Joint Legislative Committee on Performance
Evaluation and Expenditure Review (PEER)

Report to
the Mississippi Legislature

Major Computer Systems in Mississippi's State Agencies: A Review of Their Development and Implementation

The majority of the state's current computer system implementation projects have experienced revisions in estimated costs and completion dates. PEER reviewed current projects with estimated costs greater than $1 million to identify factors which could lead to new systems costing more than originally budgeted or requiring more time to become operational than originally anticipated.

Although the causes of revisions and delays are often complex and each project's problems are unique, agencies often fail to adhere to one or more of the generally accepted project management principles during computer system development and implementation. Agencies may fail to define project objectives and requirements, review vendor experience and resources sufficiently, involve system users in designing and testing the system, limit changes to a system once the project has commenced, divide the project into manageable milestones, or engage in substantive quality assurance review.   The Department of Information Technology Services has not fully exercised its statutory authority to compel state agencies to use specific project planning and management procedures.

Agencies' lack of attention to accurate costing and cost reporting inhibits external oversight efforts of large-scale computer system projects. Agencies do not uniformly and periodically report cost information on such projects to the Department of Information Technology Services, any other state agency, or to the Legislature. Also, current monitoring and reporting methods do not capture all personnel costs of a computer project. Without the uniform accumulation and reporting of segmented costs of large-scale computer system projects, the Legislature does not have all the information needed for decisionmaking.

September 14, 1999

PEER: The Mississippi Legislature's Oversight Agency

The Mississippi Legislature created the Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER Committee) by statute in 1973. A standing joint committee, the PEER Committee is composed of five members of the House of Representatives appointed by the Speaker and five members of the Senate appointed by the Lieutenant Governor. Appointments are made for four-year terms with one Senator and one Representative appointed from each of the U. S. Congressional Districts. Committee officers are elected by the membership with officers alternating annually between the two houses. All Committee actions by statute require a majority vote of three Representatives and three Senators voting in the affirmative.

Mississippi's constitution gives the Legislature broad power to conduct examinations and investigations. PEER is authorized by law to review any public entity, including contractors supported in whole or in part by public funds, and to address any issues which may require legislative action. PEER has statutory access to all state and local records and has subpoena power to compel testimony or the production of documents.

PEER provides a variety of services to the Legislature, including program evaluations, economy and efficiency reviews, financial audits, limited scope evaluations, fiscal notes, special investigations, briefings to individual legislators, testimony, and other governmental research and assistance. The Committee identifies inefficiency or ineffectiveness or a failure to accomplish legislative objectives, and makes recommendations for redefinition, redirection, redistribution and/or restructuring of Mississippi government. As directed by and subject to the prior approval of the PEER Committee, the Committee's professional staff executes audit and evaluation projects obtaining information and developing options for consideration by the Committee. The PEER Committee releases reports to the Legislature, Governor, Lieutenant Governor, and the agency examined.

The Committee assigns top priority to written requests from individual legislators and legislative committees. The Committee also considers PEER staff proposals and written requests from state officials and others.

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September 14, 1999

The Mississippi Legislature

Joint Committee on Performance Evaluation and Expenditure Review

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September 14, 1999

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On September 14, 1999, the PEER Committee authorized release of the report entitled **Major Computer Systems in Mississippi's State Agencies: A Review of Their Development and Implementation**.

Representative Tommy Horne, Chairman

This report does not recommend increased funding or additional staff.

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Major Computer Systems in Mississippi's State Agencies: A Review of Their Development and Implementation

Executive Summary

The majority of the state's current computer system implementation projects have experienced revisions in estimated costs and completion dates. PEER sought to identify factors within the state's process for developing and implementing new computer systems which could lead to systems costing over budget or taking longer than originally planned. The review included computer system projects in process with estimated costs greater than $1 million as of March 31, 1999, to identify possible weaknesses in how agencies manage projects throughout the process.

Although ITS is responsible for protecting the state's interest in the development and acquisition of agencies' computer systems, ITS has not fully exercised its authority.

State law authorizes the Department of Information Technology Services (ITS) to protect the state's interest in the development and acquisition of agencies' computer systems. In practice, ITS's roles and responsibilities vary according to the stage of development and implementation of a state agency's computer system project. ITS has not fully exercised its authority to compel state agencies to use project planning and management procedures. It has assisted agencies in system planning and development on an as-needed basis.

Agencies often fail to adhere to generally accepted project management principles during computer system development and implementation.

There is no easy answer to the question of why computer system implementation projects often run over time and over budget. The causes are often complex and the pattern of problems is unique from project to project. However, through an analysis of the performance details of three large projects, PEER found that the primary condition associated with time, cost, and functionality problems was a failure to adhere to one or more of the generally accepted project management principles during system development and implementation. Agencies lacked fully defined project objectives and requirements, did not sufficiently review vendor experience and resources, failed to involve system users in designing and testing the system, failed to limit changes to the system once the project had commenced, failed to divide the project into manageable milestones, or did not engage in substantive quality assurance review.

Other factors which play an important role in successful computer system projects include proper communication

among the project team members, adequate training of project staff, fostering project team morale, and building an atmosphere of teamwork between the vendor staff and the agency staff. Each of the projects PEER reviewed experienced difficulties with at least one of these factors.

Because current reporting practices do not provide information on discrete or comprehensive project costs, the Legislature may not have all the information it needs for decisionmaking.

Compounding the problem of lack of adherence to generally accepted project management principles, agencies' lack of attention to accurate costing and cost reporting inhibits external oversight efforts. Agencies do not uniformly and periodically report cost information on large-scale computer projects to ITS, any other state agency, or to the Legislature. Also, current monitoring and reporting methods do not capture all personnel costs of a computer project. Without the uniform accumulation and reporting of segmented costs of large-scale computer system projects, the Legislature does not have all the information needed for decisionmaking.

Recommendations

ITS should develop comprehensive computer system project management guidelines and require state agencies to use them.

1. In order to develop a uniform and sound project management structure, ITS should develop a comprehensive set of guidelines encompassing all aspects of project management. These guidelines should address assignment of responsibility to appropriate agency officials and collection of information to monitor system development and implementation adequately.

    Carnegie Mellon University's Software Engineering Institute has developed a model framework for managing projects involving the development and implementation of software. ITS should consider this model, along with others, in developing management guidelines specifically designed to accommodate the needs of agencies, ITS, and the Legislature.

    Under its authority to approve or disapprove contracts as specified in MISS. CODE ANN. §25-53-5, ITS should require as precondition to contract approval that agencies follow the promulgated guidelines and requirements in performing feasibility studies of proposed systems and in designing, developing, and implementing computer systems approved by the ITS board.

ITS should require agencies to submit annual quality assessments of each computer system project with a budget over $1 million. ITS should report findings from these assessments, along with ITS's recommendations, to the Legislative Budget Committee as part of the budgetary process.

2. The ITS Board and ITS Executive Director should exercise their authority under MISS. CODE ANN. § 25-53-5 and 25-53-21 to require agencies to submit periodic project reports detailing the progress and expenditures of computer system projects.

   At a minimum, the ITS Board should require an annual independent quality assessment of each computer system project with a budget exceeding $1 million. The purpose of the annual independent quality assurance assessment is to have an independent review of the project to identify problems that could cause the project to be over budget or delay its implementation. For example, such problems could include poor quality of work by the vendor, lack of vendor or state staffing, poor communications in the resolution of problems, project team morale problems, or excessive change orders. This review should be conducted by ITS unless ITS staff are participating in the design, development, and implementation of the system, in which case an independent consultant should conduct the review.

   The results of the annual independent quality assurance assessment, along with recommendations for addressing any problems noted in the project, should be reported to the ITS Board. The ITS Board should endorse recommendations it believes are needed to correct problems noted and, if problems persist, take aggressive action to ensure that such problems are addressed. Such action could range from refusal to approve further change orders on troubled projects to directing the ITS Executive Director to cancel a project vendor's contract, if warranted.

   The ITS Board should report these findings, along with any of its own recommendations, which could range from endorsing recommended solutions to canceling the project, to the Joint Legislative Budget Committee as part of the budgetary process.

   As part of their appearance before the Budget Committee during annual budget hearings, executive agency managers should address project problems and recommendations noted by ITS and outline needed corrective actions.

ITS should work with the Legislative Budget Committee to develop guidelines for agencies to use in reporting all computer project costs and completion date changes.

3. ITS and the Legislative Budget Committee should jointly develop guidelines for reporting pertinent information on computer projects to the Joint Legislative Budget Committee as part of the budgetary process. At a minimum, the reporting guidelines should:

- require agencies to capture all costs associated with a computer project, including expenditures from all sources;

- require agencies to report a project's originally estimated cost, revised project cost (if applicable), and the amount spent as of the end of the most recent completed fiscal year;

- require agencies to report a project's originally estimated completion date, revised completion date (if applicable), reasons for any delays, and actions to be taken by the agency to address any delays; and,

- require agencies to capture personnel resource costs by implementing a tracking system (recommended by ITS) to capture employee time dedicated to computer projects. This tracking system should, at a minimum, capture the number of hours which agency employees spend on the design, development, and implementation of a new computer system.

4. To expedite the capture of accurate, comprehensive cost information, the Legislature should adopt legislation which requires:

- the creation of separate funds for computer projects over $1 million in order to capture and track all related expenditures; and,

- agencies to report all costs relating to a computer project (including funds expended from all sources).

For More Information or Clarification, Contact:

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Major Computer Systems in Mississippi's State Agencies: A Review of Their Development and Implementation

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Introduction

Authority

In response to a legislative request, the PEER Committee authorized a review of the development and implementation of large computer systems for Mississippi agencies. These systems (or projects) usually consist of devising methods to collect and manage data more efficiently and be more responsive to agency and client needs. PEER conducted this review pursuant to the authority granted by MISS. CODE ANN. § 5-3-57 et seq. (1972).

Scope and Purpose

PEER sought to determine the state's process for developing and implementing new computer systems and to identify factors which could lead to new systems costing more than originally budgeted or requiring more time to become operational than originally anticipated.

To examine these problems, PEER first had to determine the role, authority, and responsibilities of participants in the development and implementation process, including the Mississippi Department of Information Technology Services (ITS). PEER examined current computer system projects with estimated costs greater than $1 million as of March 31, 1999, to identify possible weaknesses in how agencies manage projects throughout the process.

To explore further the factors associated with cost and time overruns, PEER selected three of the nine systems currently in process for more detailed review. PEER examined:

- project management and oversight methods in place;

- the nature of problems encountered; and,

- whether problems might have been avoided by establishing a framework for oversight and requiring agencies to follow project management guidelines.

Method

PEER interviewed personnel of ITS and agency personnel associated with the development and implementation of selected computer systems, and reviewed documents associated with the development and implementation of selected computer systems. PEER also reviewed three projects in detail by examining management reports and other agency and ITS documentation.

Background

Nationwide Trends in Cost and Time Overruns

Cost overruns and delays are common nationwide, with some 53 percent of projects being over budget, taking longer than originally projected, or delivering fewer features than planned.

Cost overruns and time delays associated with the development and implementation of computer systems are not problems unique to the state of Mississippi. Research by the Standish Group International, Inc., a market research and consulting firm, shows that nationwide, approximately 31% of computer system projects will be canceled before being completed and approximately 53% of projects will be over budget, take longer than originally projected, or deliver fewer features than planned. Only approximately 16% of projects will be completed on time, on budget, and with the promised features. The Standish Group's research for projects costing more than $10 million showed that none of the projects were finished on time, on budget, and with the promised features. Approximately 49% of these large projects were canceled before completion of the project, with the remaining 51% being either over budget, delayed, or delivered without all of the features originally planned.

