

An Audit Report on

Post-Implementation Reviews of Information System Development Projects



Office of the State Auditor
Lawrence F. Alwin, CPA

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Key Points Of Report

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Overall Conclusion

The Post-Implementation Evaluation Reports (PIERs), as requested by the Quality Assurance Team, are working toward improving accountability for development of information systems which require such reports. Agencies not required to submit *PIERs* could benefit from similar post-implementation reviews. Without such evaluations, state leadership and management can not objectively know whether the benefits and objectives are met by new systems. We found that in some cases we are not achieving expected results and that in other cases where systems are not monitored by the Quality Assurance Team, we are not in a position to determine whether the State received the intended benefit for the dollars expended.

The guidelines for preparing the *PIERs* need improvement to provide even more accountability information to agency management to further lessen the risk of project failure or potential problems. For example, they can require that a comparison of budgeted costs to actual costs be reported. The development costs of the systems which we audited and surveyed totaled more than \$88 million.

Key Facts And Findings

- Four out of six *PIERs* and corresponding evidence for new systems audited indicate that functional objectives and benefits are met; however, two systems are not meeting their objectives yet.
- For systems requested by the Quality Assurance Team to have *PIERs*, several improvements are needed. Agencies need to better follow the Quality Assurance Team's reporting guidelines, ensure more adequate system development methodologies are used, report quantifiable performance measures, and better track and report total costs. However, we found that inadequate *PIERs* did not necessarily indicate inadequate systems. Agency management and Information Resource Managers should ensure that improvements in these areas are made. The Quality Assurance Team can better monitor the adequacy of the *PIERs*.
- Management at other state agencies surveyed do not always recognize the need for post-implementation reviews. There are a variety of system development methodologies which do not always include a final review of the project or the functionality of the system. The Quality Assurance Team and Department of Information Resources should realize the statewide potential for post-implementation reviews and better promote the benefits of them.

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Executive Summary

Post-Implementation Evaluation Reports (PIERs) and related evidence for four out of six system development projects selected for review demonstrated that planned objectives and benefits are met. However, improvements are needed in the evaluation processes and cost reporting, as well as the guidelines used to produce the reports. These projects were required to have reports sent to the Quality Assurance Team.

The Quality Assurance Team, as authorized by the General Appropriations Act, monitors major information resource projects according to the assessed risk of the projects. The team is composed of staff from the State Auditor's Office and Department of Information Resources.

Management across the State not asked by the Quality Assurance Team to report such evaluations indicate they are not aware of the benefits of post-implementation reviews. Eight new systems had no plans for such a review or equivalent formal evaluation. The remaining 11 systems had plans to perform evaluations or audits, but typically not of the caliber that the Quality Assurance Team requests.

Agencies in this audit are spending over \$88 million to implement new systems.

Six systems with PIERs	\$52,130,000
Nineteen surveyed systems	33,494,351
Two planned systems	3,173,455

We strongly believe that a system development project should include a post-implementation review. This has always been an expected standard phase of a comprehensive system development methodology. Research indicates there are several methodologies for conducting such

reviews. Therefore, we are not necessarily promoting the *Guidelines for Quality Assurance Review* as the state standard for performing post-implementation reviews. These guidelines are published by the Quality Assurance Team. Post-implementation reviews are significant because they assess the effectiveness of a system in meeting user needs. They can be a valuable assessment tool in measuring whether original promises of such factors as cost savings, increased productivity, and greater accuracy are achieved.

Four Out of Six Post-Implementation Evaluation Reports Selected for Review Indicate That Planned Project Objectives and Benefits Are Met

Evidence of meeting planned objectives and benefits exists for four systems. These systems include:

- S. B. 1/Workers' Compensation (71st Legislature, Second Called Session) at the Texas Department of Insurance
- Student Information Management System at The University of Texas Medical Branch in Galveston
- Patient Care System at The University of Texas M.D. Anderson Cancer Center
- Strategic Tax Application Redesign at the Texas Employment Commission

Two systems which have not yet achieved the objectives and benefits are:

- Integrated Client Encounter System at the Texas Department of Health
- Automated Case Management System at the Texas Youth Commission

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As of the date of the *PIERs*, as well as the date of the audit, not all regional sites for these two agencies had the new systems installed. Therefore, a thorough determination of objectives and benefits could not be made. The *PIER* for the Integrated Client Encounter System could have been better used to evaluate whether the objectives and benefits were obtained for the pilot sites. Also, there was some indication of user dissatisfaction and reluctance in using the new Automated Case Management System.

Improvements Are Needed in Post-Implementation Evaluation and Reporting Processes

This round of *PIERs* was a learning experience for the agencies and universities involved. We found that none of them adequately followed the reporting guidelines developed by the Quality Assurance Team. The guidelines called for the following items:

- project statement of need
- benefits and outcome measures
- project costs
- overall impact to the organization

When the guidelines are not adequately followed, it is difficult to tell if just the report was poorly done, or the system was inadequate, or both. We found improvements are needed in the process of conducting the *PIERs*. Policies are needed to compensate for missing phases when a third-party contractor uses their own methodology. Quantifiable performance measures of the benefits were difficult to do and only two of the *PIERs* had quantified benefits.

Total reported costs in a majority of the reports were incomplete. Personnel time was

inconsistently reported. There was an inadequate cost-tracking process for two projects. Impacting the cost reporting is the guideline developed by the Quality Assurance Team.

Improvements are needed in the reporting guidelines to better communicate expectations and requirements for the *PIERs*. The guidelines may be confusing and lack necessary how-to information. Operating cost definitions are not clear and there needs to be a specific instruction for agencies to compare the budgeted costs to actual costs. User time costs vary from system to system because the different versions of the instructions for the *Biennial Operating Plans for Information Resources* specify different approaches to planning personnel time for new systems.

