
An Update on the Department of Education's Financial Management System and School Information System

A Report to the
Governor
and the
Legislature of
the State of
Hawai'i

Report No. 93-3
February 1993



THE AUDITOR
STATE OF HAWAI'I

The Office of the Auditor

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OVERVIEW

THE AUDITOR
STATE OF HAWAII

An Update on the Department of Education's Financial Management System and School Information System

Summary

In January 1991 we reported on the development by the Department of Education of two major computer systems—the Financial Management System (FMS) and the Student Information and Program Management System (SIPMS), now called the School Information System (SIS). The 1991 report described major shortcomings in the department's development process for the FMS, which increased the cost and risk of the system. We concluded, however, that the FMS was beyond the point where past shortcomings could be corrected and recommended that the department follow a prudent course of action in implementing the system. The department disagreed with some of our findings but said it would make extra efforts to improve. Work on the SIPMS was just beginning at the time of our study and we recommended that the DOE continue its phased development approach. In this update, we report on the status of the FMS and the SIS from January 1991 to November 1992.

So far, the department has expended over \$17 million on the FMS, but the system does not deliver important benefits the department promised. It does not integrate the department's budgeting and accounting systems so that each supports the other, and, contrary to the department's statements about lumpsum budgeting at the school level, FMS does not give schools the capacity to plan and create their own budgets. Furthermore, the FMS has not increased the efficiency of school personnel, saved them time, improved their morale, or decreased their overtime. We did note, however, that FMS training and user support has been unanimously praised by school level personnel.

The department ignored our prior recommendation to proceed prudently. Instead, it implemented the FMS on July 1, 1991— against the advice of its own computer consultant, before it had completed standard testing procedures, and when FMS had over 500 identified "bugs" in the system. When implemented, the system's poor performance resulted in considerable frustration and morale problems at the school level and additional overtime costs for the department. One and a half years after implementation, system response time is still unacceptably slow and can be improved only marginally.

Concerning the SIS, we found that although the Legislature has twice denied funding, the department has continued to develop and implement the project. In doing so, however, the department has substantially followed all applicable state laws, regulations, and required computer systems development methodology in a cost effective manner.

Recommendations and Response

For the FMS, we recommend that the DOE: (1) seek to better integrate its budget system and FMS by making the appropriate organizational changes and give priority to reconciling accounts; (2) develop budget preparation capability at the school level; build in accountability for school level budgeting; explore how FMS can support and facilitate School/Community-Based Management; and provide the accountability promised under lumpsum budgeting; and (3) continue to work with the Department of Budget and Finance's Information & Communication Services Division to improve system availability and response time. For the SIS project, we recommend that the Legislature seriously consider the request for funding the SIS when the DOE provides the information needed for legislative review.

The department responded that most of the report's findings are correct with respect to the current state of the FMS and SIS projects. With respect to the findings with which the department disagreed, we note that our information was reported directly from statements made by the department's consultants. However, the department agreed with our recommendations and hopes to implement them by 1995. The department said it is aware of most of the report's findings and is working to make necessary corrections and improvements. The department stated, that this report should be considered an "interim report" because the development of the system is still underway. It said that a very different state of affairs will exist when FMS and SIS are completed, perhaps in 1995. We note that the department's current plan to transition from a centralized to a distributed processing system was not part of the original FMS plan, nor were the significant additional expenditures part of the budget for the system.

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Submitted by

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Foreword

In 1991, we issued a report on two major computer system projects at the Department of Education entitled, *Study of the Development of the Department of Education's Financial Management System and Student Information and Program Management System*. We made a number of recommendations in our 1991 study on how the department might improve its development of the two systems.

In this report, we provide an update on the two computer systems and the department's management of their development since our 1991 report.

We wish to express our appreciation for the cooperation and assistance extended to us by officials and staff of the Department of Education and the staff of the Information and Communication Services Division of the Department of Budget and Finance.

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Chapter 1

Introduction

This is an update of our January 1991 report of the development by the Department of Education of two major computer systems—the Financial Management System (FMS) and the Student Information and Program Management System (SIPMS).

Our 1991 report described major shortcomings in the department's development process for the FMS. These shortcomings increased the cost of the system and the risk that it would not function as proposed. We concluded, however, that the FMS was beyond the point where past shortcomings could be corrected; therefore we recommended that the department follow a prudent course of action in implementing the FMS.

Work on the SIPMS was just beginning at the time of our study. We recommended that the department continue its phased development approach, beginning with the first phase of developing the student information module. We also recommended that the department coordinate the FMS and SIPMS projects and take into consideration the computer equipment and software put in place as part of the FMS.

Since 1991, the department has implemented the FMS and has continued development of SIPMS, now renamed the School Information System (SIS).

This update was performed pursuant to Section 23-4, Hawaii Revised Statutes, which requires our office to conduct post audits of the transactions, accounts, programs, and performance of all state agencies. In addition, the State Auditor initiated this update because government auditing standards require us to follow up on significant or material findings and recommendations from prior audits.

Objectives of the Update

1. Determine the status of the continuing development, testing, and installation of the FMS from January 1991 to the present.
2. Determine the status of the continuing development of SIPMS, now called SIS, from January 1991 to the present.

Scope and Methodology

Our examination of the two computer systems encompassed their planning; selection of software, hardware, and consultants; coordination; funding; and compliance with state laws and standard industry practices for implementing major computer systems.

In conducting the review, we examined files, plans, and correspondence at the Department of Education from January 1991 to the present. We interviewed those involved in the FMS and SIS projects, including the superintendent of education, the assistant superintendent of the department's Office of Information and Telecommunication Services, the FMS and SIS project managers, the directors of the department's Budget Branch and Administrative Services Branch, and other state, district and school level administrators. We also attended a FMS Users Group meeting.

To assess FMS performance at the school level, we surveyed by telephone 97 school administrative services assistants and account clerks on their experience with FMS. We also made site visits to two SIS pilot schools, two of the department's Information Technology Centers (ITCs), and eleven other schools.

As criteria for our review, we used the State's strategic plans for data processing as described in the Distributed Information Processing and Information Resource Management (DIPIRM) 1988 master plan, the department's strategic plans for data processing as described in its 1990 DIPIRM plan, the SDM/70 Systems Development Methodology that all state departments and agencies are to use when developing information systems, departmental studies on the two projects, our January 1991 "Guidelines for Legislative Review" of major computer systems, and applicable state laws and regulations.

We did not audit the system cost data which was provided by the department. Our work was performed from October 1992 through January 1993 in accordance with generally accepted government auditing standards.

Chapter 2

Assessment of the Financial Management System

This chapter presents our evaluation of the Financial Management System (FMS). It examines the impact of FMS on the department's accounting and budgeting practices and on the schools.

