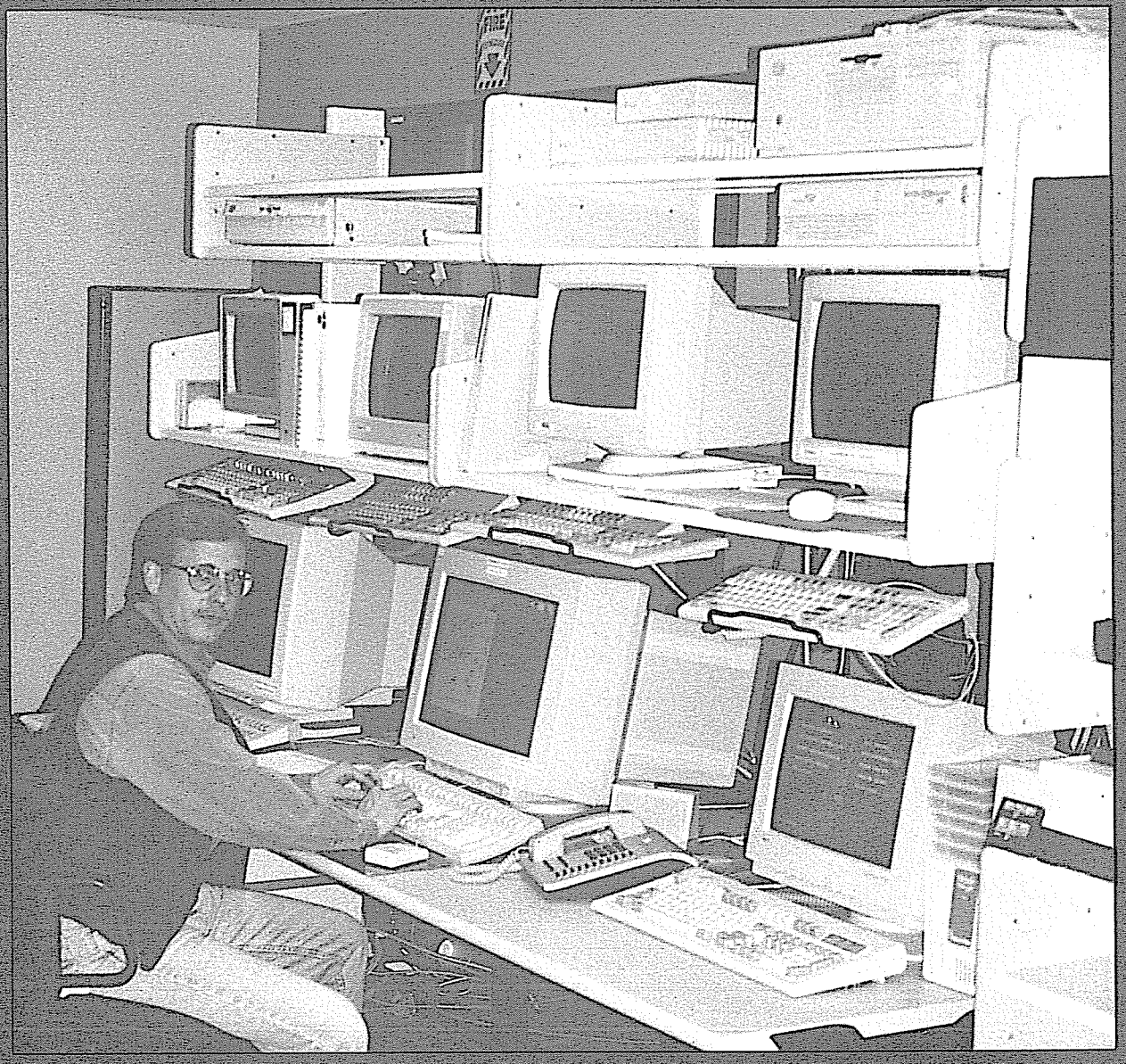
# Statewide Systems Project

February 1997

A Program Evaluation Report



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Office of the Legislative Auditor
State of Minnesota

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Report #97-05

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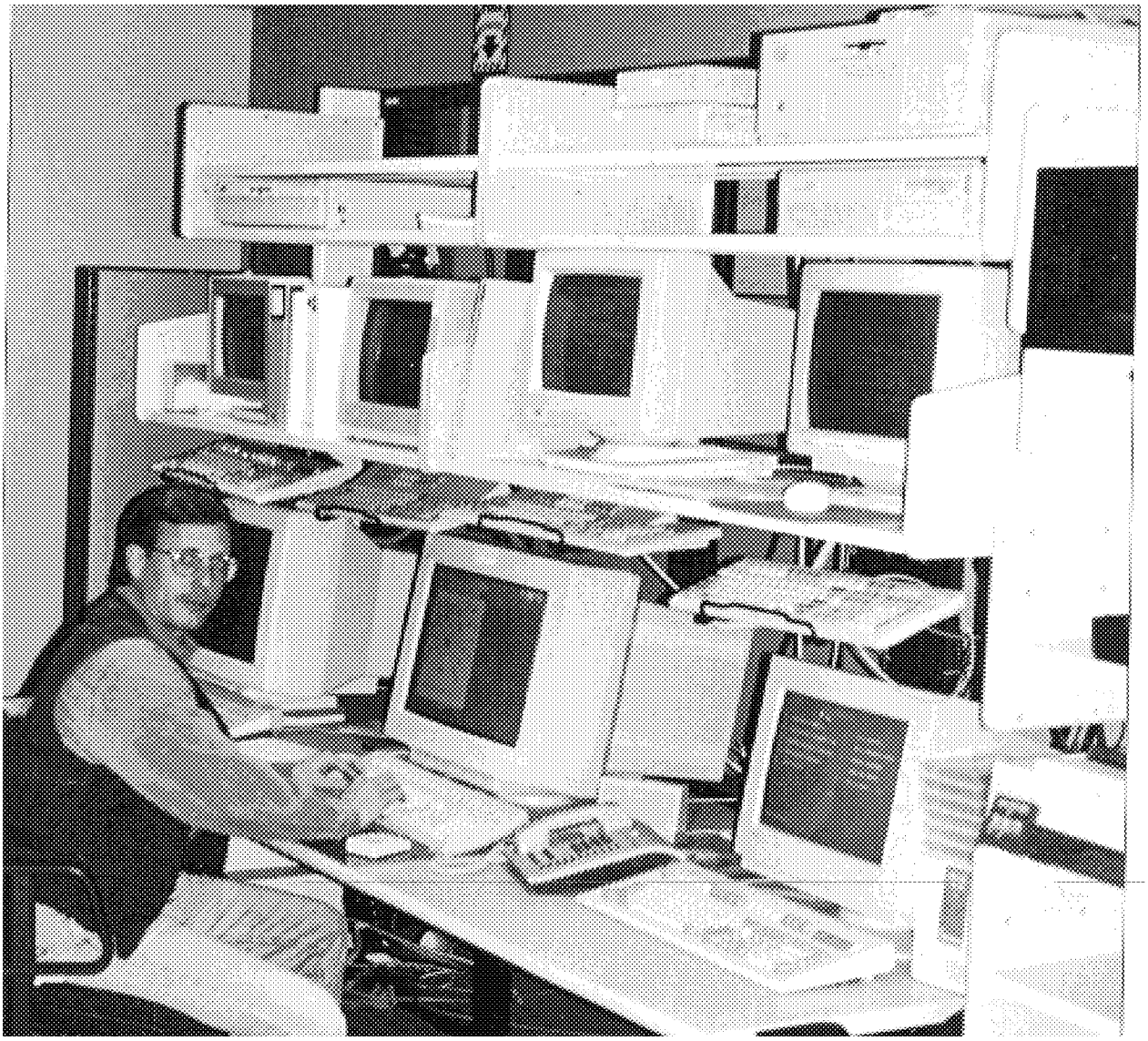

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JAMES R. NOBLES, LEGISLATIVE AUDITOR

February 6, 1997

Members
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The Statewide Systems Project was initiated in 1991 to replace state government's computerized accounting, procurement, and payroll systems and create new human resources and decision support systems. In May 1996, as the new systems became operational, the Legislative Audit Commission directed us to assess the costs and benefits of the new systems and evaluate how well they have met their objectives.

Given the inherent difficulties in developing large, complex computer systems and the state's recent experience with other large systems, we conclude that the Statewide Systems Project has been moderately successful. The project has achieved many of its most important objectives and the new systems currently perform most of the critical functions for which they were designed.

But many problems, including higher costs, resulted from the project's extensive scope and complexity. Also, many of the benefits anticipated for the new systems, such as cost savings and enhanced functionality, have not yet materialized. For the most part, users have overcome initial doubts about the new systems, but they still have serious concerns about the new procurement system. We recommend a re-examination of the design, functionality, and use of the procurement system.

We appreciate the assistance of the three agencies that sponsored the Statewide Systems Project: the Department of Finance, the Department of Administration, and the Department of Employee Relations. Our report was researched and written by Tom Walstrom (project manager), Jan Sandberg, and Nicholas Franco.

Sincerely,

James Nobles
Legislative Auditor

Roger Brooks
Deputy Legislative Auditor

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## MINNESOTA OFFICE OF THE LEGISLATIVE AUDITOR

# Statewide Systems Project

**SUMMARY**

**The departments of Finance, Employee Relations, and Administration sponsored the Statewide Systems Project.**

Like most complex organizations today, Minnesota state government relies on numerous computer systems to support its internal administrative functions. Recognizing the need to periodically upgrade these systems to meet the changing needs of government, the state initiated the "Statewide Systems Project" (SSP) in 1991. Its purpose, as defined in 1992, was to replace the state's computer systems for accounting, procurement, and payroll functions, and create new human resources and decision support systems.

The project was sponsored by the departments of Finance, Employee Relations, and Administration, which assembled a project development team of state employees and selected outside consultants to assist with different phases of the project. By the time the systems became operational, between mid-1995 and early 1996, the project cost nearly $36 million--over 50 percent more than anticipated when the project was originally conceived in 1991.

The higher than anticipated costs, and the complaints of some users that the new systems were inadequate and hard to use, prompted the Legislative Audit Commission to authorize an evaluation of the Statewide Systems Project. The commission wanted the evaluation to examine the expenditure of funds and to determine whether, on balance, the project has been successful. The commission also thought that a review of the state's experience with the Statewide Systems Project and similar large computer development projects could help policy makers make better decisions about future systems projects.

Our evaluation addressed these key issues:

- **What are the costs and benefits of the new computer systems to date? Do the new systems meet the state's planned objectives? To what extent have the new systems saved the state money?**

- **How satisfied are the users of the new systems?**

- **What steps should be taken now to address current problems, and what strategies should the state follow to maximize the chance of success with future computer development projects?**

To answer these questions, we conducted interviews with more than 120 staff in 30 state agencies about the project's development and implementation and sur-

veyed a random sample of users of the new systems. We also consulted with national experts and reviewed the literature on systems development. In order to provide a broader context for our analysis, we also briefly reviewed five other large systems projects developed in Minnesota recently.

- **Overall, we found that the Statewide Systems Project has been moderately successful.**

Virtually all of the components of the project are now performing their basic, intended functions, and in most cases the users are satisfied with the result. Increasing familiarity with the new systems has reduced the early doubts of many users.

We qualify our conclusion and call the Statewide Systems Project "moderately" successful because numerous problems, including higher costs, resulted from the project's extensive scope and complexity. In addition, many of the benefits anticipated from the new systems, such as cost savings and enhanced functionality in some areas, have not yet materialized. The new procurement system has additional shortcomings and needs to be re-examined.

**Developing new computer systems is a complex and difficult activity.**

On the other hand, we think these problems should be put in context. Developing new computer systems is a complex and difficult activity, and Minnesota's experience with SSP has been more positive than many similar efforts in both the private and public sectors. A leading consultant told us that 80 percent of systems projects "fail" because they are not completed on time or within budget, or do not meet user expectations.

# OVERVIEW OF THE STATEWIDE SYSTEMS PROJECT

The Statewide Systems Project consists of three major components (see Figure 1):

- The new accounting system is known as the Government Financial System (GFS).

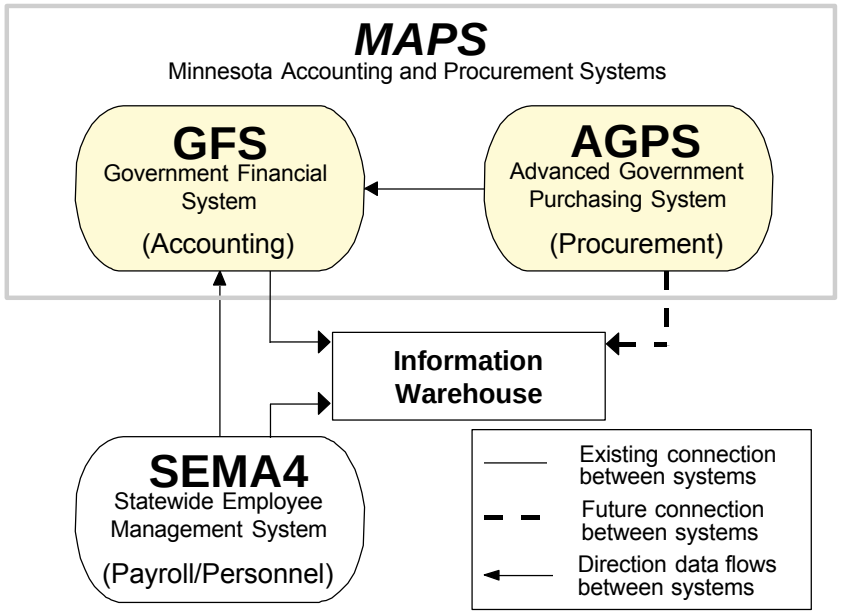
- The new procurement system is called the Advanced Government Purchasing System (AGPS).

- The new human resources/payroll system is known as the Statewide Employee Management System (SEMA4).

The first two systems are interrelated and are frequently referred to as the Minnesota Accounting and Procurement Systems (MAPS). In addition, the project developed an "information warehouse" which brings together data from the new systems and enables users to generate reports for decision support.

For most of its existence, the Statewide Systems Project has been directed by a steering committee, consisting of the commissioners of the three sponsoring

**Figure 1: Components of the Statewide Systems Project**




Source: Office of the Legislative Auditor.

agencies and deputy or assistant commissioners from four other large agencies. The Department of Finance received appropriations of $300,000 in 1991 and another $1.8 million in 1992 to help the project steering committee, assisted by a consultant and five work groups, plan for the new systems. The steering committee decided to purchase and modify existing software packages as the basis for the new systems and hired a major national consulting firm, Andersen Consulting, to customize them to meet the state's needs.

# COMPUTER SYSTEM DEVELOPMENT AND OPERATING COSTS

**Cost estimates for the project grew as it developed.**

The cost estimates for the Statewide Systems Project grew as the project developed. The earliest rough estimates in 1991 called for a $15-20 million project to replace the accounting and payroll systems. An estimate of $19.5 million was made in the steering committee's 1992 *Report to the Legislature* to replace the accounting, payroll, and procurement systems and add a new human resources and decision support system, but when the project received bids from vendors in March 1993, the projected budget rose to $26.1 million. By 1996, the total cost of the Statewide Systems Project exceeded $35.8 million. This does not include the costs of training, networking, state employee release time, or most equipment that needed to be purchased by individual agencies in order to use the new systems.

According to our study:

- **The costs rose from what was originally anticipated largely because additional components were added and there were changes to the original specifications for each of the components.**

Changes were needed in part because several separate agency accounting systems that were to be replaced were not identified until late 1993. In addition, it took much more effort than originally anticipated by either the state or the consultant to modify all components to meet the state's requirements.

Between March 1993 and mid-1996, the project's total cost rose almost $10 million. Approximately $5 million of this amount went to Andersen Consulting for the additional work required by the changes in the systems' specifications. In addition, about $1.6 million was spent on additional support for agencies, about $2 million went to pay state employees for work that was originally unanticipated, and the rest was spent on computer usage charges to test the new systems.

Over time, the most important computer system costs are those required to operate the system from year to year. We found that:

- **The Statewide Systems Project's operating costs are much higher than anticipated.**

**Operating costs are higher than expected, but the sponsoring agencies are attempting to reduce them.**

The project's earliest operating cost estimates noted that the four new systems would cost more than the old systems--perhaps as much as 250 percent more than the $1.7 million it took to run the old statewide accounting and personnel/payroll systems--because they would handle more transactions and perform additional functions. The 1992 Legislature was told by the then Commissioner of Finance that operating costs would be less than $5 million per year. However, we estimate that operating costs will exceed $16 million in fiscal year 1997. This includes the costs for approximately 60 staff in the Department of Finance's "Mn-ASSIST " office who are responsible for making technical modifications to the systems and providing user support.[1] According to agency managers we interviewed, even this level of staffing is inadequate to meet current needs, and therefore operating costs may rise even further in the future.

The state has made a number of efforts to reduce operating costs. Sponsoring agencies' staff have continually optimized the underlying computer code and data to make the system consume fewer mainframe computer resources. In addition, they have evaluated and decided to implement a non-mainframe solution for the information warehouse. According to the sponsoring agencies, this solution is projected to save over $1 million per year in operating costs. Non-mainframe systems offer the potential of saving money on operating costs (and possibly improving response time) for other components of the Statewide Systems Project. We think that the sponsoring agencies should continue to explore non-mainframe solutions for the other components of the Statewide Systems Project.

*1* Additional support is provided by functional analysts in the sponsoring agencies.

Finally, the accounting software that Minnesota chose does not accommodate transactions with four-digit dates, nor did any of the accounting packages offered for purchase by the state in 1992. This issue--often referred to as the "Year 2000 problem "--was discussed when the vendor was chosen, and although the steering committee realized it would have to be fixed later, they decided to continue with the software acquisition. According to project managers, there was no attempt to keep this information from the Legislature. However, the steering committee's action effectively committed the state to additional expenditures, and the Legislature was not informed of the problem until January 1995. Therefore, the Legislature did not have all of the relevant facts when deliberating on the 1993 and 1994 appropriation requests. The accounting and procurement software now in use will have to be upgraded at a cost estimated to be about $4.5 million.[2]

# ACHIEVEMENT OF OBJECTIVES

Early on, the proponents of the Statewide Systems Project emphasized the many benefits that would result from its implementation. We found that, in fact:

- **Many benefits have materialized from the Statewide Systems Project.**

**Project benefits include more information and a more accurate picture of the state's financial status.**

For example, the new systems collect more information than the systems they replaced. Also, information is believed to be more widely available, easier to obtain, more timely, and thus, in some cases, more accurate. In addition, for some components, the new systems give users the ability to generate custom reports on demand. The greater access to information--and the greater ease of manipulating it--has enabled agencies to better oversee accounts and has increased their ability to use information for planning purposes.

The Statewide Systems Project also forced agencies to improve their agency computer systems and networks. Some agency employees said that increased interconnectivity of state agencies has enabled better communication and cooperation between agencies. In addition, the user groups for the new systems have increased interagency communication.

The new accounting system (GFS) has many new features that were not available before and gives a more accurate picture of the state's financial status. Agencies now have accounting information on line, and, unlike the old system, the new system has largely eliminated the double-entry of information and eased the difficulty in reconciling accounts.

The new procurement system (AGPS) has enabled state agencies to decentralize the procurement function in some cases. Although on average purchase orders take longer to enter, overall, those that are entered successfully take less time to process since orders no longer have to be sent to accounting. Also, all procurement transactions are now handled by one computer-based system.

*2* The procurement software technically accommodates the year 2000, but it does not accommodate four-digit dates, and because it works in concert with the accounting system, needs to be upgraded.

**The new human resources/ payroll system is a major step forward.**

Finally, the new human resources/payroll system (SEMA4) is a major step forward since the state's human resources function is now computer-based for the first time. The new system is relatively easy to learn and navigate, and on-line processing gives agencies more time to complete certain tasks. Under the new system it is easier to transfer employees between agencies, record salary changes, and hire people much later in the pay period.

According to the state's consultant and project sponsors, the project was supposed to: 1) save money by restructuring financial and compliance control processes and by replacing paper-based transactions with electronic processes; 2) provide better and more accessible information to policy makers and administrators; 3) improve the linkage between statewide financial and human resources information; 4) replace numerous separate computerized accounting systems used by individual agencies; 5) provide flexible systems that would be easy to change to meet future needs; and 6) provide better service to the state's citizens, vendors, and customers.[3]

We examined each of these specific objectives to determine the extent to which they have been achieved so far. Unfortunately, our examination was complicated by the lack of baseline information about the old computer systems and the difficulty of quantifying many of the measures of system performance. Nevertheless, it is evident that many of the original objectives have not been met. Moreover, we conclude that many of the original objectives were probably unrealistic. The ambitious objectives heightened expectations among policy makers and contributed significantly to user disappointment and dissatisfaction.

Despite the gains, the Statewide Systems Project has not achieved all of the specific objectives it set out to accomplish. We found that:

- **The new systems have moved much more information on line than was previously available, but many users find the "information warehouse" hard to use.**
- **Procurement system users are concerned that the system's complexity discourages them from entering data as intended and results in lower data quality than planned.**

**Many of the original objectives were probably unrealistic.**

- **The accounting and procurement systems have not been seamlessly integrated as expected.**
- **Out of 14 separate accounting systems maintained by individual agencies and targeted for elimination, 6 are still operating.**
- **The objective of a flexible, easy-to-upgrade system was sacrificed in order to meet state requirements and user expectations.**

In addition, the early proponents of the Statewide Systems Project predicted that significant dollar savings would accrue from the newly designed computer sys-

*3* KPMG Peat Marwick, *Minnesota Statewide Systems Project: Report to the Legislature* (Minneapolis, February 25,1992), 2-4.

tems. Specifically, they said the project would 1) improve collection of accounts receivable by about $1 million per year; 2) reduce the price of commodity purchases by up to $2 million per year; 3) achieve a one-time savings of $7-14 million by eliminating the 14 individual agency accounting systems; 4) save $2.8-3.5 million annually by eliminating paperwork; and 5) save $16 million annually through business process "re-engineering " or redesign. The sponsoring agencies note that there were additional re-engineering ideas incorporated into the project's design for which the benefits were never estimated.

**There have likely been some cost savings, but less than projected.**

Unfortunately, there is no readily available method to determine whether these projections have been realized, and we found that the projections themselves were not calculated rigorously. Nevertheless, we think there have been some cost savings in the targeted areas, but less than projected. We conclude this because we found that:

- **Fewer state agencies are using the accounts receivable system than anticipated--currently 10 state agencies use the system.**

- **The Department of Administration has not yet used information from the system to negotiate commodity contracts, and, therefore, it would be difficult to attribute any savings to the procurement system yet.**

- **The state may have realized savings of $4-8 million from eliminating agency accounting systems, roughly half the amount projected.**

- **The savings resulting from re-engineering business processes may total $6 million per year, about $10 million less than projected.**

To the extent that savings have materialized, they tend to offset the increased system operating costs we noted earlier. But because there is little measurement of the benefits claimed for systems projects after they are completed, we recommend that:

- **The state should carefully review the likelihood that benefits will result from a proposed project and require that the project sponsors establish measurement systems to evaluate the benefits after implementation. The Information Policy Office would be the logical place for this review to occur.**

In our view, the proponents of the Statewide Systems Project oversold the benefits that could realistically be expected from the project and set the expectations of policy makers and users too high. While there have been significant gains from the implementation of the new systems, the overall costs are higher than expected, the benefits are lower, and many expected outcomes have not been realized.

Some objectives might be met in the future if, for example, the EDI (electronic data interchange) module of the procurement system and the workers' compensation, recruitment, scheduling, and training modules of the human resources system are implemented. These modules would significantly reduce the need for paper

documentation for many transactions. The Department of Administration plans to start a pilot test of the EDI subcomponent of the procurement system in January 1997, and the Department of Employee Relations has plans to implement the workers' compensation and training modules shortly thereafter.

Many of the enhancements to the system necessary for non-sponsoring agencies to fully use the system are still on the development "wish list." We think that continual investment should be made in the systems in order to increase their functionality and increase future benefits. The sponsoring agencies should periodically assess needed improvements and report to the Legislature.

# USER EXPERIENCES WITH THE NEW SYSTEMS

The users of the new computer systems--thousands of employees working for state agencies at many locations around Minnesota--have now had over a year of hands-on, practical experience working with the new systems. Their judgments about the success of the new systems, and their observations about problems and possible solutions, are important. Accordingly, we surveyed 459 users of the statewide systems, asking them how satisfied they were with various features, such as system response time and operating hours. We also asked them whether their opinions had changed over the last year. To supplement our sample of users, we also conducted interviews with over 120 staff in more than 30 state agencies.

**Overall, users have mixed levels of satisfaction with the new systems.**

Overall, we found mixed levels of satisfaction with the new systems. Users of all the systems were happy with many features, including the ability to conduct on-line inquiries and the service they received from the Mn-ASSIST office. On the other hand, users were generally dissatisfied with the standard reports and the difficulty of generating reports from the information warehouse. They were also unconvinced that the new systems have saved staff time, money, or the use of paper.

Of course, the experience of users, and their degree of satisfaction, depends largely on which system(s) they have used. We found that:

- **Users were more satisfied with the human resources and payroll systems than with the accounting and procurement systems.**

The proportion reporting that they were very satisfied or satisfied was 67 percent for human resources, 60 percent for payroll, 41 percent for accounting, and 35 percent for procurement. Also, respondents said their level of satisfaction has increased as they have become more familiar with the new systems.