Statewide Management Does Not Always Know to Expect Post-Implementation Reviews

While the surveyed agencies generally do not know to expect post-implementation reviews of the caliber that the Quality Assurance Team requires, several had planned some type of system evaluation or audit. Eight out of 19 surveyed agencies had no plans for a formal post-implementation review or equivalent formal evaluation for new systems.

Improvements are needed to system development methodologies across the State. There are a variety of in-house and purchased methodologies and not all of them have a post-implementation review phase. In addition, research on methodologies for performing post-implementation reviews indicates there are a variety of approaches.

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Two projects in the early planning phase which we visited, the Voter Registration/Jury Wheeling System at the Secretary of State and the Crash Records System, a joint project between the Department of Public Safety and the Texas Department of Transportation, indicate additional preliminary outcome measures and baseline measurements are needed. Additionally, a comprehensive system development methodology should exist prior to project development in order to compensate for deficiencies or gaps in a third party contractor's methodology.

Issue for Further Study

There does not appear to be a mechanism to report and compare total project costs statewide. Without a cost allocation function or major information system which would facilitate this reporting, state leadership cannot know total expenditures for system development projects, cannot objectively make outsourcing comparisons, or compare systems on a cost basis.

Summary of Management's Responses

We made recommendations to agency management, Information Resource Managers, and the Quality Assurance Team in order to enhance accountability for costly projects. Management concurs with the recommendations included in this report, within limits of available resources, and has begun implementation of the recommendations.

Summary of Audit Objectives and Audit Scope

The objective of the audit was to determine if benefits from information system development projects have been achieved as estimated before development, and if the benefits have been evaluated after implementation of the systems.

We assessed whether six *Post-Implementation Evaluation Reports* (as requested by the Quality Assurance Team) followed reporting guidelines and whether project files showed evidence of a valid evaluation and reporting process at each represented agency. We made assessments of user satisfaction with the systems. We performed desk reviews of the remaining ten *PIERs* which had been submitted to the Quality Assurance Team. We evaluated whether they followed reporting guidelines and whether they had reported the required information. Overall, we focused on significant software projects as opposed to just hardware upgrades or hardware installations.

Next, we surveyed 19 other systems recently completed which have not been asked by the Quality Assurance Team to submit a *PIER*. This included nine systems greater than \$1 million and ten systems less than \$1 million. We asked whether any type of post-implementation review had been done or was planned.

We also looked at two projects in the early planning phase. We determined whether quantified benefits and objectives were being formulated, and whether a system development methodology was being used which would result in a post-implementation review.

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Section 1:

Four Out of Six *Post-Implementation Evaluation Reports* Selected for Review Indicate That Planned Project Objectives and Benefits Are Met

Evidence of meeting planned objectives and benefits exists for four systems which were required by the Quality Assurance Team to have *Post-Implementation Evaluation Reports (PIERs)*. These include:

- S.B. 1/Workers' Compensation (71st Legislature, Second Called Session) at the Texas Department of Insurance
- Student Information Management System at The University of Texas Medical Branch in Galveston

Why Are *PIERs* Requested?

In accordance with Article V of the General Appropriations Act, Sect. 133, and S. B. 381, (73rd Legislature) the Quality Assurance Team selects systems to have *PIERs* because the projects are determined to be high risk and where failure of the system would result in adverse consequences to the agency and/or the State.

The Quality Assurance Team has identified 21 systems for which they have requested *PIERs*. Sixteen reports have been submitted. The other *PIER* reports are pending.

Systems determined to have lower risk and less adverse impact do not have *PIERs* requested by the Quality Assurance Team. However, post implementation reviews should be reported to agency management regardless of system risk.

The Quality Assurance Team is composed of individuals from the State Auditor's Office and the Department of Information Resources. This team monitors major information resource projects according to the amount of risk which is assessed for the projects.

- Patient Care System at The University of Texas M.D. Anderson Cancer Center
- Strategic Tax Application Redesign at the Texas Employment Commission

Two systems which have not yet achieved the objectives and benefits are the:

- Integrated Client Encounter System at the Texas Department of Health
- Automated Case Management System at the Texas Youth Commission

We evaluated the reports against the reporting guidelines and examined project files at the respective agencies and universities. The benefits and objectives for these systems are described in Figure 1 on the next page.

Figure 1

Systems, Benefits, and Objectives

Systems	Benefits and Objectives
S.B. 1/Workers' Compensation	<ul style="list-style-type: none"> • Allow the Department to comply with Senate Bill 1. • Eliminate overhead in maintaining stand-alone systems. • Eliminate duplication of data entry. • Provide on-line access to data for querying or updating. • Facilitate the regulation of Workers' Compensation Insurance. • Provide diskette filings in the Financial Statistical Data System. • Cycle out other systems on other platforms. • Allow more timely response to open records requests.
Student Information Management System	<ul style="list-style-type: none"> • Automate current manual procedures to permit more accurate and efficient services and to provide additional services without adding personnel. • Integrate the academic systems to eliminate error-prone redundant data entry. • Provide more accurate, required reports and ad hoc reporting capabilities. • Provide automated prerequisite and academic history validation to eliminate errors that could affect a student's graduation date. • Provide touch-tone telephone/voice response registration and access to applicant and student information to better serve applicants, students, faculty, and staff.
Patient Care System	<ul style="list-style-type: none"> • Improve operational efficiency. • Enhance institutional revenue. • Provide more timely and easier access to information. • Improve data accuracy.
Strategic Tax Application System Redesign	<ul style="list-style-type: none"> • Make application less labor intensive and more technically up-to-date. • Enhance the ability to identify, classify, and collect delinquent taxes. • Provide timely status liability determinations. • Improve tracking and management of performance measures.
Integrated Client Encounter System	<ul style="list-style-type: none"> • Perform mandated federal reporting. • Allow clinic personnel to review patient service histories as new services are administered. • Provide outcome measures to evaluate the effectiveness of programs. • Reduce the labor of manual forms and processes. • Maximize Medicaid reimbursement for billed services.
Automated Case Management System	<ul style="list-style-type: none"> • Give the Primary Service Worker the information he/she needs to give the youth the best service possible with the least required resources. • Lay a foundation for expansion to other applications or systems.