Summary of Findings

1. The department has expended over \$17 million so far on the FMS, but the system does not deliver important benefits that the department said it would. It does not integrate the department's budget system with its accounting system and it does not give schools the capacity to plan and create their budgets.
2. In implementing the system, the department ignored our prior recommendation to proceed prudently. Instead, the department chose to implement the FMS on July 1, 1991 before the system had been properly tested. This resulted in considerable frustration and morale problems at the school level.
3. The FMS has improved accounting and expenditure reports but operational improvements at the school level have been marginal. The FMS has not increased the efficiency of school personnel, saved them time, improved their morale, or decreased their overtime, as promised. Furthermore, the system's slow response time cannot be improved appreciably. It should be noted, however, that FMS training and user support has been unanimously praised by school personnel.

Background on FMS

In 1988, the department issued a study, the *Financial Management System Study*, that identified problems and recommended improvements in its financial management system. The study characterized the department's financial system as in the dark ages, "cumbersome," and generating "a paper blizzard and excessive red tape."¹ Problems included the additional work caused by an outmoded financial system, bureaucratic policies and procedures, and overburdened school employees.

The study recommendations included that the department develop a new, on-line, integrated financial management computer system; a comprehensive financial management training program; streamlined policies and procedures; and a standardized and comprehensive coding structure.

The department used the study to request funds from the Legislature for a new computerized financial management system. A summary of the costs to date and planned for implementing FMS, including the costs of establishing 37 new positions, are shown in Table 2.1.

TABLE 2.1
FMS Implementation Costs

FISCAL YEAR	ACTUAL/PROJECTED COSTS
1988-1989	\$ 981,153
1989-1990	7,544,935
1990-1991	3,788,427
1991-1992	4,580,528
Sub-Total	16,895,043
1992-1993	3,385,422*
1993-1994	3,385,422*
1994-1995	3,385,422*
Total	<u><u>\$27,051,309</u></u>

* = projected

Source: Department of Education

Prior assessment of FMS by the Auditor

We examined the FMS project and reported some major shortcomings in the department's system development process—specifically in the analysis, design and construction phases (see the Auditor's Report No. 91-2, *Study of the Development of the Department of Education's Financial Management System and Student Information and Program Management System*). For example, the department had not completed defining its requirements, and it had skipped critical checkpoints in the design phase. These shortcomings increased the risk that the system would not function as it should. We concluded, however, that the FMS project was beyond the point where past shortcomings could be corrected and therefore recommended that the department take a prudent course of action in implementing the system.

We recommended that the department develop a solid understanding of the capabilities of the new system, continue acceptance testing to be sure that the system functioned as it should, and implement it only when the

system was completely and satisfactorily installed and tested. The department disagreed with some of our findings but it said it would make extra efforts to improve. At the time of our initial study, the department had set a target date of July 1, 1991 for implementing the system.

FMS Not What Was Intended

Since then, FMS has been implemented in the schools. The FMS, however, has not delivered the most important improvements that the department proposed in 1988. It does not integrate budgeting and accounting in one system where each supports the other, and it does not give schools the capability to prepare their own budgets.

An “integrated on-line financial system” was the primary recommendation made in the department’s 1988 study. The department sought a system that, among other features, would update from one application to another and provide accurate and up-to-date financial records with a clear audit trail.

Applications of the integrated financial system would include budgeting, accounting, purchasing, receiving, inventory, payroll, and others. The new computer system was to accommodate both budget preparation and execution, on-line budget planning and management information, and school level planning and preparation of budgets. The department’s study stated that operational benefits would include:

- Support and monitoring for decentralized school operations. Encouragement of school initiated innovation and improvement.
- Accurate, properly controlled and useful financial records leading to better planning, forecasting and management of funds at the school level.
- Readily available, timely and accurate program, budget and expenditure information for policy makers, executives, planners, and managers.

Budgeting and accounting remain fragmented

Instead of integrating budgeting and accounting, the department has allowed its Budget Branch in the Office of the Superintendent to develop a separate computerized Budget System, consisting of a budget execution module and a preparation module not fully integrated with the FMS. The budget execution module has been completed while the budget preparation module is expected to be completed in time to use for the FY1995-97 budget preparation cycle. For now, budget preparation

continues to be done, as it has in the past, on the old mainframe program. The Budget Branch controls appropriation and allotment information in the Budget System while the Office of Business Services controls expenditure information in the FMS.

Before expenditures can be compared to appropriations, information must be transferred from the FMS to the Budget System. The information in these independent systems does not always agree. This has led to additional problems in reconciliation between the Budget System, the FMS, and state accounting records in the Financial Accounting Management Information System (FAMIS).

The department's own consultant found that the department was not capitalizing on the new technology afforded by FMS by making the appropriate organizational changes. In a management letter to the department on July 8, 1992, the consultants stated:²

Within the last year, the Department of Education has made extraordinary technical achievements. On the other hand, it has failed to achieve more than marginal operational improvements. The Department will be unable to capitalize on its technological achievements without a formal organizational change management program (OCM). The OCM should focus on adapting the organization, its people, and its processes to new ways of conducting the Department's business. These new business ways should be consistent with the potential offered by the advanced technology which is now in place.

The consultants also identified other problems with FMS, including the following:

- *Lack of systems integration.* Accounting, budget, and time-keeping policies, procedures, and systems are not integrated or coordinated so that they help each other. In some instances, the separate systems actually manufacture problems for each other. With proper integration, benefits derived from each application would greatly improve.
- *Irrelevant to management and educators.* From senior executives down to school level managers and teachers, the system provides little more than was available from the old system.
- *Underutilization.* The system has the ability to record data at more meaningful levels than is currently being used. It also has the ability to improve processes, but old processes which are not in keeping with advanced automation are still being used.

The consultants concluded that "...technical problems, while serious in certain instances, are not the main long term problem. The main long term problem is changing organizational behavior so that it adapts to newer and more efficient ways of conducting the public's business."

Problems in reconciliation

Allowing the Budget Branch to develop a separate computer system has led to problems in reconciling the budgeting and accounting systems. The department's consultant noted material out-of-balance conditions that could lead to overexpenditure of funds, lapsing of funds, inaccurate financial information, and serious audit problems.

The Budget Branch controls the allotment of funds for various programs and units within the department. It then enters these transactions into the FMS. The allotment information in the Budget System and FMS are not always the same. Differences have been found among appropriations and allotment balances in FMS and the State's accounting system (FAMIS).