## Human Resources and Payroll

Survey responses and interview comments from the human resources professionals we interviewed were generally positive about the human resources system

(SEMA4). Respondents were pleased with many features of the new system, including the ease of making inquiries (76 percent), being able to process transactions on line, not having to send paper forms to the Department of Employee Relations for processing, and current advisories and special reports (66 percent). Users were less satisfied with the standard reports (45 percent satisfied) and the information warehouse (only 33 percent satisfied and 25 percent dissatisfied).

**Users were pleased with many features of the new human resources and payroll systems.**

Both satisfied and dissatisfied users reported that:

- **The major problem with the new human resources and payroll computer systems is poor system response time during some time periods.**

Nearly two-thirds of all human resources users rated system response time as a problem. Some actions, during some time periods, can take several minutes to process. The sponsoring agencies are actively assessing where bottlenecks exist in the system.

The limited availability of the system to process some types of human resources transactions is another problem cited by about one-fourth of users. Some transactions can only be processed during a few days of the 10-day payroll cycle. The sponsoring agencies have responded to this problem and expect to complete a project at the beginning of 1997 that will permit transaction processing during 7 of the 10 days in a payroll cycle.

Users were also generally satisfied with the payroll component of SEMA4. Users were satisfied with their ability to complete transactions (75 percent), navigate the system (72 percent), and make inquiries (67 percent). Users were also happy with the ability to have an on-line history of payroll, fewer errors in payroll because of edits in the on-line entry, and on-line business expense reporting. Users were somewhat less satisfied with the on-line help feature (47 percent) and the standard reports (52 percent). Like human resources system users, 73 percent of payroll users told us they were unhappy with the system's response time, and 21 percent reported difficulty in generating reports from the information warehouse. We heard similar assessments in our personal interviews.

# Accounting and Procurement

**Users were less happy with the new accounting and procurement systems.**

As noted above, users were less happy with the accounting and procurement components of the Statewide Systems Project. Overall, 41 percent of accounting system (GFS) users said they were satisfied, 37 percent were dissatisfied, and 22 percent were uncertain. The accounting users liked the ability to complete transactions on line and to perform on-line inquiries. Users also frequently mentioned that they liked having more information available. Users were generally satisfied with their ability to complete transactions (54 percent), navigate the system (52 percent), and make inquiries (52 percent). Users were much less satisfied with the standard reports (33 percent). Also, two-thirds of the users of the new accounting system told us that it does not perform all of the functions of the old system, and users thought that the new system does not save staff time.

Users were least satisfied with the new procurement system (AGPS). Overall, only 35 percent of users said they were satisfied, while 40 percent were dissatisfied and another 25 percent were uncertain. Users were divided about their ability to complete a transaction (46 percent satisfied), navigate around the system (45 percent satisfied) and make inquiries (46 percent satisfied). We found the highest level of dissatisfaction with the procurement system in our interviews and survey comments from state supervisors and managers.

- **According to many users, the new procurement system is too "cumbersome," "complex," and "difficult to use."**

**Some state managers think the state is trying to collect too much procurement information.**

A significant number of users said that completing transactions requires navigating through too many computer screens and that the system employs too many complicated document types.[4] The general consensus of state managers was that the state was trying to collect too much information. We were told that some agencies such as the Department of Transportation do need to keep track of item level data for inventory purposes, but most agencies do not. Also, the "seamless integration" between the accounting and purchasing systems has not occurred. Finally, users were least satisfied with the contents of the AGPS standard reports (27 percent satisfied, 35 percent dissatisfied). In part, this is because procurement information has not yet been put into the information warehouse and only a limited number of standard procurement reports were ever programmed.

Managers in several agencies, including some of the most frequent users, told us that they would like to abandon the new system altogether and use the new accounting system, with modifications, to conduct procurement transactions. Many users told us that they were taking shortcuts around AGPS in order to get their business done.[5] As a result, the data in the system are incomplete and unreliable, and one of the primary benefits claimed for the system, that the state can negotiate better contracts using the information gathered by AGPS, has not yet occurred.

**Many users are taking shortcuts around the procurement system in order to get their business done.**

The Department of Administration is aware of these problems and received high marks from users for attempting to solve the problems, especially in recent months. However, at a minimum, we think the department should try to reduce the numbers of document types and make it easier to navigate through the system. In addition, we recommend that:

- **The state should formally re-examine the use of the new procurement system (AGPS).**

Alternatives include 1) modifying AGPS to make it work in concert with agency business needs, 2) making the system optional for certain transaction types and/or for certain agencies, or 3) replacing AGPS with an alternative system.

We acknowledge that the state needs a central procurement system and that replacing AGPS would be an expensive and time-consuming (and, therefore, not the

*4* Document types are the equivalent of different types of electronic forms used to enter information into the system.

*5* The sponsoring agencies note that they have approved some of these "workarounds."

most attractive) option. But, we still think there would be value in a "ground zero" review. We also think an independent consultant may need to be hired to help the user agencies and the departments of Administration, Finance, and Employee Relations evaluate the costs and benefits of state agencies' current use of the AGPS system. The basic question is whether or not the state really needs the massive amount of data that it currently is collecting through its new procurement computer system.

A separate issue involving the procurement system relates to the collection of sales taxes on purchases by state agencies. Agencies have been liable for paying the sales tax since 1987. One of the "re-engineering" ideas implemented by the Statewide Systems Project was to have the tax paid directly into the state treasury instead of giving it to the vendor who would then pay it back to the state. Now the only way for a state agency to make a purchase that is taxable is to use AGPS. But all the managers we interviewed said that this has proved time-consuming and costly for state employees. Basically, they report, vendors know more about the taxability of the products they sell than state employees do.

But if the procurement (AGPS) system were replaced or made optional, some way would have to be found to facilitate the collection of sales taxes from state agencies. Currently the new accounting system will not accommodate this. Alternatively, the Legislature may want to reconsider its 1987 decision to require state agencies to pay sales taxes.

**Help desk staff generally get high marks from users.**

The departments of Finance and Administration have tried to respond to agency complaints and concerns about all of the new computer systems. They have worked on solutions that help agencies get state business done. They have also allowed users to enter certain types of transactions, such as professional/technical contracts, grants, and interagency payments, directly into the new accounting system (GFS) instead of using the procurement system. Finally, the users of all system components reported a relatively high level of satisfaction with the help they received from Mn-ASSIST staff.

# SYSTEMS DEVELOPMENT IN S TATE GOVERNMENT

Computer systems development is an evolving field. Unlike constructing a building or a highway, there is a high level of uncertainty and risk associated with such projects. Experts told us that few organizations in either the private or public sector undertake systems development without encountering significant problems. In fact, according to experts at the Gartner Group, a national consulting firm, about 80 percent of all computer development projects "fail" because they are not completed on time, on budget, or in a way that meets user expectations.

The literature on computer systems development suggests that successful projects have the following features: 1) effective executive sponsorship, 2) user involvement and influence, 3) manageable technology and complexity risk, and 4) good

project management. In our view, the Statewide Systems Project exhibited some but not all of these characteristics.

**There is a high level of uncertainty and risk with systems development projects.**

## Executive Sponsorship

Leadership for the Statewide Systems Project was provided by a multi-agency steering committee rather than by a single person or agency. Although the Commissioner of Finance was technically in charge (the Department of Finance received SSP's appropriation), the multi-agency arrangement diffused responsibility and slowed the project's decision-making process. In addition, there was less continuity than desirable in the membership of the steering committee, with at least 10 membership positions turning over during the course of the project. The absence of a single person in charge and the high turnover among the members of the steering committee put the Statewide Systems Project at a higher risk of failure. Nonetheless, the sponsoring agencies believed that no other arrangement would have worked on a project of this magnitude. Other projects we reviewed had one person in charge, although sometimes the person in charge changed several times during the project.

## User Involvement

On the other hand, the project succeeded in involving a large number of users in planning and designing the new systems. According to some people we interviewed, this emphasis on user involvement was a reaction to the problems of developing similar large systems where user involvement was low, although others say user involvement was always a key strategy. The Statewide Systems Project also followed other "best practices," such as involving state managers as co-project leaders, using steering committees, designating departmental liaisons, providing for a user review of specifications, and involving users at many points in the design of the system. The results of our survey and interviews suggest that user involvement has been a key factor in ensuring that user satisfaction is at least moderately positive on most measures.

## Manageable Technology

**The Statewide Systems Project was more complex and risky than most systems development projects.**

The Statewide Systems Project was highly ambitious. Although there are examples of larger public or private systems development projects, this project was more complex and risky than most. Also, the technology of the SEMA4 component was new and untested in a state government situation like Minnesota's. In addition, the various components of the project were implemented virtually simultaneously, rather than incrementally. One consultant told us that the Statewide Systems Project was simply "unprecedented."

The result of this complexity was a large number of changes to the scope and specifications of the computer systems as the project proceeded. As we have seen, the changes contributed to higher costs than were originally anticipated. Overall,

the ambitious and complex nature of the Statewide Systems Project put the whole project at a greater risk of failure.

## Project Management

The size and complexity of the Statewide Systems Project made the project very difficult to manage. In fact, the project was suspended for four months in 1993 because the costs exceeded the appropriation, and the project management decided not to proceed without legislative approval. There was conflict between the state team and the consultant as they constantly negotiated what work was within the scope of the contract and what was not. Also, the decision to modify some of the state's business practices could have been made earlier (as it was in several other large systems projects undertaken by the state). And user training, a critical component of successful systems development and implementation, was criticized by many trainees because the materials for the accounting and procurement training sessions were inconsistent with the way the systems actually worked. SEMA4 training was much better, according to users.

**The decision to modify some of the state's business practices could have been made earlier.**

On the other hand, the Statewide Systems Project utilized a range of "best practices" techniques, including a variety of change management strategies to aid in the transition between the old and new systems, an active communications component, and a structured systems development methodology. The project also conducted an internal risk assessment (in addition to the external risk assessment authorized and funded by the Legislature). These steps eased the transition to the new systems and reduced the overall amount of risk involved in the systems development process.

# CONCLUSION

Despite the risks of failure that accompanied the Statewide Systems Project, the project has been virtually completed and is functioning in a moderately successful fashion. However, its size and complexity contributed to its higher than anticipated costs, and one component (the procurement system) needs to be re-examined.

In our view, the state of Minnesota should avoid computer development projects of this scope in the future. Projects that are developed in stages probably offer a greater chance of success, and smaller projects present less uncertainty about costs. We recommend that:

- **In the future, the state should undertake large computer development projects only in more carefully planned stages, rather than trying to implement a large, multi-component project all at once.**

- **Also, the Legislature should require an external risk assessment (as it did for the Statewide Systems Project) for any future large scale computer development projects.**

**Investment in computer systems is an ongoing expenditure.**

Finally, we think both the executive and legislative branches need to acknowledge this hard reality: computer systems are never permanent. Even after new systems are developed and implemented, they often need adjustments and "fixes," and in time they will need to be replaced. In short, investment in computer systems is an ongoing, rather than a one-time, expenditure, especially for large complex organizations like Minnesota state government.

# Introduction

Legislators have concerns about the way the state has approached computer systems development in recent years, in part because some projects have had outcomes different than expected. This report evaluates one recent state systems development project—the Statewide Systems Project—in detail.

**The new systems affect 55,000 state employees and everyone doing business with the state.**

The Statewide Systems Project was a large and complex computer development project undertaken to create new computer systems for the state's core accounting, procurement, payroll, and human resources functions. The systems are important because in some way they affect all 55,000 state employees and every vendor that does business with the state. In 1996 the Legislative Audit Commission directed the Program Evaluation Division to study the project in detail to see what could be learned to help the state make wise decisions about future systems projects. We asked the following questions:

- **What were the key executive and legislative actions and decisions regarding the statewide systems project?**
- **Do the systems meet the state's planned objectives? What monetary and non-monetary benefits have the systems achieved?**
- **How much did the project cost and why did the costs increase over initial projections?**
- **Are the systems likely to save the state money in the future? Are there additional ways the systems could be used to save money or increase administrative productivity? What options are available to control operating costs?**
- **What impact have the statewide systems had on the administrative functions of smaller state agencies? What actions were taken to mitigate negative impacts and are there additional steps that could be taken?**
- **Does the statewide systems project share any characteristics of other recent system development projects? What has the state learned from recent systems development projects that would reduce risks for future projects?**

- **How can the Legislature and the executive branch better oversee systems development projects?**

We used several methods to answer these questions. We conducted interviews with over 120 state staff in 30 state agencies about the project's development and implementation. In addition, we conducted a survey of a random sample of the users of each component of the Statewide Systems Project. We also consulted with national experts and reviewed the literature on systems development. To put the Statewide Systems Project in context, we also briefly reviewed five other large systems projects developed in Minnesota recently.

In Chapter 1 we examine the key decision points in the Statewide Systems Project, as well as how much the project cost to develop and to operate. In Chapter 2 we consider whether the project has met its objectives. Chapter 3 discusses the project's implementation and users' recent experiences with the systems. Chapter 4 discusses state computer systems development in a broader context and offers our view on some of the lessons to be learned from recent projects.

# Background

**CHAPTER 1**

Executives in the Department of Finance had been interested in replacing the state's accounting system since the early 1980s. In this chapter we review the rationale for the project and present a brief history of its development. We asked:

- **What were the key executive and legislative actions and decisions regarding the statewide systems project?**
- **How much did the project cost to develop and how much does it cost to operate? Are there ways to reduce operating costs?**

In order to answer these questions we interviewed steering committee members and other project participants, reviewed the tapes of legislative appropriation hearings, and reviewed the project's work papers.

**The Statewide Systems Project was originally intended to replace aging accounting and payroll systems.**

## RATIONALE FOR THE PROJECT

The rationale for the project as presented to the Legislature in 1991 and 1992 had several facets.

- The Statewide Accounting System (SWA) was over 20 years old and its inability to accommodate the state's business processes had led to the development of duplicative stand-alone systems in many state agencies.
- The state's automated procurement system processed less than 25 percent of the state's purchases.
- The state had no computerized system for managing and tracking human resources information.
- The state's payroll system was nearing capacity and had become costly to maintain.
- The state had no decision support system to provide for the information needs of managers and the Legislature.

- Project sponsors thought that as the new systems were developed, the state could take advantage of the opportunity to re-engineer many of its business processes to be more cost effective.

# PROJECT DEVELOPMENT

**The scope of the Statewide Systems Project expanded to include new procurement and human resources systems.**

In 1991, the executive branch brought forth a proposal to replace the accounting and payroll systems. The 1991 Legislature reviewed the proposal and appropriated $300,000 to plan for the systems' replacement. The project became known as the Statewide Systems Project (SSP) and was directed by the commissioners of the three sponsoring agencies (Administration, Employee Relations, and Finance), and deputy or assistant commissioners from four other large agencies.[1] The project steering committee, assisted by a consultant and five work groups, developed a plan to present to the 1992 Legislature.[2]

During the 1991-92 planning process, the scope of the project increased. Among other things, new systems for procurement and human resources were added to the project. During the planning phase the consultant and the state work groups also considered whether the state should develop its own programs or buy software already available on the market. The consultant recommended buying existing software packages as the lowest risk alternative. The person then serving as Commissioner of Finance told us that he had a strong preference for buying and modifying existing software, as opposed to custom development, because he felt that the state would be more likely to stay current with technology changes as the result of vendor upgrades.

The 1992 Legislature approved an additional $1.8 million to continue planning. Planning continued into 1992, with the development of a Request for Proposals (RFP) in the fall of 1992, and an evaluation of various software products and vendors that responded to the RFP from September 1992 to January 1993.

**The state decided to purchase and modify existing software packages.**

In January 1993, the project's steering committee decided to purchase three commercially available software packages and hired Andersen Consulting, one of the world's largest software consulting firms, to customize the packages to meet the specific needs of state agencies.[3] The state signed the contract with Andersen Consulting in March 1993 and also hired a new state project director and began to assemble the state staff for the development phase of the project.

The Statewide Systems Project consists of three major components (see Figure 1.1):

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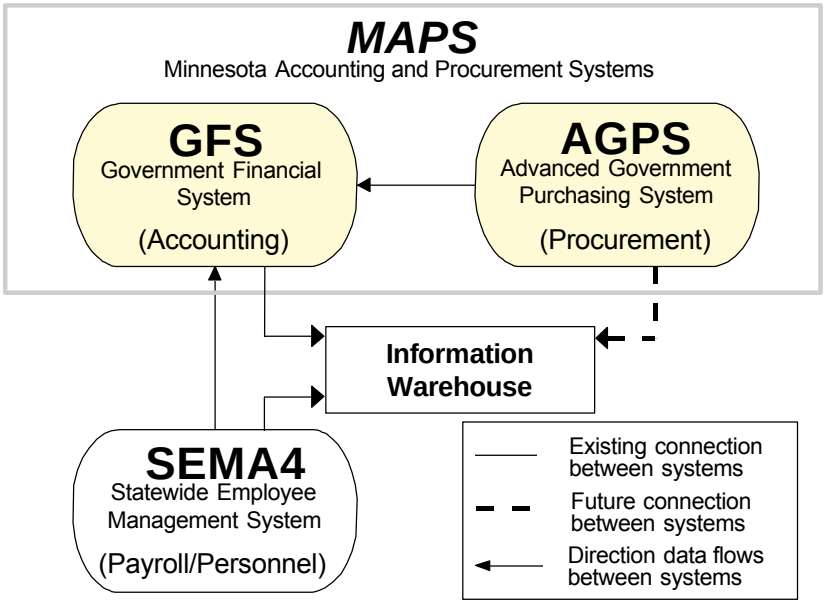
*1* The deputy commissioners from the departments of Revenue, Transportation, and Human Services, as well as the assistant commissioner for administration from the Department of Natural Resources participated on the steering committee.

*2* KPMG Peat Marwick was the state's consultant for the planning phase.

*3* Arthur Andersen Consulting is the world's largest system integrator. System integrators specialize in customizing commercial software for particular clients and industries.

**Figure 1.1: Components of the Statewide Systems Project**




Source: Office of the Legislative Auditor.

- The new accounting system is known as the Government Financial System (GFS).[4]

- The new procurement system is called the Advanced Government Purchasing System (AGPS).[5]

- The new human resources/payroll system is known as the Statewide Employee Management System (SEMA4).[6]

The first two systems are inter-related and are frequently referred to as the Minnesota Accounting and Procurement System (MAPS). In addition, the project developed an "information warehouse" which brings together data from the new systems and enables users to generate reports for decision support.

# REALIGNMENT

**In September 1993 the project reached a critical point.**

The consultant, the project work team, and work groups of state employees developed detailed specifications for the actual computer coding until September 1993. In the fall of 1993, the project reached a critical point triggered by the inability of the accounting work group to specify a detailed design for the accounting system that would do what was needed without significant modifications to the software

*4* American Management Systems (AMS) is the vendor for the accounting software.

*5* INFORMS is the vendor of the procurement software.

*6* PeopleSoft is the vendor for the payroll and human resources software.

that was estimated to add $4 to 5 million to the original cost. Project management was unwilling to continue the project without increased appropriations. The sponsoring agencies also had concerns about agency implementation costs and the viability of the proposed solution for the decision support component of the project.

**During realignment, the project focused on redesigning state business processes and further defining an information access component.**

As a result, SSP entered a "project realignment" phase. The project suspended further development work in the accounting and procurement components until the 1994 legislative session began and focused additional efforts on "re-engineering," or redesigning the business processes that were to be computerized.[7] In addition to exploring re-engineering ideas, the project examined what would be necessary to retire duplicate stand-alone accounting systems, and it formed a work group to further define the decision support or information access component of the project.

As the result of the "re-engineering" work phase, the schedule for accounting implementation was moved back one year to July 1995. The schedule for procurement implementation was moved from November 1994 to July 1995, and the decision support component was moved ahead to be implemented in July 1995 instead of July 1996.

The 1993 Statewide Systems Project appropriation required a recommendation from the Legislative Commission on Policy and Fiscal Planning on the release of funds for the second year of the project's biennial funding depending on whether legislative information needs were being met.[8] Project managers consulted with the commission in September 1993 and January 1994. At the January meeting, the commission voted to recommend that the Commissioner of Finance release the second half of the 1993 appropriation to the project. At both meetings, legislators were told about the projected cost increases for the project.

**State agencies began using the accounting and procurement systems in July 1995, but payroll and human resources were implemented in stages.**

The project leadership presented in a more formal way the revised schedule and costs to the 1994 Legislature and received an increased appropriation of $15 million for the biennium, including $1.6 million for user and agency support. Development continued in high gear for the next year through March 1995. In the fall of 1994 there was a real risk that the payroll component might not be finished by July 1995. As a result, the project management made finishing the payroll system its highest priority, deferred development of several parts of SEMA4, and decided to implement SEMA4 in several stages.[9]

In April 1995, the systems became available for budget, encumbrance, and procurement processing by state agencies. Training and preparation continued until the July 1 conversion date, when all state agencies started to use the accounting and procurement components (MAPS) and the Department of Transportation began to pilot the use of the new human resources and payroll (SEMA4) systems.

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*7* The project defined "re-engineering" as "the process of fundamentally rethinking and radically redesigning business processes to achieve dramatic improvements in quality, service, speed, and cost. It is the process of rethinking and redesigning processes before they are automated." (Statewide Systems Project newsletter, November 1993.)

*8* *Minn. Laws* (1993), Ch. 192, Sec. 2, Subd. 4.

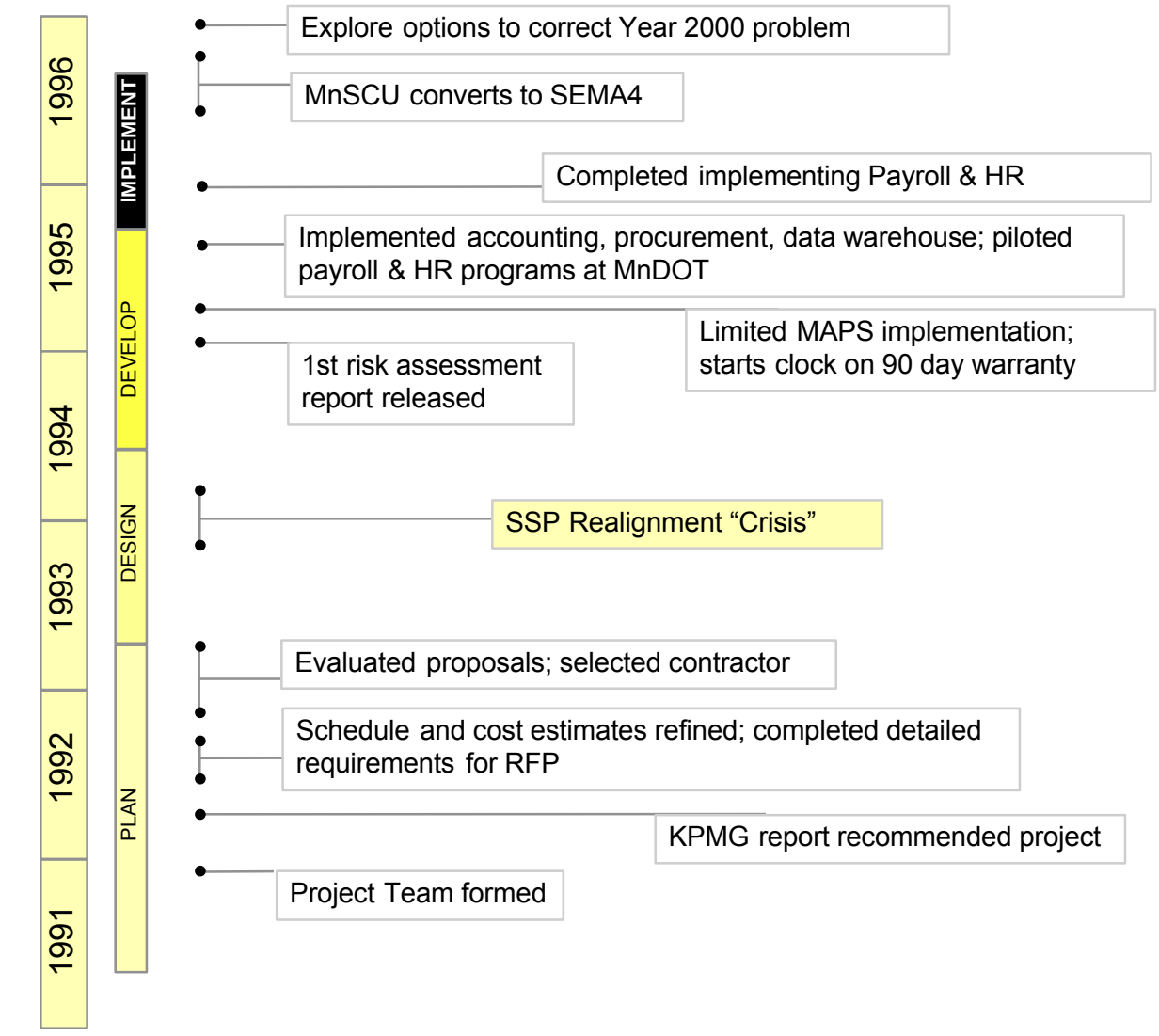
*9* The implementation was deferred for the training, workers compensation, recruitment, and work schedules components of SEMA4.

Project phases overlapped and varied somewhat by component, but Figure 1.2 highlights the various phases of the project in a general way. A more detailed chronology of the project's history is provided in Appendix A.