In the case of the Integrated Client Encounter System, the *PIER* was actually performed on the pilot at two locations. As of the date of the evaluation report, as well as the date of the audit, not all regional sites had the new system installed. Therefore, a thorough determination of the attainment of objectives and benefits could not be made. We feel that the *Post-Implementation Evaluation Report* could have been better used to evaluate whether the objectives and benefits were obtained for the pilot. Instead, it focused on how effective the implementation process was.

Regarding the Automated Case Management System, not all regional sites had implemented the system at the time of the *PIER* or the audit. Even still, there was some indication of user dissatisfaction and reluctance in using the new system.

Section 2:

Improvements Are Needed in Post-Implementation Evaluation and Reporting Processes

We determined improvements are needed in the post-implementation review processes, the cost reporting, and the guidelines used to produce the *PIER* reports. All six of the *Post-Implementation Evaluation Reports (PIERs)* selected for review did not adequately follow the reporting guidelines and did not contain all the required pieces of information. On-site audits of project files for the projects indicated that evaluation processes lacked key policies and procedures. Furthermore, reported costs for projects were incomplete.

Section 2-A:

None of the Agencies Adequately Followed Reporting Guidelines

We determined that the agencies did not completely follow the recommended *Guidelines for Quality Assurance Review* which were available in final form in February 1994. These guidelines have seven categories where specific information is to be documented in the *PIERs*. We acknowledge the fact that the agencies had already started the development of several of these systems before the guidelines were published, thus making it difficult, if not impossible, for the agencies to have measured the baseline outcome measures. For example, the S.B. 1/Workers' Compensation project was initiated in January 1990 and was completed in November 1993. The *PIER* was completed December 1, 1994.

We reviewed the six *PIERs* to determine if the required information was provided. Figure 2 notes which *PIERs* did not have the required information. We also performed desk reviews of the remaining ten *PIERs* which were not selected for site visits. These reports also did not adequately follow the reporting guidelines.

We should point out that one should not necessarily conclude that the systems are inadequate if the *PIERs* are inadequate. This would be easy to conclude, but our site

visits indicated otherwise for a majority of the systems audited. Specifically, this applies to the Patient Care System and S.B. 1/Workers' Compensation System. Nevertheless, when the guidelines are not adequately followed, it is difficult to determine if the *PIER* was inadequate or the system was inadequate, or both. Without adequate reporting, management and state leadership cannot properly make a comprehensive assessment about information system projects statewide.

Figure 2

Comparison of *PIERs* to Reporting Guidelines ("X" denotes guidelines which were not met)

	Services & Deviations from Original Designs	Executive Overview of the Technical Design	Statement of Need	Baseline for Outcome Measures	How the system changed the organization or services	Final Outcome Measures	Actual and projected costs
Sen. Bill 1/ Workers' Compensation		X		X		X	
Student Information Management System						X	X
Patient Care System		X	X	X		X	X
Strategic Tax Application Redesign		X					
Integrated Client Encounter System	X	X	X	X		X	X
Automated Case Management System						X	X

Recommendations:

We recommend that agency management ensure that their agencies follow the *Guidelines for Quality Assurance Review* when conducting *PIERs* in order to report the required information. Additionally, the Quality Assurance Team can better monitor the *PIERs* to ensure that the *PIER* guidelines are followed.

Management's Responses:

Agency managers concur with the recommendations. Specific agency responses can be found in Appendix 4.1. The Quality Assurance Team responses in Appendix 4.2 concur within limits of available resources.

Section 2-B:

Improvements Are Needed in the Evaluation Process

We identified needed improvements to the agencies' post-implementation review processes. These improvements will result in better and more reliable post-implementation review evaluations.

Components of a Project Development Plan

Major Project Deliverables
Completion Dates
Staffing Plans
Testing Plans
Training Plans

Maintaining project and planning documentation -The S.B. 1/Workers' Compensation at the Texas Department of Insurance and the Patient Care System at The University of Texas M.D. Anderson Cancer Center did not have complete documentation readily available on their respective automation projects because these documents were not properly maintained. There was no overall documented system development plan for the Automated Case Management System at the Texas Youth Commission.

Standard system development methodology control principles recommend that project documentation be developed and be centrally retained. Project documentation is necessary to perform post-implementation reviews and for third-party examinations. In addition, documentation allows for the planning of future automation projects. Past efforts can provide a rule of thumb on new ventures.

Phases of a Comprehensive System Development Methodology

Developed System

Needs analysis/Feasibility Study
Design
Development
Testing
Implementation
Post-Implementation Review
Maintenance

Packaged System

Needs analysis/Feasibility Study
Selection
Customization
Testing
Implementation
Post-Implementation Review
Maintenance

Consistently using a comprehensive system development methodology on all automation projects - Three agencies had methodologies that they did not adequately follow. Two agencies did not have comprehensive methodologies at the time the selected systems were developed. By "comprehensive," we mean the methodologies did not include a formal post-implementation review phase. Nevertheless, the agencies prepared the *PIERs* because they were asked to do so by the Quality Assurance Team. Automation projects, either developed or purchased, should follow a system development methodology to help ensure project success and ensure that the project's objectives are met.