Discrepancies have occurred where allotments in FMS were in excess of appropriations recorded in FAMIS. This means that users have been allocated funds in excess of the legal ceiling in appropriations made by the Legislature. Department managers were warned that the department may be in the embarrassing position of having to cancel issued purchase orders, use money from the next fiscal year to fund deficiencies, or to request emergency funding to make up deficits. There were also instances where FMS appropriations and allotments were overstated or understated with respect to data in FAMIS.³

We note that in a November 1992 status report on the FMS, the department noted that "accounting is still only one-third complete in its effort to reconcile the discrepancies in the allotment amounts between FMS, the Budget System and DAGS..."⁴ The situation is further confused since responsibilities for reconciling appropriations and allotments between budget, FMS, and FAMIS were not clearly defined.

Other problems in the Budget System and FMS include the following:

- The two systems use different codes.
- Budget System balances are not readily reconcilable to end of quarter allotment results in FAMIS.
- Allotment amounts in the Budget System are not reconciled to allotment transactions interfaced to the FMS.

Budget preparation capability nonexistent at school level

The FMS has not increased the capability of schools to plan or to prepare budgets; it is used solely to control and record expenditures. The distinction between budget preparation and budget execution is important. Currently, schools prepare budgets to a very limited extent, and it does not appear that the department intends for schools to prepare true budgets under lumpsum budgeting. Schools prepare primarily expenditure plans for the approximately seven percent portion of their budgets not allocated to personnel costs, i.e. primarily for equipment and supplies.

The department has not realized the potential offered by FMS to support full budgetary capability and accountability at the school level. Rather, the department continues its long standing practice of central state-level control by allowing the Budget Branch to parcel out to schools limited expenditure authorizations in the form of allotments. The FMS reports for schools show only expenditures against these allotments. Thus, the FMS is operating as little more than an electronic accounting ledger at the schools.

Most important, the budget for personnel, the major budget item for schools, accounting for over 90 percent of their costs, is not allotted to schools in FMS but remains in the Budget System's central salary account. This will not change under lumpsum budgeting. Without the authority to make decisions on personnel costs, schools will be significantly limited in their ability to manage programs or make decisions on programs.

The current approach is counter to the stated intent of lumpsum budgeting which the department defines as a "system of budgeting in which funds are allocated to schools in one large amount and the schools are authorized to make the allocation decisions to specific programs."⁵ We had noted in a recent study that if the department truly intends to delegate responsibility and accountability to schools through lumpsum budgeting, it should have each school prepare a budget document detailing all budget categories, including personnel funds.⁶

To really give schools the power to budget, the department should give schools control over funds for personnel as well as equipment and supplies. In building the department's request for appropriations, the department should also give schools the automated ability to prepare their budget requests, based partly on past expenditure information in FMS. We understand that the FMS has a budget module, currently not utilized, that could support this concept. This would be preferable to requiring the schools to learn and use two separate, not fully integrated, computer systems to prepare and execute their budgets.

Recommendations To Proceed Prudently Were Ignored

The department implemented the FMS before it had completed system testing. This was contrary to the State's systems development methodology, our prior recommendations, and the department's original plan.

In our prior report, we cautioned the department to fully test the system prior to implementation. The State's required systems development methodology, SDM/70, also provides for testing a new computer system prior to its implementation. The department had agreed to complete the required testing and had included those tests in the FMS project plan.

The department had also been forewarned by its own consultant not to implement the FMS on July 1, 1991 but to delay implementation for one year so that the necessary system testing could be completed⁷ and so that the "bugs" in the system could be removed. Despite this advice, the department decided to implement the system in July 1991, with no allowance for manual processing of transactions as a back-up to the new system.

When the system was implemented on July 1, 1991, the department had not completed acceptance testing. The department also chose to bypass a critical system test known as stress testing. In acceptance testing, users test the system for a specified period of time to be sure that the system functions as expected. In stress testing, the system is tested for its capacity to handle the expected volume of transaction processing. The department's failure to complete testing before implementing the system resulted in frustration and overtime costs for school personnel.

Acceptance testing not completed

Acceptance testing is that phase of testing in which technical "bugs" in the system are identified and corrected. It allows the system to be tested and adjusted so that it will process individual data and transactions properly.

In January 1991, the department had informed the Senate Committee on Ways and Means that it had identified 500 "bugs" in the system.⁸ The department assured the committee that it would "continue our comprehensive Acceptance Testing efforts to insure that all software problems are corrected by the vendor." It also informed the committee of the July 1, 1991 implementation date and that "No manual system will continue after July 1, 1991."

The department continued working on the acceptance testing in March and April 1991. It met its commitment to the July 1, 1991 implementation schedule, and ended acceptance testing prematurely in April 1991, "despite the fact that all problems have not been resolved in accordance with the Acceptance Test Exit Agreement."⁹

Stress tests not performed

Stress testing, also known as volume testing, follows acceptance testing. During this phase, voluminous test transactions are processed, multiple users access the system, and timeliness of system response time is evaluated.

The department bypassed stress testing, even though it was aware that serious system performance problems might exist. The stress testing would have indicated the impact that these problems would have on the users, and could have altered the department's implementation schedule and prevented the hardship that was imposed on school personnel.

No alternative system allowed

The department kept to its commitment to prohibit manual processing of transactions beginning July 1, 1991. For FY1991-92, department personnel were required to use *only* the FMS to prepare purchase orders and process payments to vendors. This created an added hardship for school level personnel.

During the fiscal year beginning July 1, 1991, over 800 users were required to work only with the FMS. They became the real life "stress test" of the FMS, resulting in staff frustration and additional overtime costs at the schools.

Frustration and additional overtime at the schools

The first year of FMS operation can only be described as "frustrating" for the schools' administrative services assistants (SASAs) and account clerks. The system was often "down" during working hours. When the system was "up" and operational, response time was excruciatingly slow. It would often take up to *two minutes* before a piece of information could be entered on the system. Processing simple purchase orders became a source of extreme frustration. We quote from some of the correspondence:

- *It takes 40 minutes to enter a 10 line purchase order; screen response time is 110 seconds;*
- *It takes 60 minutes to prepare one purchase order; frustration all over;*
- *It takes consistently 20-30 minutes to input one purchase order and over an hour just for a 10 item purchase order (3 or 4 employees could type purchase orders under the old system); DEEP CONCERN; other SASAs experiencing same problems;*
- *Screen response time is 90 seconds; the system is so slow I can enter purchase orders on 2 computers at the same time;*

- *With 400 purchase orders to enter, the log-on process takes 30 minutes, just to find out that the system is down;*
- *Only 50 of over 200 purchase orders entered as of July 15 (all would have been out under the old system) because the system is often down and is very slow when working...is causing a morale problem;*
- *The system has proven no benefit to me. I am totally frustrated...morale among clerical staff in the district office is at an all time low...FMS is every secretary's worst nightmare...the system is down 3-5 hours/day...there are only 2 workstations for 14 clerical staff...utterly disgusting...it takes 20 minutes to cut a single purchase order;*
- *System needs to be improved so overtime can be eliminated;*
- *We're so backlogged within the school level, it's pathetic.*

School personnel overtime increased

School administration overtime costs jumped from \$287,043 in FY1990-91 to \$842,407 in FY1991-92 (first year of FMS implementation).¹⁰ In our November 1992 survey of school SASAs and account clerks, 40 percent reported that they claimed one to six hours of overtime per week due to the FMS, although some reported they do not claim all FMS-related overtime. Another 20 percent claimed seven or more hours of FMS-related overtime per week. Other respondents reported working overtime without claiming it.

