

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State Auditor

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