Without a methodology, projects are at a higher risk for not meeting user needs and system objectives. And, without a formal post-implementation review phase, agency management is less likely to be able to adequately evaluate project strengths and weaknesses for input into future development projects.

Providing policies when a third-party contractor uses their own methodology for development and implementation - We determined that agencies do not have formal policies when automation projects are developed by third- party contractors and consultants. In these cases, it may be more cost-effective to use a vendor's methodology, which some did. However, a vendor's methodology may not be applied to the implementation or maintenance phases. As a result, any deviations from the agencies' formal system development methodologies could cause failure in reporting the results of implementation. Agencies assume the risks associated with maintaining systems after the contractors leave.

For example, the Texas Employment Commission contracted a third-party consultant for the development of their Strategic Tax Application Redesign project. In addition, the Student Information Management System at The University of Texas Medical Branch in Galveston was a purchased system implemented with the vendor's methodology. In each case, the contractor's system development methodology was used to complete the project. Formal agency policies requiring a post-implementation review did not exist. Without formal agency policies, any deviations from agencies' approved system development methodologies could result in post-implementation reviews not being performed when third-party system development methodologies do not require one. As a result, there is no assurance of management's expectation of an assessment of the success or failure of the project, a determination of how much was spent, and if system objectives have been achieved.

In another case, the Integrated Client Encounter System project at the Department of Health (the Department) used contracted project management, software development, and project monitoring. Now, since the contractors are no longer working on the project, the Department bears all the risks inherent in maintaining and implementing the system. More than \$9 million in expenditures are projected for the next four years. However, at the time of the audit, there was no departmental requirement that a final review be done to determine if the system met its objectives.

Recommendations:

Agency management and Information Resource Managers should take the following actions to improve the post-implementation evaluation and reporting processes and strengthen oversight over automation projects:

- Retain project planning and monitoring documentation.
- Develop policies and oversight procedures when gaps or deficiencies in a contractor's development methodology exist.

- Consistently use comprehensive system development methodologies. Any deviations from agency methodologies should be properly documented and approved by agency management.

Management's Responses:

Agency managers concur with the recommendations. Specific agency responses can be found in Appendix 4.1.

Section 2-C:

Four of the *Post-Implementation Evaluation Reports Reviewed Did Not Mention Quantified Performance Measures*

Only two *PIERs* reported quantified benefits received from system implementation. The others did not contain quantified performance goals and benchmarks required to properly measure final outcomes. The *Guidelines for Quality Assurance Review* require outcome measures to evaluate whether or not the project meets its business needs and to measure efficiencies gained. *Biennial Operating Plans* also require identification of planned, quantified benefits. Specifically, we noted the following:

- The only outcome measure for the S.B. 1/Workers' Compensation project at the Department of Insurance was if the system was implemented or not. This is not a quantified measure.
- The benchmarks for the Student Information Management System at The University of Texas Medical Branch in Galveston were those related to automation of manual procedures. We acknowledge that the University is in the process of developing agency-wide performance measures and goals.
- Quantified performance data and final outcomes were lacking in the *PIER* on the Patient Care System at The University of Texas M.D. Anderson Cancer Center.
- The Automated Case Management System at the Texas Youth Commission did not include specific performance measures.

We determined the most probable cause of omission was a lack of projected goals and benefits in the initial planning of the projects. Another reason may be that the *Guidelines for Quality Assurance Review* were published after the projects were started. Therefore, agencies were not aware of a requirement to prepare baseline measures. As a result, an analysis of projected and actual realized benefits from the systems was not properly reported in the *PIERs*.

Without quantified outcome measures, it is difficult to objectively determine if a project was successful in terms of increased productivity, fewer errors, more useful reports, etc. Therefore, the actual impact on business services is not known. Agency management, state leadership, and citizens do not know the return on the investment or if the appropriations were spent wisely.

Recommendation:

We recommend that agency management ensure that their agencies establish performance measures, take baseline measurements on the old system, and take final measurements on the new system. The State Auditor's Office has prepared the *Guide to Performance Measurement* (SAO Report No. 95-158, August 1995) that may be useful in developing and using performance measures.

Management's Responses:

Agency managers concur with the recommendations. Specific agency responses can be found in Appendix 4.1.

Section 2-D:

Reported Costs for Projects Are Incomplete

Reported Project Costs	
Senate Bill 1/Workers' Compensation	\$ 1.28 million
Student Information System	\$ 1.7 million
Patient Care System	\$ 17.75 million
Strategic Tax Application Redesign	7.4 million
Integrated Client Encounter System	\$ 23 million
Automated Case Management System	\$ 1.2 million

Project costs in four of the reports were not complete. The guidelines developed by the Quality Assurance Team are impacting the cost reporting processes. The guidelines on costs appear confusing and lack definite information on what costs should be tracked and when. (See Section 2-E.) More specific instructions for agencies are needed to ensure consistent cost reporting.

Of the agencies reviewed, only the Texas Employment Commission and the Department of Health had adequate cost tracking procedures. These procedures allowed the agencies to make cost comparisons between budgeted and actual expenditures and report the final project costs in the *PIERs*. We determined the remaining four agencies did not have adequate cost-tracking procedures.

Project costs, both planned and actual, were not comprehensive and conclusive. Costs such as user costs for needs analysis, design, testing, and training, are legitimate costs and should be reported. As a result, management is made aware of the true costs of the projects and extent of user involvement. In addition, it allows for present and future planning for impacts on business operations, scheduling, and staffing needs.