# COSTS OF DEVELOPMENT

In this section we examine how much the project cost and why the costs increased over initial projections. Table 1.1 summarizes all the appropriations and transfers of funds between agencies made for development. As the table shows, the sys-

**Figure 1.2: Timeline for the Statewide Systems Project**




Source: Office of the Legislative Auditor.

## Table 1.1: Appropriations for Statewide Systems Project Development

| | Amount of Appropriation in: | | | | | | |
|---|---|---|---|---|---|---|---|
| | FY 1992 | FY 1993 | FY 1994 | FY 1995 | FY 1996 | FY 1997 | Total |
| Minnesota Laws | | | | | | | |
| 1991 | $300,000 | $2,500,000 [a] | | | | | $300,000 |
| 1992 | | 1,800,000 | | | | | 1,800,000 |
| 1993 | | | $10,300,000 [b] | $4,700,000 | | | 15,000,000 |
| 1994 | | | | 14,600,000 [c] | | | 14,600,000 |
| 1995 | | | | | $2,727,000 | $73,000 | 2,800,000 |
| Subtotal | 300,000 | 1,800,000 | 10,300,000 | 19,300,000 | 2,727,000 | 73,000 | 34,500,000 |
| Inter Agency Transfers | | 837,633 | | 807,318 | | | 1,644,951 |
| Total SSP Development | 300,000 | 2,637,633 | 10,300,000 | 20,107,318 | 2,727,000 | 73,000 | 36,144,951 |
| Minus transfer to LCPFP | | | | | | | 285,000 |
| Total Development Costs | | | | | | | $35,859,951 |

Source: *Laws of Minnesota*, Department of Finance.

[a]Vetoed by Governor.

[b]Included $285,000 transfer to the Legislative Commission on Planning and Fiscal Policy (LC PFP).

[c]Included $100,000 for IPO evaluation.

tems created by SSP cost over $35.8 million to develop when considering all sources of funding. That figure, however, does not count the training or equipment costs agencies incurred to implement the systems, which we conservatively estimate at more than $10 million.

**Development cost estimates for the project nearly doubled from the first estimate in 1991.**

Development cost estimates for the systems grew as SSP progressed. The earliest rough estimates in 1991 called for a $15-20 million project. A more refined estimate of $19.5 million was made in the project's 1992 *Report to the Legislature*. When the project received bids from vendors, a project budget could be established. At that time, in March 1993, the project budget was $26.1 million ($23.2 million plus the $2.1 million spent already on planning and $800,000 in agency contributions). By December 1994, when a modified contract with the consultant was signed, the project's cost had grown to approximately $35.6 million. Since December 1994, there has been an additional $125,857 added to the budget. In total, therefore:

- **The development costs for the Statewide Systems Project have been about $35.8 million.**

According to our study,

- **The costs rose from what was originally anticipated largely because of the addition of several components and changes in the specifications for the original components.**

Changes were needed in part because functions performed by several separate agency accounting systems that were to be replaced were not identified until late 1993. In addition, it took much more effort than originally anticipated by either

the state or the consultant to modify the human resources, payroll, procurement, and accounting components to meet the state's requirements.

**While change orders helped reduce overall costs, they also sacrificed system functions.**

Between March 1993 and mid-1996, the project's total cost rose almost $10 million. Approximately $5 million of this amount went to Andersen Consulting for the additional work required by the changes in the systems' original specifications. In addition, about $1.6 million was spent on additional support for agencies, about $2 million went to pay state employees for work that was originally unanticipated, and the rest was spent on computer usage charges to test the new systems.

Ten change orders decreased the scope of the project and saved $1.4 million. The savings were applied against other change orders to balance the project's budget. Each of these changes represent functions or components that users thought the new systems would provide, but which had to be sacrificed because of budget or other concerns.

# YEAR 2000

The accounting software that Minnesota chose does not accommodate transactions with four-digit dates, nor did any of the accounting packages offered for the state to purchase in 1992. This issue -- often referred to as the "Year 2000 " problem -- was discussed when the vendor was chosen, and although the steering committee realized it would have to be fixed later, they decided to continue with the software acquisition. According to project managers, there was no attempt to keep this information from the Legislature, but the next time the issue received consideration was during a risk assessment by an external consultant during late 1994. We found that:

- **The steering committee's action effectively committed the state to additional expenditures, but the Legislature was not informed of the problem until January 1995.**

**The Legislature did not have all the facts when appropriating funds for SSP in 1993 and 1994.**

Therefore, the Legislature did not have all of the relevant facts when deliberating on the 1993 and 1994 appropriation requests. The accounting and procurement software now in use will have to be upgraded at a cost estimated to be about $4.5 million.[10]

# OPERATING COSTS

The most significant part of most computer systems' life cycle costs are operating costs. We were asked to look at whether operating costs could be reduced for the Statewide Systems Project. We found that:

*10* The procurement software technically does accommodate the year 2000, but it does not accommodate 4-digit dates, and because it works in concert with the accounting system, it needs to be upgraded.

- **Statewide Systems Project operating costs are much higher than anticipated, but the sponsoring agencies are working to reduce them.**

**Operating costs have increased nine-fold, partly due to the addition of the new systems.**

The earliest estimates showed that the systems developed by SSP would have higher operating costs than the old systems. This was anticipated because the new systems would perform more functions and process more transactions. KPMG Peat Marwick, the state's consultant for the planning phase of the project, estimated operational costs might be as much as 250 percent more than the $1.7 million it took to run the old statewide accounting and personnel/payroll systems. The 1992 Legislature was told operating costs would be less than $5 million per year. Mn-ASSIST, the Department of Finance division that provides operating support for the new systems, has a budget for fiscal year 1997 of $17.2 million, and all but about $1 million is related to SS P. The Department of Finance had 16 staff supporting the previous systems while Mn-ASSIST has approximately 60 staff. This is not to say that the Mn-ASSIST staff are not needed to support the systems. In our interviews, Mn-ASSIST staff were given high marks by user agencies, but they were regarded as overworked. The staffing increase should come as no surprise, considering that the systems do considerably more than the previous ones and that the state also added two systems that did not exist before.

One of the primary reasons for increased operating costs is that the computer processing costs from InterTech, the division of the Department of Administration that operates the state's large mainframe computers, have been higher than anticipated. Computer usage costs have been higher than anticipated primarily because there have been more transactions and each transaction has consumed more computer resources than originally estimated based on the experience of other states. This has occurred even though the unit computer usage costs have declined in the last three years.

The project's original plan in 1993 called for the first year of operation to cost $1.1 million in InterTech computer usage fees. Later in 1993 this was revised to $1.6 million. As Table 1.2 shows, in April 1994, SSP project staff completed the first of several more formal estimates of operating costs, which showed estimated computer usage costs of $3.9 million. Operating costs for Inter Tech's computer time have increased from an estimated $1.6 million per year in 1993 to approximately $9 million per year in fiscal year 1997. Costs to support the systems have also increased, in part because of difficulties in recruiting and retaining technical staff, resulting in greater dependence on consultant resources than desired.

**The sponsoring agencies decided to move the information warehouse to a smaller computer, at estimated savings of almost $1 million a year.**

As the table shows, the cost of running the information warehouse increased significantly, from $58,000 in the first cost estimate to an estimated $1.4 million in fiscal year 1997. The Department of Finance issued a Request for Proposals (RFP) in the summer of 1996 to consider alternatives to running the information warehouse on the mainframe computer. As a result of the responses to the RFP, the sponsoring agencies have decided to move the information warehouse from the mainframe to a smaller computer that they will manage. The expected savings after initial implementation are over $85,000 per month.

## Table 1.2: Actual and Estimated Computer Operating Costs by Component (in Millions of Dollars)

| Estimate Date | Human Resources/ Payroll | Accounting (GFS) | Procurement (AGPS) | Information Warehouse | Total |
|---|---|---|---|---|---|
| April 1994--1st Year | $1.686 | $1.478 | $0.715 | $0.058 | $3.938 |
| 2nd Year Total | -- | -- | -- | -- | 5.829 |
| 5th Year Total | -- | -- | -- | -- | 7.174 |
| August 1994--1st Year | 1.547 | 2.044 | 0.926 | 0.079 | 4.596 |
| 2nd Year Total | -- | -- | -- | -- | 6.526 |
| 5th Year Total | -- | -- | -- | -- | 7.969 |
| April 1995--1st Year | 1.802 | 2.225 | 0.929 | 0.328 | 5.283 |
| 2nd Year Total | -- | -- | -- | -- | 7.550 |
| 5th Year Total | -- | -- | -- | -- | 8.622 |
| December 1995--1st Year | 3.454 | 1.695 | 1.217 | 0.826 | 7.826 |
| 2nd Year Total | -- | -- | -- | -- | 11.618 |
| 5th Year Total | -- | -- | -- | -- | NA |
| Actual FY 1996--1st Year | 2.905 | 2.047 | 1.254 | 0.920 | 7.126 |
| Projected FY 1997 | 4.062 | 2.101 | 1.288 | 1.426 | 8.877 |

Source: Department of Finance.

**The sponsoring agencies should continue to explore ways to reduce operating costs.**

The state has made a number of other efforts to reduce operating costs. Sponsoring agency staff have continually optimized the underlying computer code and data to make the system consume fewer mainframe resources. In addition, the department expects that running the information warehouse on a smaller computer will ultimately save over $1 million per year in operating costs. We think that the sponsoring agencies should continue to explore using smaller non-mainframe solutions for the other components of the Statewide Systems Project.

Smaller computers can sometimes be run more cost effectively than large mainframe systems and they offer the possibility of saving money on operating costs. Smaller computer solutions are currently available for the procurement and human resources components of SSP and they will soon be available for the accounting component. These smaller computer solutions also offer the possibility of improving system response time.

Taking software applications off the mainframe computers operated by InterTech raises other issues. For example, if some applications are removed from the mainframe computer environment, the costs necessary to retain that environment for remaining applications are spread over fewer users, thereby increasing the unit costs. However, we believe that the arguments for distributing the processing for SSP applications are worth exploring. The merit of smaller computer solutions is illustrated by the projected savings in the information warehouse application.

# SUMMARY

The Statewide Systems Project is a very complex, unprecedented, software development project. We found that it took longer to develop and, because there were major scope changes, it cost more than originally anticipated. We also found that operating costs are much higher than originally anticipated and that additional opportunities exist to reduce them.

# Objectives and Benefits of the Statewide Systems Project

**CHAPTER 2**

The Legislative Audit Commission asked our office to determine whether the Statewide Systems Project (SSP) has met its planned objectives and realized the benefits, monetary and non-monetary, projected for the systems. In this chapter we review the objectives of the Statewide Systems Project and analyze the specific benefits claimed for the project to determine to what extent they have been achieved. Additionally, we looked at whether SSP set expectations appropriately and what impact expectations had on user satisfaction after system delivery. In our study we asked:

- **To what extent have the objectives of the Statewide Systems Project been met?**
- **Were expectations for the Statewide Systems Project set appropriately?**
- **What monetary and non-monetary benefits have the systems achieved?**
- **Have the specific benefits claimed for the Statewide Systems Project been realized?**

**We interviewed over 120 state staff in 30 agencies and analyzed questionnaire responses from 459 users.**

We interviewed state employees and consultants contracted by the state to work on the Statewide Systems Project. State employees interviewed included agency commissioners, SSP management, members of the SSP steering committee and functional work groups, as well as numerous agency managers and end-users. In all, we interviewed over 120 state staff in 30 agencies, including employees from 12 small agencies.[1] We conducted a user survey of each of the new systems and useable responses were received from 459 employees, with a cumulative response rate over all components exceeding 70 percent. We also reviewed project workpapers, publications, and other communications to the Legislature and user community.

*1* Agencies with fewer than 100 employees were considered small for this study.

# OBJECTIVES OF THE STATEWIDE SYSTEMS PROJECT

The project's first report to the Legislature in 1992 said that the objectives of the Statewide Systems Project were to "promote and achieve" the following vision statement:

> The State of Minnesota must have efficient, effective, and technologically sound business systems that support the provision of quality services to the public.
>
> The systems must provide for levels of central control needed to ensure prudent management of financial and human resources, and at the same time provide agency-level support that aids the agencies' work and their access to information.
>
> Business policies, procedures and even statutes must contribute to the overall goal of integration that maximizes efficiency and effectiveness.[2]

**Project objectives included replacing paper forms and providing systems that are easy to change.**

The specific objectives of the Statewide Systems Project were to:

- Save state resources by re-engineering the state's business processes and providing systems to facilitate the most efficient processes to meet the state's business objectives. This includes:
  - Restructuring the financial and compliance control processes to make them more efficient and effective, and
  - Replacement of manual, paper-based forms, transactions, and controls with electronic forms transactions, controls, and edits wherever appropriate.
- Provide timely, readily accessible information that legislators and state managers need to make good decisions and do their jobs;
- Improve the interfaces of statewide financial and human resources information systems with each other and with agency systems to eliminate manual data entry;
- Eliminate the need for many agencies to develop and operate separate systems to meet their financial and human resources management information needs;
- Provide systems that are flexible and easy to change to meet future requirements; and
- Provide better service to the state's citizens, vendors, and other customers.[3]

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*2* KPMG Peat Marwick, *Minnesota Statewide Systems Project: Report to the Legislature* (Minneapolis, February 25, 1992), 2-3.

*3* *Ibid*., 2-4. We examined subsequent statements of the project's objectives and found that they did not change over the life of the project.

# EXPECTATIONS OF THE STATEWIDE SYSTEMS PROJECT

Expectations cannot be easily measured or expressed with a summary statistic. Some of the factors that affect user and policy maker expectations are: previous experience, level of involvement in a project, and the quantity and quality of information received about a project throughout its lifetime.

Employee expectations of the Statewide Systems Project largely depended on the assurances of those promoting the project. We asked about expectations during our interviews and also reviewed SSP documentation to determine if project staff communicated changes in system functions and operation to the user community and the Legislature.

**Project sponsors, vendors, and consultants oversold SSP's benefits from the beginning.**

## Were expectations of the Statewide Systems Project set appropriately?

We found that:

- **Legislative expectations about the budget, timeline, and benefits of the Statewide Systems Project were set too high.**

In the opinion of almost all state staff we interviewed, project sponsors oversold SSP benefits from the beginning, in part due to the constraints and requirements of the legislative funding process. Steering committee members we interviewed agreed that the project's benefits were oversold, particularly to the Legislature. Project managers had to create budget requests and estimate system benefits before detailed specifications could be completed. Many SSP personnel we interviewed told us that they considered it necessary to be overly optimistic about system costs and benefits in order to get legislative approval for funding. However, project managers said that they frequently communicated with users and legislators about the development of the systems.

We also heard from users in non-sponsoring agencies that:

- **User expectations for the functionality and operation of the Statewide Systems Project components were also set too high.**

Agency personnel who participated in SSP work groups and end-users of the system stated that the state's consultant (Arthur Andersen Consulting), and the vendors of the software products (PeopleSoft for human resources and payroll, INFORMS for procurement, and AMS for accounting), as well as SSP staff, oversold the systems. State employees we interviewed told us that the demonstrations presented by the software vendors and Andersen Consulting were misleading in terms of how easy it would be to modify their software to meet the state's needs. Agency staff who participated in the SSP work groups also told us that the video

SSP distributed to agencies exaggerated what the systems would be able to do. Also, we found that:

- **SSP training and documentation did not completely reflect how the systems would work in practice.**

- **Users did not know what functions the system was able to perform until they began using it.**

Many end-users we interviewed said that training materials contained information on features that were not present in the systems that were delivered. Many users did not find out how the system operated or what functions were available until they began using the system at their agencies. Users also expressed frustration that during project development there was a great deal of talk about the system but nothing concrete for them to test. Users told us that it was "hard to get a handle " on the system and what the likely impact of installation would be on their agency.

**Many accounting users expected the new system to do everything the former system could do.**

There were other factors that contributed to the heightened expectations about SSP's components. Though never stated by the project team, many in the accounting area assumed that the functionality in the old Statewide Accounting system (SWA) would provide the baseline for designing the new system. Many users were upset when the new accounting component (GFS) came on line missing some of the functionality that was available in S WA, even though the new system had significant new functionality. Other users who helped design the Request for Proposals believed that all of the functions listed would end up in the system. We were also told that many agencies simply did not understand SSP's scope, and did not believe it would ever be implemented, and therefore did not really understand what to expect. This lack of understanding may have added to the unrealistic expectations of many agencies.

## What effect did expectations have on user satisfaction with the Statewide Systems Project?

During the SSP development phase, it became clear that not all of the features specified in the Request for Proposals could be implemented with the amount of money available. This led to the realignment of the project in the fall of 1993 where the features included with the accounting component were reassessed. As a result of this realignment, and the funding constraints, some of the functions of the accounting component were dropped. The procurement, human resources, and payroll groups were also forced to eliminate or postpone implementation of important components due to schedule and budget constraints. As we discuss more completely in Chapter 4, systems development consultants say that this type of change is typical of large system development projects, and the state's experience with these types of projects confirms this. However, no evidence could be found in SSP workpapers or publications that the user community were fully informed of the changes in system functionality. We found that:

**Each system was forced to eliminate or delay program functions due to schedule and budget constraints.**

- **User expectations were never adjusted during development of the Statewide Systems Project.**

Those interviewed believed that many end-users had unrealistic expectations for the SSP and that when the components were implemented this led to dissatisfaction. These feelings of dissatisfaction were exacerbated by implementation problems: system instability, poor response time, the components not saving end-users time as expected, and unfamiliarity with the system. Unrealistic expectations also caused intra-agency discord since some agency managers believed that the new systems would save their staff time and make their jobs easier. Agency managers' expectations caused conflict when users of the systems fell behind or requested additional help to complete their work. We found that:

**Scheduling and budget problems are common on large systems projects.**

- **Unmet user expectations are a source of dissatisfaction with the Statewide Systems Project.**

- **It was misleading to expect that time savings would result from decentralization, and agency staff were not informed that decentralization of formerly centralized operations could lead to more work.**

Scheduling and budget problems on systems development projects of the size and complexity of the Statewide Systems Project are common and the projects often require modification or deletion of originally specified requirements. SSP management failed to communicate adequately to the user community changes that were necessary in system design. Better project communication with the user community would have helped reset expectations to a realistic level.

# HAVE THE OBJECTIVES OF THE STATEWIDE SYSTEMS PROJECT BEEN MET?

Legislators asked us to specifically address whether or not the systems meet the state's planned objectives. We used information from interviews, survey data, and project documentation to determine, among other things, whether SSP had met its stated objectives.

## Objective (1a): Restructuring of the financial and compliance control processes to make them more efficient and effective

The human resources system (SEMA4) is now a computer-based system. The online system has many system "edits" which help to ensure that the information entered into the system is accurate. The ability to verify information as it is entered has enabled the human resources function to be decentralized in some user agencies. The new system also enables agencies to track more information on line. For example, employee emergency information can now be recorded on line; previously this information was recorded on agency stand-alone systems or on paper.

The new procurement system (AGPS) has moved all of the state's procurement processes to one computer-based system. Previously, less than 25 percent of the state's procurement transactions were handled on line. This has imposed a consistency on state procurement processes that was not present in the numerous paper-based systems that were replaced. Electronic data interchange (EDI), when implemented, has the potential to make the procurement system more efficient by enabling electronic transmission of bids, purchase orders, and other procurement documents between the state and vendors.

**The new accounting system has many new features.**

The new statewide accounting system (GFS) has many new features that were not present in the old system. The accounting system now has multiple methods of accounting, adding cash and full accrual accounting to modified accrual accounting. In addition, there are several new modules in the system. For example, there is now an accounts receivable module that 10 agencies are using to help collect, in a more timely way, money owed the state. There is a also a new grant accounting module that helps provide some agencies and the federal government with reporting and tracking information. Greater flexibility in the new system has enabled agencies to decentralize the accounting function. GFS also provides users with more timely and easier access to information which provides them with a more accurate picture of account status and thus enables better oversight.

However, we found that:

- **Users of the new statewide accounting system (GFS) feel that it is missing important functions that were present in the previous Statewide Accounting System (SWA).**

Sixty-five percent of survey respondents said that the old Statewide Accounting system (SWA) had some or many unique functions that were not present in GFS, 18 percent were uncertain about this, and 17 percent said that there were no unique functions in SWA. Of these respondents, 86 percent rated the functions unique to SWA "very important" or "somewhat important," while 13 percent were either "uncertain" or thought the functions were "somewhat unimportant" or "very unimportant." Agency personnel we interviewed also told us that the new accounting system does not do all that the old system did. However, the sponsoring agencies said that representatives from several large agencies essentially designed the systems. We also found that:

- **Users find GFS more complex and labor intensive than SWA, and 64 percent of survey respondents said GFS "probably does not" or definitely does not" save them time.**

## Objective (1b): Replacing manual, paper-based forms, transactions and controls with electronic forms transactions, controls, and edits wherever appropriate

**SSP replaced many paper forms.**

The Statewide Systems Project replaced many paper-based forms with on-line forms, especially in the human resources and procurement systems, which had been primarily paper-based systems. SSP moved several forms on line, though

users told us that not all paper-based forms were removed from the human resources process. Users suggested that the total amount of paper that is generated has not decreased with the new human resources system. Users must print documentation for transactions, to help diagnose problems, and because of inadequate training. We found that:

- **Although the new statewide systems have replaced many paper-based forms with electronic forms, particularly in the human resources and procurement areas, the majority of employees surveyed in all areas do not believe that the new systems are saving paper.**

Procurement system (AGPS) users also believe that the amount of paper used in the process had not decreased. Employees we interviewed felt that AGPS duplicated the old paper-based system on line, though it had not reduced the amount of paper used. Some of the reasons users gave us for the lack of paper savings were that: printing information is easier than finding it on line; on-line approval is not

**Most users interviewed were pleased with getting more informatiom more quickly.**

## Table 2.1: User Perception of Paper Savings With the New State Systems

| "Has . . . . saved you or your organization paper (including screen prints and reports)?" | Percent of Respondents "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
|---|---|---|---|
| SEMA4 Systems | | | |
| Human Resources | 31% | 26% | 43% |
| Payroll | 20 | 33 | 47 |
| MAPS Systems | | | |
| Accounting (GFS) | 15 | 23 | 63 |
| Procurement (AGPS) | 16 | 17 | 66 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor Statewide System Project user surveys.

easy to use; and more purchase orders are generated with the new system because blanket purchase orders are not used as often. Survey responses support these observations, as shown in Table 2.1.

### Objective (2): Provide timely, readily accessible information that legislators and state managers need to make good decisions and do their jobs

The SSP has moved much more information on line than was the case with the previous accounting, procurement, human resources, and payroll systems. Most users interviewed are pleased with their ability to get more information from the system in a more timely manner. However, users have some concerns with the quality and availability of information. We found that:

- **The new systems have moved much more information on line than was previously available, but many users find the "information warehouse" hard to use. Also, users of the procurement system are concerned that the complexity of many data entry forms discourage users from entering data as intended, resulting in lower data quality than planned.**

For example, some staff enter purchases directly into the accounting system, or use blanket purchase orders so that item level information is not collected by the system. Users are also concerned that the resulting procurement information is incomplete and inaccurate and cannot be used to negotiate contracts or as an agency history. Human resources staff we interviewed expressed similar concerns.

We also found that:

- **There is widespread dissatisfaction with the standard reports generated by each of the systems.**

**Accounting and procurement survey respondents were especially dissatisfied with the standard reports.**

Agency personnel interviewed in all four functional areas expressed a great deal of dissatisfaction with the standard reports. Those interviewed believe that the sponsoring agencies design and generate the standard reports to meet their own needs, and they generally do not meet the needs of the user agencies. The responses of those surveyed concerning satisfaction with standard reports is shown in Table 2.2.

## Table 2.2: User Satisfaction With the Standard Reports

| "How satisfied are you with the new statewide . . . . system with respect to the available standard . . . . reports?" | Percent of Respondents | | |
|---|---|---|---|
| | "Very Satisfied" or "Satisfied" | "Uncertain" | "Dissatisfied" or "Very Dissatisfied" |
| SEMA4 Systems | | | |
| Human Resources | 45% | 32% | 23% |
| Payroll | 52 | 28 | 20 |
| MAPS Systems | | | |
| Accounting (GFS) | 33 | 22 | 45 |
| Procurement (AGPS) | 27 | 39 | 35 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor Statewide System Project user surveys.

**Some information is not yet in the information warehouse.**

We also found that:

- **Many users find the information warehouse difficult to use.**

Many of those interviewed stated that they must use the information warehouse because the standard reports do not provide them with the information that they

need. Procurement information is not yet accessible through the information warehouse, and this is a source of frustration for procurement users. Similarly, not all of the human resources information is available in the warehouse. Users must pay to access warehouse information, and those we interviewed think this is a disincentive to use the information, and at odds with the goal of using the information warehouse to provide better oversight and better service to their customers. State employees we interviewed described the information warehouse as "not user friendly and difficult to use," and only a third of the survey respondents were "very satisfied " or "satisfied " with ease of use, as shown in Table 2.3.

## Table 2.3: Ease of Use of the Information Warehouse

| "How satisfied are you with the new statewide . . . . system with respect to the ease of using the warehouse to obtain . . . . information?" | Percent of Respondents | | |
|---|---|---|---|
| | "Very Satisfied" or "Satisfied" | "Uncertain" | "Dissatisfied" or "Very Dissatisfied" |
| SEMA4 Systems | | | |
| Human Resources | 33% | 42% | 25% |
| Payroll | 34 | 45 | 21 |
| MAPS Systems | | | |
| Accounting (GFS) | 37 | 28 | 36 |

Note: Some figures do not total 100 due to rounding. About 42 percent of those surveyed resp onded that they do not use the information warehouse.