Cost and Time Overruns for Current State Projects

Agencies have revised original estimated costs and completion dates for most large projects.

The majority of the state's current computer system implementation projects have experienced revisions in estimated costs and completion dates. To determine the amount of time and money related to computer projects, PEER surveyed state agencies with computer projects that have budgets in excess of $1 million and are currently in process. Of the nine projects identified, one project's contract with the vendor has been revoked and eight are projected to be either over budget or take longer than originally planned. As a group, these nine projects are estimated to cost approximately $19 million more than originally estimated (see Exhibit 1, page 4). [See Appendix, page 21.] Agencies have revised the original completion dates of the remaining eight current projects, with some reflecting lengthy time extensions, doubling time required for completion of some projects (see Exhibit 2, page 5).

Exhibit 1: Original Versus Revised System Costs for Major Computer Implementation Projects (As of March 31, 1999)
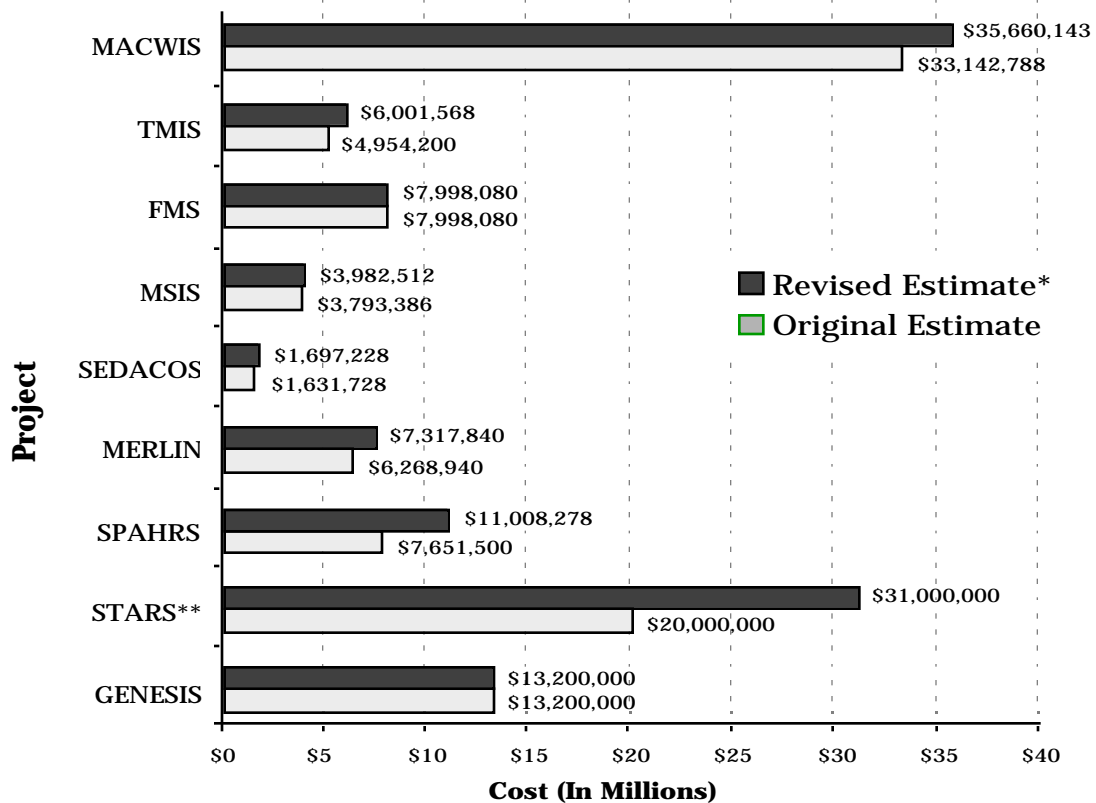
* As of March 31, 1999, no project had reached final cost.
** The STARS project was suspended in May, 1999.

Project Name / Agency

MACWIS	Mississippi Automated Child Welfare Information System (Department of Human Services)
TMIS	Transportation Management Information System (Department of Transportation)
FMS	Financial Management System (Department of Transportation)
MSIS	Mississippi Student Information System (State Department of Education)
SEDACOS	Database accessible by all teachers serving students with disabilities (State Department of Education)
MERLIN	Mississippi Executive Library and Information Network (Department of Finance and Administration)
SPAHRS	Statewide Payroll and Human Resource System (Department of Finance and Administration)
STARS	State Tax Automated Revenue System (State Tax Commission)
GENESIS	Retirement System (Public Employees' Retirement System)

SOURCE: PEER survey of computer systems projects.

Exhibit 2: Original Versus Revised Completion Schedules for Major Computer Implementation Projects (As of March 31, 1999)
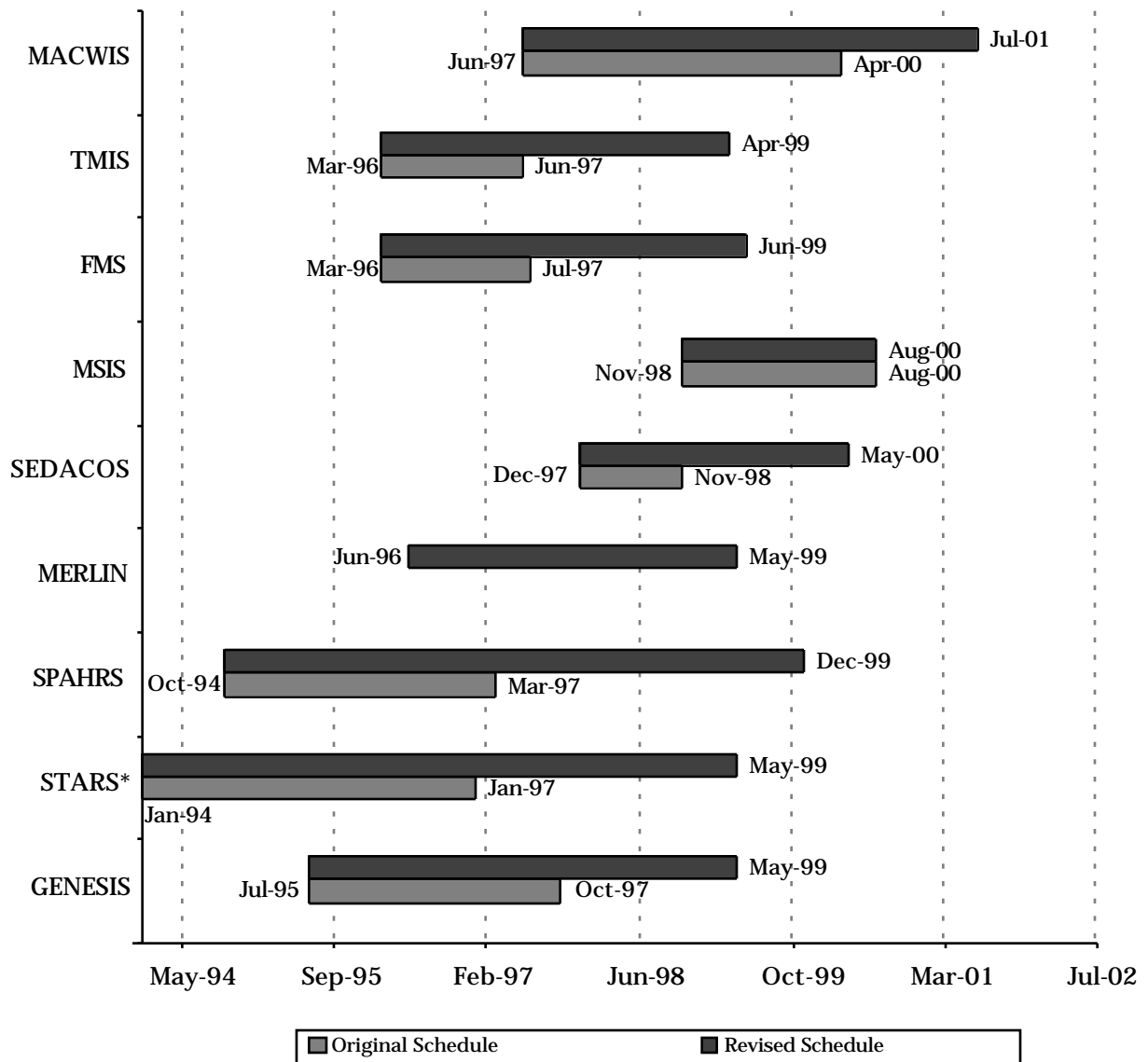
* The STARS project was suspended in May 1999. Issues related to the management of this contract are currently in litigation.

SOURCE: PEER survey of computer systems projects.

ITS Authority and Responsibility for Computer System Development and Implementation

The Legislature created and empowered the Department of Information Technology Services to be the state's manager and overseer of information technology procurement and utilization. Specifically, MISS. CODE ANN. Section 25-53-1 sets a public policy of cohesive planning and cooperation between state agencies and further declares that the department is created to carry forth this purpose, as well as other purposes provided for under law. Chapter 53 of Title 25 of the MISSISSIPPI CODE authorizes the department to carry out activities which further the policies of cohesion and cooperation. These include provisions for department oversight of development of long-range plans and procurement regulations, standardization of programs when necessary, and formation of advisory committees on matters relating to information technology. Further, the governing board, through the department, may make rules necessary to carry out purposes provided for in law.

In practice, ITS's roles and responsibilities vary according to the stage of development and implementation of a state agency's computer system project. Throughout the computer system development and procurement process, ITS exerts some influence over agency management of projects through its authority to approve project requests and contracts. However, following contract approval, ITS exercises limited influence over project management. From that point, the agency has chief responsibility for management and control over project design and implementation.

ITS Statutory Authority and Responsibility

The Mississippi Department of Information Technology Services (ITS) has the authority and responsibility to protect the interest of the state in the development and acquisition of computer systems.

Under MISS. CODE ANN. §25-53-21 (e) and (f), the Executive Director of ITS has the authority to

> *. . .review all contracts for acquisition of computer equipment or services now or hereafter in force and may require the renegotiation, termination, amendment or execution of any such contracts in proper form and in accordance with the policies and rules and regulations and subject to the direction of the authority. . . .*

and

> ***. . .shall act as the purchasing and contracting agent for
> the State of Mississippi in the negotiation and execution
> of all contracts for the acquisition of computer
> equipment or services. He shall receive, review, and
> promptly approve or disapprove all requests of agencies
> of the state for the acquisition of computer equipment or
> services, which are submitted in accordance with rules
> and regulations of the authority.***

Under these CODE sections, the Executive Director of ITS is
charged with protecting the state's interest by approving or
disapproving agency requests to enter into contracts to
purchase new computer systems, canceling or re-negotiating
contracts for the purchase of new computer systems, or
approving or disapproving changes to contracts resulting from
change orders.

ITS Board's Authority to Approve Contracts

Under MISS. CODE ANN. § 25-53-5 (k), the ITS Board has approval
authority over all computer equipment or service contracts.
(The board has granted approval authority for contracts less
than $250,000 to the ITS Executive Director.) The ITS Board
receives the recommendation from ITS staff and agency staff
for awarding the contract. The ITS Board may request any
additional information or detail about the proposal it deems
appropriate. The ITS Board has final approval of the bid and
directs the ITS Executive Director to enter into contract
negotiations with the vendor. After the contract has been
negotiated and signed, the vendor begins work on the system
and the agency has responsibility for management and control
over project design and implementation.