The SASAs and account clerks also expressed frustration about not being able to manually process documents. Whereas they could work at home previously, now they had to do all their work at the schools or at designated centers. Some school personnel reported that meant they had to work in remote, unlighted areas that were unsafe after hours or on weekends.

No Significant Benefits to School Level Personnel

The department's 1988 *Financial Management System Study* reported that benefits of a new system would include:

- Time savings of thousands of school level personnel hours that can be redirected to planning and instructional improvement leading to better services for students.
- Large reduction of red tape and paperwork at the school level.

- Improved morale, confidence, enthusiasm, and performance within the department.
- Savings on overtime, take home work and possible Federal Fair Labor Standards Act liabilities.

That these benefits have not yet been realized, a year and a half after implementation of the FMS, is due primarily to two factors. First, by implementing the system before it had been fully tested, the department had to correct bugs in the system while users stood idly by, frustrated by their inability to do work. Second, the system has limited availability and poor response time.

Inadequate system availability and response time

System availability is the amount of time that a system is available to users and not “down” during the normal workday. Response time is the amount of time it takes a system to process a piece of information before it “responds” and allows the user to enter another piece of information. Fully 89 percent of users responding to our survey identified system availability as the worst or second worst aspect of the FMS, and 98 percent identified system response time as the worst or second worst aspect.

Problems with system availability

The FMS resides on a mainframe computer maintained by the State’s Information and Communications Services Division (ICSD) within the Department of Budget and Finance. This mainframe computer also houses systems used by other departments.

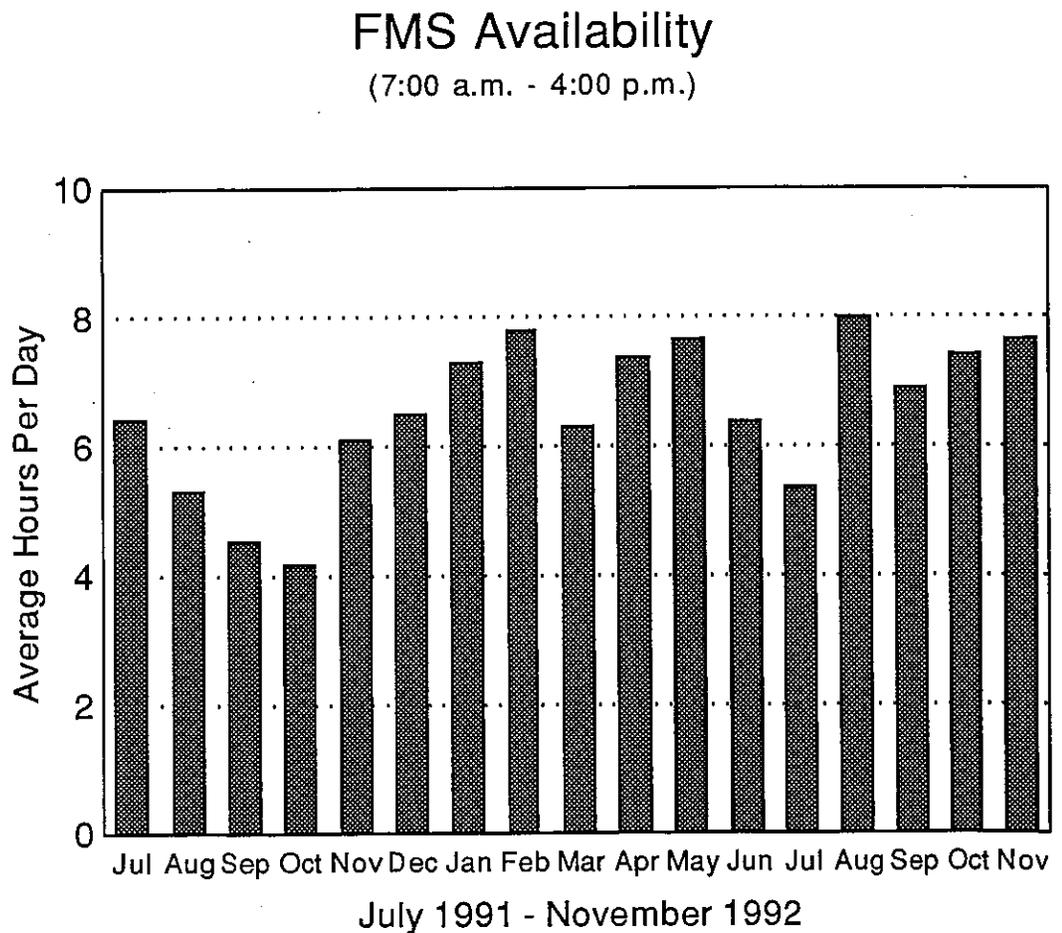
System availability for FMS users during the day is primarily determined by how soon the FMS “housekeeping” and file back-up routines are completed. These routines normally begin in the evening hours and end early the next morning. If these FMS routines “crash” during the evening or early morning hours, FMS will likely not be available until mid-morning or later. Additionally, should other departments’ systems “crash” and cause a problem with the mainframe computer, system availability to FMS users could be negatively impacted.

During the past 18 months, housekeeping and back-up routines have been improved, resulting in improved system availability. But our survey shows that the improvements have not been sufficient to satisfy school-level users.

We estimate that the average FMS availability during the normal school work day, 7:00 a.m. to 4 p.m., was only five and a half hours per day in 1991, causing much frustration and anxiety. We estimate that the

average FMS availability during 1992 improved to approximately 7 hours per day. Figure 2.1 depicts approximate system availability between 7:00 a.m. and 4:00 p.m. from July 1991 to November 1992. If SASAs or account clerks chose to work overtime, the system was usually available for an additional two hours per day from 4:00 to 6:00 p.m. (or from seven and a half hours in 1991 to nine hours in 1992). Figure 2.1 shows that availability has improved but remains inconsistent from month to month. The department estimates that with additional, marginal improvements to the mainframe software and hardware, it can extend availability an additional hour per day.