Specifically, we noted the following:

- Final costs of the Student Information Management System at The University of Texas Medical Branch in Galveston did not include those costs associated with user participation.
- The initial project management methodology used for the Patient Care System at The University of Texas M.D. Anderson did not include adequate project cost tracking procedures and policies. We acknowledge that procedures are now in place to properly track and report costs on current automation projects.
- Project costs for the S.B. 1/Workers' Compensation System at the Department of Insurance did not include user participation.
- There were no cost-tracking procedures or policies used for the Automated Case Management System at the Texas Youth Commission. Therefore, comprehensive project costs were not reported.

Recommendation:

We recommend that agency management ensure that their agencies better track and report comprehensive project costs.

Management's Responses:

Agency managers concur with the recommendations. Specific agency responses can be found in Appendix 4.1.

Section 2-E:

Improvements Are Needed in the Reporting Guidelines

We identified areas in the Final Review Section of the *Guidelines for Quality Assurance Review* that appear confusing and lack necessary information. These are noted as follows:

Cost Reporting -The *Guidelines for Quality Assurance Review* mention only three broad categories of costs: Personnel, Operating, and Capital Expenditures. However, the agencies' *Biennial Operating Plans* are required to report costs in many more specific categories.

The *Guidelines* do not specify how costs are to be reported other than all project expenditures should be well documented. We noted that the total reported costs in a majority of the *Post-Implementation Evaluation Reports (PIERs)* were incomplete. Figure 3 demonstrates the differences in cost reporting.

Figure 3
Comparison of Instructions and Guidelines

<i>Agency Operating Plan Instructions 1992</i>	<i>How to Prepare the Biennial Operating Plan 1996-1997</i>	<i>Guidelines for Quality Assurance Review 1994</i>
Staff Salaries & Fringes	Information Resources Salaries ⁽¹⁾	Personnel
Training	Information Resources Training	Operating
Operating Supplies	Supplies	Capital Expenditure
Consultant Contracts	Contract Services, Consultant	-
Contract Services	Contract Services, Non-consultant	-
Interagency Contracts	-	-
Software Licenses	Software	-
Maintenance	Software Maintenance Hardware Maintenance Telecommunications Maintenance	-
Telecommunications	Voice Telecommunications Data Telecommunications	-
Other	Other	-
Planned Hardware/ Software	Telecommunication Hardware Computer Hardware	-
Indirect Costs	-	-

⁽¹⁾ Does not include user staff that did not spend more than 50 percent of their time on the project.

User Time Reporting - User costs reported will vary depending upon which biennial operating plan instructions were used, if any were used at all. The older instructions differ on charging user time to the projects from the current instructions. However, the reporting guidelines do not provide information as to how user costs are to be tracked and charged. This could easily lead to a discrepancy between the user costs reported in a *Biennial Operating Plan*, which has strict requirements, and the *PIER*, which has no specific requirements. Indeed, we found that personnel time was inconsistently reported in the *PIERs*.

Operating Cost Requirements - Differences exist in the operating cost reporting requirements for the new biennial operating plan instructions, the old biennial operation plan instructions, and the *Guidelines for Quality Assurance Review*. The old instructions do not require future operating cost projections. Most of the *PIERs* we examined were from projects started under the old instructions. Since operating cost projections were not required, these agencies may have had difficulty creating realistic projections for the *PIERs*.

Cost Comparison - In addition, there are no specific instructions for comparing budgeted costs to actual costs in the reporting guidelines. Agencies may not know how to perform a proper comparison of budgeted costs to actual costs, or how to report results. As a result, agencies are inconsistent in reporting costs associated with automation. Without better defined cost guidelines and instructions, information reported in the *PIERs* may not be correct or contain necessary information, and true cost benefit analysis cannot be done.

Recommendations:

We recommend the Quality Assurance Team enhance the *Guidelines for Quality Assurance Review (Guidelines)* with better defined costs that should be reported in the *PIERs*.

- It would be advantageous for the *Guidelines* to request that costs be reported in a manner similar to the *Biennial Operating Plans*. This would reduce confusion for the agencies and help the Quality Assurance Team ensure that all costs were reported.
- The *Guidelines* should specify how user costs are to be tracked and reported in order to avoid discrepancies.
- Be aware that operating costs may be inconsistently reported when different *Biennial Operating Plans* are used in the planning of costs and determine if clarifications are needed in the *Guidelines*.
- Add instructions to compare budgeted costs to actual costs.

Management's Responses:

The Quality Assurance Team concurs with the recommendations. The responses can be found in Appendix 4.2.

Statewide Management Does Not Always Know to Expect Post-Implementation Reviews

The Quality Assurance Team has prompted many agencies to prepare *Post-Implementation Evaluation Reports*, and thus insist on a measure of accountability in order to determine if the benefits provided by the systems equal or exceed the costs to develop them. Other systems have fallen outside this requirement and could still benefit from internal reviews. Too often, a new system is advertised as a necessary improvement over an existing system or systems, but without a post-implementation review, project deficiencies might not be apparent until the system fails to provide promised functionalities, or the costs turn out to be much greater than expected. By then, it may be too late to hold a contracted vendor responsible for corrections or too costly to make necessary changes. It may also cause frustrating delays when later changes or corrections are made or on-going delays when some functions or objectives are not met at all. Such disappointments are noted in prior State Auditor reports, especially *Texas Lacks Effective Controls for Developing Automated Information Systems*, (SAO Report No. 93-038, February 1993.)

Post-implementation reviews can help as a checkpoint. Large systems are frequently phased in, and a post-implementation review of the pilot and the major system implementation can help determine what works well, what doesn't, and what project management processes can be improved. A contractor can be required to bring the system to meet contracted expectations before final payment is made, or necessary improvements can be made before the new system is too integrated with all other processes in an agency.