Source: Office of the Legislative Auditor Statewide System Project user surveys.

### Objective (3): Improve the interfaces of statewide financial and human resources information systems with each other and with agency systems to eliminate manual data entry

We found that:

- **Though the new statewide systems have largely eliminated the need for double entry of information, there are some exceptions in human resources and procurement.**

We found several systems that still required the double entry of data, although double entry has been eliminated in several systems also.

In addition, we found that:

- **The goal that the accounting and procurement components have a common look and feel and achieve a "seamless integration" was not fully met.**

**The goal of "seamless integration" was sacrificed as time and money became tight.**

Another SSP objective was integrating the accounting, procurement, and human resources components. The project's original concept was to have similar look and feel for the accounting and procurement components and to have them function in the same way. Movement between the systems was to be effortless and the integration of the two systems seamless. We were told that the independent functioning and lack of communication between the accounting and procurement work groups made achieving these goals difficult. Project participants we interviewed also told us that the goal of seamless integration between systems was sacrificed as time and money became tight.

### Objective (4): Eliminate the need for many agencies to develop and operate separate systems to meet their financial and human resources management information needs

Agencies have been able to eliminate several stand-alone accounting systems, however, a number of agencies continue to maintain separate systems for a variety of reasons. For example, several agencies continue to use separate accounts receivable systems, despite the new accounts receivable component of MAPS. However, there are hundreds of separate financial and human resources systems maintained by state agencies, and we made no attempt to inventory those that had been replaced.

### Objective (5): Provide systems that are flexible and easy to change to meet future requirements

We found that:

- **The goal of a flexible and easy to upgrade system was sacrificed in order to meet state requirements and user expectations.**

**The state extensively modified the computer code in the original software packages, and thus, upgrades will be costly.**

Though the project never officially modified its objectives, it is clear from interviews with the managers and steering committee members that certain objectives were sacrificed in order to deliver a system on time and without additional appropriations. Most notably, the objective of a "flexible and easy to upgrade system" was sacrificed in order to meet user expectations and state requirements.

The ramifications of this decision are already being felt. Sacrifice of the goal of "easy to upgrade" systems means that the state will have to make a considerable additional investment to upgrade its systems. For example, the Department of Finance estimates that 60 percent of the underlying computer code for the payroll system was modified to meet the state's requirements. This extensive modification makes software upgrades costly. For example, the accounting and procurement software now in use will have to be upgraded at a cost estimated to be about $4.5 million in order to make the systems year 2000 compliant.

### Objective (6): Provide better service to the state's citizens, vendors, and other customers

We found that:

- **It is difficult to find a measure of whether the state's citizens, customers, and vendors are being served better as a result of the new systems.**

There are no benchmarks or baseline data for this broad, sweeping goal. It is difficult if not impossible to comment on the direct impact of SSP on the ability of state employees to provide service to citizens, vendors, and customers. A reasonable inference is that if the new systems required more employee time and state resources, that this leaves fewer of both to serve the state's customers.

**Users cited increased information as an important benefit of the new systems.**

## BENEFITS OF THE STATEWIDE SYSTEMS PROJECT

The Legislature also asked our office to determine what monetary and non-monetary benefits the Statewide Systems Project had achieved, and whether specific benefits claimed for the project had been realized. During interviews with state agency employees, a number of non-monetary benefits were identified. The most frequently mentioned area in which benefits accrued was information. Users have benefited because the new systems collect more information than the systems they replaced. Also, information is: more widely available, easier to obtain, more timely, and in some cases more accurate. Users frequently mentioned the ability to generate custom reports on demand and to print them locally as a benefit. Greater access to, and ease of manipulating, information has enabled some agencies to do better and more frequent oversight of accounts and has increased their ability to use information for planning. The new systems have also enabled some agencies to download information electronically to unique agency stand-alone systems, reducing the amount of information that has to be re-entered.

The Statewide Systems Project forced agencies to either upgrade or establish local computer and network infrastructure. More consistent access to computers and networks within and across agencies is seen as a benefit by some state employees. Some agency employees said that increased interconnectivity of state agencies has enabled increased communication and cooperation between agencies.

Benefits were also identified for specific SSP components (accounting, procurement, human resources, and payroll) and are listed below.

### Accounting (GFS)

- GFS has many new features that were not available before.

- GFS gives a more accurate picture of the state's financial status.
- GFS forces people to be more specific about where money is being spent.
- Agencies now have a direct interface to GFS for their stand-alone systems via the Common Inbound Transaction Architecture (CITA). This type of connectivity was not possible with SWA and led to a great deal of manual entry of information and difficulty in reconciling accounts.

**The new accounting system gives a more accurate picture of the state's financial status.**

## Procurement (AGPS)

- All procurement transactions are now handled by one computer-based system.
- AGPS enabled state agencies to decentralize the procurement function.
- Though most purchase orders take longer to enter, overall, those that are entered successfully take less time to process (orders no longer have to be sent to accounting).

## Human Resources

- The human resources function is now computer-based.
- The new system is relatively easy to learn and navigate.
- On-line processing gives agencies more time to complete certain tasks.
- The system allows agencies to complete human resources tasks in a more timely manner, and they no longer have to send everything to DOER for approval.
- System "edits" will save DOER time, and they do not have to review human resources forms for content.
- It is easier to transfer employees between agencies with the new system.
- Salary increases are easier and quicker to perform.
- Agencies are able to hire people much later in the pay period.

**SSP anticipated saving over $20 million annually.**

The Statewide Systems Project anticipated that it would:

(1) Improve collection of accounts receivable by $0.8 - 1.0 million per year,

(2) Reduce the price of commodity purchases by $0.9 - 2.0 million per year,

(3) Secure one-time savings of $7-14 million by elimination of agency stand-alone systems,

(4) Save $2.8 - 3.5 million by eliminating 240,000 - 300,000 hours of staff time spent on paper work and manual systems, and

(5) Save $16 million annually through business process re-engineering.

We conducted interviews with agency personnel to determine if project staff had established baseline measurements for these benefits and to what extent the project met specific goals. We also reviewed SSP documentation to determine the basis for projected benefits and to aid in calculating the degree to which projected benefits have been realized.

**Projected benefits were roughly estimated.**

Project staff projected specific benefits based on very rough estimates. Review of SSP documentation shows that project staff based projected benefits on the estimates of a few people at one or two agencies. Interviews support the finding that the benefits estimated were extremely rough; more than one person said that "a number was pulled out of the air" to estimate savings from the new systems. Our review of SSP documentation also shows that the additional costs of performing new functions were not offset against the projected cost savings. We found that:

- **There is no evidence that projected benefits had baseline measurements established for them or a plan for measuring whether benefits were accruing after SSP implementation.**

- **Sponsoring agencies have done little to measure achievement of projected benefits.**

The sponsoring agencies have made some efforts to measure benefits of the new systems; for example, they surveyed a sample of agencies in 1995, and in December 1996 they conducted a brief customer satisfaction survey. In addition, the three sponsoring agencies hosted an open forum to discuss the new systems in December 1996. However, we recommend:

- **The Department of Finance should periodically repeat the more comprehensive customer satisfaction survey discussed in Chapter 3.**

## Benefit (1): Improve collection of accounts receivable by $0.8 to 1.0 million per year

We found that:

- **Fewer state agencies are using the accounts receivable system than anticipated--currently 10 state agencies use the system.**

The accounts receivable functionality is available in MAPS but only ten state agencies currently use it. The Department of Finance has required agencies with receivables to report on their status quarterly since March of 1994. There are a

number of methods used to improve collection of accounts receivable such as: using private collection agencies; using the Department of Revenue to withhold tax refunds; reviewing and strengthening agency policies and procedures; doing agency specific reviews; and working with the Attorney General to improve collections. The ratio of collections to billing has improved since 1994, when the department first started keeping track. However, there is no way to identify the contribution of any one factor to the increase in collections, so we cannot determine if the state has realized the predicted benefit.

## Benefit (2): Reduce the price of commodity purchases by $0.9 to 2.0 million per year

We found that:

- **The Department of Administration has not yet used information from the system to negotiate commodity contracts. The department acknowledges that it would be difficult to attribute any savings in commodity contracts to the new system at this time.**

**There is concern that information collected by the new procurement system does not accurately describe state agency purchases.**

Project sponsors based the estimated benefit on other institutions' experience with computer-based procurement systems. To date, the Department of Administration has not attempted to measure whether this benefit has accrued. The Department of Administration has negotiated commodity contracts with reduced prices since the implementation of AGPS, but the department acknowledges that it is unlikely that any savings in commodity purchases could be solely attributed to the new system. However, the Department of Administration believes this benefit may occur in the future.

Many interviewees expressed concern that the data collected by AGPS is inaccurate or unrepresentative given the number of shortcuts that agencies use to complete purchases with the system. One of several contributors to inaccurate data is the widespread use of blanket purchase orders. Also, because of problems with the use of contracts and intergovernmental payments agencies have been allowed to enter these types of transactions directly into the accounting system. Given that the procurement data may be inaccurate, it raises the question of whether Department of Administration could effectively use these data to reduce commodity purchase prices.

## Benefit (3): One-time savings of $7-14 million by elimination of agency stand-alone systems

We found that:

- **8 of the 14 stand-alone accounting systems specifically targeted by the Statewide Systems Project have been retired.**

Accepting the extremely rough estimate of avoided costs of $0.5 - 1 million per system this would reduce benefits from $7-14 million to $4-8 million. The SSP

**Several stand-alone accounting systems could not be retired as planned.**

steering committee approved a plan on December 17, 1993, designed to result in the retirement of 14 stand-alone accounting computer systems at user agencies. Agencies have replaced eight of the 14 systems as of September 10, 1996. Of the remaining six systems, four were not replaced because the new accounting system (GFS) lacked needed functions. Of these four, one has been linked to the new accounting system, allowing the agency to exchange information with GFS. Agencies have not replaced the remaining two systems because the agency in question lacks the time and/or resources to replace the old systems. Table 2.4 shows a breakdown of the systems and indicates whether or not they have been replaced.

## Table 2.4: Status of State Agency Stand-Alone Systems

| Agency | System | Status[1] | Reason not replaced |
|---|---|---|---|
| DHS | Budget Cost Control System | Replaced | |
| DHS | A/R CCDTF | **Not Replaced** | Built an CITA interface to SSP |
| DHS | FM County Billing | Replaced | |
| DHS | A/R Parental Fees | **Not Replaced** | GFS lacks needed functionality |
| DNR | Cost Coding | Replaced | |
| DOER | Accounts Receivable | Replaced | |
| DOER | General Ledger | Replaced | |
| DOF | Cost Allocation | **Not Replaced** | Plan to replace in the future |
| DOT | Accounts Receivable | Replaced | |
| DOT | Cost Accounting | Replaced | |
| DPS | Accounts Receivable | Replaced | |
| PCA | Grants | **Not Replaced** | GFS grants module lacks functionality |
| PERA | General Ledger | **Not Replaced** | Lack of time, bad information from MAPS |
| State Auditor | Accounts Receivable/Billing | **Not Replaced** | GFS lacks needed functionality |

Source: Office of the Legislative Auditor.

[1]Status as of September 10, 1996.

The one-time cost savings for each of these systems was estimated to be between $500,000 and $1,000,000. The savings are achieved through avoided replacement costs of the stand-alone systems over one to three years (1995-97). These avoided costs are extremely rough estimates at best and are not based on an investigation of the actual replacement costs for any of the systems. Further, the systems vary widely in complexity, from personal computer based spreadsheets to mainframe based systems. Cost estimates are likely to be overstated or understated.

Taking the cost savings range as given, the projected savings to date due to stand-alone accounting systems replacement is $4-8 million. The cost savings for replacing the remaining six systems may be lower than originally estimated, since, according to agencies, four of the systems require additional GFS functions. The cost of such added functions is unknown.

## Benefit (4): Save $2.8 - 3.5 million eliminating 240,000 to 300,000 hours of staff time spent on paper work and manual systems

We found that:

- **The state has made no attempt to measure any reduction in staff time spent on paperwork or using manual systems. The majority of survey respondents and employees we interviewed do not believe that the new systems are saving them paper, time, or money.**

As discussed above, agencies do not believe that the new system has saved paper, and in some cases they believe they have increased the amount of paper used. As Table 2.1 showed us, over 62 percent of MAPS users and 42 percent of SEMA4 users told us that the new systems "probably does not" or "definitely does not" save them paper. As the sponsoring agencies note, saving paper *per se* was not the goal of this effort.

**Some tasks may take more time to complete.**

Although the new systems may not save the state paper, it is possible that agencies are still saving time in completing work tasks. However, the information collected in agency interviews does not support this conclusion. Agency personnel working in all of the component areas felt that the new systems required more time to complete their work than in the past. The two most common reasons given for the increased time burden were that the new systems are collecting much more information than the old systems and the slow response time of the new systems. Many of those interviewed did not believe that the extra information being collected would be of benefit to their agency and did not believe that it was worth the extra effort to enter the information. Agency procurement staff told us that they had to perform additional work and many said they had hired additional staff to enter purchase orders into the system.

As we discuss in Chapter 3, agencies also consistently said that the poor response time for the new systems was negating or outweighing any other timesaving features of the new systems. Agency staff interviewed consistently identified SEMA4 as having the worst response time, particularly the payroll component. Several agencies stated that they decentralized some of the human resources and payroll functions because the system response time was so poor that they could no longer complete functions centrally. The survey results are shown in Table 2.5.

The majority of the respondents do not believe that the new statewide systems have saved them money. As Table 2.6 shows, roughly 65 percent of procurement system users said that the new system "probably does not" or "definitely does not" save them money.

**Interview and survey data indicate that there may be no time or money savings with the new systems.**

## Table 2.5: User Perception of Time Savings With the New State Systems

| "Has . . . . saved you or your organization time (including any necessary overtime, temporary staff, and new staff)?" | Percent of Respondents | | |
|---|---|---|---|
| | "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
| SEMA4 Systems | | | |
| Human Resources | 26% | 27% | 47% |
| Payroll | 21 | 19 | 60 |
| MAPS Systems | | | |
| Accounting (GFS) | 16 | 20 | 64 |
| Procurement (AGPS) | 18 | 16 | 66 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor Statewide System Project user surveys.

## Table 2.6: User Perception of Money Savings With the New State Systems

| "Has . . . . saved you or your organization money (including staff costs and indirect costs)?" | Percent of Respondents | | |
|---|---|---|---|
| | "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
| SEMA4 Systems | | | |
| Human Resources | 13% | 41% | 46% |
| Payroll | 9 | 40 | 52 |
| MAPS Systems | | | |
| Accounting (GFS) | 10 | 31 | 59 |
| Procurement (AGPS) | 11 | 24 | 65 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor Statewide System Project user surveys.

### Benefit (5): Save $16 million annually through business process re-engineering.

The estimated $16 million annual savings due to re-engineering is based on the savings that would accrue if agencies implemented 46 of the over 300 re-engineering ideas. We found that:

- **Sixteen of the 46 re-engineering ideas have been fully implemented and six have been partially implemented, cutting the estimated annual savings to about $6 million a year.**

**SSP staff gathered over 300 re-engineering ideas, and further developed 46 of them.**

Of the over 300 re-engineering ideas that SSP staff gathered, 46 were further developed into re-engineering opportunities by the Business Process Re-engineering (BPR) team and approved by the SSP steering committee. The BPR team estimated the cost savings associated with implementation of re-engineering opportunities and detailed each in a "Re-engineering Opportunity Benefit Estimation Worksheet."[4]

The benefit estimates calculated by the BPR team for the re-engineering opportunities overstate the true benefits, because they only account for savings that will accrue, and are not offset by ongoing costs for implementing these opportunities. Though a re-engineered process may replace a manual process, the benefit cannot be calculated by simply estimating the time saved by eliminating the manual process. Time savings must be offset by the time that it takes to implement the new re-engineered process. For example, many of the re-engineered processes are collecting more information than the old processes and so their scope has expanded. The speed to complete a process is dependent on many factors, such as: the scope and complexity of the process, the speed of local and InterTech computer hardware, the speed of the network, and the speed of the person entering the information. Simply automating a process does not mean that overall it will be faster to complete.

**Automating a process does not mean that overall it will be faster to complete.**

Based on interviews with representatives from SSP sponsoring agencies, as of September 10, 1996 the status of the 46 re-engineering opportunities was:

- Sixteen implemented,
- Six partially implemented,
- Twenty-four not implemented (10 pending).[5]

# SUMMARY

Legislators asked our office to determine whether the objectives and specific benefits claimed for the Statewide Systems Project had been achieved. We found that expectations of both legislators and users were set too high by SSP staff and state contractors. The systems were oversold to obtain legislative support for project

*4* It should be noted that the cost savings estimates were not calculated in a rigorous manner and are very rough. In many cases the experience of one or two agencies (based upon the estimate of a few people within an agency) is used to generalize the experience to all state agencies. The state's project manager stated in a September 1, 1994, memo that "Tracking these estimated savings will be difficult in many cases, impossible in others." Given that the same process would be used to both estimate and measure potential savings, the estimated benefits are likely very imprecise.

*5* We used the cost estimates developed by the BPR team in this calculation. If a process was partially completed we counted all of the estimated benefit as being achieved, therefore, the actual benefits achieved may be slightly overstated.

funding and to secure user "buy-in." As is typical with projects of the size and scope of SSP, schedule and budget constraints required the modification, deletion, or postponement of some system functions. This led to dissatisfaction with the systems in part because SSP management failed to communicate system changes to the user community, which would have reset expectations to a more realistic level.

**SSP has mixed results in achieving its stated objectives.**

The Statewide Systems Project has achieved mixed results in fulfilling its stated objectives. Though the new accounting system (GFS) has many new functions, users feel that the new system is more complex and labor intensive and that it is missing important functionality. The new systems have eliminated many paper-based forms from the human resources and procurement systems, but users do not believe that the systems are saving them paper or time or money. Users are generally happy with more timely and greater access to on-line information, though they find the standard reports unsatisfactory and the information warehouse difficult to use. Further, many believe that charging agencies for use of the information warehouse discourages use and decreases the benefits of greater availability of information. The new systems have for the most part not eliminated the need for agencies to develop and operate some stand-alone systems. Finally, the goals of flexible and easy to upgrade systems were sacrificed in order to meet user expectations and to remain on schedule and within budget. This will make upgrading the systems to make them year 2000 compliant much more expensive.

In determining whether the Statewide Systems Project had achieved the specific benefits projected we found that benefit estimates were not calculated in a rigorous manner and little attempt has been made to measure whether benefits have accrued. We found that only 8 of the 14 stand-alone accounting systems targeted have been retired, making projected savings roughly one-half what was originally projected.

We found that $6 million of the projected $16 million in annual costs savings from re-engineering may have been realized. We also found that users do not believe that the new systems are saving them paper, time, or money, making it doubtful whether savings have been achieved through a reduction in staff time.

# User Experiences With the New Systems

**CHAPTER 3**

Implementing the four new systems required more than flipping a switch. Project staff had to develop plans to coordinate the multi-system start-up, including assessing agency and system readiness. Project staff also had to develop curricula and manuals for training thousands of state employees in nearly 100 agencies to use the systems. Finally, project staff had to make long-term plans for supporting users after the systems were activated, including user help services and allocating resources to correct errors and upgrade the new systems. In this chapter we address the following questions:

- **What did state agencies experience in their first year using the new computer systems?**
- **How satisfied are the users of the new systems?**

**We interviewed and surveyed users from large and small state agencies.**

We interviewed over 120 managers and users of the systems and asked them about the first year of operation. We requested statistics measuring the system's operation time and the number of users' calls for help to Mn-ASSIST.[1] We surveyed users of all four systems and asked about their satisfaction with specific system processes, training, response time, operating hours, and how their opinion had changed over the last year.[2] We also interviewed employees from a sample of 12 small agencies to determine if they had special concerns about the project and its various components.[3]

*1* Mn-ASSIST stands for Minnesota Administrative Statewide Systems InterAgency Support Team. Mn-ASSIST is a division of the Department of Finance that provides user support for all the new systems. Additional support is provided by each of the sponsoring agencies.

*2* We selected a random sample of 500 MAPS users and 470 SEMA4 users from employees approved to use either the MAPS or SEMA4 systems. We sent each MAPS user in the sample the accounting and procurement questionnaires. We sent each SEMA4 user in the sample the payroll and human resources questionnaires. About one-third of those in each sample indicated that they did not use either system, and 25 employees were no longer in state government. We received no response from about one-fourth of each sample. We coded only responses received on the original survey form, although several duplicate forms were also submitted. We transcribed all comments from each questionnaire. Our final analysis included 725 valid responses from 138 human resources users, 209 payroll users, 180 accounting users, and 198 procurement users representing 60 different agencies and 459 different state employees. Both MAPS systems were used by 137 employees and both SEMA4 systems were used by 106 employees. Twenty-three employees used at least one MAPS system and one SEMA4 system, with 20 of these using both procurement and payroll.

*3* Our small agency sample included: the Board for Public Defense, Board of Animal Health, Capitol Area Architect, Council on Indian Affairs, Higher Education Services, Minnesota Planning, Ombudsman for Corrections, Ombudsman for Mental Health, Peace Officers Standards and Training Board, Public Utilities Commission, Secretary of State, and the State Treasurer. We also received several unsolicited letters from other small agency employees.

Generally, there was confusion among users about how to use the new systems when they were first implemented in the summer and fall of 1995. However, users are generally more satisfied now, in part due to experience using the new systems, but also because the sponsoring agencies have addressed some of the problems. There were initial difficulties with some user training, but user support through Mn-ASSIST and some sponsoring agencies is generally highly rated. Statewide Systems Project staff partly accommodated the special equipment and training needs of smaller agencies. However, a few agencies and employees failed to take the project seriously and were less prepared than other agencies to use the new systems.

**Users have become more satisfied with all systems in the year or so since they were implemented.**

Users are reasonably satisfied with the new payroll (60 percent satisfied) and human resources systems (67 percent satisfied) despite slow response times. There are significant problems with the new procurement system (AGPS), and, as we discuss later, the sponsoring agencies should review whether all state agencies should continue to use AGPS in the same way.

# THE FIRST YEAR

Most projects of the magnitude of the Statewide System Project encounter problems at start-up. This is usually due to errors in the system itself, a mismatch between what users expected and what actually appeared on their desktops, technical factors such as the amount of time the computer system is available, or limits on the amount of time employees can spend learning and working with the new system.

During our interviews, SSP users carefully distinguished between initial system implementation and current system performance. We found:

- **Project staff were aware of likely difficulties with the new systems, but the problems were somewhat more severe than expected.**

**The first few months were more stressful than user agencies anticipated.**

Project management knew that the new systems would affect thousands of employees who would need training and help getting used to the new systems. They also knew that many state agencies would need to allocate funds to upgrade computer systems. As described below, project management did attempt to address some of these issues. However, the first few months were more stressful than user agencies anticipated. Users were particularly critical of the Minnesota Accounting and Procurement System (MAPS) implementation period, often described as a "time of chaos," with some agencies barely prepared to go on line. For many agencies, working overtime became the norm, and some had to add part-time staff. For some agencies, the time to complete tasks lengthened from days to weeks, and many jobs were simply left undone.

Users were especially critical of the procurement system (AGPS), and we were told that vendors either canceled or threatened to cancel many of the state's cellular phones and pagers due to unpaid bills. Employees in larger agencies formed in-

**The phased implementation of the payroll and human resources systems was successful.**

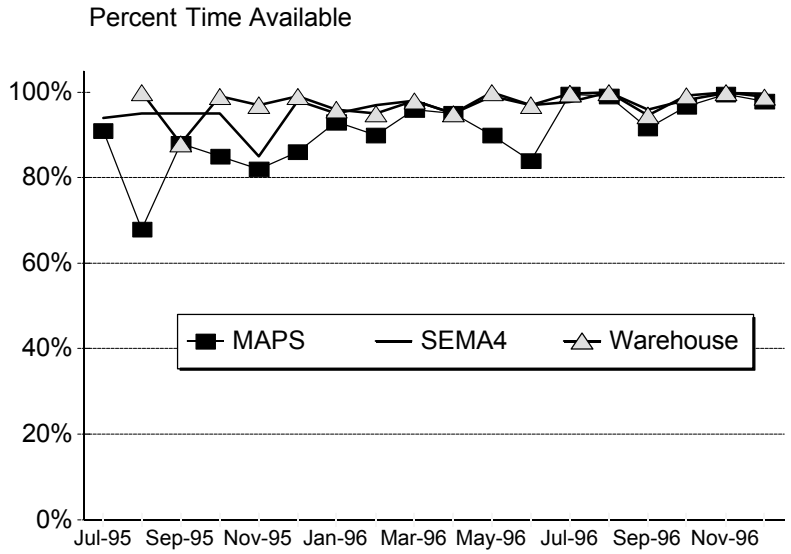
ternal networks and shared ideas on how to work around system requirements. In contrast to users' experience with the new procurement (AGPS) and accounting (GFS) systems, SEMA4 users generally felt that the phased implementation of the human resources and payroll systems was smoother. In the phased SEMA4 implementation, there were fewer new users starting to use the system at any one time and staff could make changes based on the experience of the Department of Transportation's SEMA4 pilot project and previous implementation stages.