Figure 2.1
FMS Availability
 (7:00 a.m. - 4:00 p.m.)



Response time the larger problem

In our survey, 67 percent of the respondents reported system response time as the worst aspect of the FMS, while 31 percent reported it as the second worst. To improve response time, the department corrected problems with the computer network and made some needed changes in the FMS software. ICSD has helped by providing the FMS with additional disk storage memory and core memory on its host mainframe. These improvements have reduced response time from two minutes to about one-half minute.

In November 1992, we visited eleven schools to measure the average system response time during the peak use afternoon period. We found it to be 27 seconds. We also measured the average purchase order entry time to be 9 minutes. This limits a school's purchase order processing capability to approximately 47 purchase orders per day, fewer than could be done under the former manual system.

Response time has improved dramatically from the 60-110 second response times experienced when the system was first implemented, but is still frustratingly slow for the FMS users, especially between 11:00 a.m. and 3:00 p.m. when most school personnel use the system.

Only Marginal Improvements Possible

The department reports that it has done all it can to improve system response time and availability through improvements to the FMS software. The department has explored several avenues to further improve system availability and response time. One avenue is to improve the network equipment the schools use to communicate with the mainframe computer at ICSD. Another is to increase the capabilities of the mainframe computer at ICSD. Neither avenue promises more than a marginal improvement to system performance.

Improving network equipment expensive

Improving the schools' network equipment would improve response time but we could not determine the magnitude of the improvement. The department estimates that this would cost more than \$1 million to implement.

Improving the mainframe capabilities not feasible

Mainframe capabilities at ICSD could be improved in two ways—both would require the cooperation and assistance of ICSD. The first way is to increase computer memory or storage for the FMS. The second way is to improve the operating software on the mainframe computer.

It is not feasible to increase computer memory for the FMS. The FMS is already utilizing all its allocated resources on the mainframe. To give the FMS more capacity, ICSD would have to take capacity from other

departments whose systems reside on the same mainframe. The only other way to increase FMS capacity would be for ICSD to acquire a newer, more powerful mainframe. This is not in ICSD's current budget.

System availability could be increased by about one hour a day if ICSD added magnetic tape cartridge drives for the FMS. These additional tape drives would speed up the evening "housekeeping" and back-up routines. ICSD contends, however, that it has no cartridge drives available and limited physical space to install more tape drives.

Improving operating software possible

Marginal improvements to the FMS response time could be achieved by updating the operating software on the mainframe. The department says it will pay the upgrade installation costs but it would need ICSD assistance to install them. ICSD reports, however, that it does not have personnel it can spare for the three to five days it would take to install the system upgrades.

The department estimates it would cost about \$200,000 to purchase additional magnetic tape cartridge drives (if space were available) and install the needed mainframe software upgrades. This \$200,000 cost is approximately one-third of the 1992 FMS-related overtime cost of \$555,364. If these upgrades reduced FMS-related overtime even by half, their cost would be amortized in a little less than six months of FMS operation. We believe, therefore, that the department should pursue these options with ICSD.

FMS Training Program Highly Praised

For its FMS training program, the department established ten Information Technology Centers (ITCs) throughout the State. The ITCs are staffed by 13 user support technicians, all of whom were former SASAs or account clerks. The mission of the ITCs was to train and to provide ongoing support to over 1,000 FMS users.

School users have unanimously and consistently rated the ITCs and support technicians as "outstanding." The respondents to our survey unanimously reported great satisfaction with them also; 77 percent of the respondents see the potential benefit of the FMS to the schools, if system response times and availability can be improved.

In its management letter dated July 8, 1992, the department's consultants praised the training, noting that "we have not noticed this level of concern or support for the end user in other system installations of similar size and scope...The level of service appears to be very high....Many of the FMS project staff seem to have adopted attitudes

about customer service that is sometimes only found in the better for-profit service companies...If the Department had not installed this customer service function, the FMS system probably would have had to have been withdrawn in its first year.”¹¹

Recommendations

1. The Department of Education should seek to better integrate the Budget System and FMS by making the appropriate organizational changes. The department should give priority to reconciling FMS, the Budget System, and FAMIS.
2. The department should develop budget preparation capability at the school level and build in accountability for school level budgeting. It should explore how FMS can support and facilitate SCBM and provide accountability promised under lumpsum budgeting.
3. The department should continue to work with ICSD to improve system availability and response time through adding magnetic tape cartridge drives and updating the operating software on the mainframe.

Chapter 3

School Information System

This chapter discusses the School Information System (SIS) project, its relationship with the Financial Management System (FMS), and projected implementation costs.

Summary of Findings

Although the Legislature has twice denied funding for SIS, the Department of Education has continued to develop and implement the project. In doing so, the department has substantially followed all applicable state laws, regulations, and required computer systems development methodology in a cost effective manner.

Background on SIS

In August 1988, the department recognized it needed better information on students and instructional programs at the state offices, district offices, and schools. The department initiated a study, with the assistance of IBM, to document the information needed at each of these levels, identify the information being provided by existing systems, and recommend improvements. The results of the study were reported in December 1988 in the *Student Information and Program Management System: A Study*. The study recommended a seven-phase project to be installed in 10 years at a cost in excess of \$100 million.

The Legislature turned down the department's request for \$3.26 million for SIPMS for the 1989-1991 biennium as well as its supplemental budget request for \$361,000 in 1990. The Department of Budget and Finance, however, agreed to fund the development of a Preliminary Project Plan and a System Requirements Definition. The resulting Preliminary Project Plan concentrated on the first stage, the student information portion, which was estimated to take six years and \$23.8 million to complete.

In our January 1991 report, we judged the Requirements Definition to be comprehensive, in accordance with SDM/70 Systems Development Methodology, and capable of serving as a good foundation for subsequent phases of the SIPMS project. We found the cost estimates to be realistic. We also found, however, that there was no formal communication or coordination of efforts between the SIPMS and the FMS project teams. In the report, we recommended that the department determine the potential of the SIPMS and the FMS to share resources, and that it continue the phased project approach.

Since then, the department changed the name of SIPMS to the Student Information System, and requested \$898,826 for the 1991-92 biennium and \$1,100,000 in its 1992 supplemental budget request, both of which were turned down by the Legislature. The department then again changed the name of the system to the School Information System (SIS).

In November 1990, the department decided to purchase an existing computer software package that would substantially satisfy the SIS Requirements Definition. It identified three possible computer software packages for consideration. The three were demonstrated to a select group of school, district and state office employees who subsequently selected two for pilot testing: SASI and Mac School.

Dole Intermediate and Wahiawa Intermediate were chosen from a list of volunteer schools to pilot Mac School. Waianae High and Waimea High were chosen to pilot the SASI Scheduler. The pilot project trained the four schools in their respective systems and formally evaluated the strengths and weaknesses of both systems.