We conducted surveys on 19 selected systems implemented within the last three years to determine if post-implementation reviews had been performed or were planned. Eight systems had no evidence for having conducted or planned post-implementation reviews or equivalent evaluations. Also, the surveyed agencies generally do not know to expect post-implementation reviews of the caliber that the Quality Assurance Team requires. For a list of the surveyed systems and selection procedures, see Appendix 1. We also found that two systems in the planning stages needed better preparation and development of outcome measures. Improvements are needed in the system development methodologies used across the State so that they contain a post-implementation review phase.

Section 3-A:

Eight New Systems Surveyed Out of 19 Had No Plans for Reviews

Eight systems implemented within the last three years lacked evidence of post-implementation reviews or plans for such reviews. The agencies expect to spend approximately \$7,146,807 for these systems. Three of the systems cost over \$1 million each.

Without post-implementation reviews of these systems, management and key participants will miss the benefits available from a constructive evaluation of the system or the process used to develop the system. How well the system improved the previous processing, or if it did at all, cannot be objectively determined. Post-implementation reviews could help management know whether the funds were well spent instead of just assuming that they were.

Surveyed personnel expressed interest in knowing more about performing the reviews. Findings were distributed to these agencies and the responses indicated management has taken steps to implement post-implementation review processes.

Section 3-B:

Surveyed Agencies Generally Do Not Perform Reviews of the Caliber That the Quality Assurance Team Requests, But Several Had Planned Some Type of Evaluation or Audit

The *Guidelines for Quality Assurance Review* require that quantified performance measures be designed, that baseline measures be taken before the final system is implemented, and that final performance measures be taken. The measures are to be used to assess whether expected benefits and objectives have been achieved. Nevertheless, the surveyed agencies who had reviewed or planned reviews of their systems typically did not design and use quantified performance measures. For the most part, they either conducted internal audits of system functionality or involved key users and technical personnel in comparing the final system to the contract for the system. The *Guidelines for Quality Assurance Review* were sent to several of these agencies in order to expand or enhance their in-house methodologies.

The tightening of public resources has caused increased attention to be focused on waste, abuse, and inefficiency in government. Greater pressure has been exerted on officials to be accountable for the use of public resources. Without quantified performance measures, a true and objective cost benefit analysis of major new systems cannot be performed. Advertised or promised cost savings, productivity gains, reductions in resources, or other benefits cannot be evaluated effectively.

Outcome indicators can provide a basis for developing efficiency (cost-effectiveness) indicators when compared with inputs. Relating outcomes to resources used can provide important additional information to elected officials and the public about the cost of the results of program activities, thereby enabling them to consider the value of the service relative to its resource requirements.

Improvements Are Needed in System Development Methodologies Statewide

Why perform a post-implementation review?
What is a post-implementation review?
Who should perform a post-implementation review?
When should a post-implementation review be performed?
What about reviewing a small system?

See Appendix 5 for the answers to these questions.

Improvements are needed to the system development methodologies across the State. There are a variety of methodologies and some have post-implementation reviews and some don't. For example, the Stradis and Spectrum methodologies have the review phases, but the Method/1 methodology does not. There are several in-house developed methodologies used across the State and we found that some of them had the post-

implementation review phase as well. We strongly believe a system development methodology should include a post-implementation review. This has always been an expected standard phase of a comprehensive system development methodology. Research indicates there are several methods for conducting such reviews. Therefore, we are not necessarily promoting the *Guidelines for Quality Assurance Review* as the state standard for performing post-implementation reviews.

Our research of post-implementation review methodologies in Appendix 5 shows that there are several approaches to performing the reviews. This appendix was included to provide assistance in educating those interested in performing such reviews.

Recommendations:

Management and Information Resource Managers at state agencies and universities should make sure they have adequate system development methodologies and post-implementation review processes. Copies of the *Guidelines for Quality Assurance Review* were sent to some of the surveyed agencies. [Additional copies of the guidelines can be requested from the Department of Information Resources by calling at (512) 475-4700. Our research of post-implementation review methodologies is summarized in Appendix 5 and specific questions can be directed to the State Auditor's Office at (512) 479-4700.]

We would like the Quality Assurance Team and the Department of Information Resources to realize this statewide potential for their guidelines and for the need to ensure that a post-implementation review step exists in all agency system development methodologies. The Department of Information Resources can better promote the benefits of such reviews on a statewide basis.

A report issued by the State Auditor's Office, *The Guide to Performance Measurement*, (SAO Report No. 95-158, August 1995) can be of assistance in developing and using performance measures. A copy of this report was previously distributed to the executive head of each state agency and university. Additional requests for this report can be directed to the State Auditor's Office at (512) 479-4700.

The Governmental Accounting Standards Board has additional research publications on performance measures. GASB can be reached at (203) 847-0700, ext. 10.

Management's Responses:

Agency managers concur with the recommendations and have begun implementation of the recommendations. The Department of Information Resources concurs in Appendix 4.2 within limits of available resources.

Section 3-D:

Two Projects in the Planning Phase Need Additional Outcome Measures and Better Preparation

Projects in the Planning Stage

- **Voter Registration/Jury Wheeling System** at the Secretary of State (\$2,173,455 estimated cost)
- **Crash Records Information System** at the Department of Public Safety and the Department of Transportation (\$1 million estimated cost)

Two projects in the planning phase should have additional outcome measures and better preparation for post-implementation reviews. Without adequate quantified performance measures and plans for post-implementation reviews, the agencies may not be able to assess whether the projects' goals and objectives are obtained.

The following factors impact the agencies' ability to properly perform post-implementation reviews and report the results:

- **A comprehensive system development methodology should exist prior to project start-up.** A system development methodology has not been selected for the Crash Records Information System project. The Texas Department of Public Safety, the agency responsible for project leadership, has not used formalized project management methods, nor has the agency adopted a formal system development methodology. The Texas Department of Transportation, an agency participating in the project, is currently evaluating new system development methodologies.