Statewide Systems Project and Inter Tech staff worked to upgrade agency and state networks and equipment in preparation for the new systems. As shown in Figure 3.1, MAP's smooth July start-up (the system was available to users 91 percent of the time) was followed by decreased August availability.[4] Overall, we found:

- **The SEMA4 system has been available to users at least 95 percent of the time, and while there were initial problems with MAPS availability, the system has been available over 97 percent of the time in recent months.**

The addition of new users to the system might explain some of the variation in availability. As shown in Figure 3.2, the number of MAPS transactions was fairly low in July 1995. This number increased during the year, and, as expected,

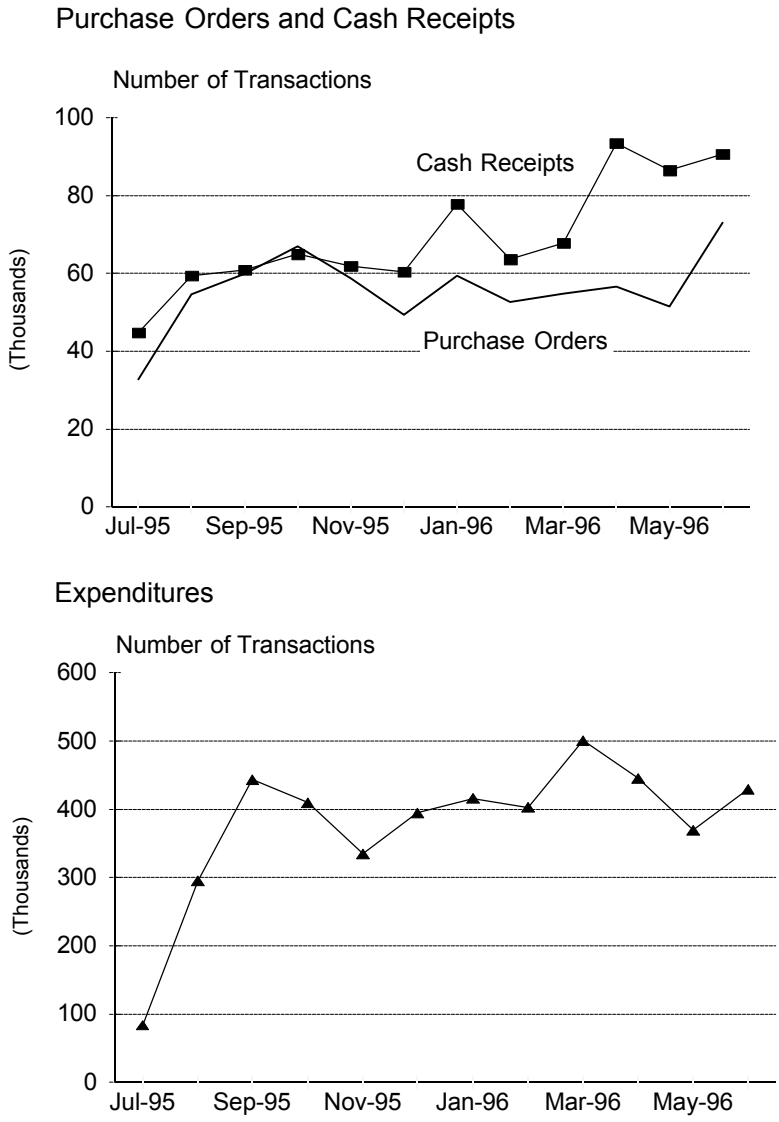
**Figure 3.1: System On-Line Availability for MAPS, SEMA4, and the Information Warehouse**




Source: Mn-ASSIST, Minnesota Department of Finance.

*4* Availability means that the system was available to process transactions. Ninety-one percent availability means that for ninety-one percent of the time that the system was scheduled to be available to any user, that the user could actually log on to the system and process transactions. This is in contrast to where the system might be available but very slow.

**Figure 3.2: MAPS Transaction Usage: Purchase Orders, Cash Receipts, and Expenditures**




Source: Mn-ASSIST, Minnesota Department of Finance.

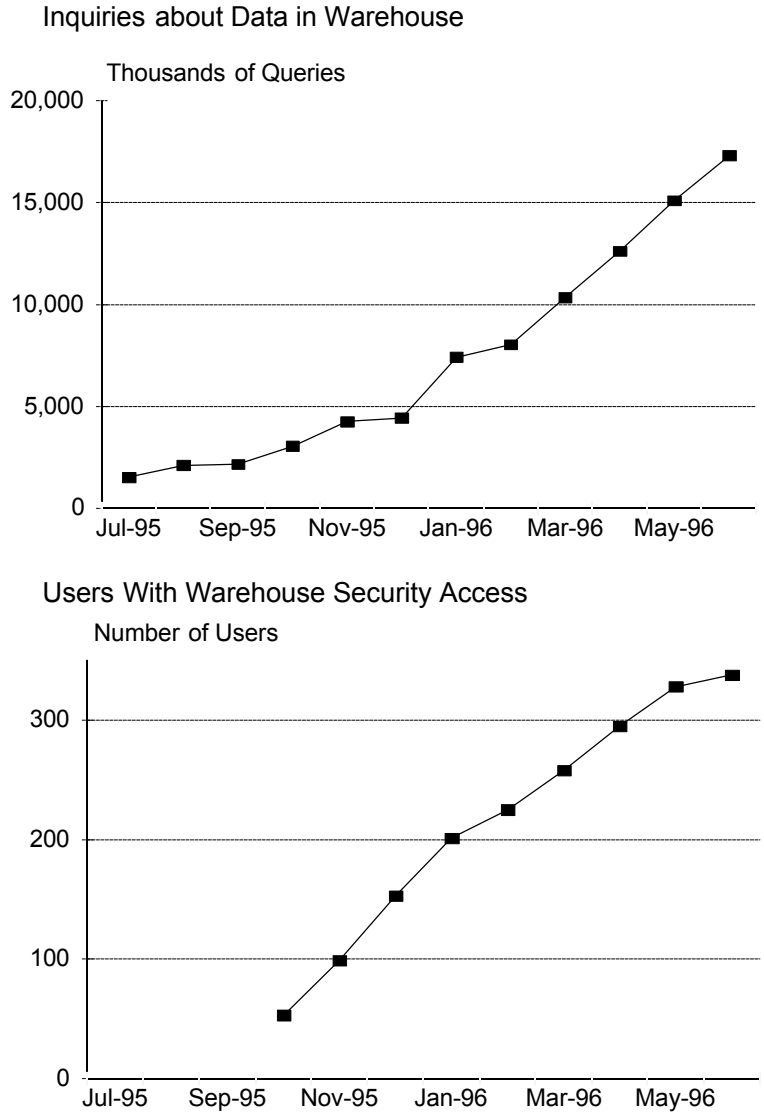
jumped at the end of fiscal year 1996 because of end-of-year purchasing. Availability of the information warehouse is similar to that for SEMA4.[5] Figure 3.3 shows a steady increase in information warehouse usage, paralleling ongoing user training and generally high system availability.

System users had many questions during the first few months of system use, as shown in Figure 3.4. We found that:

*5* As described in an earlier chapter, the information warehouse is a database maintained by Mn-ASSIST that allows trained users to create customized reports.

**Use of the information warehouse increased.**

## Figure 3.3: Information Access Warehouse Usage



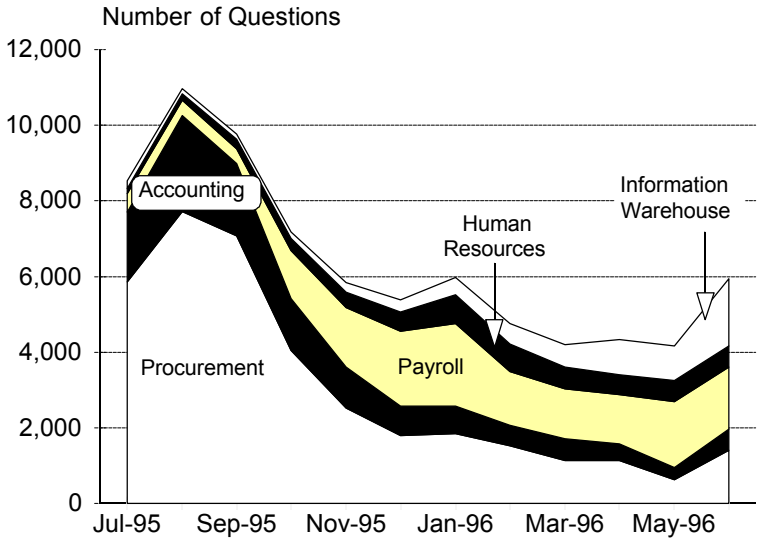

Source: Mn-ASSIST, Minnesota Department of Finance.

- **Help desk requests have declined for procurement and accounting and remained fairly constant for payroll and human resources, despite steady or increasing system usage.**

Requests for help with the procurement and accounting (GFS) systems peaked early and then dropped fairly steadily until June's purchasing rush. Payroll, human resources (SEMA4), and information warehouse inquiries reflect a growing population of trained users. Overall, the procurement system initially accounted for most of the help desk activity (about 70 percent) but that proportion dropped to 15 percent in May 1996 and 24 percent in June 1996.

**Help desk calls declined.**

**Figure 3.4: Phone Calls to the Mn-ASSIST Help Desk About the New Systems and the Information Warehouse**




Source: Mn-ASSIST, Minnesota Department of Finance.

A few agencies did not take the project seriously, and some employees felt that a project of this magnitude would not happen or would be similar to the older systems, and therefore preparation or training was a waste of time. We found:

- **Some agencies and users contributed to their own difficulties in using the new systems by ignoring training and the new systems' technical requirements.**

A few agencies scrambled at the last minute to achieve critical technical readiness, and not all employees elected to take the training they needed by the time project staff implemented the new systems. Project staff point out that they monitored agency readiness and assisted where it was possible.

# Training and User Support

State employee training needs varied widely depending on factors such as agency size, decentralization of work processes, use of technology, and previous experience. About 5,000 employees were trained directly by project contractors or indirectly through their own agencies.[6] We found:

- **Training for the MAPS system suffered from problems created by tight timelines and the sheer size of the project.**

*6* We estimated that about 200 agency trainers were directly trained by the project. They returned to eight large agencies to train over 2,200 other employees. Nearly 2,500 end-users were directly trained by the three sponsoring agencies or by professional trainers at two vocational-technical colleges.

**Training did not become a high priority until midway through the project.**

According to internal project documents, training was a concern, but did not become a high priority until after the project went through "realignment." Ongoing disagreements with Andersen Consulting about the timing and quality of deliverables and other issues threatened the integrity of the MAPS training. The most consistent problems were: (1) a frequent mismatch between training content and features in the final system, particularly for MAPS, as discussed in Chapter 2; (2) system downtime that affected the ability of employees to use training options such as the model office; (3) course requirements that limited how much training some employees could realistically cover; and (4) a lack of adequate back-up resources either in printed, electronic, or live (help desk) forms. Professional trainers at technical colleges provided many MAPS and SEMA4 classes, and some state employees had to travel from St. Paul to Anoka for most of their training. Instructors were sometimes unfamiliar with state government in general and specifically the systems being replaced, and they often could not explain how to perform the same task in both the old and new systems. Those who were being trained on more than one of the new systems had to learn how to perform similar tasks using different procedures.

Users report that current support for the system is generally good. We found that:

- **Mn-ASSIST does a good job of answering users' questions.**

**Satisfaction with the sponsoring agencies' support staff was uneven.**

Between 70 and 78 percent of users said they were satisfied or very satisfied with the help they received from the Mn-ASSIST help desk. The level of user satisfaction with support staff in the sponsoring agencies was also high for the Department of Employee Relations' support of human resources (74 percent) and Finance's payroll support (70 percent), but much lower for Finance's accounting support (50 percent) and Administration's procurement support (49 percent). Some users have created their own support network with employees they met during training or contacts in other agencies. Several of those interviewed said that system manuals were out of date before the training ended, and only about one-third were satisfied with updates to the manuals. We recommend:

- **Mn-ASSIST should continually update the system manuals as they fix errors and add new features.**

The sponsoring agencies are currently conducting refresher courses for those initially trained in MAPS and they have revised many of the manuals.

# Small Agencies

Project staff were aware that small agencies had special needs and we found:

- **Project staff attempted to meet the training, equipment, and support needs of small agencies, with partial success.**

Small agencies were not able to participate widely in project planning due to financial and time constraints. Many small agencies simply did not understand the pro-

ject's likely impact and the transfer of previously centralized functions to the user agencies.

**The project did not initially budget for equipment agencies would need to use the new systems.**

Although aware of the issue, the project staff did not initially address funding any agency's technology needs for support equipment, including networks, personal computers, printers, and modems required to use the new systems. During the project restructuring in late 1993, project management created a fund to help support agency equipment and related needs, particularly those of small and medium size agencies.[7] Of the $1.6 million budgeted for small-agency needs, including technical support and equipment, agencies requested just over $2.2 million for equipment; and the project awarded about $436,900.[8] Several small agencies hired an outside consultant to help them get their network and the system up and running.

Project staff initially assumed agencies could absorb all training costs. Larger agencies developed their own materials and in-house help procedures, but small agencies did not have these options. Moreover, because they are more likely to use more than one system, small-agency employees had to take more training. In response to these concerns, small agencies were given the option of training employees directly through the sponsoring agencies. Currently, two Department of Finance staff specifically work with small agencies. Several agencies suggested establishing a small-agency user group that could make recommendations specific to small-agency needs.

# USER SATISFACTION

**The new systems were very different from those they replaced.**

The new human resources, payroll, accounting, and procurement systems differed substantially from the systems they replaced. The new human resources component (SEMA4), and to a lesser extent the new procurement system (AGPS), automated what were previously paper-based processes.[9] The new MAPS accounting system (GFS) and the new payroll component (SEMA4) looked and worked much differently than their predecessors. Because of these changes, project staff predicted that users might have some difficulty adapting to the new procedures, but they expected gradual improvement in state employees' "comfort level." State employees have used MAPS' accounting and procurement systems since July 1, 1995. Employees have somewhat less experience with the payroll and human resources systems implemented between July and December 1995.[10]

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*7* However, agencies had less than one month's notice (May 20 to June 15, 1994) to put together a request for equipment funding, and several small agencies told us that they were unaware of the program until it was too late to apply.

*8* Most of the 46 agency requests were funded -- requests from the Attorney General, Council on Black Minnesotans (only a printer was requested), the Department of Human Services, and the Department of Natural Resources were denied. However, not all agencies receiving these funds were small--the departments of Administration and Health together were given just over $40,000.

*9* The procurement transactions that went through the Department of Administration (about 22 percent) were processed with an automated system.

*10* Implementation for the Minnesota State Colleges and University system was phased in during 1996 with the conversion being completed in October 1996.

We surveyed users of all four systems and asked about their satisfaction with the systems overall and with specific functions. We also conducted over 120 interviews with those who planned the project or were current users, and we also reviewed project file documents, reports, and materials from current user groups.

Generally, we found:

- **Users were more satisfied with the human resources and payroll systems than with the accounting and procurement systems.**

- **Users were unhappy with the accounting and procurement standard reports, and even less happy with the information warehouse.**

**While many problems with the new systems have been fixed, more changes are needed if they are to function as originally conceived.**

Overall, users were frustrated with the procurement system, but felt that the new payroll and human resources systems represented an improvement in how they could do the state's work. Nearly half of all our survey respondents reported improvement in satisfaction with a system since its implementation. Accounting and procurement system users were dissatisfied with the standard reports. Most users were not satisfied with the ease of using the information warehouse. Large- and small-agency users reported similar levels of satisfaction with the new systems.[11] During our interviews, users and work group members told us that there had been many changes since implementation, many errors were fixed, missing features added, and procedures clarified. However, many additional modifications are needed before the systems will function as originally promised. As discussed in Chapter 2, project sponsors pushed user expectations to a fairly high level, and users expect the systems eventually to match those expectations-- better response time, consistently high system availability, added features, and modifications to procedures that are difficult to use. Two active MAPS and SEMA4 user groups generated a long list of system modifications designed to fix some features that do not work properly and add functions that users believed the systems would include. The sponsoring agencies have implemented some of these modifications and improved system capability.

# The Human Resources and Payroll Systems

**Human resources and payroll system users were generally satisfied.**

Table 3.1 shows user satisfaction ratings for 19 human resources questionnaire items.[12] Nearly two-thirds of the human resources system users responded that overall they were satisfied with the new system, about 20 percent reported that they were uncertain, and only 15 percent were dissatisfied. While just under half of all respondents reported an improvement in their level of satisfaction during the last year, a similar number reported that their opinion had not changed. Only 9

*11* There were relatively few users from small agencies in our samples, consistent with the small number of total system users from small agencies. This made it difficult to identify any statistical differences between the two sub-groups.

*12* This table and those that follow combine questionnaire response categories for simplicity of presentation. When discussing how satisfied users were with a specific dimension of a system, we will consider that satisfied includes both "very satisfied" and "satisfied" categories. In most cases there were few "very satisfied" responses, usually less that 10 percent of the combined category. We also combined "dissatisfied" and "very dissatisfied" responses. Generally, about one-third of the combined category responses were "very dissatisfied."

percent said that they were less satisfied. Generally, the highest ratings were given to users' ease of entering information into the system. Over 60 percent of human resources questionnaire respondents were satisfied with making inquiries, completing a transaction, navigating the system, obtaining information from the system, and updates and advisories. About 57 percent were satisfied with their human resources training, and over 70 percent of users were satisfied with the help they received from both Mn-ASSIST and the Department of Employee Relations support staff. Users rated the ease of retrieving information, including standard reports and the information warehouse, fairly low.

Human resources users made many written comments about the system. Those who rated the system highly appeared generally satisfied with what the system can do, but were dissatisfied with the system's complexity, including multiple layers of screens and the difficulty of generating reports from the information warehouse. Interviewees listed on-line processing of transactions, ease of performing inquiries, and elimination of paper forms previously sent to DOER for processing as benefits of the new system. Users from small agencies were less likely to be satisfied with any system feature, especially their ability to make inquiries. Small-agency users were generally more satisfied than others with the help from Mn-ASSIST. Overall, they were only slightly less satisfied with the new human resources system than other users.

According to the users we interviewed and surveyed:

- **The major problem with the new human resources and payroll system was slow response time during some time periods.**

**Some transactions during some time periods can take minutes to process.**

Over 60 percent of human resources system (SEMA4) users responded on the questionnaire that response time was "definitely" or "possibly" a problem, and they frequently made written comments about response time. Some actions, during some time periods, can take minutes to process. Mn-ASSIST, InterTech, and DOER are assessing exactly where bottlenecks exist in the system.

The system is available during weekday hours (7 AM to 6 PM), and is not available at all on weekends. During our interviews, some users told us that system operating hours were a problem during emergencies or when work backed up during a particularly busy period. Also, about one-fourth of users cited the limited availability of the system to process some types of human resources transactions as a problem. For example, employees can process some transactions only during a few days of the 10-day payroll cycle. Mn-ASSIST and DOER have responded to this problem and expect to complete a project in early 1997 that allow these transactions to be processed for 7 of the 10 days in a payroll cycle.

Overall, user satisfaction with the new payroll system was nearly as high as that for human resources, with almost 60 percent of respondents reporting that they were satisfied. Table 3.2 shows user satisfaction ratings for 19 payroll questionnaire items. Just over 40 percent of all respondents reported that they were more satisfied with the system since implementation, although nearly 40 percent reported that their opinion had not changed. Only 16 percent responded that they

## Table 3.1 User Satisfaction with the SEMA4 Human Resource System

| | Valid Responses | Percent of Respondents: "Very Satisfied" or "Satisfied" | "Uncertain" | "Dissatisfied" or "Very Dissatisfied" |
|---|---|---|---|---|
| "How satisfied are you with the new statewide SEMA4 human resource (HR) system with respect to:. . . ." | | | | |
| What you need to do to complete an HR transaction in SEMA4? | 101 | 72% | 12% | 16% |
| Navigating HR in SEMA4? | 133 | 71 | 14 | 16 |
| Making HR inquiries in SEMA4? | 133 | 76 | 10 | 14 |
| The information you receive about SEMA4 HR updates? | 126 | 67 | 24 | 9 |
| The assistance you receive from the MN-Assist help desk about SEMA4 HR questions? | 104 | 72 | 14 | 13 |
| The assistance you receive from the DOER SEMA4 support staff about SEMA4 HR questions? | 105 | 74 | 19 | 7 |
| Your ability to obtain HR information from the system? | 131 | 64 | 17 | 19 |
| The HR reports you can generate from the information warehouse? | 77 | 36 | 43 | 21 |
| The ease of using the warehouse to obtain HR information? | 76 | 33 | 42 | 25 |
| The available standard HR reports? | 97 | 45 | 32 | 23 |
| The current HR advisories, special bulletins, and user tips? | 118 | 66 | 25 | 8 |
| The timeliness of the information you receive about changes to policies, laws, transaction requirements, and other similar changes? | 115 | 43 | 37 | 19 |
| The implementation of changes in laws, bargaining unit agreements, taxation requirements, and other similar changes? | 111 | 41 | 47 | 12 |
| The SEMA4 HR training that you received? | 123 | 57 | 13 | 30 |
| The SEMA4 updates to training manuals? | 112 | 33 | 38 | 29 |
| Your overall level of satisfaction with the performance of the HR component of SEMA4? | 132 | 67 | 18 | 15 |
| | | "Much More Satisfied" or "More Satisfied" | "No change" | "Less Satisfied" or "Much Less Satisfied" |
| "How has your satisfaction with the HR component of SEMA4 changed since implementation in your agency?" | 127 | 47% | 44% | 9% |
| | | "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
| "Are system operating hours currently a problem for you?" | 135 | 25% | 6% | 69% |
| "Is system response-time while doing HR tasks in SEMA4 currently a problem for you?" | 134 | 61 | 12 | 27 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor, *Minnesota Statewide Employee Management System (SEMA4) User Survey: Part 2 Human Resources.*

# Table 3.2 User Satisfaction with the SEMA4 Payroll System

| | | Percent of Respondents | | |
|---|---|---|---|---|
| | Valid Responses | "Very Satisfied" or "Satisfied" | "Uncertain" | "Dissatisfied" or "Very Dissatisfied" |
| "How satisfied are you with the new statewide SEMA4 payroll system with respect to:. . . . " | | | | |
| What you need to do to complete a payroll transaction in SEMA4? | 170 | 75% | 7% | 18% |
| Navigating payroll in SEMA4? | 173 | 72 | 13 | 15 |
| Making payroll inquiries in SEMA4? | 183 | 67 | 12 | 21 |
| On-line help for payroll in SEMA4? | 162 | 47 | 33 | 20 |
| The information you receive about SEMA4 payroll updates? | 175 | 67 | 23 | 10 |
| The assistance you receive from the MN-Assist help desk about SEMA4 payroll questions? | 160 | 70 | 19 | 11 |
| The assistance you receive from DOF Central payroll staff about SEMA4 payroll questions? | 149 | 70 | 23 | 6 |
| Your ability to obtain payroll information from the system? | 184 | 63 | 15 | 23 |
| The payroll reports you can generate from the information warehouse? | 116 | 41 | 38 | 22 |
| The ease of using the warehouse to obtain payroll information? | 116 | 34 | 45 | 21 |
| The available standard payroll reports? | 150 | 52 | 28 | 20 |
| The current payroll advisories, special bulletins, and user tips? | 169 | 64 | 29 | 7 |
| The timeliness of the information you receive about changes to requirements such as policies, laws, taxation requirements, and other similar changes? | 166 | 42 | 45 | 14 |
| The SEMA4 payroll training you received? | 192 | 61 | 11 | 28 |
| The SEMA4 payroll updates to training manuals? | 170 | 36 | 39 | 25 |
| Your overall level of satisfaction with the payroll component of SEMA4? | 200 | 60 | 19 | 22 |

| | Valid Responses | "Much More Satisfied" or "More Satisfied" | "No change" | "Less Satisfied" or "Much Less Satisfied" |
|---|---|---|---|---|
| "How has your satisfaction with the payroll component of SEMA4 changed since implementation in your agency?" | 194 | 43% | 40% | 16% |

| | | "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
|---|---|---|---|---|
| "Are system operating hours currently a problem for you?" | 199 | 21% | 14% | 66% |
| "Is system response-time while doing payroll tasks in SEMA4 currently a problem for you?" | 198 | 73 | 11 | 16 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor, *Minnesota Statewide Employee Management System (SEMA4) User Survey: Part 1 Payroll.*

were less satisfied since implementation in their agency. Well over 60 percent of payroll questionnaire respondents reported that they were satisfied with how they worked with the system including, completing a transaction, navigating, making inquiries, and obtaining information from the system. Seventy percent of users were satisfied with the help they received from both Mn-ASSIST and Finance support staff. Just over 60 percent were satisfied with training, although just under 30 percent said they were dissatisfied. Users rated several activities related to the information warehouse fairly low, although relatively few users completed the information warehouse items.

Users from small agencies were less likely to be satisfied with specific system features, compared to other users. Small-agency users were generally more satisfied than other users with the help from Mn-ASSIST and Finance. Overall, they were only slightly less satisfied with the new payroll system than other users.

Those we interviewed identified a wide variety of features that they liked about the new payroll system, including on-line history and business expense reporting, increased detail, mass time entry, and the reduction in errors due to on-line edits. Unpopular characteristics of the new payroll system included the time needed to enter information into the system and using the information warehouse. Nearly three-fourths of the payroll system users rated response time as a problem.

# The Accounting and Procurement Systems

Users were less happy with the Minnesota Accounting and Procurement System (MAPS). As shown in Table 3.3, far fewer users reported that they were satisfied with the new accounting (GFS) and procurement (AGPS) systems compared to the two components of SEMA4. However, 43 percent of respondents said that they were more satisfied with the new accounting system and 52 percent are more satisfied with the procurement system since implementation. Table 3.4 shows user satisfaction ratings of 20 accounting questionnaire items.