In January 1992, the department announced the selection of Mac School for the SIS and that the developer of Mac School would modify it so that it could be used at the schools on both IBM and Macintosh computers.

The next step is to transfer data now on the department's VAX computer to Mac School, while continuing to plan the implementation of Mac School throughout the schools. The department plans to implement Mac School in a phased manner; work on the interface between Mac School and the VAX began in January 1992. We note no significant problems with the department's efforts in this phase.

Relationship Between SIS and FMS

In June 1991, the department combined the offices responsible for the development of the FMS and the SIS—the Special Projects Branch and the Statistical Information Services Branch respectively—under a new Office of Information and Telecommunication Services, headed by a new assistant superintendent. This new organizational relationship, though not yet approved by the governor, offers the potential for more effective communication between the two offices. The stated goal of the office is for the FMS and the SIS to be available at the schools on the same computer terminal in three years.

SIS Project Costs

The department has absorbed personnel costs for SIS so far. Equipment and other costs attributable to the SIS as of November 1992 amounted to \$47,794. In addition, the department plans to commit \$451,200 for the

software. Projected SIS implementation costs are presented in the department's December 1992 report to the Legislature entitled "Strategic Plan for Information Technology" and are summarized below in Table 3.1.

TABLE 3.1
Projected SIS Implementation Costs

FISCAL YEAR	PROJECTED COSTS
1992-93	\$407,010
1993-94	4,601,572
1994-95	4,540,551
1995-96	4,063,746
Total	<u>\$13,612,879</u>

Of the above amount, \$8,777,300 is allocated for workstations, printers, scanners, and local area networks for the schools. Network upgrades that benefit SIS are planned to be implemented and funded as part of the department's FMS and network enhancement projects. The department has requested approximately \$8.5 million to implement SIS in all public schools as part of its 1993-95 biennium budget.

We believe that the SIS is worthy of consideration. We believe, however, that the department should submit information to the Legislature in accordance with our suggested guidelines for legislative review of funding requests for major computer systems. In our 1991 report, we provided such guidelines, and we have again included those guidelines as an appendix to this report.

The guidelines require requests for the funding of major computer systems to include an overview of the existing system and a discussion of its problems, an analysis of alternatives, a discussion of the goals of the new system and the organization to achieve those goals, a workplan for the system development process, and cost estimates for each phase of development.

Recommendation

The Legislature should seriously consider the request by the Department of Education for funding its School Information System when the department provides the information needed so that the Legislature can effectively review the SIS funding request.

Notes

Chapter 2

1. Hawaii, Department of Education, *Financial Management System Study*, January 1988, p. iv.
2. Letter from Ernst & Young to Dr. Herman Aizawa, July 8, 1992.
3. Memorandum to Chris Ito, Accounting Director and Lionel Aono, Director Budget Branch, from Eugene Tanaka, Information Resource Management Office, Subject: FMS/FAMIS Budget Differences, June 17, 1992.
4. Department of Education, Information Resource Management Office, FMS Status Report dated November 6, 1992.
5. Hawaii, Department of Education, *Lumpsum Budgeting*, Honolulu, October 1992, p. 1.
6. Office of the Auditor, *A Study of Curriculum, Budgeting, and Repair and Maintenance for Hawaii's Public Schools*, Report No. 92-31, December 1992.
7. Interview with Dr. Phil Bossert, Assistant Superintendent, Office of Information and Telecommunication Services, October 1992.
8. Letter from the Department of Education to Senator Mamoru Yamasaki, Chairman Senate Committee on Ways and Means, January 31, 1991.
9. Memorandum to Mr. Peter R. Julicher, Principal, KPMG Peat Marwick from the Department of Education, April 3, 1991.
10. Interview with Mr. Shuichi Nakamura, DOE Fiscal Specialist, December 15, 1992.
11. Letter from Ernst & Young to Dr. Herman Aizawa, July 8, 1992.

Guidelines for Legislative Review

Here we propose general guidelines for the Legislature in reviewing requests for funding of major computer systems.

We believe that a legislative review should not be limited to the initial request for funds. It should be ongoing. It should span the system development process and end only when the system is fully operational and has become part of the agency's routine. Our guidelines for review are therefore twofold. They cover (1) the review of the funding request, and (2) the requirements for status reports to the Legislature during system development.

The review of the funding request has two objectives: first, to assure the Legislature that the requesting department or agency has identified its needs, evaluated alternatives, and selected the best course of action, and second, to provide assurance that the department or agency has a reasonable workplan and cost estimates for achieving the desired outcome. The objective of requiring status reports is to allow the Legislature to monitor the progress of major computer system projects.

Review of Request for a Major Computer System

The initial request for funding of a major computer system should be accompanied by a report justifying the need for the system. The report should contain a description of problems with the existing system, an analysis of alternatives, a project workplan, and cost estimates of implementation. It should be written in language a lay person can understand. In reviewing the report, the Legislature should look for the following information:

- *Overview of the existing system.* The overview describes the system currently in place at the department or agency.
- *Discussion of problems with the existing system.* This section describes the problems with the existing system and provides the rationale for a new system.
- *Analysis of alternatives.* This section should identify and evaluate alternative ways of dealing with the existing situation. It would propose the best course of action. It should justify why the proposed course is the best alternative.

- *Discussion of the goals of the new system and description of project organization.* The report should describe the goals of the new system, both long and short term. It should then set forth how the project will be organized to achieve those goals.
- *Workplan for the system development process.* This section should include a fairly detailed workplan that lays out the timeframe and resources necessary for each of the system development phases: analysis phase, design phase, construction phase, and implementation phase.
- *Cost estimate.* This should estimate what each phase will cost. The estimates should be classified by major cost category: for example, consultants, system software, system hardware, and so forth. Cost estimates should include the recurring costs of maintaining the system that the State must incur.

Review Annual Status Reports

Because major computer systems often take several years to implement, ongoing legislative review will be aided by annual status reports. These should be mandatory until the new system is fully operational and has become part of the day-to-day routine of the department or agency. While each computer system will have different characteristics, certain basic information will hold the same and should always be part of the status reports.

Status reports should at a minimum (1) compare the implementation status of the project to the workplan and explain any variances; (2) discuss problems encountered and their actual or intended resolution; (3) describe major shifts in direction or major changes in plans; (4) break down the actual costs to date; and (5) break down the estimated costs to complete.

Response of the Affected Agency

Comments on Agency Response

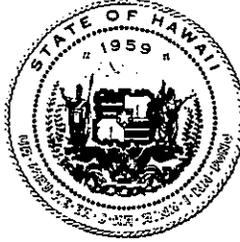
We transmitted a draft of this report to the Board of Education and the Department of Education on February 3, 1993. A copy of the transmittal letter to the board is included as Attachment 1. A similar letter was sent to the department. The response from the department is included as Attachment 2. The board did not respond to the draft report.