ITS's Authority to Require Reports

Under state law, ITS has authority to require agencies to file
reports concerning the costs, progress, problems, and
schedule of computer system implementation and what
actions agencies are undertaking to address these issues. MISS.
CODE ANN. § 25-53-5 (h) states that ITS has the authority to
require:

> ***. . .the reporting to the authority through the office of
> executive director of such information as may be
> required for carrying out the purposes of this chapter.***

While the authority is broadly stated, the ITS Board could
determine what information is needed concerning computer

projects, how often such information is needed, require agencies to submit this information to the ITS Executive Director's office, and instruct the Executive Director to present information from the reports to the ITS Board.

ITS Exercises Limited Influence Over Project Management

The Mississippi Department of Information Technology Services (ITS) has not exercised its authority to compel state agencies to use project planning and management procedures. It has assisted agencies in system planning and development on an as-needed basis.

ITS has not exercised its statutory authority to compel agencies to follow specific procedures in planning and managing computer projects, nor has it consistently required agencies to report on project status.

Under MISS. CODE ANN. Section 25-53-5, the ITS Board has the authority to formulate rules, regulations, and procedures governing acquisition of computers and telecommunications equipment and services. ITS has the authority to cancel a project or a contract, and a reasonable reading of this authority would include the power to set standards for contract approval. ITS could specify terms and conditions to be met before contracts are approved and could incorporate planning and contract renewal requirements.

State law also vests ITS with the authority to assist agencies with planning and developing their projects and to consult on projects, but all statutory provisions which specifically address program and project planning are permissive in nature rather than mandatory. Consequently, state agencies do not have to seek advice and guidance on project planning and development.

ITS has not exercised its authority to compel state agencies to use project planning and management procedures. It has assisted agencies in system planning and development on an as-needed basis. ITS has developed guidelines which outline its recommended methods for project management, but these are broad guidelines it has not required agencies to implement. ITS distributes copies of these guidelines to agencies using ITS's consulting services, to participants in ITS's training classes, and to agencies which request the guidelines.

Also, concerning ITS's authority to require reports [MISS. CODE ANN. § 25-53-5 (h) and § 25-53-21 (c)], ITS currently does not consistently exercise its authority to obtain periodic reports on the status and resource use involved in implementing a new computer system. Establishing reporting requirements on the types of project information needed and how often it should be reported would enhance ITS's oversight of computer projects. These reports could be filed with the ITS Executive Director's office and the results compiled and forwarded to the ITS Board.

Primary Problems with Computer System Implementation

There is no easy answer to the question of why computer system implementation projects often run over time and over budget. The causes are often complex and the pattern of problems unique from project to project. However, through an analysis of the performance details of three large projects (SPAHRS, MACWIS, and GENESIS; see Exhibit 1, page 4, for full project and agency names), PEER found that the primary condition associated with time, cost, and functionality problems was a failure to adhere to one or more generally accepted project management principles during system development and implementation. The analysis should not be taken as an overall indictment of any of the projects named. Rather, it provides perspective on the critical events that contributed most directly to observed overages in cost or time.

Lack of Adherence to Generally Accepted Project Management Principles

Generally Accepted Project Management Principles for Large-Scale Computer System Implementation

The need for new and modified large-scale computer systems has led to formulation of management principles for developing and implementing computer system projects. PEER reviewed research and literature from the information systems industry (i.e., public and private sector users, developers, and consultants) to determine generally accepted project management principles for computer system implementation.

PEER identified seven principles crucial to project success:

- defining project objectives and requirements;

- reviewing experience and resources of the contracting vendor;

- involving system users in designing and testing the system,

- fostering strong executive management support;

- limiting changes to the system scope;

- dividing the project into small, manageable milestones; and,

- conducting quality assurance reviews.

Comparison of Problems with State Agencies' Computer System Implementation to Project Management Principles

The following sections discuss ITS and agency performance in the development of three state agency computer systems (SPAHRS, MACWIS, and GENESIS) relative to the above-mentioned project management principles. PEER found problems in system implementation related to six of the seven project management principles listed above. Concerning the seventh principle, "foster strong executive management support," PEER found evidence of strong management support for all three of the systems reviewed.

Lack of Defined Project Objectives and Requirements

Agencies should clearly define project objectives and requirements in the first stages of a computer system project.

The information systems industry emphasizes the importance of determining the purpose and benefits of a proposed system and determining specifically what is required (hardware, software, programming packages) to achieve the purpose and realize the benefits.

State agencies initially define project objectives and requirements during a feasibility study prepared prior to selecting a vendor. Agencies analyze the proposed system's function, such as determining if the system will be a mainframe or client server system. At this point, agencies should also define the goals of the system, such as automating certain functions or consolidating diverse systems, and should consider options for the system, such as whether to buy a generic software package designed by vendors or develop software unique to the agency. At this time, agencies also estimate the costs of the system and the time frame of the project.

ITS usually enters the process when an agency prepares to issue a request for proposals (RFP) to develop the project. ITS assigns a project manager during the RFP process and the project manager determines if the system has been adequately planned, working with the agency to resolve deficiencies. After ITS is satisfied that the system has been adequately planned, ITS works with the agency to prepare an RFP. The RFP sets forth the functions (or purposes) that the proposed system is intended to fulfill, general requirements of the proposed system, and possibly detailed requirements. ITS and the

agency evaluate the proposals received and recommend a project vendor to the ITS Board for approval.

The GENESIS project required system modifications and time extensions due to lack of consideration of system requirements.

The lack of fully defined project requirements and resulting system modifications contributed to a delay in implementing the GENESIS project for the Public Employees' Retirement System. The vendor chosen to develop GENESIS had previously designed a retirement system for another state and believed the same system could be implemented in Mississippi. However, major differences in the requirements for the Mississippi system and the other state's system, discovered after the project had commenced, required major modifications in the vendor's proposed system. Earlier and more careful attention to the functional details of the system in relation to the system being offered may have prevented some of the delays. PEER notes that, in spite of the delays for system modification, PERS was able to complete the project within budget.

Insufficient Review of Vendor Experience and Resources

Potential vendors should have had experience with similar projects.

According to information systems industry guidelines, vendors should have successful experience in projects similar in size and complexity to the project being bid. Successful completion of previous similar projects is an indication that the vendor has the technical knowledge, staff, and experience to make the project successful. Reviewing the vendor's technical knowledge, staff size, and experience is a crucial part of the RFP evaluation process.

According to quality assurance reports, the contractor for the SPAHRS project had inadequate expertise and failed to assign sufficient personnel resources to the project.

For the Statewide Payroll and Human Resource System (SPAHRS) of the Department of Finance and Administration and State Personnel Board, the quality assurance contractor noted after the project began that the vendor had inadequate expertise in human resource systems and had failed to assign a full-time manager to the project. This contributed to a change in vendors during the project's implementation and also to cost and time overruns. While the quality assurance contractor's identification of experience and resource deficiencies can be viewed in a positive light, the question arises as to why the Department of Finance and Administration, the State Personnel Board, and ITS did not address these issues earlier in the RFP evaluation process. These agencies should have applied more strictly the industry standards for expertise and capability.

Failure to Involve System Users in Designing and Testing the System

Involving users throughout the project helps to ensure a system's usefulness.

Information systems industry principles stress the importance of involving users of the system throughout the design, development, and implementation of the system. If the new system does not meet the needs of the users, it is highly likely that users will resist the new system and its value will be greatly diminished.

Industry principles promote early involvement of users during the feasibility study and continuing involvement throughout subsequent stages of the project. Ideally, users should be involved in the following types of project decisions:

- in developing a process model, which defines how data moves from function to function within the system (e.g., in what types of information appears on the screen and how users should move from screen to screen);

- in deciding what equipment is needed and what information will be processed;

- in developing a prototype of the proposed system that demonstrates how the system will operate; and,

- in testing the system to determine if it meets the agency's needs.

User involvement in the MACWIS project led to the decision to change the type of development software to better accommodate users.

In the case of the Department of Human Services' MACWIS system (Mississippi Automated Child Welfare Information System), the originally selected development software did not perform as expected and inhibited users' ability to determine whether the system would meet user needs. The selected development software did not have the capability to meet user expectations. Although DHS's decision to select another development software increased system cost and delayed implementation, it helped to accommodate users.

Failure to Limit Changes to the System Once the Project has Commenced

Agencies should weigh proposed system changes against possible time or cost overruns.

Although some changes to a proposed system are likely, information services industry principles suggest management should carefully review proposed changes to determine the impact on the cost and implementation schedule of a project. Although some changes to the system may be prudent, industry research suggests that management avoid the tendency to expand a project beyond its original goals and objectives just because such changes are possible. All three systems reviewed by PEER experienced change orders that contributed to increased costs and delays in implementation.

Changes in SPAHRS resulted in increased costs; MACWIS changes increased costs and caused delays.

For example, subsystem enhancements and security changes in the SPAHRS project and changes in printer requirements in the GENESIS project resulted in increased costs. In the MACWIS project, a change in the development software increased costs and delayed the implementation schedule. Although some of these changes may have been warranted, the agency and vendor should concentrate on identifying and meeting needs in the planning stage to minimize the number of changes made during the latter phases of a project. While these changes did not signal a dramatic departure from the project's original goals, the introduction of new project components affected project costs and completion schedules.

Failure to Divide the Project into Manageable Milestones

Agencies and vendors should jointly set intermediate goals for the project to facilitate project monitoring.

Computer system projects frequently take years to design, develop, and implement. Information systems industry principles promote setting goals that are achievable in months, not years, in order to give the project team a sense of accomplishment and an opportunity for project managers to monitor progress.

According to industry principles, the original preliminary project plans should propose a realistic schedule with achievable milestones. It is a common practice for vendors to submit preliminary project plans as part of the RFP process. While some project plan adjustments are warranted, it is important that these plans be revised as more information is gathered during subsequent phases.

SPAHRS's expected project completion date is thirty-three months beyond the original estimate.

Through examination of project records, PEER identified weaknesses in one project that stemmed from failure to divide the project into manageable milestones. The original project plan for the SPAHRS project failed to allow adequate time for completion of key components in the design, development, and implementation of the system. As a result, the original implementation dates were not realistic and the project completion date (now projected for December 1999) has extended far beyond the original estimated completion date (March 1997).

Lack of Quality Assurance Review

Quality assurance, performed either in-house by the agency or by a contractor, should yield a report of problems and recommended solutions.

Information systems industry project management principles emphasize the importance of a strong quality assurance function which incorporates a review of the project's progress to ensure that the project delivers the system as specified in the system design. Quality assurance may be performed by a party independent of the project, such as an outside consultant, or the function can be performed by members of the project team, similar to an internal audit function. In addition to noting problems, quality assurance should yield recommended solutions to problems. Even if the quality assurance function is fully staffed with experienced, qualified individuals, the effectiveness of the function is limited to project managers' willingness to accept and implement recommendations arising from the quality assurance reviews.

Although all three projects reviewed by PEER had some form of quality assurance review, the effectiveness of the function was negatively impacted by qualifications of personnel and inconsistent reporting methods. Despite the presence of a quality assurance function, the three systems were plagued with the problems described above.

Other Factors Contributing to Project Success

Other factors which play an important role in a computer system project include proper communication among the project team, adequate training of project staff, fostering project team morale, and building an atmosphere of teamwork between the vendor staff and the agency staff. Each of the three projects reviewed by PEER experienced difficulties with at least one of these factors.