A third-party contractor may be hired to develop the system and may be allowed to use their own development methodology. Typically, contractors do not provide later phases such as maintenance and post-implementation reviews. As a result, without an existing system development methodology in place which includes a post-implementation review phase, management may not adequately supplement a contractor's methodology if the contractor's methodology is deficient.

Similarly, we determined that a system development methodology that covers a post-implementation review is not in place for the Voter Registration/Jury Wheeling System project at the Secretary of State. This system is being developed by a contractor. The agency has not documented plans to apply their own system development methodology to the implementation phase which is not covered by the contractors. Without plans and preparation for a post-implementation review, there is no assurance that a post-implementation review will be performed.

For both projects, we determined that comprehensive project cost-reporting procedures are not in place. Therefore, comprehensive costs cannot be reported to agency management. When costs are not known, the cost/benefit analysis becomes unreliable, and post-implementation reviews cannot be properly done.

- **Additional preliminary outcome measures are needed as well as baseline measures.** Both the Crash Records and Voter Registration System/Jury Wheeling projects need additional planned outcome measurements as well as baseline measures. The *Biennial Operating Plans for Information Resources* requires the determination of performance measures for new projects.

We are suggesting baselines and final measurements to facilitate the post-implementation reviews and to clarify expectations for the users. Without specific performance measures, it is more difficult for management to objectively determine if the projects were successful. It is also more difficult to assess expected productivity, cost savings, or improved availability of information.

Recommendations:

We recommend that agency management and Information Resource Managers:

- Ensure that a formal system development methodology and a policy for its use exist prior to project initiation. Upon project completion, an assessment should be performed and documented in a post-implementation review.
- Ensure that management reviews the system development methodologies used by contractors and that existing agency methodologies are applied whenever deficiencies or gaps are identified.
- Ensure that project management procedures include comprehensive cost-tracking procedures. These would include procedures which track costs of hardware, software, information resources, and personnel time. Actual costs can then be monitored and retained for the cost benefit analysis of the post-implementation review.

- Develop additional outcome performance measures that represent impacts on user activities and business services. These measures should be quantified. The *Guide to Performance Measurement* (SAO Report No. 95-158, August 1995) developed by the State Auditor's Office may provide guidance in their development.

Management's Responses:

Agency manager's concur with the recommendations. Specific agency responses can be found in Appendix 4.3.

Issue for Further Study

There Is No Mechanism to Report and Compare Total System Development Costs Statewide

Total system development costs are not easily compared or evaluated because there is no mechanism to report the costs on a statewide basis. There are no standards for cost allocation for major system projects. For those systems reported "over threshold" in the *Biennial Operating Plan for Information Resources* in state agencies, planned costs are required to be broken down and reported in various categories. However, systems are not required to report final costs, except if so requested to in a *Post-Implementation Evaluation Report*. Neither the Uniform Statewide Accounting System (USAS) nor any other statewide system is used for this purpose. While there is a project profile for this purpose in USAS, this profile is not currently used. Caution should be used in comparing existing costs. Some total costs may contain user time and training costs, overhead, or operating costs, and some may not. Arriving at total costs for systems during this audit was difficult because cost-tracking systems are not rigorously used and documentation is not always kept.

The effects are that state leadership cannot compare the systems on a cost basis. Ultimately, true total costs cannot be evaluated against project objectives to arrive at a cost/benefit conclusion. Comparisons and decisions for outsourcing system development cannot accurately be made. Alternatives which may be considered are a rider which would accompany major system funding to require a post-implementation review and a mechanism which would be established by state leadership for cost reporting.

Objective, Scope, and Methodology

Objective

The objective of our audit was to determine if benefits from information system development projects have been achieved as estimated before development, and if the benefits have been evaluated after implementation of the systems.

Scope and Methodology

The scope included recently implemented systems which had been required by the Quality Assurance Team to produce *Post-Implementation Evaluation Reports*, systems which had not been required to have such reports, and planned systems.

Systems Required to Have Post-Implementation Evaluation Reports

In the first phase of the audit, we selected six *Post-Implementation Evaluation Reports (PIERs)* conducted by agencies. Factors that influenced the selection included significance in terms of dollars spent as well as impact to the State. The systems had been in operation for six months to a year. The systems also had received little or no previous or current audit coverage by our Office.

We performed desk reviews of the reports to determine if they followed the *Guidelines for Quality Assurance Review* and contained all required pieces of information. Next, we visited the agencies and universities to examine project files and to interview project leaders, users, managers, and other key personnel. We determined whether there was adequate evidence to support the reported information. Areas in these reports which we audited included:

- Description of services and deviations from original plans
- Executive overview of the technical design
- Statement of need
- Baseline for outcome measures
- How the system changed the organization or services
- Final outcome measures
- Actual and projected costs

The six *PIERs* and system development projects audited were:

System	Agency
S. B. 1/Workers Compensation	Texas Department of Insurance
Student Information Management System	The University of Texas Medical Branch in Galveston
Patient Care System	The University of Texas M.D. Anderson Cancer Center
Strategic Tax Application Redesign	Texas Employment Commission
Integrated Client Encounter System	Department of Health
Automated Case Management System	Texas Youth Commission

We performed desk reviews of the remaining 10 *PIERs* which had been reported to the Quality Assurance Team to determine if they had been prepared according to reporting guidelines and contained all required pieces of information. These systems were:

System	Agency
Claims Document Management System	Texas Department of Transportation
Texas Reference Marker	Texas Department of Transportation
Student Information System Phase I	The University of Texas Medical Branch in Galveston
Early Warning Project	Texas Department of Insurance
Common Data Architecture	Texas Department of Insurance
Texas Evaluation and Assessment Management	Department of MHMR
TXDOT's Executive Information System	Texas Department of Transportation
Optical Character Recognition Expansion	Comptroller of Public Accounts
Uniform Statewide Payroll System	Comptroller of Public Accounts
Uniform Statewide Accounting System	Comptroller of Public Accounts

Surveys of Recently Completed Systems

We surveyed other recently completed systems which have not been asked by the Quality Assurance Team to submit a *PIER*. They have been completed within the last three years. These included nine systems greater than \$1 million and ten systems less than \$1 million. We asked Information Resource Managers, project leaders, key users, and Internal Auditors whether any type of post-implementation review had been done or was planned.