The department agrees with our recommendations and hopes to have them implemented by 1995. It also responds that it found "most of the report's findings to be correct with respect to the current state of the FMS and SIS projects." But the department says that the report should be considered an "interim" one since the FMS will not be fully operational until 1995 and it is working to correct problems.

The department states that certain of our findings were not accurate—that FMS is irrelevant to management and educators, and that it is underutilized. We wish to point out that these comments were taken directly from statements made by the department's own consultants. We also note that although the department reports that it "completed comprehensive tests," it did not comment on the lack of stress testing, probably the most important and significant test in the acceptance series. In addition, the department says that significant improvements will be made during the final phase of the implementation when FMS moves into a "client-server" architecture. The concept of a "client-server" architecture was not part of the original FMS plan or intent, and was not examined for this report since the department has only recently begun to explore how to make the transition from a centralized to a distributed processing architecture. However, this transition will entail significant additional expenditures not originally budgeted for this program.

ATTACHMENT 1

STATE OF HAWAII
OFFICE OF THE AUDITOR
465 S. King Street, Room 500
Honolulu, Hawaii 96813-2917



MARION M. HIGA
State Auditor
(808) 587-0800
FAX: (808) 587-0830

February 3, 1993

COPY

The Honorable Debi Hartman, Chairperson
Board of Education
Queen Liliuokalani Building
1390 Miller Street
Honolulu, HI 96813

Dear Ms. Hartman:

Enclosed is copy number 6 of our draft report, *An Update of the Department of Education's Financial Management System and School Information System*. We ask that you telephone us by February 5, 1993, on whether you intend to comment on our recommendations. If you wish your comments to be included in the report, please submit them no later than February 12, 1993.

The Governor and presiding officers of the two houses of the Legislature have also been provided copies of this draft report.

Since this report is not in final form and changes may be made to it, access to the report should be restricted to those assisting you in preparing your response. Public release of the report will be made solely by our office and only after the report is published in its final form.

Sincerely,

Marion M. Higa
State Auditor

Enclosures



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

February 12, 1993

RECEIVED
FEB 16 3 02 PM '93
OFC. OF THE AUDITOR
STATE OF HAWAII

Ms. Marion M. Higa
State Auditor
Office of the Auditor
465 South King Street, Room 500
Honolulu, Hawaii 96813-2917

Dear Ms. Higa:

Subject: An Update of The Department of Education's Financial Management System

The Department found the draft report to be in general a fair assessment of both the Financial Management System (FMS) and the School Information System (SIS) as they stand today. However, in the case of the FMS analysis, I feel that the report fails to place this review in the proper context of an "interim report" on the development of an information system which is still in process. The FMS is a major statewide information system which was initially brought on line only last year and which is not scheduled to be fully operational until 1995. The report presents its findings as though FMS were a fully-implemented and operational system and, as a result, judges the efforts of the Department in this area unfairly.

We find most of the report's findings to be correct with respect to the current state of the FMS and SIS projects. There is nothing in the report that we are not already fully aware of and working to correct and/or improve. I believe that a similar audit at the completion of the FMS and SIS projects, perhaps in the 1995 time frame, would find a very different state of affairs.

Attached are our comments concerning specific sections of the report. We hope that these comments will be taken into account in the preparation of the final report.

Thank you very much.

Sincerely,

Handwritten signature of Charles T. Toguchi in cursive script.
CHARLES T. TOGUCHI
Superintendent

CTT:jit
Attachment
cc: Office of Information and Telecommunication Services

DOE's comments to draft report "An Update of the Department of Education's Financial Management System and School Information System"

FMS Not What Was Intended

Auditor's Comments: The department has expended over \$17 million so far on the FMS, but the system does not deliver important benefits that the department said it would. It does not integrate the department's budget system with its accounting system and it does not give schools the capacity to plan and create their own budgets.

DOE Response: We feel that "does not yet fully integrate" would be more accurate. There presently is a basic level of integration between the Budget and FMS systems and we have already implemented a reconciliation process between FMS and the Budget System. We agree that the level of integration needs to be improved and note that this integration will be a feature of the fully implemented FMS. The capability for schools to plan and create their own budgets is part of the FMS functionality yet to be implemented.

The current integration interface is through a batch process. Changes to the budget system are currently transmitted into the accounting system three times a week. The current goal is to provide a one day turn around time; however, FMS cannot at this time accommodate daily updates. The DOE is looking to improve this system so that eventually the budget system will be on-line with the accounting system and all budget changes will instantly and electronically update the accounting system.

It should be noted that no matter how integrated the two software systems are, budgeting is a separate function from accounting and has its own identifiable work tasks. For example, the budget system covers such functions as the preparation of budget requests, the allocation of funds to program managers, the preparation of expenditure plans, and the allotment of funds. Accounting, on the other hand, has to do with purchasing, recording financial transactions, vendor payments, payroll, vouchering, equipment inventory, etc.

The audit report also fails to mention that a team of ten persons from several branches of DOE spent a whole year examining the "built-in" budget module provided with original FMS software from KPMG. This budget module was so unsuited for DOE that, in the end, it was decided that rather than trying to modify the FMS budget module, it was deemed to be less

expensive and more efficient for DOE to design its own budget module. And this is what is being done.

Auditor's Comments: *In implementing the system, the department ignored our prior recommendation to proceed prudently. Instead, the department chose to implement the FMS on July 1, 1991 before the system had been properly tested. This resulted in considerable frustration and morale problems at the school level.*

DOE Response: We do not feel it is accurate to state that the system was implemented without proper testing. The FMS project team completed comprehensive tests of the software with the software vendor and was confident that the software was ready to be implemented. The problems encountered were no different than the problems normally encountered with other systems of the size and complexity of FMS.

Auditor's Comments: *The FMS has improved accounting and expenditure reports but operational improvements at the school level have been marginal. The FMS has not increased the efficiency of school personnel, saved them time, improved their morale, or decreased their overtime, as promised. Furthermore, the system's slow response time cannot be improved appreciably. It should be noted, however, that FMS training and user support has been unanimously praised by school personnel.*

DOE Response: First of all, we note again that the FMS is not yet complete nor fully implemented as an information system and that many of the promised benefits of the system are yet to be realized. Although the operational benefits have not yet been at the level anticipated, the operational improvements already attained at the school level have been significant. Users have on-line access to up-to-date allotment, encumbrance, expenditure, cash receipt and fixed assets information. Users also have access to on-line reports, extended data entry deadlines and centralized data entry support.