Lack of Attention to Accurate Costing and Reporting

No Guidelines Require Uniform Collecting and Reporting of Project Cost Information

Current reporting practices do not provide information on discrete or comprehensive project costs.

Compounding the problem of lack of adherence to generally accepted management principles, agencies' lack of attention to accurate costing and cost reporting inhibits external oversight efforts. Agencies do not uniformly and periodically report cost information on large-scale computer projects to ITS, any other state agency, or the Legislature. Although agency budgets capture the information in budgeted and actual expenditures, this information is often imbedded in other categories and not isolated and reported discretely by computer system project. Costs for computer systems are included in regular budget categories of Equipment (hardware), Contractual Services (software and consultants), and Salaries, Wages and Fringes (personnel). Also, project-related expenditures may span multiple years and current reporting practices do not provide a comprehensive view of expenditures.

Because no guidelines exist to require such, the Legislature depends on agencies' initiative in reporting segregated, detailed cost information on computer system projects.

The Legislature receives information concerning ongoing computer projects in the budget requests agencies submit annually. However, budget guidelines do not require agencies to segregate project costs or to report specific types of details in a uniform manner. Thus the level of detail provided about each project varies and is largely dependent on each individual agency's initiative in reporting such information.

For example, in its FY 1998 budget request, the Department of Finance and Administration gave detailed information concerning SPAHRS expenditures, accomplishments, and goals for the upcoming year. However, the FY 1998 budget request for the Public Employees' Retirement System's GENESIS system gave little detail on expenditures and did not include all costs which PEER believes to be part of the project. PERS considered only payments to the software development vendor as costs of GENESIS because these payments were made from funds designated for GENESIS. Other expenses related to GENESIS, such as expenses for the project's quality assurance function, were paid from Public Employees' Retirement System (PERS) general operating funds and special funds and were not reported as a GENESIS cost.

No Guidelines Require Agencies to Isolate Costs of Employees' Time Spent on Projects

Current monitoring and reporting methods do not capture all personnel costs of a project.

Of the three projects reviewed by PEER, only SPAHRS made an attempt to track the number of hours which state employees dedicated to the project. In SPAHRS, a time management system was not implemented until after the first year of the project and the system implemented was replaced with a second system. From July 1, 1995, through March 31, 1999, SPAHRS reported a total of approximately 110,000 hours of agency employees' time dedicated to the project, amounting to about $2.7 million.

MACWIS and GENESIS did not track the number of hours agency employees dedicated to each project, thus the cost for that portion of state employee salaries attributable to the project is not included as part of total system cost. As a result, the true costs of each project are not captured and, as noted above, legislators and agency managers do not have complete cost information available for the decisionmaking process.

Without the uniform accumulation and reporting of segmented costs of large-scale computer system projects, the Legislature does not have all the information it needs for decisionmaking. Legislators and other decisionmakers need complete project cost information in sufficient detail to determine whether to cease or continue spending money on a project. Also, this type of information is important to oversee information systems costs and progress in the budgeting and appropriations process for projecting costs for future systems procurement.

Recommendations

ITS should develop comprehensive computer system project management guidelines and require state agencies to use them.

1. In order to develop a uniform and sound project management structure, ITS should develop a comprehensive set of guidelines encompassing all aspects of project management. These guidelines should address assignment of responsibility to appropriate agency officials and collection of information to monitor system development and implementation adequately.

   Carnegie Mellon University's Software Engineering Institute has developed a model framework for managing projects involving the development and implementation of software. ITS should consider this model, along with others, in developing management guidelines specifically designed to accommodate the needs of agencies, ITS, and the Legislature.

   Under its authority to approve or disapprove contracts as specified in MISS. CODE ANN. §25-53-5, ITS should require as precondition to contract approval that agencies follow the promulgated guidelines and requirements in performing feasibility studies of proposed systems and in designing, developing, and implementing computer systems approved by the ITS Board.

ITS should require agencies to submit annual quality assessments of each computer system project with a budget over $1 million. ITS should report findings from these assessments, along with ITS's recommendations, to the Legislative Budget Committee as part of the budgetary process.

2. The ITS Board and ITS Executive Director should exercise their authority under MISS. CODE ANN. § 25-53-5 and 25-53-21 to require agencies to submit periodic project reports detailing the progress and expenditures of computer system projects.

   At a minimum, the ITS Board should require an annual independent quality assessment of each computer system project with a budget exceeding $1 million. The purpose of the annual independent quality assurance assessment is to have an independent review of the project to identify problems that could cause the project to be over budget or delay its implementation. For example, such problems could include poor quality of work by the vendor, lack of vendor or state staffing, poor communications in the resolution of problems, project team morale problems, or excessive change orders. This review should be conducted by ITS unless ITS staff are participating in the design, development, and implementation of the system, in which case an independent consultant should conduct the review.

   The results of the annual independent quality assurance assessment, along with recommendations for addressing

any problems noted in the project, should be reported to the ITS Board. The ITS Board should endorse recommendations it believes are needed to correct problems noted and, if problems persist, take aggressive action to ensure that such problems are addressed. Such action could range from refusal to approve further change orders on troubled projects to directing the ITS Executive Director to cancel a project vendor's contract, if warranted.

The ITS Board should report these findings, along with any of its own recommendations, which could range from endorsing recommended solutions to canceling the project, to the Joint Legislative Budget Committee as part of the budgetary process.

As part of their appearance before the Budget Committee during annual budget hearings, executive agency managers should address project problems and recommendations noted by ITS and outline needed corrective actions.

ITS should work with the Legislative Budget Committee to develop guidelines for agencies to use in reporting all computer project costs and completion date changes.

3. ITS and the Legislative Budget Committee should jointly develop guidelines for reporting pertinent information on computer projects to the Joint Legislative Budget Committee as part of the budgetary process. At a minimum, the reporting guidelines should:

- require agencies to capture all costs associated with a computer project, including expenditures from all sources;

- require agencies to report a project's originally estimated cost, revised project cost (if applicable), and the amount spent as of the end of the most recent completed fiscal year;

- require agencies to report a project's originally estimated completion date, revised completion date (if applicable), reasons for any delays, and actions to be taken by the agency to address any delays; and,

- require agencies to capture personnel resource costs by implementing a tracking system (recommended by ITS) to capture employee time dedicated to computer projects. This tracking system should, at a minimum, capture the number of hours which agency employees spend on the design, development, and implementation of a new computer system.

4. To expedite the capture of accurate, comprehensive cost information, the Legislature should adopt legislation which requires:

- the creation of separate funds for computer projects over $1 million in order to capture and track all related expenditures; and,

- agencies to report all costs relating to a computer project (including funds expended from all sources).

Appendix

EXPENDITURE AND TIME FRAME COMPARISON FOR
ITS BOARD APPROVED PROJECTS GREATER THAN $1,000,000 CURRENTLY IN PROCESS
As of March 31, 1999

Agency Name	System Name	Project Start Date	Original Completion Date	Revised Completion Date	Original Cost Estimate	Revised Cost Estimate	Cost as of 3/31/99	Purpose of Project
Public Employees' Retirement System	GENESIS	Jul-95	Oct-97	May-99	$13,200,000	$13,200,000	$9,272,481	Replace and fully automate the retirement system
MS State Tax Commission	STARS	Jan-94	Jan-97	contract suspended May 1999	$20,000,000	$31,000,000	$21,894,741	To automate all tax processing functions (includes Y2K and DRDC)
Department of Finance and Administration	SPAHRS	Oct-94	Mar-97	Dec-99	$7,651,500	$11,008,278	$6,709,021	Statewide payroll and human resource system
Department of Finance and Administration	MERLIN (Phases I-IV) Phase V Amendment 1 Amendment 2	Jun-96 *		May-99	$6,268,940	$7,317,840	$6,203,542	The state's financial and administrative data warehouse. SAAS and SPAHRS are the primary data sources for MERLIN. Additional functionality SP2 Expansion due to increasing user demand
State Department of Education	SEDACOS	Dec-97	Nov-98	May-00	$1,631,728	$1,697,228	$855,285	To develop a system to support the Individualized Education Program (IEP).
State Department of Education	MS Student Information System	Nov-98	Aug-00	Aug-00	$3,793,386	$3,982,512	$356,545	To develop a comprehensive management information system for student and school district personnel information.
Mississippi Department of Transportation	Financial Management System	Mar-96	Jul-97	Jun-99 **	$7,998,080	$7,998,080	$7,998,080	Automated financial management system
Mississippi Department of Transportation	Transportation Management Information System (TMIS)	Mar-96	Jun-97	Apr-99 **	$4,954,200	$6,001,568	$6,001,568	Provide MDOT Pavement Management System, Bridge Management System, and Highway Safety Management System.
Department of Human Services	MACWIS***	Jun-97	Apr-00	Jul-01	$33,142,788	$35,660,143	$15,405,396	To automate the State's Child Welfare Programs. The current manual system will be replaced by MS Automated Child Welfare Information System.
TOTAL					$98,640,622	$117,865,649	$74,696,659	

The Project Start Date is the month the ITS Board approved the project.
The Original Completion date is the date the development and implementation of the system was to be completed.
The Revised Completion Date is the agency's current projected completion date.
The Original Cost Estimate is the amount the agency stated at the onset of the project.
The Revised Cost Estimate is the current amount the agency stated will be spent on the project.
The Cost to Date reflects the cost of the project as of March 31, 1999.

* The project start date is the start of Phases I-IV. The revised completion date is the estimated completion date of the final portion, Additional Functionality. Original completion dates varied for the each phase/amendment.
** Completion is defined here to mean acceptance of TMIS/ FMS by MDOT. A 15-month onsite post-implementation commences upon acceptance of TMIS/FMS by MDOT. The project continues through the expiration of the onsite post-implementation period.
*** 75% Federal funding, 25% State funding through 10/97. 50% Federal funding and 50% State 10/97 through present.

NOTE: Development and implementation cost and time frame information was provided by agencies in response to a PEER survey.
SOURCE: PEER Agency survey

Agency Responses

October 4, 1999

Peer Committee
222 North President Street
Jackson, MS 39201

> RE: **Department of Information Technology Services response to PEER Committee report on the development and implementation of computer systems**

Background

The fact of cost and schedule overruns in the development of automated information systems is a universal issue throughout the information technology industry. State government, with perpetually scarce resources, is even more vulnerable than private industry to the problems of late delivery of systems costing significantly more than the initial project budget.

ITS concurs with the PEER Committee's overall assessment and recommendations for addressing these issues in state government in Mississippi. ITS is charged by statute with helping the State of Mississippi receive the maximum use and benefit from information technology, including application software systems. We acknowledge that ITS can and should do everything practical to ensure that application development projects undertaken by state agencies and institutions avoid the more common pitfalls and plan for the inevitable risks of such ventures.

There are several points and issues, however, that need to be considered before the implementation of major changes.

(1)   In its report, PEER has emphasized the control role that is outlined in ITS' enabling legislation. Although ITS, formerly CDPA, has filled a strong control role for technology during the agency's history, in recent years we have deliberately increased our emphasis on the service components of the ITS mission and correspondingly decreased the exertion of control over our customer agencies. Following the recommendations outlined in this report will require ITS to exercise more of the control functions listed in ITS statute. **We believe that a joint resolution and/or specific legislation redefining ITS' role in application development projects would be required prior to a major shift in the direction and focus of our role.**

Because agency directors plan for and obtain budget dollars for developing application systems to meet their business needs, there has historically been strong opposition to ITS' filling a role stronger than recommending alternatives and expressing an opinion on specific project risks. Agency directors rightly believe that they should make the final decision about projects and expenditures undertaken by their agencies. Some agencies have IT professionals on staff with the expertise and experience to manage large application development projects. Others do not.