## Table 3.3 Overall Satisfaction with the Human Resource, Payroll, Accounting, and Procurement Systems of the Statewide Systems Project

| | | Percent of Respondents | | |
|---|---|---|---|---|
| "How satisfied are you with the new statewide system (.....) with respect to your overall level of satisfaction with . . . .? | Valid Responses | "Very Satisfied" or "Satisfied"[1] | "Uncertain" | "Dissatisfied" or "Very Dissatisfied"[2] |
| SEMA4 Systems | | | | |
| Human Resources | 132 | 67% | 18% | 15% |
| Payroll | 200 | 60 | 19 | 22 |
| MAPS Systems | | | | |
| Accounting (GFS) | 177 | 41 | 22 | 37 |
| Procurement (AGPS) | 190 | 35 | 25 | 40 |

Source: Office of the Legislative Auditor statewide system user surveys.

[1]"Very Satisfied" responses accounted for less than 7 percent of the combined category.

[2]"Very Dissatisfied" responses accounted for 15 to 38 percent of the combined category.

## Table 3.4 User Satisfaction with the GFS Accounting System

| | Valid Responses | Percent of Respondents: "Very Satisfied" or "Satisfied" | "Uncertain" | "Dissatisfied" or "Very Dissatisfied" |
|---|---|---|---|---|
| "How satisfied are you with the new statewide accounting system (GFS) with respect to:. . . . " | | | | |
| What you need to do to complete a transaction in GFS? | 155 | 54% | 15% | 31% |
| Navigating in GFS? | 168 | 52 | 18 | 30 |
| Making inquiries in GFS? | 174 | 52 | 16 | 32 |
| The information you receive regarding changes to GFS? | 164 | 45 | 34 | 22 |
| The assistance you receive from the MN-Assist help desk with GFS questions? | 142 | 74 | 12 | 14 |
| The assistance you receive from the Accounting Services Division (Functional experts) with GFS questions? | 117 | 50 | 32 | 17 |
| The accounting reports you can generate from the information warehouse? | 105 | 43 | 25 | 32 |
| The ease of using the warehouse to obtain accounting information? | 101 | 37 | 28 | 36 |
| The available standard accounting reports? | 137 | 33 | 22 | 45 |
| The current advisories, special bulletins, and user tips? | 149 | 54 | 28 | 19 |
| The GFS training you received? | 169 | 37 | 12 | 50 |
| The GFS updates to training manuals? | 153 | 27 | 45 | 28 |
| Your overall level of satisfaction with GFS? | 177 | 41 | 22 | 37 |
| "How satisfied are you with your ability to obtain the following types of information from the system?" | | | | |
| Budget | 140 | 61 | 11 | 29 |
| Vendor | 148 | 58 | 18 | 24 |
| Payment | 150 | 55 | 13 | 31 |
| Receipts | 129 | 48 | 19 | 33 |
| | | "Much More Satisfied" or "More Satisfied" | "No change" | "Less Satisfied or Much Less Satisfied" |
| "How has your satisfaction with GFS changed over the last 12 months?" | 176 | 43% | 40% | 17% |
| | | "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
| "Are system operating hours currently a problem for you?" | 177 | 22% | 9% | 69% |
| "Is system response-time while working in GFS currently a problem for you?" | 175 | 34 | 14 | 52 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor, *Minnesota Accounting and Procurement System (MAPS) User Survey: Part 1 Accounting (GFS).*

**Users liked the on-line accounting features.**

Accounting system users liked the ability to complete transactions on line and to perform on-line inquiries. Users also frequently mentioned that they liked having more information available. About half of accounting users responded that they were satisfied with the method of completing transactions, navigating, and making inquiries in GFS. About half were satisfied with the Department of Finance's Accounting Services Division assistance, and over 70 percent were satisfied with the help they received from Mn-ASSIST. Users rated the information warehouse fairly low, including both reports and ease of use. Almost half of accounting users were dissatisfied with the standard reports and the training they received. Users were generally satisfied with the system's response time and system operating hours.

During our interviews, we were told that the new system did not have all the features available in the Statewide Accounting System (S WA) that GFS replaced, as discussed in Chapter 2.[13] In written questionnaire comments and during the interviews accounting users criticized the system for failing to deliver promised functions and using old technology. Users from large agencies were generally less satisfied than other users on all satisfaction ratings included in our accounting questionnaire. Large agency users were much less satisfied with information about system changes, standard reports, training, and updates to training manuals.

**Procurement system users were least satisfied.**

Procurement system (AGPS) users reported the least satisfaction. As shown in Table 3.5, only 35 percent of procurement system respondents reported that overall they were satisfied with the new system, while 40 percent reported they were dissatisfied. The most positive ratings were for information regarding changes to AGPS (57 percent) and current advisories (63 percent). Nearly half of users were satisfied with Material Management Division's help, although over three-fourths said they were satisfied with Mn-ASSIST's help. In contrast, just over one-fourth of users were satisfied with the standard procurement reports. Training was rated nearly as low (46 percent dissatisfied) as that for the new accounting system. Users were generally satisfied with response time and system operating hours. As many users were dissatisfied as satisfied with several system features, especially completing transactions, navigating, making inquiries, and obtaining procurement information from the system. Users from large agencies were more likely to be dissatisfied with specific items compared to users from small agencies, especially navigating the system, training, and manual updates. Users told us that:

- **The new procurement system is too "cumbersome, " "complex, " and "difficult to use. "**

Our interviews with state managers about the procurement system found many with critical views, and representatives from several agencies said they would like to abandon its use. The general consensus of state managers we interviewed was that the state was trying to collect too much information. Some agencies such as MnDOT do need to track item level data for inventory purposes, but most agencies do not.

*13* The Statewide Accounting System was the former state accounting system.

## Table 3.5 User Satisfaction with the AGPS Procurement System

| | | Percent of Respondents | | |
|---|---|---|---|---|
| | Valid Responses | "Very Satisfied" or "Satisfied" | "Uncertain" | "Dissatisfied" or "Very Dissatisfied" |
| "How satisfied are you with the new statewide system (AGPS) with respect to:. . . . " | | | | |
| What you need to do to complete a transaction in AGPS? | 178 | 46% | 10% | 45% |
| Navigating in AGPS? | 186 | 45 | 17 | 39 |
| Making inquiries in AGPS? | 188 | 46 | 16 | 37 |
| The information you receive regarding changes to AGPS? | 184 | 57 | 24 | 18 |
| The assistance you receive from the MN-Assist help desk with AGPS questions? | 170 | 78 | 13 | 9 |
| The assistance you receive from MMD staff with AGPS questions? | 136 | 49 | 34 | 18 |
| Your ability to obtain procurement information from the system? | 176 | 38 | 23 | 39 |
| The available standard procurement reports? | 124 | 27 | 39 | 35 |
| The current advisories, special bulletins, and user tips? | 178 | 63 | 24 | 13 |
| The AGPS training you received? | 177 | 44 | 10 | 46 |
| The AGPS updates to training manuals? | 169 | 38 | 39 | 23 |
| Your overall level of satisfaction with AGPS? | 190 | 35 | 25 | 40 |
| | | "Much More Satisfied" or "More Satisfied" | "No change" | "Less Satisfied or Much Less Satisfied" |
| "How has your satisfaction with AGPS changed over the last 12 months?" | 191 | 52% | 35% | 13% |
| | | "Definitely Yes" or "Possibly" | "Uncertain" | "Probably Not" or "Definitely Not" |
| "Are system operating hours adequate for your agencies' needs?" | 195 | 70% | 12% | 18% |
| "Is system response-time while working in AGPS currently a problem for you?" | 192 | 40 | 15 | 45 |

Note: Some figures do not total 100 due to rounding.

Source: Office of the Legislative Auditor, *Minnesota Accounting and Procurement System (MAPS) User Survey: Part 2 Procurement (AGPS)*.

The contrast between the new procurement system and the other three systems is fairly clear. Although about 45 percent of procurement system respondents indicated that they were satisfied in how they completed a transaction or navigated the system, this proportion is far lower than for other systems. We also heard from users who expressed considerable frustration with AGPS yet simultaneously told us that the payroll system, and especially the human resources system, represented an improvement in how they could do their work. According to the comments on the survey, and our other interviews, the dissatisfied users are mostly supervisors and

managers. Some told us their staff were spending two to three times as long to enter orders and pay bills. All those we interviewed agreed it took longer to process transactions using the new system.

In an effort to get necessary state work done in the time available, we found:

- **User agencies are taking shortcuts around the new procurement system and negating some of the benefits originally claimed for the system.**

**There are currently few standard procurement reports.**

As a result, one of the primary benefits claimed for the system, that the state can negotiate better contracts using data gathered by AGPS, has not occurred. In addition, agencies have yet to see the benefits of all the information they are entering into the system. There are currently few standard reports; and many reports that were originally designed never were programmed. In addition, there is currently no procurement information in the information warehouse so agencies can not write their own reports.

We recommend that,

- **The state should formally re-examine the use of the new procurement system.**

The Department of Administration has primary responsibility for AGPS. We believe they may need to contract with an independent outside party to facilitate an evaluation of the costs and benefits of how agencies' should use AGPS. In considering our recommendations, we decided to re-interview agency accounting and procurement personnel. We re-interviewed representatives of the agencies that use AGPS the most. [14] User agency personnel we spoke with suggested a variety of alternatives, including: considering the costs and benefits of replacement with an alternate system; making modifications to AGPS to make it work in concert with agency business needs; making the system optional for certain transaction types, and making it optional for certain agencies. At a minimum, there was consensus among those we spoke with that the system should be simplified, perhaps by reducing the number of document types, status codes, and screens.

**The procurement system needs to be re-examined.**

A related issue is the state treatment of sales tax, one of the most visible changes in how the state does business. Since 1987, state agencies have paid sales tax to vendors who returned these taxes to the Department of Revenue. The new system requires agencies to pay sales tax directly to the Department of Revenue, allowing quicker collection and theoretically saving considerable dollars. Almost all managers we interviewed agreed that this has not worked well. Item taxability and tax rates are complicated, and vendors are more knowledgeable about the taxability of their product lines than state employees. Currently the only way to purchase items that are taxable is to use AGPS. If, as some agencies desire, the use of AGPS was optional, the sponsoring agencies would need to modify the new accounting sys-

*14* Including the Department of Administration's roughly 17 percent of transactions, we interviewed one or more representatives of agencies that processed 84 percent of the transactions (orders, payments, etc.) through AGPS in FY 1996.

**Processing sales tax on agency purchases is a problem.**

tem to handle those transactions. Alternately, the state should consider returning to the previous system of collecting all sales tax on state purchases. Or, the state could consider treating all items sold to state agencies as nontaxable, as they were before 1987, and agencies could use GFS for all transactions.

We should note that the sponsoring agencies have responded to agency complaints and concerns and made several modifications to the system. The departments of Finance and Administration also have allowed users to enter certain types of transactions, such as professional/technical contracts, grants, and interagency payments, directly into the accounting system (GFS). The departments also have been hampered by a lack of programming resources to make changes. For example, the state currently has only one programmer working full-time on the procurement system, but the state has recently entered into an extended warranty arrangement with the procurement software vendor to make programming changes.[15] A significant refinement of the procurement system will be implemented in January 1997. The department notes that currently there are no state technical staff that understand the system very well. The vendor told us that it was common in the other eight states that use AGPS for the state to have three to five programmers that understand and work on the system.

The Department of Administration believes that part of the difficulty users have with the system is due to a lack of training and the first round of training was not done well. The department has formed a team of people to go out to agencies and help users learn to use the system more effectively. Also, a work group in the department is considering the level of detailed information that needs to be collected.

# SUMMARY

Project managers were aware of likely problems with training, equipment and support requirements, initial implementation concerns, and small-agency needs. However, tight timelines and the sheer size of the project made it difficult to get everything done. There are valuable lessons from their experience, including: carefully designing mandatory, accessible training that accurately reflects the final system; working aggressively with state agencies to communicate project requirements and the likely impact on employees; matching user expectations and needs with the final product; and identifying subsets of users, such as small agencies, that may have special needs.

*15* The state entered into an extended warranty agreement with the vendor on October 15, 1996.

# Systems Development in State Government

**CHAPTER 4**

Although the primary focus of our evaluation was the Statewide Systems Project (SSP), we wanted to obtain a broader perspective so we could determine whether the state's experience with SSP was unusual. We also wanted to draw lessons from a variety of computer software development projects. Therefore, we spoke with national experts, reviewed a wide range of literature, and interviewed a number of Statewide Systems Project participants about what, in retrospect, they would have done differently. In addition, we examined five other recent state of Minnesota systems development projects, including:

- Maxis (Department of Human Services' recipient eligibility project);
- Project Delta (a Pollution Control Agency project to modernize their technology and improve permitting and enforcement);
- Project Daedalus (a Department of Labor and Industry imaging and document retrieval project);
- the Department of Revenue's sales tax project; and
- MMIS2 (an update of the Medicaid Management Information System in the Department of Human Services).

A project synopsis of each project is included as Appendix B.

To focus this part of our evaluation, we asked the following questions:

- **What are the typical characteristics of successful and unsuccessful information technology projects?**
- **What strategies should the state follow to maximize the chance of success with future computer development projects?**
- **What lessons can be learned from the Statewide Systems Project?**

# OVERALL OBSERVATIONS

In reviewing the relevant literature and consulting with a variety of computer software development experts as well as state system development project managers and project participants about successful and failed systems development projects, we found that:

- **Neither the private sector nor the public sector is consistently good at computer software development.**

**There is much uncertainty associated with systems projects.**

The experts we consulted told us that software development is relatively new and constantly changing. Unlike constructing a building or a highway where the state of the art has developed over thousands of years, the standards and technology of systems development are relatively new and rapidly evolving. Because the sophistication of computer software development is not well developed, there is much more uncertainty associated with systems development projects than with constructing a building or repaving a highway.

According to a 1994 study of a sample of 365 public and private sector organizations by the Standish Group, a technology consulting firm, almost "one third of all [information] systems development projects are canceled before they are ever completed," and "only sixteen percent of all IT (Information Technology) projects were considered successful."

> The Standish Group research shows a staggering 31.1% of projects will be canceled before they ever get completed. Further, results indicate 52.7% of projects will cost 189% of their original estimates. The cost of these failures and overruns are just the tip of the proverbial iceberg. The lost opportunity costs are not measurable, but could easily be in the trillions of dollars. One just has to look to the City of Denver to realize the extent of this problem. The failure to produce reliable software to handle baggage at the new Denver airport is costing the city $1.1 million per day.
>
> Based on this research, The Standish Group estimates that in 1995 American companies and government agencies will spend $81 billion for canceled software projects. These same organizations will pay an additional $59 billion for software projects that will be completed, but will exceed their original time estimates. Risk is always a factor when pushing the technology envelope, but many of these projects were as mundane as a drivers license database, a new accounting package, or an order entry system.
>
> On the success side, the average is only 16.2% for software projects that are completed on-time and on-budget. In the larger companies, the news is even worse: only 9% of their projects come in on-time and on-budget. And, even when these projects are completed, many are no more than a mere shadow of their original specification requirements. Projects completed by the largest American companies have only approximately 42% of the originally-proposed features and functions. Smaller companies do much better. A total of 78.4% of their software projects will get deployed with at least 74.2% of their original features and functions.[1]

*1* The Standish Group, *Chaos: A White Paper* (Cape Cod, 1995).

According to the Gartner Group, another worldwide technology consulting firm that tracks information technology projects, "over 80 percent of large systems development projects fail to come in on-time, on-budget, and meeting user expectations."[2] According to the Gartner Group, large system development projects, defined as over $6 million in cost, have a failure rate over 90 percent.[3]

**The vast majority of large systems projects have problems.**

Although the exact percentage of computer development "failures" varies depending on the study ( as does the exact definition of "failure"), the vast majority of large systems projects clearly have some sort of significant problem. There have been many notable cases in both the private and public sector where many millions of dollars were spent -- in some cases hundreds of millions of dollars -- and no computer system was ever turned on. The General Accounting Office notes that this fact "highlights the reality of the complexity in planning, designing, and managing successful IT (Information Technology) projects."[4]

Even large state governments like California have not had much success with systems development. According to the California Legislative Analyst, many major computer systems developed by the State of California have experienced serious problems (see Figure 4.1).

**The federal government has also had problems with systems development.**

The General Accounting Office (GAO) has found similar difficulties with federal government software development. According to the GAO, "The management of IT (information technology) projects has long been a significant problem for many federal agencies. Federal information systems often cost millions more than expected, take longer to complete than anticipated, and fail to produce significant improvements in the speed, quality, or cost of federal programs."[5]

Management information professors Kenneth and Jane Laudon sum up the situation:

> In nearly every organization, information systems take much more time and money to implement than originally anticipated, or the completed system does not work properly. Because so many information systems are trouble-ridden, designers, builders, and users of information systems should understand why they succeed or fail.[6]

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*2* Richard Hunter, Gartner Group, teleconference with audit staff, August 30, 1996.

*3* *Ibid.* The Gartner Group told us studies have found over 90 percent of large system development projects fail to come in on-time, on-budget, and meeting user expectations.

*4* General Accounting Office, *Information Technology: Best Practices Can Improve Performance and Produce Results*, Testimony before the Subcommittee on Government Management, Information and Technology, Committee on Government Reform and Oversight, U.S. House of Representatives (Washington, February 26, 1996), 7.

*5* General Accounting Office, *Information Technology Investment: Agencies Can Improve Performance, Reduce Costs, and Minimize Risks* (Washington, September 24, 1996), 1.

*6* Jane Laudon and Kenneth Laudon, *Essentials of Management Information Systems* (Upper Saddle River: Prentice Hall, 1995), 297.

**Figure 4.1: Legislative Analyst's Assessment of State of California Systems Development Projects Which Have Experienced Significant Problems**

- *Department of Motor Vehicles Database Re-design* - $40 million spent and little to show.
- *Department of Corrections Corrections Management Information System* - Continued schedule slippage and cost increases ($101 million is the latest estimate of project cost).
- *Department of Social Services Statewide Automated Welfare System* - Cost increases, delay and reduced net benefits (project cost now estimated at $800 million, to be implemented over 12 years).
- *Department of Social Services Child Welfare System* - Three years behind schedule with implementation difficulties anticipated to result in a change in project scope and/or a significant cost increase.
- *Department of Social Services Statewide Automated Child Support System* - Cost increase (from $140.8 million to $152.2 million) and significant schedule slippage.
- *Student Aid Commission Financial Aid Processing System* - Cost increases and contract management problems.
- *Board of Equalization Conversion to State Data Center* - Cost increases and delays.
- *Department of Health Services Vital Records Improvement Project* - Implementation delays related in part to cost concerns.
- *Secretary of State Imaging Technology* - New system failed and was abandoned.
- *Department of Housing and Community Development Mobile Home Registration and Titling* - Repeated difficulties over several years in efforts to implement an effective system.
- *Department of Transportation New Database Structure* - Delays and difficulties implementing a new database structure for departmental applications.

Source: Legislative Analyst, State of California, *Information Technology: An Important Tool for More Effective Government* (Sacramento, June 1994), 10-11.

# Characteristics of Project Success and Failure

The literature and expert testimony set forth a number of factors that influence software implementation success and failure. According to the Gartner Group, successful projects have:

- Effective executive sponsorship,
- User involvement and influence,
- Manageable technology and complexity risk, and
- Good project management.

Other experts and the literature tend to agree with these characteristics of successful projects, although a number of other lesser factors can also contribute to project success, such as:

- Realistic expectations,

- Project ownership by users,
- Smaller project milestones,
- Competent staff, and
- Clear vision and objectives.

According to the literature and the experts we consulted, the characteristics of project failure are almost the inverse of the characteristics of success. The Gartner Group, in fact, regards the lack of the top four characteristics of successful projects as the top four causes of project failure. Gartner regards effective executive sponsorship as essential for project success. The Standish Group, on the other hand, found in its survey of information executives that the top reasons for project failure were: incomplete specifications, lack of user involvement, lack of resources, and unrealistic expectations, followed by lack of executive support.

**The Statewide Systems Project was moderately successful.**

While we think the Statewide Systems Project can be called moderately successful, it had some of the characteristics of a project at high risk of failure. For example, it was extremely complex and large; it tried to implement all its components at once; it had no single person in charge; it had incomplete specifications (necessitating significant midcourse changes); and it won approval in the Legislature and among state agencies based on unrealistic expectations.

### Executive Sponsorship

The Statewide Systems Project had a significant amount of executive sponsorship, but it was weakened by high turnover among members of the steering committee. During the course of the project, the committee had a turnover of at least 10 members, and the state project manager changed as well. However, key high level managers in all of the sponsoring agencies remained in place throughout the project. In addition, the SSP management team had no single person to whom they reported, slowing decisionmaking. At various times, the Commissioner of Finance stepped to the forefront to champion the project, but overall, the turnover on the steering committee and the lack of "one person in-charge" put the project at serious risk of failure.

### User Involvement

The Statewide Systems Project strongly emphasized user involvement. SSP involved more than 700 state employees in some capacity during the course of its development. Many state employees took mobility assignments to work directly for the project, and many more were released by their employing agency to spend time working on the project's development. Still, as we saw in Chapters 2 and 3, there are complaints that user involvement was not emphasized more. Users, and non-sponsoring agency steering committee members, felt that their input was heard clearly early in the development process, but less clearly as the project approached implementation.

### Manageable Technology

**SSP was an "unprecedented" project.**

The client-server technology of the human resources (SEMA4) portion of the SSP project was new and untested anywhere in as wide an implementation as Minnesota planned.[7] It was as one consultant told us "an unprecedented project." The risks associated with large projects that have not been done before are especially high, according to the experts we consulted. Similar risks were faced by the Maxis project implemented by the Department of Human Services in 1991.

The result of this complexity was a large number of changes to the scope and specifications of the computer systems as the project proceeded. As we have seen, the changes contributed to higher costs than were originally anticipated. Overall, the ambitious and complex nature of the Statewide Systems Project put the whole project at a greater risk of failure.

### Project Management

The Statewide Systems Project took steps to follow "best management practices" for systems projects by:

**SSP followed many systems development "best practices."**

- Having state managers as co-project leaders,
- Using steering committees,
- Having users review specifications,
- Having users involved in the design of the system,
- Utilizing a variety of change management techniques to aid in the transition between the new and old systems,
- Using a structured systems development methodology,
- Conducting internal and external risk assessments, and
- Having an active communications component.

One "best practice" that SSP did not completely follow was to complete the "re-engineering," or redesign, of state agencies' "business processes" before the project development started. Re-engineering is best completed at a project's beginning. Several of the other large systems projects we examined, such as the Department of Revenue's sales tax system and the Department of Labor and Industry's Daedalus project, did re-engineer their business processes before designing the system approach with good results. The Statewide Systems Project performed some limited re-engineering in the middle of the project's design stage. However,

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*7* Client-server technology, put simply, utilizes the user's computer (the client) to accomplish some of the information processing after downloading some information from the server (in this case a mainframe computer).

SSP staff performed the re-engineering work so late in the development cycle that its utility was limited.

As mentioned in Chapter 3, user training is a critical part of any successful software implementation. Training for the SSP project was problematic because the training and the training materials for the two MAPS components (accounting and procurement) did not always match the way the system actually worked.

**Risk assessments can be beneficial.**

Another best practice in systems development is ongoing risk assessment both by the project team and by external reviewers. The SSP had internal risk assessment procedures and also had an external risk assessment near the project's end at the Legislature's direction. Although risk assessments are somewhat disruptive to the project's development, we believe they offer a valuable outside perspective on the progress of development. Another project we reviewed, PC A's Project Delta, also used risk assessment to good effect. The Information Policy Office has recently negotiated a contract with three outside consultants that offers risk assessment services, making it easier for state agencies to engage their services. We believe external risk assessment is a beneficial part of any large systems project. We recommend:

- **The Legislature should require an external risk assessment as a part of any large systems project.**

The systems development literature, confirmed by several consultants we spoke with, recommends that systems projects should be done in phases or increments. Smaller scale projects generally result in less uncertainty about cost and development time. Many users of the systems also told us that, in hindsight, it would have been much better to have brought the systems on line in phases. Many state employees thought the phased implementation of the SEMA4 human resources component of the project worked smoother than the all-at-once "big bang" implementation of the accounting and procurement systems.

Another "best practice" recommended in the systems development literature and by the experts we consulted is to measure the benefits of the project after implementation. There was little assessment of the benefits of any of the Minnesota systems development projects we reviewed. We recommend that:

- **The state should carefully review the likelihood that benefits will result from a proposed project and require that the project sponsors establish measurement systems to evaluate the benefits after implementation. The Information Policy Office would be the logical place for this review to occur.**

# Scope and Cost Changes

In examining the Statewide Systems Project and other large state systems development projects, we found that:

- **Changes in the scope and specifications of computer systems during development have been common in Minnesota state government.**

We found scope changes and change orders, in some fashion, on all of the projects we reviewed. We found that it is common that system requirements have not been specified precisely at a project's start. This lack of specification, in SSP's case, resulted in conflict between the state team and the consultant as they constantly negotiated what work was "in-scope " or "out-of-scope " of the original contract. On other projects the scope changed just due to the multi-year nature of the project; that is, there were changes in the program during the time period that the system was being developed. For example, on the Maxis project the eligibility for the Medicaid program became an issue for project developers several years into the project.