Auditor's Comments: *FMS is irrelevant to management and educators. From senior executives down to school level managers and teachers, the system provides little more than what was available from the old system.*

DOE Response: This is not accurate. Significant improvements and increased information are being made available to school level managers and teachers. We are currently expanding our training of managers and grade level chairpersons and department

heads to inform them of the information that is available and how to more effectively use the information. Through this process we expect to greatly improve our ability to provide more relevant information to managers and educators.

Auditor's Comments: *FMS is underutilized. The system has the ability to record data at more meaningful levels than is currently being used. It also has the ability to improve processes, but old processes which are not in keeping with advanced automation are still being used.*

DOE Response: This is not accurate. The system is currently recording financial information at more meaningful levels than in the past. Information is now available at the sub-school/department level, school level, district office level, and department wide level. Although it is not a requirement, many schools/offices make use of the sub-school accounting and reporting capability in FMS.

No Significant Benefits to School Level Personnel

Auditor's Comments: *The department's 1988 Financial Management System Study reported that benefits of a new system would include:*

- *Time savings of thousands of school level personnel hours that can be redirected to planning and instructional improvement leading to better services for students.*
- *Large reduction of red tape and paperwork at the school level.*
- *Improved morale, confidence, enthusiasm, and performance within the department.*
- *Savings on overtime, take home work, and possible Federal Fair Labor Standards Act liabilities.*

That these benefits have not yet been realized, a year and a half after implementation of the FMS, is due primarily to two factors. First, by implementing the system before it had been fully tested, the department had to correct bugs in the system while users stood idly by, frustrated by their inability to do work. Second, the system has limited availability and poor response time.

DOE Response: We have already commented earlier regarding the complete comprehensive testing of the system and noted that the FMS is

not yet fully implemented. The statement regarding "... the department had to correct bugs in the system while users stood idly by, frustrated by their inability to do work" is unfair, misleading, and should be qualified and explained more specifically. Otherwise, we feel that it should be deleted.

Also, considerable red tape and paperwork have been eliminated at the school level. Improvements in these areas will also be significantly increased with the implementation of planned training in May regarding FMS Filing and Office Organization and the implementation of Electronic Data Interchange (EDI) capabilities.

Only Marginal Improvements Possible

Auditor's Comments: *The department reports that it has done all it can to improve the system response time and availability through improvements to the FMS software. The department has explored several avenues to further improve system availability and response time. One avenue is to improve the network equipment the schools use to communicate with the mainframe computer at ICSD. Another is to increase the capabilities of the mainframe computer at ICSD. Neither avenue promises more than a marginal improvement to system performance.*

DOE Response: The word "almost" should be added before "all" into the first sentence. We continue to try to improve the FMS software to provide improvements to response time.

"Neither avenue promises more than a marginal improvement to system performance" is not accurate. Increasing the line speeds and capacity of the network and increasing the computer processing resources available to FMS at ICSD will result in additional improvements in both system availability and response time. The final phase of the implementation will move the FMS into a "client-server" architecture which will provide significant improvements to end user response time and system availability even if response time and system availability improvements at the mainframe level are limited.

Improving operating software possible

Auditor's Comments: *Marginal improvements to the FMS response time could be achieved by updating the operating software on the mainframe. The department says it will pay the upgrade installation costs but it would need ICSD assistance to install them. ICSD reports, however, that it does not have personnel it can spare*

for the three to five days it would take to install the system upgrades.

DOE Response: "Marginal" is not accurate. Significant improvements can be made to both response time and system availability by upgrading to higher levels of CICS and DB2.

FMS Training Program Highly Praised

Auditor's Comments: *For its FMS training program, the department established ten Information Technology Centers (ITCs) throughout the State. The ITCs are staffed by 13 user support technicians, all of whom were former SASAs or account clerks. The mission of the ITCs was to train and to provide ongoing support to over 1,000 FMS users.*

School users have unanimously and consistently rated the ITCs and support technicians as "outstanding". The respondents to our survey unanimously reported great satisfaction with them also; 77 percent of the respondents see the potential benefit of the FMS to the schools, if system response times and availability can be improved.

In its management letter dated July 8, 1992, the department's consultants praised the training, noting that "we have not noticed this level of concern or support for the end user in other system installations of similar size and scope . . . The level of service appears to be very high Many of the FMS project staff seem to have adopted attitudes about customer service that is sometimes only found in the better for-profit service companies If the Department had not installed this customer service function, the FMS system probably would have had to have been withdrawn in its first year".

DOE Response: We are very pleased that this positive part of the FMS project has been included in this report. However, it is incomplete to only cite the ITCs and User Support Technicians. In addition to the training support services, as a part of the FMS project, the department established "help line" services and a team of functional application integration analysts and technical support technicians. All of these FMS related services are looked upon by FMS users as one entity and are provided by an entire project staff who have adopted "service oriented attitudes".

Recommendations

Auditor's Comments: *The Department of Education should seek to better integrate the Budget System and FMS by making the appropriate organizational changes. The department should give priority to reconciling FMS, the Budget System, and the FAMIS.*

DOE Response: We agree and this functionality will be part of the fully implemented FMS.

Auditor's Comments: *The department should develop budget preparation capability at the school level and build in accountability for school level budgeting. It should explore how FMS can support and facilitate SCBM and provide accountability promise under lumpsum budgeting.*

DOE Response: We have already begun to explore how FMS can be used to support and facilitate SCBM and providing school level accountability under lump sum budgeting.

In the development of the budget system, priority was given to budget execution to coincide with FMS implementation. The budget branch has just begun work on the budget preparation module, and as stated in the auditor's report, will have it ready for the preparation of the 1995-97 biennium budget. We believe it is premature to criticize the budget preparation module when it has not yet been designed and installed.

Under lumpsum budgeting, the schools have full control over all their funds, salaries, as well as supplies and equipment. Eventually, after the weighted pupil allocation formula is completed, each school's full lumpsum entitlement will be allocated to the school. The school can then use the funds in whatever way they want to meet their needs. This approach to lumpsum budgeting has been explained repeatedly to everyone, including the auditor. It is a mystery why the auditor continues to state that only 7 to 15 percent of the school's budget is being allocated to the schools. Most of DOE comments on lumpsum budgeting have already been explained in the other auditor's report on lumpsum budgeting.

Auditor's Comments: *The department should continue to work with ICSD to improve system availability and response time through adding magnetic tape cartridge drives and updating the operating software on the mainframe.*

DOE Response: We agree. We will continue to work with ICSD on specific operating system software and mainframe resources. In addition, we will continue to explore ways to implement off line

and distributed processing solutions and work with B&F, the BOE and the Legislature to improve the system availability and response time for FMS users.