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ITS does not own application systems. Agencies develop and pay for the application software required to meet their unique business needs. ITS is charged with the responsibility for approving the procurement and contract for these major projects and with providing an appropriate technology infrastructure to support the state's application systems. Both the customer agency and ITS have responsibilities for making every effort to ensure a successful outcome for development projects.

The scope of responsibility and authority of both ITS and the customer agency would have to be clearly outlined by the legislature before ITS could successfully assume a strong control role over application projects. Ideally, the customer agency and ITS should partner to create a strong state project team that protects the investment of state government in any major application development effort. Without such a partnership, vendors have historically tried a "divide and conquer" approach to accomplish their own objectives on projects. Vendors have traditionally pitted the customer agency against ITS when ITS project team members tried to hold the vendor more accountable to the terms and conditions of the contract. To reduce this area of vulnerability, ITS and customer agency staff must form a cohesive and united project team with common objectives and must present a united front to the vendor.

(2)   We appreciate the difficult job PEER staff undertook in researching both industry standards for application development and the histories of individual application projects undertaken by state agencies in recent years. The report reflects a good understanding of both best practices and of ways in which sample projects may have deviated from these practices.

However, it is an oversimplification to believe that better project management, review, and reporting will solve all problems related to large application development projects. The variables are too many and too complex, and sometimes no amount of management and assessment will resolve the real issues. Contractors working on application projects are, quite simply, motivated by the potential for profit. To maximize profit, the vendor wants to minimize the resources and time expended on the project, even at the expense of quality. The objective of the contracting agency, on the other hand, is to obtain the most functional system possible. These two viewpoints are by definition in opposition to one another.

Agencies naturally try to work with vendors to encourage a successful project outcome, including making concessions and compromises that seem reasonable at the time, in trying to achieve a successful implementation. It is much easier to look at a development project in retrospect and decide that the concessions were too great and that the project or vendor should have been terminated at a certain point than it is to make the call during the project. When a great many staff and financial resources have been invested in an effort, it is extremely difficult to cancel a project and lose the investment made to that point.

The application development arena is a sellers market. Vendors have more opportunities for work than they can fill and are able to pick and choose their projects. In this situation, the

best vendors will simply elect not to do business with state government if contractual conditions are too onerous or if the state is too inflexible. This reality greatly complicates decisions made concerning vendor performance during the course of an application development project.

(3)   We would also like to differentiate between the management of the project and the management of the contract for that project. In developing an organizational structure for the state project team, **ITS recommends that there be both a state project director and a state project manager. The project director is the primary stakeholder, who has access to the resources required by the project and who is charged with the management of the contract developed and executed for the project.** The director must be a member of the customer agency staff who has a business interest in the functionality of the prospective system. The project manager, on the other hand, is responsible for the day-to-day activities of the project, including monitoring of the project workplan, budget, and schedule. The best project management cannot overcome the damage of poor contract management, in which the contractor is not held to the terms and conditions negotiated in the project contract to protect the state's interests.

As discussed above, the state must balance the need for strong, protective contracts and close contract enforcement against placing demands that are too stringent or even unreasonable on the vendor. ITS always begins contract negotiations with strong contract language. Vendors' legal counsel frequently are unwilling to accept some of the proposed conditions. Customer agencies, on their own and/or with urging from the vendor, have often requested that ITS back away from contract controls that are viewed as excessive and unnecessary. It is frequently preferable to execute a somewhat weaker contract with a vendor who has been selected as "lowest and best" provider of the needed services than to break off contract negotiations and proceed with a lower-ranked vendor who has been judged less capable of performing the work.

(4)   There will always be change orders on large application projects. Some change is inherent and beneficial due to the need to respond to rapid advancements in technology. Federal and/or state statute and policy frequently change after the project is underway, and these changes must be incorporated into the system. Change orders in themselves are not necessarily negative. Nor do they always indicate a project is off track. Sometimes change orders are engendered by the success of the vendor in achieving the customer agency's objectives. When a vendor does an outstanding job, the customer may ask to expand the scope of the project to include additional business objectives.

ITS agrees that requests for change orders should be closely and objectively examined to weigh the potential benefits against any increased cost or extended schedules. The decision concerning approval of change orders should be made only after full consideration of the appropriateness of the change and the impact on the project's budget, schedule, and scope.

(5)   Finally, ITS believes that the ground-up development of large application systems is inherently a risk-fraught undertaking. To mitigate these risks, we have always encouraged agencies to look at other means of acquiring the systems to meet their business needs. Other approaches include: (a) transferring applications from other states; (b) purchasing off-the-shelf software, with or without customizations; (c) using business reengineering to adjust the business requirements to existing software, and (d) partnering with other states or other agencies to develop systems that meet the needs of multiple entities, thus making most effective use of available resources.

Response to PEER Recommendations

PEER Recommendation # 1:
ITS concurs with the recommendation for a standard project management methodology and a requirement for formal feasibility studies on projects above a certain threshold of cost and/or time and complexity.

ITS has previously developed, distributed, and conducted classroom training on a project management methodology derived from industry best-practices and customized for our state government environment. We also have scheduled a workshop for October 1999, to be conducted by the State Information Technology Consortium (SITC), whose objective is to discuss and document needed customization of standard project management methodologies for use in state government. We will then plan an appropriate means of documenting, distributing, and providing training for this customized methodology.

ITS project and planning guidelines require a cost-benefit analysis (CBA) for major application development projects. ITS has published and provided training on a detailed cost-benefit methodology for use on technology projects. The CBA is one of the final deliverables produced by a comprehensive feasibility study. Other components of a feasibility study include definition of the project objectives and project scope, analysis of the potential risks and plans for mitigating them, a list of alternatives considered, and the anticipated benefits and costs of the alternative selected.

We believe that producing a formal feasibility document for a large application development project can help the state make better decisions on the use of funds available for automated systems. Several issues related to an across-the-board requirement for formal feasibility studies that need additional consideration are the timing of the study in relation to the budget cycle and project funding, the audience to review and evaluate the feasibility study, and the additional cost the study would add to the initial phase of the application development project. Perhaps a subset of the two legislative appropriations committees could be designated to review these studies and make recommendations to the full committee. Such an approach would combine approval of the project itself and of the initial funding for the project. Therefore, only funded and approved projects would come to ITS as requests for the procurement of contractor services.

PEER Recommendation # 2:

ITS concurs with the recommendation for requiring more frequent and formal reporting on the status of application development projects. The quality assurance function is a valid mechanism for obtaining a snapshot view of the status of the project. Projects that are not tracking well in terms of schedule, budget, or quality could then be placed under more stringent reporting requirements while corrective measures were being taken.

Several states are requiring post-project reporting to compare the project's objectives with the benefits actually achieved by the implemented system. This mapping of final product to the initial requirements is a valuable means of promoting accountability from both the state agency and contractor perspective.

Several years ago, ITS established the Information Resource Council (IRC), an advisory group comprised of the executive management of representative customer entities. ITS has used this group as a sounding board for policy and technology direction. When ITS presented to the IRC a resolution calling for ITS participation in the project management of all major application projects, this group was very concerned with both the costs that would be incurred from ITS services and the implied loss of control over their application systems projects. **As ITS is self-funded, we believe that the cost issues remain as potential barriers to the success of these recommendations and that some funding mechanism needs to be established to implement these changes.**

PEER Recommendation # 3:

ITS concurs that it is important to capture information on the total costs associated with an application project. We believe that tracking time expended by all project participants is essential to the successful management of large projects. State staff resources are a critical component of the overall project costs, as for any program or business function of an agency.

In conjunction with the adoption of a project management methodology, **we recommend the selection of a full project management tool that includes a time reporting component and/or interface to existing time tracking systems.** All estimated costs from the feasibility study can be entered in such automated tools, with actual costs and timeframes captured as the project progresses. The use of project management software allows resource loading and monitoring of the project workplan at a more detailed level than is possible without such a tool. Use of project management software also builds a data base of information concerning the time required to complete certain products and tasks that is extremely useful in the formulation of future project plans.

3. We do not have an opinion on the best accounting mechanism for collecting and reporting all costs associated with a project. Since ITS' automated systems capture only the contractor (systems integrator) component of the project cost, we are not sure what percentage of projects cost more than a million dollars once all associated costs are included.

Of course, the addition of feasibility studies, formal quality assurance, and additional reporting will add time and cost to application development projects. Agencies would have to know of and request funding for these costs as part of their project funding requests. We would consider these expenses the cost of added insurance for successful application projects.

Additional ITS Recommendations:

(1) **Continue to emphasize strong contracts for application development projects, with substantial protections for the state and penalties for the vendor in the event the vendor fails to deliver as contractually obligated.**

Such mechanisms as performance bonds, liquidated damages, and payment hold-backs provide monetary incentive for the vendor to perform. During contract negotiations, the parties must balance the need of the state to have the application developed within the timeframe and budget promised and the need of the vendor to realize a profit on the venture. Such contracts can be difficult to negotiate.

The best contract offers no protection if it is not managed throughout the project. The project director must be aware of the terms and conditions of the contract and be willing to make the hard decisions regarding invocation of penalties if this is warranted. Invoking penalties is always a pivotal decision that inevitably changes the dynamics of the project relationship and must not be undertaken frivolously or prematurely. Failure to invoke such penalties, however, can also undermine both the project and the future bargaining position of the state regarding vendor performance.

(2) **Consider using niche vendors rather than or in conjunction with large-scale systems integrators.**

Many large application projects are performed by systems integrators who are generalists in the application development arena and who pull together teams within the industry to try to address the particular business area being automated. Integrators, as a whole, tend not to have deep expertise in the business function being automated and usually target mainstream technical environments with the objective of reselling the product being developed.

Niche vendors have developed an application system to meet a particular business need. These systems typically originate from a group of business area experts who were trying to solve a functional problem by building an automated system. These vendors may have more insight and experience to develop software that is a better fit to the needs of an agency, often at a lower cost and within a shorter timeframe.

Niche vendors are best identified through networking within the national organizations that support particular business areas of state government.

(3)   Allocate more agency resources to the project team.

From our experience in working on application projects with customer agencies, we find that many project delays are caused by the state project team. Because project participants on the state team typically continue to have full-time job responsibilities outside the project, these persons are often unable to devote the time needed for meetings, definition of business requirements, review of project deliverables, and other state obligations as outlined in the project contract. Tracking time spent by state staff on application projects, as recommended by PEER, should help raise the awareness that state staff are frequently not able to participate at the level outlined in the project work plan. To be effective in their roles, key members of the project work team must be relieved of at least a portion of their day-to-day responsibilities so they can adequately fill roles on the project team.

(4)   Invest in main-stream technology and structure project plans with intermediate system deliverables.

Projects with the greatest risk of failure are those that push the technical envelope too quickly and too far, and those of very large scope in which the initial system deliverables take multiple years to complete. State government is not typically a good arena for trying "bleeding edge" technology. We should invest our limited dollars in sound, field-proven products and platforms that have already been applied successfully to similar business problems.