**Experts told us it is impossible to accurately estimate costs at a project's start.**

Problems also exist because it is difficult to estimate precisely the costs of a project at its beginning. According to the experts, final cost should not be estimated until after the system has been designed. The Gartner group told us that it is impossible to estimate accurately the costs of a systems project at the project's inception. A Gartner consultant told us that:

> [E]stimating an entire project at the very beginning of a project can very easily lead to variations between estimated and actual of 100 percent or more. Simply put, it is a practical impossibility for a project manager to estimate at the very beginning of a project what the entire project will take to complete, unless that project manager has done a number of projects that are exactly the same in type and scope.[8]

The Gartner Group told us that: "[The most capable information technology organizations'] best practice is to estimate costs for a project on a phase-by-phase basis, and they commit the funding for a project on a phase-by-phase basis, and they recommit the funding at the end of every phase when the estimates for the previous stage are done.[9] Experts from the Software Evaluation Institute, a federally funded institute to promote quality software development, gave us similar advice. Agencies should be held to cost estimates to design the system, the project should then be re-estimated for development, and the process should be repeated before implementation. This represents somewhat of a dilemma for the Legislative branch both in appropriating funds and in holding the Executive branch agencies accountable. One of the observations we found about the software development process in state government was that the development cycle is not synchronized with the appropriation process. Agencies are forced to begin the budget process before they are far enough advanced in the development to have a good idea of what the project will really cost. There is no easy solution to this problem in a government setting. On the Statewide Systems Project, development had to stop for four months because projected costs exceeded the appropriation. This was costly to the project's schedule and budget.

**The software development cycle is not synchronized with the budget process.**

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*8* Richard Hunter, Gartner Group, teleconference with audit staff, August 30, 1996.

*9* *Ibid.*

In our view, the state of Minnesota should avoid computer development projects of this scope in the future. Projects that are developed in stages probably offer a greater chance of success, and smaller scaled projects present less uncertainty about costs. We recommend that:

- **In the future, the state should undertake large computer development projects only in more carefully planned stages, rather than trying to implement a large, multi-component project all at once.**

# Future Benefits

As we saw in Chapter 2, some of the project's objectives might be met in the future if, for example, the EDI (electronic data interchange) module of the procurement system and the workers' compensation, recruitment, scheduling, and training modules of the human resources system are implemented. These modules would significantly reduce the need for paper documentation for many transactions. The Department of Administration plans to start a pilot test of the EDI subcomponent of the procurement system in January 1997, and the Department of Employee Relations has plans to implement the workers' compensation and training modules shortly thereafter.

**Many system enhancements are still on the development "wish list."**

Many of the enhancements to the system necessary for agencies to fully use the system are still on the development "wish list." We think that a continuing investment should be made in the systems in order to increase their functionality and in crease future benefits. The sponsoring agencies should periodically assess needed improvements and report to the Legislature.

# SUMMARY

We found that software development is rapidly evolving and that no one in the private or public sector does it consistently well. Scope changes and cost overruns are common. Successful development projects almost always have effective executive sponsorship, user involvement and influence, manageable technology and complexity, and good project management.

# Chronology

**APPENDIX A**

**Spring 1989 Legislative Session** -- The Department of Finance proposed replacing the Statewide Accounting System (S WA) and the Personnel/Payroll System, and developed a long-term plan to integrate and improve the systems. The Information Policy Office (IPO) recommended alternate funding and suggested adding functions for procurement and fixed assets to the system. The Legislature did not fund the proposal.

**Spring 1991 Legislative Session** -- The Department of Finance again proposed replacing the Statewide Accounting System and the Personnel/Payroll System. The Legislature appropriated $300,000 for planning. Project sponsors estimated that the project would cost $15-20 million and take four years to complete.

**September 1991** -- The Department of Finance hired KPMG Peat Marwick (KPMG) to assist in the project planning phase.

**November 1991** -- The Department of Finance hired a state Project Manager to coordinate the planning.

**November 1991 to August 1992** -- The project planning and Request For Proposals (RFP) development involved over 120 state employees. The project formed five functional work groups: general management, accounting, payroll, human resources, and procurement. The functional work groups defined the requirements for the new systems and over 3,500 requirements were included in the RFP.

**February 1992** -- The *Minnesota Statewide Systems Project Report to the Legislature* proposed: replacing the Statewide Accounting System and Personnel/Payroll System; automating the procurement system; and adding new human resources and decision support systems.[1] KPMG estimated the costs to build the five new systems at $19.5 million, not including costs incurred by end-user agencies for computers and network development. The report recommended that the state purchase and modify existing software packages for all components.

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*1* The decision support system evolved into the information access or information warehouse system. The intended function, to make information available to managers and others for use in decisionmaking, was essentially the same.

Operational costs were unknown, but "based on the experiences of other organizations undergoing similar transitions, the new systems could easily double current operating costs; an increase of 250 percent would not be uncommon."[2]

**Spring 1992 Legislative Session** -- Legislature approved $1.8 million in funds to continue planning.

**August to September 1992** -- The steering committee issued the Request for Proposals (RFP) for a software firm to propose software vendors, integrate the software, and act as the primary project consultant. The RFP gave a strong preference to software packages already in use in other states. The project received three responses to the RF P.

One of the vendors dropped out of the selection process. The remaining two vendors each proposed using the same accounting software, Government Financial System (GFS). GFS was not year 2000 compliant—a requirement of the RFP—but management decided to go ahead with the project anyway. The sponsoring agencies recognized that it would be costly to modify the packages later to make them year 2000 compliant.

**September 1992 to January 1993** -- The project team reviewed the proposals and viewed product demonstrations from vendors.

**January 1993** -- The state selected Andersen Consulting to integrate and modify the software products. Three software vendors supplied separate systems-- AMS provided the accounting system (GFS); INFORMS provided the procurement system, Advanced Government Procurement System (AGPS); PeopleSoft provided the payroll and human resources systems. The state also selected BEAMS, a product that Andersen Consulting developed for the state of Texas, as the decision support component.

**February to March 1993** -- SSP conducted vendor negotiations with Andersen Consulting.

**Spring 1993 Legislative session** -- Because of the timing of the budget process, the sponsoring agencies had to propose an appropriation amount before they had received bids. The sponsoring agencies proposed a $15 million appropriation ($10.3 million for 1994 and $4.7 million for 1995) for SSP. The Legislature required a recommendation from the Legislative Commission on Planning and Fiscal Policy to the Commissioner of Finance before releasing the second part of the funding. The commission was to base its recommendation on whether the project adequately provided for legislative information needs.

**March 18, 1993** -- The state and Andersen Consulting signed a fixed price $15.88 million contract. The state agreed to provide state employees to assist

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*2* KPMG Peat Marwick, *Minnesota Statewide Systems Project: Report to the Legislature* (Minneapolis, February 25,1992), 5-10.

with the development (at an estimated cost of $7.541 million). The project budget, not counting agency contributions, was then $26.1 million.

Project staff notified several legislators that the bids had come in higher than anticipated and that the project required an additional $8.2 million appropriation. The legislative conference committee on state departments appropriations discussed the need for the additional funds.

**March to September 1993** -- The project teams organized in March 1993 and proceeded with system design, detail specification, and prototyping.

**September 1993 to January 1994** -- The accounting work group determined that to get the functionality they needed from the system required an additional $4-5 million in modifications. However, project management was unwilling to continue the project without increased appropriations. They also had concerns about agency implementation costs and the viability of the proposed solution for the decision support component of the project.

In an attempt to resolve these concerns, SSP entered a "Project Realignment" phase. The project suspended further development work in the accounting and procurement components until the legislative session began and focused its efforts on "re-engineering," or redesigning, agency business processes. In addition to exploring re-engineering ideas, the project examined what would be necessary to retire duplicate stand-alone accounting systems. The project formed a work group to further define the decision support component of the project.

As the result of the realignment work phase, the project moved the schedule for accounting implementation back one year, from July 1994 to July 1995. They also changed the schedule for procurement implementation from November 1994 to July 1995. Finally, they advanced the implementation date for the decision support component to July 1995 instead of July 1996.

**September 1993** -- The Legislative Commission on Planning and Fiscal Policy (LCPFP) met with the SSP sponsors. SSP project management told legislators about the re-engineering effort and said that they would advance the schedule for the decision support component. Project management asked the commission to defer their recommendation until project staff completed the realignment phase.

**January 1994** -- In January the LCPFP met again to consider whether to recommend that the Commissioner of Finance should release the second half of the biennial funding to the project. The commission heard testimony about the project's realignment and the decision support component's accelerated schedule, and they unanimously recommended that the Commissioner of Finance release the funds.

**Spring 1994 Legislative Session** -- The Legislature appropriated $14.6 million for 1995. This appropriation included funds to help small agencies buy

equipment, money to pay for the increased scope of the project, and $100,000 for the Information Policy Office (IPO) to contract for an evaluation of the project. Project staff told legislators that this would be the final appropriation for SSP development.

**May 1994** -- Project staff invoked the contract's formal dispute resolution process to resolve serious disagreements between the state and Andersen Consulting. The major disagreements centered on the state's contractual obligation to provide specific staff, such as systems analysts rather than the functional analysts provided by the state, and whether Andersen should provide updated system documentation for GFS and PeopleSoft.

**July 1994** -- The state resolved, in principle, the contract dispute with the vendor. The state and Andersen agreed to increase the contract $2 million, and to hold Andersen Consulting responsible for all deliverables. The state took over responsibility for the decision support component of the project and dropped several deliverables in the payroll area. The state also added up to 15 state FTE's to work on training and delayed payroll implementation until July 1995. Because the state waived a number of requirements (with a value of $1.2 million), the net increase in contract price was about $1.1 million.

**August 1994 to December 1994** -- The state and Andersen Consulting drafted and negotiated the actual contract amendment language.

**December 1994** -- The state and Andersen Consulting signed the new contract. The revised fixed price contract for $20,435,763 incorporated the $2 million increase agreed to in July as well as all change orders (modifications of systems specifications) to date.

**December 1994** -- The HR/Payroll work group announced that SEMA4 would be implemented in stages with one agency piloting the systems during the first stage. The project would also stagger training schedules to insure that staff were ready for the phased implementation.

**January 1995** -- SSP drafted a memo to Andersen detailing problems with the preparation of training materials.

**January 1995** -- SSP released the *Third Report to the Legislature.*

Coopers and Lybrand released a report, *Project Management Risk Assessment and Risk Abatement Report for the Statewide Systems Project*, requested by the legislature. The report highlighted a number of specific risks, including user readiness and expectations, technical issues (continuity and network capacity), year 2000 issues, and other problems.

**Spring 1995 Legislative Session --** The Legislature appropriated an additional $2.8 million for development and $6.12 million for operating expenses for the systems.

**April 1995 to June 1995** -- The systems became operational (although not broadly implemented) on April 3 and SSP made last minute changes and fixed bugs. The 90-day warranty began from this date.

**May 1995** -- Coopers and Lybrand released a second risk assessment report. Project actions reduced several of the risks cited originally, although the report recognized a few new risks.

**July 1, 1995** -- The state fully implemented the accounting (GFS) and procurement (AGPS) systems. Together the two systems are known as the Minnesota Accounting and Procurement System (MAPS).

The state implemented the SEMA4 human resources and payroll system in the Department of Transportation as a pilot project.

**August 1995** -- The systems experienced considerable "down time." MAPS was only available 68 percent of the time in August.

**September 1995** -- Coopers and Lybrand issued a third and final risk assessment report. The report noted that the number and severity of the risks had decreased, and only two risks received high-risk ratings--year 2000 transactions and on-going support funding. The consultant added three new risks in the September report: on-going support funding, business effectiveness, and procurement data integrity.

The second group of state agencies began using the SEMA4 human resources and payroll system.

**November 1995** -- The third group of state agencies was added to the SEMA4 human resources and payroll system.

**December 1995** -- The state implemented the SEMA4 human resources and payroll system in the fourth and last (except for MnSCU) group of state agencies.

**Spring 1996 Legislative Session --** The Legislature appropriated only half of requested operating funds, but allowed the Department of Finance to create the Statewide Systems Account. This fund will receive all billings for SSP services with authority to bill up to $6,400,000 in FY 1997.

The Legislature also required a report (January 15, 1997) including an accounting of moneys spent and future spending projections.

On April 4 the Legislative Audit Commission requested an evaluation of the Statewide Systems Project.

**June 1996** -- The first of three groups of MnSCU employees was added to the SEMA4 human resources and payroll system.

**August 1996** -- The state implemented the SEMA4 human resources and payroll system with the second group of MnSCU employees.

**October 1996** -- The third and last group of MnSCU employees was added to the SEMA4 system.

# Five Other Large Minnesota Systems Projects

**APPENDIX B**

In order to place our evaluation of the Statewide Systems Project within a broader context, we examined five other large systems projects recently undertaken by the state of Minnesota. These projects were sponsored by the Pollution Control Agency and the departments of Human Services, Labor and Industry, and Revenue, over the past 10 years. The systems are substantially completed, although some components have yet to be implemented.

We present data on these projects purely as background information. We have not done a full evaluation of any of the projects, nor have we independently verified the claims made on their behalf by the project sponsors or vendors. However, as noted below, two of the projects (the Pollution Control Agency's Project Delta and the Department of Human Service's Maxis Project) have been scrutinized by outside evaluators, and the Department of Revenue conducted an internal review of its Sales Tax Re-Engineering Project.

## POLLUTION CONTROL AGENCY'S PROJECT DELTA

### Project Description

Project Delta is the Pollution Control Agency's (PCA) multi-year, multi-phase project to re-engineer and automate many of its work processes. The project consists of:

- conversion of agency hardware and software from a mini-computer to a client-server local area network environment,
- training for agency staff, and
- new environmental compliance management software for the Air Quality, Ground Water and Solid Waste, Hazardous Waste, and Water Quality divisions.

The need for the new systems was noted in our 1991 program evaluation.[1] PCA lacked basic systems for effectively keeping track of permit, license, and certificate status. In 1991, the agency also had yet to embrace desktop computing as a business tool. The goals for Project Delta are to:

- reduce permit, license, and certificate backlogs,
- reduce costs to regulated businesses,
- improve information analysis,
- improve permit issuance productivity,
- more consistently enforce environmental protection regulations, and
- better coordinate the programs and agencies that jointly address environmental problems.

# Project History and Budget

## Timeline and Funding

PCA began planning the project in 1992. Initial planning indicated a total cost of $7.5 million. The project will actually cost $8.6 million. The agency approached the 1993 Legislature with a four-year phased $8.6 million plan and received an appropriation for $3.7 million for the 1994-95 biennium. In 1995, PCA received a second appropriation of almost $5 million. PCA signed a contract with American Management Systems (AMS) in July 1993 for $4.9 million to design a client-server network for the central office and the five regional offices, and to research and lead the selection process for user desktop software, standard relational database, graphical user interface and a computer aided software engineering tool. AMS was also contracted to develop software applications for a centralized core database and six MPCA environmental compliance applications. After the scoping process and design for the first system fully revealed the complexity needed to meet the business requirements, the PCA's Information Management Board decided to reallocate funds from Tanks and Spills and Superfund to those programs with a major compliance orientation. In addition to Air Quality, design and programming went forward on applications for the Solid Waste, Water Quality and Hazardous Waste divisions.

## Planned and Actual Implementation Dates

In order to meet the budget target, the systems for tanks and spills and site response have not been developed under the existing contract.

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*1* Office of the Legislative Auditor, Program Evaluation Division, *Pollution Control Agency* (St. Paul, January 1991).

| Component | Implementation Target | Actual Implementation |
|---|---|---|
| Air Quality/Central Hub | February 3, 1994 | August 1995 |
| Solid Waste | June 30, 1996 | Data currently being loaded |
| Water Quality | September 17, 1996 | Acceptance Testing |
| Hazardous Waste | June 30, 1997[a] | In design process |
| Tanks and Spills | | Not Implemented |
| Site Response | | Not Implemented |

[a]The hazardous waste system is currently in the detailed specification stage. The goal is to have it operational by July 1, 1997.

PCA's contract with AMS is a fixed price contract, but it does not contain a warranty provision. Instead, a fixed number of hours of post implementation support are guaranteed.

# Implementation Problems

The only notable problems in implementation have been some concerns about system response time. PCA included a section in the contract requiring a response time of 2 to 3 seconds. Response time for complex queries is longer than 2 to 3 seconds. Response time was an issue in the acceptance testing for the solid waste system. The contractor re-wrote portions of the software which significantly improved the response times. The contractor is required to review the entire solid waste system and correct any deficiencies that could result in performance problems. Response time was highlighted as a priority in the water quality and hazardous waste systems. The water quality system has been delivered with much improved response times.

The other issue which has come up is the length of time for acceptance testing. The MPCA wants an open-ended test period, using reduction in the number of bugs to an "acceptable" number as the way to determine when testing is concluded, whereas the contractor wants a fixed time allotted for testing. This is still under discussion.

# Measuring Benefits of the System

Although two of the systems have been implemented, PCA has not done any work to measure the achievement of project goals. PCA is currently having a project risk assessment completed by Coopers and Lybrand. PCA identified the issue that some end users do not use the software that has been developed and suggested to Coopers and Lybrand that this might be an area to look at in the risk assessment. This indicates a change management problem in getting the users to change their ways of doing business.

However, the changeover from a minicomputer to a desktop/LAN computer environment is now complete. As a benefit, all PCA staff now have access to basic word processing, scheduling, e-mail, and other computer tools at their desktops.

# DEPARTMENT OF LABOR AND INDUSTRY'S DAEDALUS PROJECT

## Project Description

DAEDALUS is the Department of Labor and Industry's electronic digital imaging project to re-engineer and automate many of the functions of the Workers' Compensation Division. Imaging will convert paper files into an electronic format so that staff can simultaneously view and update electronic files and more easily track each case through the system.

The project goal is to improve workers' compensation claims handling by:

- shortening the time needed for dispute resolution,
- tracking and reporting claim status in real time,
- reducing time and cost to manage and store documents,
- allowing multiple access to individual files, and
- allowing balancing of workloads.

## Project History and Budget

### Timeline

Project planning began in 1989. The five-year internally-funded planning phase included pilot projects (a custom application and an "off-the-shelf" solution), site visits, and preliminary scoping.

In addition to a project director, overall guidance came from the Operational Board, comprised of key members of the department's business and technical units and upper level management. Information technology staff sat on the board and also worked directly with the project director. The project used consultants at various stages—scoping, re-engineering, writing the RFP, technology, training, and change management. In order to keep within the budget appropriated by the Legislature, the project dropped some lower priority functions originally included in the desired project scope, specifically electronic data imaging and optical character recognition.

In early 1993 Coopers and Lybrand was hired to help define the scope of the project. The "requirements definition phase" lasted from August 1993 through January 1994. A business process re-engineering (BPR) consultant was hired September 1993. The re-engineering phase extended from September 1993 through March 1994. The RFP for a consultant or integrator to lead the development process, including selecting and integrating hardware and software, was is-

sued in January 1994. The RFP specified hardware requirements but no specific hardware or software packages. Contracts with the integrator, Unisys, and software/hardware vendors were signed in June 1994.

A six-month pilot test of the project's first stage began in January 1995. The contract shifted from a fixed bid to a time and materials basis. According to project staff, the project became something of a "moving target" as technology continued to change rapidly and management continued to consider and implement changes.

During the first stage of implementation in 1996 there was some user adjustment, and the system had to be modified when applied to "real" data. As the technology became a part of the regular work day, various changes to the system were requested by users. Funds were dedicated for these changes.

## Budget / Funding

The department estimated total project cost in 1992 to be about $10 million over a two-year period. The project will actually cost about $10.3 million over a four-year period by the time it is fully implemented in 1998. In 1993 the Legislature funded $5 million of the department's initial request for $10 million.[2] The department's second request in 1995 for $5 million was funded in two parts: $2.5 million for 1996 and $2.8 million for 1997.[3] The department expects the project to be fully implemented by January 1998.

## Planned and Actual Implementation Dates

Project implementation will continue as shown below.

| | Implementation | |
|---|---|---|
| **Component** | **Target Date** | **Actual Date** |
| First phase document scanning | March 1995 | March 1995 |
| Data model | September 1996 | September 1996 |
| Investigative services access | October 1996 | October 1996 |
| Office of Admin. Hearings access | March 1997 | Likely March 1997 |
| Workers' Compensation Court of Appeals access | March 1997 | Likely March 1997 |
| Vocational Rehabilitation unit access | April 1997 | Likely April 1997 |
| Automated Claims monitoring | July 1997 | Likely July 1997 |
| Special Compensation fund access | July 1997 | Likely July 1997 |
| Electronic worksheet | January 1998 | Likely January 1997 |
| Access to claims performance data on line | January 1998 | Likely January 1997 |
| Validate new processes | Ongoing | Ongoing |
| Measure benefits | January 1998 | Likely January 1998 |

*2* The Information Policy Office (IPO) recommended staged funding ($5 million the first year), added a year to the schedule, and recommended the use of an external consultant to focus on re-engineering rather than attempt to re-engineer and implement technology simultaneously.

*3* IPO supported the second request with several conditions including an independent risk assessment of the project, quarterly progress reports, other more technical requirements, and phased release funding.

# Implementation Problems

There were logistical problems with implementing some of the re-engineering recommendations. The original software manufacturer discontinued support for the data capture software package that was installed early in the project. User adjustment during first stage of implementation was mostly due to applying the system to "real" data, and required some system modifications.

Project staff listed the following findings from this project:

- Re-engineering must occur as one of the first stages of the project and precede software and hardware development.
- A workflow analysis, a major part of the re-engineering phase, must be completed before the software/hardware development. The technology can then support the new business process rather than applying new technology to old ways of processing the work.
- Project deadlines must be flexible so that staff can deal with unexpected problems and user needs, and "get it right" the first time.
- Information technology staff must be a formal part of project leadership.
- Consultants should be used, as appropriate, at all project stages if in-house staff are not trained/qualified. Also, the consultant's role should move from one of leadership to one of mentorship.
- Where flexibility is critical and the half-life of applicable technology is shrinking, a fixed bid approach to contracts is simply untenable. A time and materials approach offers a better opportunity to develop a system that meets project goals.

# Measuring Benefits of the System

The department has not yet implemented all components, and they have not done any work to measure the achievement of project goals. Currently they have developed a list of objectives for use when they evaluate the system beginning January 1998. Several of these could easily be made measurable, such as "redistribute permanent records staff to customer service" and "reduce storage costs."

# DEPARTMENT OF HUMAN SERVICES' MAXIS PROJECT

## Project Description

The Maxis project is an on-line automated system for a variety of human service programs. The Maxis system automates eligibility determination, benefit calculation and issuance, and case management for the Aid to Families with Dependent Children, Food Stamp, General Assistance, Emergency Assistance, Minnesota Supplemental Aid, and Refugee Assistance programs. The system also provides eligibility and case management for the Medicaid and General Assistance Medical Care programs and serves as a data entry system for Minnesota Care. Human services caseworkers in all 87 counties as well as Department of Human Services employees use the system.

The rationale for the project was to improve the efficiency of county eligibility caseworkers, to avoid federal quality control sanctions, and to meet a requirement for statewide program development. Specific benefits included:

- consistency in the application of program policy across 87 counties,
- reduction in AFDC, Food Stamp, and Medicaid overpayments,
- simplification of the assistance application process through the use of a combined application form,
- increased continuity for clients through a change in the role of the program worker from program specialist to generalist,
- reduction in routine paperwork to free up more time for client contact,
- connectivity between the counties and DHS, and
- interfaces with other systems (e.g., Child Support).

## Project History and Budget

### Timeline

Project planning to automate the functions of eligibility determination began in July 1986. The project was largely funded by three federal government agencies: the Department of Agriculture (Food Stamps), the Health Care Financing Administration (Medicaid), and the Department of Health and Human Services (AFDC). Each agency has varying rates of financial participation for development and operations. Averaging the financial participation of all federal agencies, the federal government paid an average of 70 percent of development costs.

Development of the project took place over several years. The federal government requires several things as a condition of its financial participation. First, the federal government requires that states upgrading or implementing new systems transfer a system from another state and modify it for the new states use. In 1987, the Maxis project made a decision about the transfer state and prepared the first Advance Planning Document (APD). In 1988 a Request For Proposal was completed, a vendor was chosen, and the APD was amended to include a number of new public assistance programs including Medicaid. During 1989 the project design was completed and programming and certification testing for the food stamp portion of the project occurred. In 1990, programming was completed for the other public assistance programs and testing began at a group of pilot sites in September to December 1990. Statewide conversion was phased in between February 1991 and December 1991.

### Budget / Funding

The planned and actual implementation schedule and costs were:

| | Initial | Actual |
|---|---|---|
| Schedule | December 1990 | December 1991 |
| Cost | $46.3 million | $50.6 million |

Costs increased on the project for a variety of reasons. One of the more prominent reasons was the decision to include Medicaid and GAMC eligibility in the project, resulting in increased design and programming time, extra costs for testing and fixing programming errors, and significant increases in conversion support. The department also reports that the cost of the application development contractor was greater than anticipated because they vastly underestimated the amount of work effort involved in application development. Also there was an increase in the number of end-users over what was anticipated (4,000 compared with 2,500 anticipated), resulting in increased training and support costs. There was a decision made to have a centralized Issuance Operations Center to issue checks and mailings which also increased costs somewhat.

The schedule increased because it took longer to receive approval for the RFP, contracts, and updates to the Advance Planning Document. In addition, the increase in the project's scope noted above, and delays in installing the communication lines connecting the counties due to the Gulf War, negatively impacted the project's schedule and cost.