The state should also structure projects so that some system components can be delivered fairly soon (months rather than years) after project initiation. There is no proof of concept equal to actually delivering system functionality in the production environment. Modular delivery of large application systems serves to provide real business benefits to the user, maintain the user's interest and confidence in the project, and to shake out technical difficulties as early in the process as possible.

Conclusions

ITS does not believe that all project failures, cost overruns, and schedule overruns on application development projects can be prevented. We have seen examples of vendors whose profit objectives were in direct conflict with the needs of the customer agency and who used unprofessional methods to exploit the state. In such cases, the best methodology and project management techniques can not prevent problems. At best, we can monitor the project and take corrective action to preserve the investment made to date.

ITS establishes and enforces a well-defined evaluation methodology for each Request for Proposals (RFP) that we issue. We work with the customer agency to evaluate the vendor's overall proposal, suggested workplan, proposed staffing, references from past projects, and total cost. However, a good score on the evaluation does not always mean that the vendor will perform as needed on a

given project.

We agree that additional structure, guidelines, and reporting can lead to a higher success rate and to application systems that more nearly meet the needs of state government. ITS wants to contribute as fully as possible to making success the expected and achieved outcome.

October 1, 1999

Dr. Max Arinder
Executive Director
PEER Committee
222 North President Street
Jackson, MS 39201

Dear Dr. Arinder:

Enclosed is PERS' response to the PEER Committee Report pertaining to the review of the development and implementation of computer systems in Mississippi's state agencies.

Should you need additional information, please let me know.

Sincerely,

Frank Ready

Frank Ready
Executive Director

FR:bwp

Enclosure

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In concept, and in general, PERS concurs with the recommendations made by the PEER committee and with the purpose of the Report.

As noted in the Standish Group's statistics referenced in the PEER Report, any project of this size and complexity is inherently difficult. PERS is pleased with the efforts made by staff and vendors that have allowed us to implement a project of this size within scope and within budget, even though there have been time delays. The final result will give PERS a fully integrated system with the basic functionality requested in the original Request for Proposal (RFP). As with any project of this size, there have been modifications along the way due to the follows factors:

- ❖ Better / clearer understanding of the processes
- ❖ Redefining processes during the project
- ❖ Taking advantage of improvement opportunities
- ❖ Statutory changes that occurred within the implementation time frame
- ❖ Implementation of new programs and business objectives
- ❖ Business process changes
- ❖ Advancing and changing technology.

PERS agrees that projects should be limited to the original scope and budget, while allowing the flexibility for changes to the components and weighing the cost benefit of each change to the overall project. PERS was able to stay within the original scope and budget of the project while taking advantage of new technologies that provided the same or a better solution within the original cost. Practically speaking, implementation of a large system should not be limited or constrained to the initial requirements to the detriment of opportunities to be taken. To do so could restrict the agency from implementing the best solution available.

Excerpt from PEER Report:

Lack of Defined Project Objectives & Requirements.
The Genesis project required system modifications and time extensions due to lack of consideration of special requirements.

PERS RESPONSE:

PERS agrees that it is critical to project success to clearly define project objectives and requirements in the early stages of a project. Both PERS and the vendor underestimated the time to develop and implement a project of this magnitude. The time extensions incurred by the project were not a result of unclear project objectives or a lack of understanding of the requirements, but as a result of a change in the architecture and methodology being used by the vendor to implement the project, not any lack of understanding of the requirements. In addition, in retrospect it is clear that the original timetable mandated by PERS in the RFP was overly aggressive for an implementation of this magnitude.

Excerpt from PEER Report:

Failure to limit changes to the system once project has commenced.

PERS RESPONSE:

PERS concurs with the PEER finding that there should be sufficient planning in the early stages to minimize the number of changes made during the latter phases of a project.

PERS agrees with the assertion that changes in system scope should be limited once the project has commenced. However, there should not be a requirement that restricts one from making any changes when to do so is prudent, especially when the overall effectiveness of the project is enhanced. Such rigid restrictions could be detrimental to the overall project in the long run. There should be some level of reasonableness applied to this area.

While it is true that PERS executed a Statement of Work (SOW) for an analysis of the printing related requirements at a cost of $30,688 that had not been identified in the proposal, the cost was absorbed within the original project budget as noted in the Report. In addition, it should be noted that the analysis resulted in a net cost savings to the project of $200,272 as documented in our letter to ITS dated June 28, 1996.

Excerpt from PEER Report:

Quality Assurance may be performed by a party independent of the project, i.e. outside consultant....

All had some form of Quality Assurance review, the effectiveness of the function was negatively impacted by qualifications of personnel and inconsistent reporting methods. Despite the presence of a quality assurance function, the three systems were plagued with the problems described above.

PERS RESPONSE:

PERS concurs that a strong quality assurance function is critical to the success of any project. This function should incorporate detailed reviews of deliverables, as well as periodic review of project status and requirements tracking.

PERS takes exception to the statement "the three systems were plagued with the problems described above." In our opinion, while normal project implementation issues have occurred and everything has not been perfect, the implementation has proceeded within normal project expectations.

In addition to a consultant that has functioned in the capacity of Quality Assurance Consultant, PERS annually has a Computer Risk Assessment Audit by Arthur Andersen, LLP that is conducted as a part of the annual financial audit. The scope of the audit has encompassed the GENESIS project and there have been no issues or problems reported as a result of these audits. PERS internal audit staff has also conducted periodic reviews of the costs associated with the project to ensure proper documentation and adherence to the proposal.

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Excerpt from PEER Report:

The legislature receives information concerning on going computer projects in the budget request agencies submit annually. However, budget guidelines do not require agencies to segregate project costs or to report specific types of details in a uniform manner. Thus the level of detail provided about each project varies and is largely dependent on each individual agency initiative in reporting such information.

PERS RESPONSE:

While no detailed specific report was submitted to the Legislature on the GENESIS project with the budget, all information relative to the GENESIS project was submitted regularly to ITS. In addition, PERS prepared handouts and had information available at the budget hearings to address any issues and questions concerning the project. PERS agrees that a separate uniform method of reporting project costs would be beneficial to legislators and other interested parties, as well as the agency itself, especially in multi-year contracts. PERS repeatedly requested a separate fund be established for the tracking of the GENESIS expenditures, as well as for the carry-over funding. PERS took the initiative to segregate the expenditures in an effort to more clearly reflect the development costs.

When PERS requested funding for the GENESIS project in FY '95, it was for the total software development cost of $13,260,686, the amount approved by the ITS Board. Other significant costs were absorbed in the PERS operating budget as these funds had been requested within that framework.

PERS agrees that segregating all costs associated with the project would give a more accurate picture of the total costs incurred in the system implementation. This would be facilitated by the establishment of a separate budget fund for each project, as well as, a lump sum budget amount with the flexibility to carry forward for the duration of the project.

CLOSING REMARKS:

It is PERS position that any project structure and guidelines that are established should be done so in a manner that is easily understood by those in agency positions without project management experience. The guidelines need to be detailed with illustrations, not just broad concepts. There should be a standardized reporting format or checklist (developed in conjunction with the guidelines). Training should be developed for agency personnel that will be involved in the project. There should be clear guidelines for reporting budget information, as well as a process that facilitates tracking multi-year projects.

There should also be a certain amount of reasonableness and logic involved in the development of the structure and the process. It should be remembered that the primary focus of the project is successful implementation, not bureaucratic oversight. The role of the Department of Information Technology Services (ITS) should be clearly defined and should provide support and assistance to the agency, without unnecessarily increasing the administrative burden. The cost of implementing each of the aspects of project management as suggested, e.g., employee time sheets, outside consultants, etc. should be weighed against the benefit as with any project.

PERS does support the adoption of sound project management principles and concurs with the seven project management principles the report defines. In addition, PERS believes that every

agency that implements a project of any size could benefit from guidelines in this area. However, over-regulation in this area could cause the State to incur more costs with little or no benefit. This should be taken into consideration in any guidelines that are established. In addition, a certain level of reasonableness should be built into any guidelines to keep from negatively impacting project implementation.

PERS RECOMMENDATIONS FOR INCLUSION IN
PROJECT MANAGEMENT PROCEDURES / GUIDELINES
(SUBMITTED TO PEER STAFF)

While it is PERS contention that it is probably impossible to address all project management issues and ensure that there will be no deviation from the proposal, no time extensions, or cost overruns, there are some things that would enhance the agency's ability to help ensure that these do not occur (in addition to those mentioned in the report).

❖ Uniform Documented Project Management Procedures / Guidelines (some of the following items listed could be incorporated in these guidelines).

❖ Primary ITS contact throughout the project, one person with a clear understanding of the business needs of the agency, as well as the current and proposed technical environments and system implementation issues.

❖ Agency staff, ITS consultant or outside consultant to act as both Project Technical Advisor and Quality Assurance Leader. (While one individual performed this role for PERS, it could be several individuals performing these functions.)

> As Project Technical Advisor, this individual should have an extensive knowledge of the agency's business, the RFP and proposal, and the technical requirements, as well as an understanding of computer systems and system implementation. This individual should have an in-depth knowledge of the functional and technical details of the existing and proposed systems at the agency, including extensive business experience. This individual reports to the Project Director and provides technical advice, researches questions on request, provides input to the decision-making process, and addresses specific technical or functional issues that arise, at the direction of the Project Director.

> As Quality Assurance Leader, this individual would lead an independent review of the accuracy, reliability and conformance to standards and RFP requirements of all project activities and deliverables. This person reports to the Project Director, reporting any deficiencies that need to be addressed.

> The individual would be needed on an almost full-time basis during the first phases of the project, with requirements tapering off with each phase implementation and building up again near the end for the project outstanding issues list, ensuring closure on all items related to the project. If an ITS consultant or an outside consultant is used, there would be a cost associated with this aspect that is not included when a vendor submits a proposal, but should be part of the agency's overall project budget.

❖ Agency staff to serve as Project Director (primary contact between the vendor and the agency). This person has authority for the direction and coordination of all project activities, with primary responsibilities in ensuring the project has all needed resources, that the project objectives are being met, and for the final approval of all project deliverables. This does not require an individual on a full-time basis, but it should be clearly understood that in order to do an adequate job, it would be at least half-time or more as the project dictates.

◈ Agency staff to serve as Project Manager (the individual who manages the agency's day-today participation in the project). This individual reports to the Project Director and has responsibility for ensuring that the overall technical approach to the project is sound and that the project is being conducted in the best interest of the agency. This person works very closely with the vendor's Project Manager in all aspects of project planning, organizing and administration, including resource allocation, developing and reviewing staffing plans, monitoring of project progress, identification and resolution of issues and making and following up on assignments. This individual would typically be the agency MIS director. Again, this does not necessarily require an individual on a full-time basis, but it should be clearly understood that the demands can be high at times and if there are a lot of ancillary initiatives being implemented or competing priorities, it could be challenging for this individual to do an adequate job as both project manager and MIS director.

◈ Agency staff to serve as project coordinator. This individual coordinates and facilitates all aspects of project administration. This individual removes administrative barriers and ensures the project team has the administrative support needed to function effectively. This role includes:
(1) establishing and maintaining a project schedule / calendar.
(2) coordinating clerical support for the project, ensuring the project has adequate equipment and staff for copying, faxing, word processing, etc.
(3) coordinating meetings, including scheduling rooms, ensuring the correct participants are informed, ensuring materials are distributed as needed, etc.
(4) coordinating written documentation from the project, including setting up a filing system for hard and soft copies of documents, organizing documentation, and ensuring documentation is accessible to the people who need it.
(5) Document project procedures (e.g., deliverable review, meeting minutes)
(6) Document, track and route Problem Incident Reports (PIRs) to ensure proper resolution.

◈ Agency staff to serve as business owners. These are individuals (or one individual who is very knowledgeable about all aspects of the business and the needs) with sufficient business knowledge to communicate to the vendor the detailed requirements of the system. Again, this does not necessarily require individuals on a full-time basis, but it should be clearly understood that the demands can be high at times and it could be challenging for individuals to do an adequate job as both business owners while managing their day to day responsibilities.

◈ Data conversion issues should be understood clearly and a plan developed to address them either as part of the project or in conjunction with the project development. Failure to recognize the problems that can be inherent with legacy information can render the most up-to-date implementation ineffective. "Garbage-in" equals "garbage-out".

◈ Employee morale and productivity issues associated with a large multi-year implementation need to be taken into consideration prior to the beginning of the project. The stress associated with a multi-year large implementation can negatively impact the services the agency performs when duties are reassigned to allow individuals to work on the project. The agency should asses the personnel situation to determine what staffing issues and needs are required to dedicate employees to the project as well as maintain the day to day requirements of meeting the needs of the agency.

(It should be noted that while PERS had some aspects of Project Management in place throughout the project, some aspects were learned "on-the-job". It is not our intention to imply that PERS did everything that should be done in a project of this size, but that, especially with staff inexperienced in project management or systems implementation, we have tried to adhere as closely as possible to best ensure successful completion of the project.)

STATE OF MISSISSIPPI
DEPARTMENT OF HUMAN SERVICES

Donald R. Taylor
Executive Director

October 4, 1999
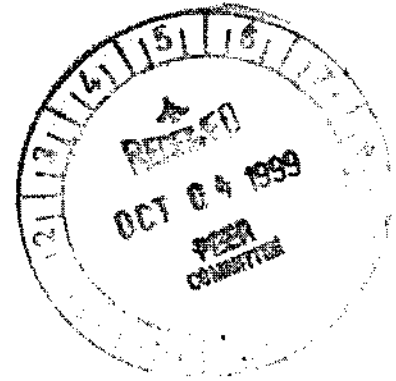
Dr. Maxwell Arinder
Executive Director, PEER Committee
222 North President Street
Jackson, MS 39201

Dear Dr. Arinder:

The following is the Mississippi Department of Human Services' response to the PEER report entitled, "The Review of the Development and Implementation of Computer Systems in Mississippi's State Agencies."

The Mississippi Department of Human Services (MDHS) has read a draft and interprets the following recommendations and responds accordingly:

PEER Recommendation 1: ITS should develop a comprehensive set of guidelines encompassing all aspects of project management...

The concept of uniformity in application of project management activities to large projects is a commendable ambition with extreme difficulty in application. It is difficult for any agency to have the level of experience in large projects wherein they have participated in the projects from beginning to end. ITS has historically participated in procurement processes and then participated on a limited basis once the procurement activities are concluded.

MDHS has exercised "best practice activities" in the engagement of a quality assurance contractor to constantly review all aspects of the MACWIS project. The quality assurance contractor reports weekly on all aspects of the project including review of work plans, current status, current activities, and projected time lines to complete the project. MDHS management utilizes these reporting structures to monitor current project activities and interject corrective actions as are required toward a successful project.

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Many project management models exist in today's technology. Utilization of a standard model could assist some agencies in better quality control but has the potential to handicap others in the completion of another level of "red tape."

PEER Recommendation 2: *ITS Board & Executive Director will exercise their authority to require agencies to submit periodic project reports detailing progress and expenditures.*

MDHS's MACWIS project has a full-time QA contractor whose job it is to act independently, providing ongoing quality assurance assessments. These are available and have been routinely provided to ITS. In addition, reporting of this nature is required by our federal partners. The latest reports are available upon request at any time. State agencies do not need or should not have to fill out different forms, one for the Federal Government, one for ITS, and another for the state legislature, all saying the same things but in a different format. Examples of where this currently exists are the state budget and state strategic planning process.

PEER Recommendation 3: *ITS and the Legislature should jointly develop guidelines for reporting pertinent information for computer projects to be presented to LBO during the budgetary process.*

MDHS agrees that all state government entities need to work jointly in improving the reporting process. This recommendation will only address a symptom of a larger problem, joint unified reporting for all areas of state government, not just the legislature and ITS on computer projects.

MDHS currently captures all costs reporting these costs quarterly; reports original and revised estimated completion dates; reports revised dates and actions to correct any delays associated with MACWIS. Also, MDHS has a cost override accounting system that can capture the number of hours spent on any project. If the Executive and Legislative Branch desires this detail of reporting, could SPAHRS capture this level of information? Developing a state-wide system to capture desired information is a desirable project management approach. Currently, each agency has varying levels of reporting responsibilities, often depending on whether it is a general or special fund agency.

PEER Recommendation 4: *The Legislature should require a separate fund for computer projects over $1 million dollars.*

As far as reporting all cost related to the MACWIS computer project, currently this is being done. The capability currently exists to allow agencies to track costs using the Statewide Automated Accounting System (SAAS), provided adequate preparation is done on the part of the Budgets & Accounting Divisions.

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Summation:

Massive computer system development projects are extremely difficult projects in which to force a particular type of management model. All projects have common elements that lend themselves to traditional project management models. MDHS has endeavored to utilize "best practice" in our project management activities which include engagement of a Quality Assurance contractor to review all aspects of the project. This contractor is actively on-site on a daily basis reviewing details of the MACWIS project. This activity is common to large projects at MDHS.
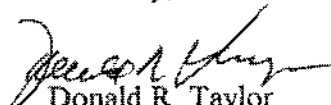
Insertion of any additional "oversight" activities will tend to slow projects and ultimately cost the state of Mississippi more money for the reporting requirements. MDHS is compelled to meet both the Federal Government and state of Mississippi reporting requirements for all major development projects. MDHS reports, on a frequent basis, progress to federal agencies for work on these developmental projects. PEER is encouraged to utilize existing reporting structures and management models for desired reporting in the state to avoid an additional layer of bureaucracy in projects.

MDHS has utilized all levels of staff in the MACWIS project. Thousands of hours of participation has come from the program staff, Management Information Systems' staff, ITS' staff, and others with interest. MDHS has maintained throughout the project that good communication is critical and has done all possible to encourage and demonstrate this. It is impossible to look at a multimillion dollar project and not find some area of project management that could have been done better or differently. MDHS is constantly reviewing our activities to demonstrate "best practices" toward successful projects. ITS' Board currently reviews project activities over the $250K price tag. Agencies present various forms of documentation and reporting with each request or change order. ITS' Board can now exercise their oversight authority and often does by requiring additional information, additional activities, or delay in approval of requests.

The total original cost for the MACWIS project was $28,134,829, which has been updated to $31,920,919 as of June, 1999.

Should you need additional information, please do not hesitate to let me know.

Sincerely,

Donald R. Taylor
Executive Director

DRT:RF:obe

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DEPARTMENT OF FINANCE AND ADMINISTRATION

EDWARD L. RANCK
EXECUTIVE DIRECTOR

September 29, 1999

Max K. Arinder, Ph.D.
Executive Director
PEER Committee
222 North President Street
Jackson, Mississippi 39201 HANDMAIL

Dear Dr. Arinder:

Thank you for the opportunity to review the draft report prepared by the PEER Committee regarding the Development and Implementation of Computer Systems in Mississippi's State Agencies.

Mississippi Code of 1972, Annotated, 7-7-3(5), states, in part, the following:

> There is hereby established within the State Treasury a special fund to be designated as the Mississippi Management and Reporting System Revolving Fund. This fund is established for the purpose of developing and maintaining an executive information system within state government. Such a system may include the state centralized automated accounting system, a centralized automated human resource/ payroll system for state agencies and the automation of performance programmatic data and other data as needed by the legislative and executive branches to monitor the receipt and expenditure of funds in accordance with desired objectives.

> A Steering Committee consisting of the State Fiscal Officer, the Executive Director of the State Personnel Board and the Executive Director of the Mississippi Department of Information Technology Services shall establish policies and procedures for the administration of the Mississippi Management and Reporting System Revolving Fund.

> The MMRS Steering Committee, composed of the Executive Directors of the Department of Finance and Administration (DFA), the State Personnel Board (SPB), and the Department of Information Technology Services (ITS), provides policy guidance to the program.

MMRS, which operates as an office of the Department of Finance and Administration, since July 1993, has aggressively sought to achieve the objectives set forth in this statute:

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- Stabilization, expansion, and Year 2000 renovation of the Statewide Automated Accounting System (SAAS), the *centralized automated accounting system* referenced in 7-7-3(5);
- Development and implementation of the Statewide Payroll and Human Resource System (SPAHRS), the *centralized automated human resource/payroll system for state agencies* referenced in 7-7-3(5);
- Development and implementation of the Mississippi Executive Resource Library and Information Network (MERLIN), *the executive information system within state government* referenced in 7-7-3(5).

In each of these efforts, DFA has worked closely with ITS and the user community in system planning, all aspects of procurement, followed ITS guidelines for project management, and employed quality assurance and change management practices.

Since SPAHRS was the DFA project chosen by PEER for specific review, our response will be relative to SPAHRS.

Response to Recommendation 1

DFA disagrees that the SPAHRS project failed to follow a sound project management structure. The time line on page 5 of the draft report implies that SPAHRS is not implemented nor accounts for the aggressive action taken, *with the full knowledge and support of the MMRS Steering Committee and the ITS board,* to ensure that the State received a quality application for the taxpayer dollars expended.

The time line presented does not reflect termination of the initial vendor and continuation of the SPAHRS project with State staff and a new vendor. The decision to continue, rather than to trash the salvageable initial general and infrastructure design, was done to preserve the initial $2 million investment for work done and accepted under the original agreement. The time line for the implementation of the various SPAHRS subsystems was (is) as follows:

April 1997	Implementation of SPAHRS Manage Contract for personal services contracts under the purview of SPB (and effective July 1, 1997, of the Personal Service Contract Review Board);
November 1997	Implementation of SPAHRS Human Resource functions effectively replacing the outdated, non Year 2000 compliant mainframe systems of SPB;
July 1998	Completion of fiscal year rollover for human resources. This is significant in that it was accomplished in less than three weeks and the prior year had required almost three months effort in the old SPB systems to complete;

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August 1998	Implementation of SPAHRS payroll functions in five pilot agencies (DFA, ITS, SPB, Education, Health);
July 1999	Complete payroll conversions for all agencies except DECD, MDHS, MDOT, Military, and the Legislative membership;
October 1999	Complete payroll conversions for DECD, MDHS, MDOT (done 9/99), and Military;
January 2000	Complete payroll conversion for Legislative membership; implement SPAHRS travel subsystem; implement SPAHRS subsystem for payment of contract workers.

While we acknowledge that the initial time frame of the project expanded, this was done under the regular review of the MMRS Steering Committee and the ITS Board. The current Agreement with Software AG Professional Services (SAGA) has not been without problems, but the vendor has worked with the State to keep the cost controlled, get the requirements implemented, and stabilize the system as quickly as possible.