## Measuring Benefits of the System

The department claims success on almost all of the planned benefits. A survey conducted by Grant Thornton in 1993 found that county users identified the following benefits:

The new system:

- provides improved consistency and uniformity of eligibility and benefit determination,
- reduces "paperwork" and mistakes caused by human factors,
- makes the inter-county transfer of client files more efficient and timely,
- provides some time for assisting clients with other needs and services extending beyond "providing benefit payments,"
- enables more timely distribution of client benefit payments,
- eliminates the need for counties to issue and handle food stamps and benefit warrants, and
- provides for more complete and timely distribution of program policy, information, and communication.

In its first post-implementation report in 1993, Maxis reported a cumulative savings of $20 million.

# DEPARTMENT OF HUMAN SERVICES' MEDICAID MANAGEMENT INFORMATION SYSTEM II

## Project Description

The first Medicaid Management Information System (MMIS I) began operation at the Department of Human Services (DHS) in 1974 and by October of 1993 processed 607,000 claims. In the late 1980s MMIS I was deemed to be at risk because the technology used in the system was out of date and difficult to maintain and upgrade. There were also concerns about the inability of the system to provide the necessary summary information and reports to effectively manage the programs administered with the system.

## Project History and Budget

### Timeline and Budget

In 1988, DHS contracted with KPMG Peat Marwick to prepare an Advance Planning Document (APD) to submit to the Health Care Financing Administration (HCFA). HCFA approved the APD and issued an RFP for development and implementation in 1989 with an estimated replacement cost of $9,360,999 and an implementation date of June 25, 1990. In 1990, DHS signed a contract with Consultec for development ($5.9 million) and implementation maintenance ($2.6 million).

However, in 1991, after completion of the detailed design requirements, the state and Consultec agreed that the original RFP/APD did not match the scope of the work that had to be done. A revised APD was submitted to HCFA, and DHS signed the first supplemental contract with Consultec for $4.3 million, changing the implementation date to the end of 1993.

In 1993, the scope of the MMIS II project was increased because of new requirements by the state for Minnesota Care and point-of-sale. A second APD was submitted to HCFA, and DHS signed a second supplemental contract with Consultec for $5.7 million and moved the implementation date to May 31, 1994.

MMIS II was implemented on May 31, 1994, though some planned features were not functional. In September 1994, DHS and Consultec set November 30, 1994 as the final delivery date for all missing features. In March 1995, HCFA conditionally certified MMIS II, and in January 1995 DHS issued a letter of default to Consultec for the missing features. On November 1995 HC FA certified MMIS II retroactive to November 1994. On August 23, 1995 DHS implemented a new contract with Consultec giving the state a $1.5 million credit, with all work in the new contract to be completed by October 31, 1996.

The federal government covered 90 percent of the approved development costs for MMIS II. Of the final total cost of $29.7 million, about $7.0 million in state dollars were allocated.

### Planned and Actual Implementation Dates

The original Advance Planning Document (APD) submitted to the Health Care Financing Administration (HCFA) estimated an implementation date of June 1990. MMIS II came on line four years after this date on May 31, 1994. Reasons for the delay included: contract re-negotiations due to misunderstanding about the scope of the project, changes in the scope of the project mainly due to new state legislation, and the uncertainty and delays that come with large computer systems projects.

## Measuring Benefits of the System

Several benefits were part of the original APD submitted to HCFA in 1988 and were also claimed for MMIS II in 1989 and 1990 documents. Benefits and savings anticipated by the department include:

(1) Reduction in payments for health care services through more comprehensive edits and audits--$1,000,000 per year,

(2) Third party liability (TPL) and subrogation recoveries and/or cost avoidance under an improved system -- $1 to $1.75 million per year,

(3) More efficient use of data center resources through a redesigned MMIS--up to $500,000 in savings,

(4) Reduced maintenance costs--$125,000 per year, and

(5) Project payback is expected by the department in 3.4 years.

DHS had made no attempt to measure whether these benefits had been achieved until information was requested by the Office of the Legislative Auditor.[4] The department told us that they believed that MMIS II has enabled DHS to save money through increased operational efficiency, and allowed DHS staff to handle increased transaction volumes without hiring additional staff. While it is true that more claims were processed with MMIS II (16 million versus 22 million) it is not clear that this is strictly due to use of the new system. The department also reported that savings for the second benefit listed above have exceeded the objective of $1.75 million. The other benefits have either not been evaluated or have not produced the desired savings, although in some cases the project's expanded scope may have been a contributing factor.

DHS also claimed additional monetary and non-monetary benefits for MMIS II that were not included in the original proposal, such as:

- $3,000,000 annual savings from not printing Minnesota-specific paper claim forms,
- $8,250,000 annual savings to providers (not the state) from use of electronic claims instead of paper,
- Elimination of multiple billings to providers due to expansive remittance,
- Increase in electronically submitted claims from 55 percent to 85 percent by the end of the second year of operation, and
- Adjudication of an average claim in 5 days, and payment of 96.5 percent of claims within 30 days, as of June 1996.

# DEPARTMENT OF REVENUE'S SALES TAX RE-ENGINEERING PROJECT

## Project Description

The former sales tax processing system, which is the entry system for data collection for many of the Department of Revenue's (DOR) other functions, was slow, expensive, and inflexible. DOR determined that it was important to complete business process re-engineering before attempting to design or implement a new sales tax processing system. The project included a sales tax processing module and a pilot project for sales tax document processing using optical disk technology. DOR hired CSC Index to provide training and consulting on business process re-engineering. CSC Partners was hired to help with the programming during business system design. The department viewed the project as an educational

*4* Initial responses to requests for information on benefits were communicated to this office via several memos from DHS dated October 31, 1996 and December 4, 1996.

experience that would provide them with the knowledge to guide future investments in similar technologies and processes. One of the keys to the new system was optical disk technology which would reduce the paper handling and allow immediate access to the document regardless of where it is in the system.

DOR had two contracts: (1) for re-engineering business processes with CSC Index, $1.1 million, and (2) for development with CSC Partners, $1.975 million. DOR management felt that the 90-day warranty period was sufficient, and no major problems were found after the warranty period. It is possible that the vendor, CSC, may have had a greater incentive to be responsive because they were going to try and market the system to other states and wanted DOR as a satisfied customer and reference.

# Project History and Budget

## Timeline

During the period February through May 1991, DOR assessed the sales tax system and established targets to improve performance. The second phase, October 1991 through June 1992, involved redesigning DOR business processes using targets identified in the first phase. The last phase, August 1992 through November 1993, was the actual development and implementation of information systems, job designs, and management systems.

## Budget / Funding

| | Funding | | Spending | |
|---|---|---|---|---|
| **Date** | **Item** | **Amount** | **Item** | **Amount** |
| Phase I: Feb. 1991 to May 1991 | Intertech rate reduction | $350,000 | CSC Index | $382,000 |
| | Internal funding, DOR systems group | 56,700 | CSC Partners | 11,800 |
| | | | Miscellaneous | 12,900 |
| Phase II: Oct. 1991 to June 1992 | 1992 Sales Tax Document Processing Appropriation | 300,000 | CSC Index | 1,100,000 |
| | | | Computer equipment | 650,000 |
| | Intertech rate reduction | 500,000 | Miscellaneous | 300,000 |
| | DOR internal funds | 1,250,000 | | |
| Phase III: Aug. 1992 to November 1993 | 1992 Sales Tax Document Processing Appropriation carry forward | 900,000 | CSC Partners for development work (90 day warranty) | 1,975,000 |
| | | | NCR/AT&T - scanning and imaging equipment | 1,000,000 |
| | 1993 Sales Tax Document Processing Appropriation | 1,200,000 | | |
| | | | Training and development, communications, and project management costs | 225,000 |
| | Intertech Rate Reduction | 800,000 | | |
| | DOR strategic investment | 300,000 | | |

[a]Internal funding came primarily from cutbacks in lower priority services and not filling positions in anticipation of potential re-engineering changes. DOR staff noted that this lead to increased stress in the department as others had to pick increased slack during project development.

Project funding came from legislative appropriations, Inter Tech rate reductions, and internal DOR funding.

### Planned and Actual Implementation Dates

| | Implementation | |
|---|---|---|
| **Component** | **Target Date** | **Actual Date** |
| Profiling and registration processes | June 30, 1993 | August 1993 |
| Electronic filing and paying options | June 30, 1993 | November 1993 |
| Core sales tax processing system | June 30, 1993 | November 1993 |
| Compliance gradient / analysis process 10 major functions, 8 have been implemented to date and 2 are still being developed | June 30, 1993 | The first piece was implemented in November 1993 |
| Performance measures of these processes and customer satisfaction | June 30, 1993 | Beginning August 1993 |

# Measuring Benefits of the System

The Department of Revenue (DOR) made an early attempt in 1994 to measure the achievement of goals in six broad areas: customer registration and profiling, filing and paying processes, processing, ensuring compliance, ensuring payment, and performance measurement.[5] We obtained additional information on achievement of goals through interviews and communication with DOR staff, but we did not attempt to independently verify this information.

According to the department, there has been considerable improvement in several of these areas. For example, new business registrations are completed more quickly, services are frequently customized to the taxpayer, legislative changes can often be made within a few days, the number of paper forms filed has been significantly reduced, filing information is available within a week, and cases are resolved within a few months rather than almost a year.

The department feels that the efficiencies and savings go beyond current operation of the sales tax processing system. They have used experience with the sales tax re-engineering project to assist them in the implementation of many additional efforts like the Statewide Systems Project and Minnesota Care.

*5* Department of Revenue, *Sales Tax Re-engineering: Overview* (St. Paul, May 1994).

# Glossary of Terms Used in the Statewide Systems Project Report

**AGPS:** Advanced Government Purchasing System, the new MAPS procurement/purchasing system.

**AMS:** American Management Systems, the vendor of the accounting software modified for the Statewide Systems Project.

**Client-Server:** An architecture where a client (personal computer) provides the user interface and performs some or all of the application processing. The server is a separate machine that maintains databases and processes requests from the client to extract data or update the database.

**Electronic Data Interchange or EDI:** An electronic system to support the application to application movement of structured data. The Department of Administration plans to start a pilot test of the EDI sub-component of AGPS in January 1997.

**Electronic forms transactions, controls, and edits:** Collecting data by directly inputting it into a form on the computer screen rather than on a paper form. Because there is an underlying computer program collecting the data, the system can build in controls and edits that limit the errors users are likely to make.

**GFS:** Government Financial System, the new MAPS accounting system.

**Help Desk:** The user help function supported by Mn-ASSIST. Staff answer specific user questions about using the system, help solve problems, and identify errors in the system.

**Information Access Warehouse, Information Warehouse:** A large database of accounting, human resources, and payroll information from MAPS and SEMA4 that trained users may access for inclusion in standard or customized reports. Data is updated daily based on new transactions.

**INFORMS:** Vendor of the procurement software modified for the Statewide Systems Project.

**InterTech:** A division of the Department of Administration that supports several mainframe computers needed for several large state systems.

**MAPS:** The acronym for the Minnesota Accounting and Procurement Systems. GFS and AGPS are components of MAPS.

**Mn-ASSIST:** Minnesota Administrative Statewide Systems InterAgency Support Team, housed in Finance and providing assistance to users of the four new systems.

**PALS:** Procurement Automated Logistics System, the predecessor of AGPS, formerly used for about 20 percent of agency transactions.

**PeopleSoft:** Vendor of the payroll and human resources software modified for the Statewide Systems Project.

**Re-engineering, Business process re-engineering, BPR:** Process to redesign procedures used as part of a specific business practice with the objective of doing the job better and/or cheaper. For SSP, "It is the process of rethinking and redesigning processes before they are automated." (Statewide Systems Project newsletter, November 1993).

**Stand-alone systems:** Computer systems, hardware and software, supported by state agencies that paralleled, and in some cases passed data to, statewide systems.

**Statewide Accounting System or SWA:** The twenty-year-old accounting system that GFS replaced.

**Statewide Employee Management System, or SEMA4:** The new human resources/payroll system of the Statewide System Project, SEMA4 is the acronym for the State Employee Management System (4 = payroll, human resources, interfacing, and reporting).

**Work Groups:** Five separate working committees of state employees that helped develop the RFP and provided feedback to the development staff that actually modified the computer software. The five groups corresponded to the four systems plus a managers group.

**Year 2000 problem, Y2K:** The inability of some software to accommodate transactions with four-digit dates. This can negatively affect any program that uses dates in calculations, such as calculating retirement benefits.

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January 29, 1997

Mr. James R. Nobles, Legislative Auditor
First Floor, Centennial Office Building
St. Paul, Minnesota 55155

Dear Mr. Nobles:

Thank you for the opportunity to respond to your report on the Statewide Systems Project. This letter serves as a consolidated response from the three sponsoring agencies: Administration, Employee Relations and Finance. (Our letter of January 28, 1997, covers the executive summary only. This extended response addresses issues throughout the entire report.)

As we reflect back on the lessons learned from the Statewide Systems Project, we especially appreciated your reporting on the track record of other systems projects. We agree that Minnesota's achievements cannot be fairly evaluated except in this context:

- Thirty-one percent of all information technology projects are canceled without being completed - at a cost of $81 billion to government and industry in 1995;

- Only 9 percent of projects completed within large companies are ontime and within budget;

- Completed projects in large companies average only 42 percent of the originally proposed features and functions.

Given the above plus the acknowledged risk and complexity of this effort, we believe you should have been more generous with the adjective used in describing the Statewide Systems Project as "moderately successful." As your report verifies, the project consistently exceeded the industry norms. We concede that all hoped-for benefits have not been achieved and that we have much remaining work to do in raising user satisfaction levels and optimizing effective use and performance of the new systems. However, your report aptly characterizes the project as "unprecedented." Five new systems were brought up in more than 100 agencies without a major disruption in state business activity. We believe that if judged by industry standards, the project was an unprecedented success.

We agree with much of what is in the report. The following response addresses the exceptions and provides clarifications and context. It is organized by chapter and section.

Background (Chapter 1) - Costs of Development

- The project team is criticized throughout the report for imprecise estimates. However, it consistently documented its assumptions, so however good or poor the estimates may appear in retrospect, they can be understood and analyzed. Yet, the report's "conservative estimate" of "more than $10 million" in training and equipment costs incurred by agencies (p. 8) is provided without a basis for the estimate. The project received $1.8 million in equipment requests that it did not fund with project dollars and billed agencies for $0.8 million in training costs. Although these figures do not capture the full cost to agencies, it leads us to question the reliability of the estimate.

Objectives and Benefits of the Statewide Systems Project (Chapter 2) - Expectations of the Statewide Systems Project

- The project did set extremely ambitious goals (pp. 15-17), but not with any intent to deceive the Legislature or system users. For this project to succeed, it was essential to aim high and generate a spirit of genuine optimism about what we could accomplish. We could never have motivated our team to perform so far beyond their normal capabilities month after month by aspiring to mediocrity.

- The conclusion that "user expectations were never adjusted during development" (p.16) is simply not true. Although we retained our optimism and tried to instill it in others, we also put considerable effort into communicating difficult realities. The entire realignment crisis was precipitated by our direct communication with future accounting system users regarding needs that fell outside of the scope of the existing contract. Users subsequently redetermined specifications and priorities. Individuals attending monthly liaison meetings or quarterly user update sessions were routinely informed of changes as they occurred. For example, attendees at update sessions held on September 30, 1994 (MAPS), and October 24, 1994 (SEMA4), were advised of scope reductions in payroll and information access that had been negotiated as part of the contract dispute with Andersen Consulting. (Video tapes of all user sessions are available for verification.) In this specific instance, users from some of the more-involved agencies had also participated in the decision, which was further ratified by the steering committee.

- Because the amount of "paper" going to agencies about all aspects of the project was overwhelming, information about system changes may have been overlooked in the process. However, the project employed multiple communication vehicles to reach users and constantly struggled to provide the appropriate level of details for its multiple audiences. On balance, we believe our communication efforts--including information dissemination mechanisms in each of the agencies--was one of our successes.

Objectives and Benefits of the Statewide Systems Project (Chapter 2) - Have the Objectives of the Statewide Systems Project Been Met?

- You note that electronic data interchange (EDI) "when implemented, has the potential to make the procurement system more efficient" (p. 18). We are pleased to report that the first EDI order was sent via AGPS on January 28, 1997. We will follow the report's advice and roll it out statewide in a cautious, phased approach.

- We are intrigued by the finding that GFS users "feel that it is missing important functions" from SWA (p.18). The report never indicates what these functions are.

- The fact that many users continue to print forms available on-line is no surprise (pp. 18-19). The quantity of hard copy duplicates should gradually decrease as users' comfort levels increase.

- We share your concerns about data quality (p.20). Obviously, the data output will only be as good as the data input. We see three strategic solutions: reassessment of the optimal quantity of data to enter, simplification of the data entry process, and a better payoff to agencies for their efforts in the form of improved standard reports and procurement data in the warehouse.

- We understand that users may find the data warehouse "difficult to use" (p. 20), but that fails to tell the whole story. In assessing viable options, we concluded that an easy-to-use "executive information system" would not sufficiently meet the numerous agency-unique reporting needs. A conscious decision was made to sacrifice ease-of-use in order build a data warehouse from which trained "power-users" could extract and customize information that would truly meet agency information needs. Minnesota's warehouse has received two national awards for excellence and has been featured on *World Business Review*, hosted by Casper Weinberger. It has generated sufficient interest internationally to prompt visits to Minnesota from Sweden and Hong Kong. However, the warehouse is a work in progress. Additional data needs to be added and, with time and resources, we intend to address the ease-of-use concerns. Expanded training as well as options to simplify access will be reviewed. One intriguing prospect we hope to consider is access to reports via the World Wide Web.

- Due to the number and complexity of Minnesota's unique requirements, the goal of developing systems that would be "flexible and easy to change to meet future requirements" (p. 22) was never realistic. For example, SEMA4 needed to be customized to handle the differing elements of 15 different bargaining unit agreements as well as 250 classifications of pay and hundreds of types of deductions. It was useful to have the goal as an ideal and to discourage any optional customization, but this was truly a case of irreconcilable goals.

- The concluding comment regarding improved services to citizens, vendors and other customers (p. 23) seems uncharacteristically cynical. One has only to read the report's section on project benefits to identify numerous service improvements - particularly when one recognizes that the primary direct "customers" of the systems are state agencies and employees.

Objectives and Benefits of the Statewide Systems Project (Chapter 2) - Benefits of the Statewide Systems Project

- It is misleading to suggest that "a number was pulled out of the air" (p. 25) to estimate potential dollar savings. Assumptions underlying all estimates are documented. Given the number of unknowns we were dealing with, we question whether it would have been a good investment of project resources to have attempted to be more precise.

- It is not true that "additional costs of performing new functions were not offset against the projected cost savings" (p. 25). Although we undoubtedly missed some and generally

overestimated the time savings achieved through automation, we did net out the additional costs identified. For example, our analysis of increased use of direct deposit included an estimated $52,000 in additional labor plus $195,000 in lost interest.

- Likewise, it is not true that there was no plan for measuring benefits after implementation (p. 25). A tentative plan existed but was not executed because of much higher competing priorities such as system stabilization and user assistance.

- The information regarding data availability for commodities contracts (p. 26) contains inaccuracies. Use of blanket purchase orders and entry of interagency payments into GFS do not undermine the data needed to negotiate commodity contracts.

- The project documented more than 300 re-engineering ideas during the design of the new systems. An additional 46 ideas were identified later during the project realignment. The project only estimated the savings potential of the 46 realignment-phase ideas. The report indicates that $6 million annually may be accruing due to savings from the realignment-phase re-engineering (p. 30), but fails to acknowledge or analyze the benefits resulting from the design-phase re-engineering.

User Experiences with the New Systems (Chapter 3) - The First Year

- First year problems were not "somewhat more severe than expected" (p. 34). In our report to the 1995 legislature, we indicated that the first year would "involve considerable trauma for agencies and individuals" and that legislators should initially expect to hear "almost nothing but complaints about the new system." In fact, although the problems were very real, none of our worst-case scenarios ever developed.

User Experiences with the New Systems (Chapter 3) - User Satisfaction: the Accounting and Procurement Systems

- The sole area where we have serious reservations with the report is in your commentary on the new procurement system - AGPS (pp. 47-50). We agree we got off to an especially rocky start with this component and that user satisfaction has yet to reach our desired level, but the following mitigating facts need to be considered:

  The user survey gave AGPS the highest rating for improvement over the past year. Additionally, 22 percent of the priority enhancements for AGPS identified by the MAPS user group are now completed and another 64 percent are in progress. Furthermore, Administration has convened a twelve-agency steering committee that has examined state procurement at the statutory, rule, policy and practice levels with the intent of simplifying and streamlining the entire process and delegating more authority to agencies.

  Users experienced more change with AGPS than with the other new systems. AGPS replaced a mostly manual system and dramatically altered roles and power/control relationships among agency staff. Understanding the normal human response to change, one would expect higher levels of personal anxiety and discomfort - and resulting dissatisfaction - associated with such changes.

Although some users now describe AGPS as too "cumbersome" and "complex," users made the initial software selection. Also, some of the complexity now criticized (e.g., number of document types) was added to the base software specifically to respond to user input during the design phase. Realistically, current versions of GFS and AGPS will never appear as state-of-the-art and user-friendly as SEMA4. The state consciously chose to lower its risks by selecting a mix of "tried and true" mainframe-based technology with the higher-risk client/server software in the human resources/payroll area.

Clearly one aspect of user dissatisfaction stems from state business practices unrelated to AGPS. The sales tax issue is an excellent example. Unless and until the Legislature revisits its requirement that the state pay sales tax to itself, any purchasing system will require complex modifications to address this unique circumstance. Similarly, the standard accounting practice of pre-encumbering/encumbering funds does make it "cumbersome" to change initial chart of accounts decisions. However, this is not a fault of the software.

AGPS, currently used statewide in eight states plus Wisconsin's transportation department, is the most widely-implemented state procurement software in the marketplace. Once selected, no state has ever stopped using AGPS.

We have concerns that your report reflects unfairly on INFORMS, the AGPS vendor, and its product. In the course of this project, we have had the opportunity to work with a large number of vendors of software and related services. INFORMS has consistently been among the most responsive and customer service-oriented.

- Nonetheless, your point is well taken that AGPS needs additional assessment and attention. We agree. We are committed to aggressively identifying and resolving user concerns with all the new systems. Within AGPS, that includes - as recommended - reducing the number of document types, determining optimal levels of data to capture and working hands-on with agencies in finding solutions to their agency-specific problems. Within GFS, that includes enhancements of the accounts receivable module. Within SEMA4, that includes improvement of response times. For all the systems, we clearly have work to do in improving standard reports, providing relevant additional training and managing operating costs.

Systems Development in State Government (Chapter 4) - Characteristics of Project Success and Failure

- A recurring theme in this section (pp. 54-57) is the significant risk that the state faced in tackling a project of this magnitude. Certainly it is reasonable to criticize our naivety or judgement and to recommend that the state not do it again. We agree. However, please do not lose sight of the fact that our agencies successfully navigated through all of the cited risks without a major calamity. Regardless of whether one considers that the result of pure luck or hard work or both, it is an enormous accomplishment.

- The report's commentary on "executive sponsorship" (p. 55) fails to acknowledge the gap between textbook "best practices" and the reality of the public sector. We believe one of our finest accomplishments was creating an organization structure that worked as a multi-department and public/private collaboration. Clearly, consensus-building takes longer than a unilateral decree, but given the legal autonomy of the many partners, the project would have been at much greater risk using any other approach.

- The timing and depth of the project's re-engineering effort may not have been fully understood (pp. 56-57). We did not wait until the realignment to re-engineer business processes. In fact, one task of the realignment team was to document the more than 300 re-engineering ideas already considered and potentially incorporated into the system design, as noted in a project newsletter (November 1993).

  > Re-engineering has always been a major focus of the project. Throughout the project, staff and systems users have been charged with rigorously reviewing existing business practices and asking the tough questions "why do we do it this way?" and "can we streamline or simplify the process?" Realignment gives us the opportunity to devote additional resources to re-engineering and to assign staff to re-engineering on a project-wide basis. These changes will expand the breadth and depth of idea generation and analysis and will assure a more fully integrated and consistent effort.

- The comment regarding "conflict" and "constant" negotiation between the state and Andersen Consulting (p. 58) overstates what is in fact a day-to-day reality of project management. Nonetheless, we are proud of our assertive advocacy of state interests and hope that your report will dispel any lingering impression that--as stated in a recent letter from the leadership of the House Government Operations Committee and State Government Finance Division--"lax enforcement of contract provisions [may have] cost the state millions in development of the Statewide Systems Project." The reality is that due to Minnesota's fixed-price-for-defined-scope contract and aggressive negotiation around all changes, the new systems came in at a price which was "quite reasonable," according to an analysis by Coopers and Lybrand.

In conclusion, our departments are grateful to the Legislative Audit Commission and your office for undertaking an in-depth assessment of this massive systems development initiative. We agree with and support the majority of your conclusions and recommendations and believe the report will serve as an excellent educational vehicle for both the executive and legislative branches as the state embarks on other large systems projects. In the meantime, we appreciate your recognition of our success and the acknowledgment of our ongoing efforts to improve the functionality and performance of the new systems. We are committed to continuing these efforts and your report offers both encouragement and helpful guidance for us as we do so.

Sincerely,

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Karen L. Carpenter
Deputy Commissioner/
Acting Commissioner
Department of
Employee Relations

Wayne Simoneau
Commissioner
Department of Finance

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