DFA disagrees that sufficient and appropriate planning and project objective definition did not occur. In 1992, a feasibility study was requested by SPB regarding the development of a new statewide, state of the art, human resource system. This study, known as the Human Resource Information System (HRIS) project, was conducted by the Central Data Processing Authority (CDPA), the predecessor to ITS. This project was stopped by SPB before a formal report was made to the CDPA Board. This study did, however, become the basis of the SPAHRS Request for Proposals (RFP). CDPA, SPB, and DFA agreed that HRIS was needed as part of an integrated human resource/statewide payroll system to replace the existing SPB systems and the non Year 2000 compliant, twenty odd payroll systems in use by agencies throughout Mississippi government. The statute referenced earlier acknowledges concurrence in this matter by the inclusion of *a centralized automated human resource/payroll system for state agencies.*

DFA disagrees that users have not been appropriately involved in the design, testing, and implementation of SPAHRS. During the September 20, 1993, meeting of the MMRS Steering Committee, it was reported that 22 agencies had requested copies of the draft RFP specifications (this was offered to all agencies) and that comments/recommendations had been provided by 9 of these. The RFP release date was postponed to allow these recommendations to be incorporated into the RFP. The RFP was advertised in October 1993. User involvement was important from the initiation of the project. (Reference: Minutes of the Mississippi Management and Reporting System Committee Steering Committee Meeting, September 20, 1993).

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Intensive involvement of the user community continues for SPAHRS in all facets of design, testing, and other forms of validation. DFA does acknowledge, however, that State agencies find it difficult to do their regular jobs and implement projects of the scope and magnitude of SPAHRS. DFA, with SPB and ITS, attempted to ensure that fully qualified users were assigned full-time to SPAHRS. Even with the full-time commitment of staff, there were times when these same staff had to be pulled back by the respective user agencies to meet existing statutory and regulatory business operations. When this occurs, the project time line can, will and did expand.

DFA concurs that a project's feasibility must be fully explored. We caution, however, that feasibility studies must be accomplished timely with respect to the development of an RFP and initiation of a contract. If not, the effort is wasted due to the changes in the operating environment (political and practical) of the entity and the aggressive changes in technology. We believe these criteria were met for SPAHRS. We specifically believe that it is critical that agencies manage as a risk the potential impact a project will have on *all affected agencies'* ability to meet continuing day-to-day demands as well as meet the resource requirements for an effort of this magnitude.

The ITS Long Range Plan documents request resource commitments be estimated in terms of agency personnel costs and positions. This is extremely difficult across divisions of the sponsoring agency (DFA in this case) and almost impossible to do on an inter-agency project such as SPAHRS with a great deal of accuracy. This should be required as a component of risk management. We believe we managed this risk within the scope of available resources and made adjustments as were appropriate.

We also believe it is critical to understand the cost benefit to automate specific functions. If this is not a component of any required feasibility study, then the study will be without merit. For SPAHRS, an initial cost benefit was not done for all functions; however, throughout the life cycle of SPAHRS, we have made every effort to eliminate those requirements where the cost outweighs the benefit. This, we agree, is a matter of scope control, thus a risk to be managed. Our recommendation would be that once feasibility is determined, that more attention be given to on-going risk management.

DFA disagrees that ITS' input was not included in the review of credentials of potential vendors. In 1993, when the SPAHRS RFP was prepared, CDPA policy restricted the infrastructure to a mainframe ADABAS platform. ADABAS was, at that time, the database standard for the State and the only option open to us. This policy was changed after the initial SPAHRS bid was awarded. While DFA and SPB concurred that the mainframe was the appropriate platform for an application of this size and complexity, the ADABAS policy resulted in only two bids being received and evaluated.

The American Management Systems option was a "buy and modify" proposal similar to the SAAS implementation proposal in 1988-1989. The second bid was a "build from scratch" proposal from Deloitte and Touche. The bids, though diverse in approach, were very competitive. Both vendors

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had demonstrated in *other verified projects* the ability to build comprehensive payroll and human resource systems. Deloitte and Touche was awarded the contract based on their proposal to build this custom application using ADABAS and Natural 2. CDPA staff led the evaluation and selection process. Of the six members of the final selection committee, three were CDPA consultants. One of these was assigned full-time as the SPAHRS project manager, the second for all technical oversight of MMRS projects, and the third was the procurement analyst. Others involved in the selection process included user agency representatives and control agency representatives. (Reference: Recommendation of Award for the SPAHRS Project to the MMRS Steering Committee dated June 22, 1994.)

The SPAHRS project work papers clearly document vendor management issues. The initial Deloitte and Touche project manager was replaced approximately 6 months into the project due to failure to perform. Staffing issues were repeatedly addressed to the vendor and reported to the MMRS Steering Committee and ITS. In fact, one outcome of the initial SPAHRS agreement is that bidders for any DFA initiated projects *must now agree*, within certain constraints, to guarantee all proposed staff for the initial six months of an engagement.

MMRS, also at the direction of the MMRS Steering Committee and specifically at the direction of David Litchliter, Committee Member and ITS Executive Director, developed and implemented both functional and technical change management procedures. (Reference: MMRS Steering Committee Minutes, March 10, 1995, and April 18. 1995.)

In November 1995, discussions occurred between senior management of DFA and Deloitte and Touche regarding problems with SPAHRS. MMRS Steering Committee members were at all times involved in the project discussions and remedial activities.

The MMRS Steering Committee, with ITS concurrence, requested a joint QA review of SPAHRS in December 1995 due to the continuing problems with project management and lack of confidence in the vendor. The review was conducted by a senior QA specialist for Deloitte and Touche and a senior ITS consultant. The results were reported to the MMRS Steering Committee on January 12, 1996. The outcome of this report was the request by the MMRS Steering Committee for a face-to-face management discussion regarding the project. During this meeting with Deloitte and Touche in early February, remedies for the on-going problems were again discussed.

On February 26, 1996, Deloitte and Touche was notified by ITS of material breach of contract regarding SPAHRS. On March 20, 1996, ITS notified Deloitte and Touche that the breach had not been cured and on that same date filed a lawsuit (later withdrawn) against Deloitte and Touche in Hinds County Circuit Court. On April 8, 1996, the settlement agreement was signed by all parties and all efforts shifted toward continuation of SPAHRS to meet the objectives in the shortest possible time frame.

We disagree with the PEER finding that scope was not managed. In the government environment, it is not possible to prevent some change in scope. Both federal and state regulatory changes contributed to this for SPAHRS. Scope changes have been required to correct design deficiencies discovered in the original design, a possible issue that was identified to both the MMRS Steering Committee and the ITS Board when the continuation agreement with SAGA was approved. While not an issue in SPAHRS, with the aggressive changes in technology, scope changes must be considered to take advantage of proven technology improvements once cost benefit has been determined. This occurred in several instances in the MERLIN project.

Specifically cited was the change order for additional SPAHRS security and approval functionality. The user community identified these additional requirements at the implementation of the human resource functions. These enhancements were deferred until the basic payroll functions were operational and, in one case, until specifically required by one of the Legislative agencies. Several enhancements identified in this change order will never be implemented with those change order dollars redirected to provide significant documentation of the system for use of the State in long-term support of the system (a cost versus benefit comparison result).

Response to Recommendation 2

The SPAHRS project work papers also consistently document the quality assurance (QA) practices followed during the course of the project. Initially, a separate team was established to QA all SPAHRS efforts. Due to the need for additional business analysts for the development team, this process was refocused as a SWAT team to review, resolve, and track issues and the QA staff reassigned as project business analysts.

As the application moved to production status, the QA process again was expanded to accommodate final acceptance testing for all deliverables and all maintenance support changes. This process, fully qualified to the Office of the State Auditor with respect to the FY1998 financial audit and in place today, is consistently followed and includes extensive involvement of the user community in the definition of requirements and in the acceptance testing of system changes. (Reference: MMRS Policies and Procedures; Memorandum to Mary Jo Milner, Office of the State Auditor, regarding Reportable Condition - SPAHRS QA Function, December 21, 1998).

DFA disagrees that an annual independent quality assessment will add value to a project of this magnitude. "One time shots" are charged with "finding something". On-going quality assurance ensures a strong working relationship between the development/support community and the user community. If appropriate funding is available, a specifically empowered quality assurance function would add the most value but comes with a high price tag. Quality assurance analysts must be fully trained in all system functions, all cross application functions (for example: SPAHRS to SAAS and SPAHRS to MERLIN) and procedures as well as in all requirements, all project management

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trained in all system functions, all cross application functions (for example: SPAHRS to SAAS and SPAHRS to MERLIN) and procedures as well as in all requirements, all project management guidelines, and all project standards. Most agencies, including DFA, do not have enough qualified staff to do this and to be the lead business and technical analysts for the applications supported.

To a lesser extent, an annual quality assurance review would still come at a cost to the agency. Since DFA has continuously employed senior ITS analysts in all project areas to stretch our existing staff, it appears that outside entities would be required. Unless budgets are expanded to accommodate this, we would be forced to not use ITS consulting staff in order to adhere to the QA guideline. Under our present budget structure, we cannot afford to do both.

As noted earlier, all issues with SPAHRS, as well as with SAAS and MERLIN, have remained before the MMRS Steering Committee and have been reported to the ITS Board on a regular basis.

Response to Recommendation 3

As noted in the draft PEER report, DFA does capture all hours assigned to every project. These hours are used in establishing cost allocation parameters for staff as well as to determine how non-project related time is expended.

From the very beginning of MMRS, all inception to date costs for all projects are appropriately allocated to a project. These include direct costs including costs associated with the vendor and include indirect costs such as pro rata shares of networks, training facilities, and office equipment. DFA uses the SAAS organizational structure to budget and track expenditures.

The estimated costs for each application are requested annually by project in the DFA budget request. To our knowledge, the only indirect costs not estimated/captured are those of agency personnel outside of MMRS for DFA and in external agencies who participate in SPAHRS (or other related application activities). Life cycle to date costs are reported annually in each application plan document in the MMRS Long Range Plan submitted to ITS each August. Additionally, as a component of the DFA budget request, performance measures are set for deliverables to be accepted each year with the actual number accepted documented and exceptions noted.

Appropriate cost benefit analysis and risk management practices would include estimation and tracking/reporting of all costs. Regarding SPAHRS, this information can be made available from all budget requests and SAAS organizational reports from FY1994 forward.

As noted earlier, reasons for delay and proposed remedies are regularly reviewed with the MMRS Steering Committee and with the ITS Board, when requested.

Response to Recommendation 4

DFA concurs with the PEER recommendation that all costs related to a project, regardless of funding source, be reported. We strongly disagree, however, that specific identification of funds per project is the appropriate means for accomplishing this objective.

As noted, DFA uses the SAAS organizational budget structure to estimate costs and track expenditures. Multiple funds can be tied to a SAAS organization. In this manner, for example, a project using both general and special funds can be tracked and reported in the same structure with expenditures being appropriately allocated to the funding source. *All fund sources cannot be captured if a specific fund is assigned for the project since there is no way to mix general and special funds in a single fund.* Additionally, requests have been made to separate federal funds from other special funds for tracking of how federal dollars are used in Mississippi. Under that scenario, in planning at this time, there may be three or more unique funding sources tied to a project. These could all be tracked through the organizational budget.

General Issues

On the chart on page 4 of the draft, the Financial Management System (FMS) was identified as a DFA project. FMS is a project of the Department of Transportation. This application feeds data to SAAS and SPAHRS and receives data from these systems; however, the development and support of this application is not the responsibility of DFA.

Conclusion

If there are any questions regarding our response, please direct these to Cille Litchfield, MMRS Administrator, at (601) 359-1433 or via email at **litchc@mmrs.state.ms.us**.

Sincerely,

Edward L. Ranck
Executive Director

ELR:CL:at

cc: David Pray

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