The systems greater than \$1 million included:

System	Agency
Textual Oil Spill Information System	General Land Office
Automated Records Storage Management Systems	Texas State Library and Archives Commission
Fourth Generation Programming Project	Texas Commission for the Blind
Accounts Receivable Tracking System	Department of Human Services
Integration of Licensing	Texas Department of Agriculture
Patient Care System	The University of Texas Medical Branch in Galveston
Radiology/Laboratory Information System	The University of Texas Southwestern Medical Center
Integrated Library Expansion	University of Houston
Library Automation	Texas Tech University

The systems less than \$1 million included:

System	Agency
Refugee Data Center Project	Department of Human Services
Administrative License Revocation System	State Office of Administrative Hearings
Agents Licensing System	Texas Department of Insurance
Child Nutrition Programs	Texas Employment Commission
Financial Information System	The University of Texas Medical Branch in Galveston
Library Management System	Stephen F. Austin State University
Cash Flow System	Texas Higher Education Coordinating Board
Report Writing Systems	University of Houston System
Electronic Scheduling System	University of Houston System
Administrative Systems/New Student Records	University of Houston - Downtown

Identifying recently completed systems would have been very time-consuming if it had not been for the assistance of the Department of Information Resources (the Department) in sharing their data files of projects "over threshold." As the Department receives the *Biennial Operating Plans for Information Resources* from the agencies, projects over threshold are noted and logged in a data file. These systems are significant to the respective agencies in terms of cost. However, they do not make up the total population of all recently completed systems in the State. By using these data files, we felt that we were identifying systems that were the most significant to the agencies in terms of dollars spent as well as in importance to the agencies.

Two Systems in the Planning Phase

We visited two agencies in the early planning phase of system development projects. These projects were identified by the Department of Information Resources and the Quality Assurance Team. They were selected based on importance to the State as well as the phase of development that they were in at the time of the audit.

We interviewed key personnel and audited plans for the systems to determine if benefits and objectives were being formulated and quantified, and whether a system development methodology was being used which would result in a post-implementation review. These systems were:

System	Agency
Voter Registration/Jury Wheeling	Secretary of the State
Crash Records System	Department of Public Safety jointly with the Texas Department of Transportation

The following criteria were used:

- Statutory requirements
- *State Auditor's Office Project Management System: The Methodology*
- *State Auditor's Office Project Management System: The HUB*
- Other standards and criteria developed through the secondary research sources. (See Reference List in Appendix 6.)

This audit was conducted in accordance with professional standards including:

- Generally Accepted Government Auditing Standards
- Generally Accepted Auditing Standards

Other Information

This audit was performed by the following members of the State Auditor's Office:

- Judith Anderson Hatton, CISA (Project Manager)
- David P. Conner, CISA
- Jeffery A. Graham, MBA
- Frank Locklear, CISA
- James W. Story, CISA, CIA
- Paul H. Hagen, CPA (Audit Manager)
- Craig D. Kinton, CPA (Audit Director)

Background Information

Quality Assurance Reviews

Our approach was complicated, but greatly accommodated by the fact that there is an oversight process in the State which identifies high-risk systems and reviews the planning and development efforts of those systems. The Quality Assurance Team was established to ensure that all information resources projects are guided by the best quality assurance, project management and risk management procedures, and to conduct monitoring of such projects when deemed necessary or determined to be considered high risk. The team is composed of staff from the State Auditor's Office and the Department of Information Resources, as authorized by the General Appropriations Act.

High Risk - a project is defined as having a probability of failure and causing major consequences on the agency and/or the State if the project failed.

Medium Risk - a project has a medium probability of failure and will have some impact on the agency and/or State if the project failed.

Low Risk - a project has factors with a low probability of failure and/or there would be slight or no impact.

High-risk systems are selected based on the possibility of an act or event occurring that would have an adverse effect on the State, an organization, or an information system. Therefore, the systems that have been asked to document *Post-Implementation Evaluation Reports* are typically those systems having a high risk. However, all automation projects funded by the State should report results to management in a post-implementation review regardless of risk.

As of the date of this audit, 21 systems had been requested to have *Post-Implementation Evaluation Reports*. Agencies for 16 of these systems had submitted the *Post-Implementation Evaluation Reports*. The Quality Assurance Team's review efforts have generally focused on the early stages of projects, while this audit was concerned with the implementation reviews after the systems were implemented.

System Development Projects Previously Audited or Monitored

Several system development projects were passed over by this audit because they have been audited recently or are planned for an upcoming audit. The objective and methodology of these audits were not necessarily the same as this audit, but there were some similarities in the consideration of system development methodologies, project management controls, contract management, and integrity of the systems. These projects are noted in Figures 4 and 5.

Figure 4

System Development Projects Already Audited by the State Auditor's Office

Project/System	Agency	Audit Date	Type of Audit	SAO Report Number
Child and Adult Protective System	Dept. of Protective and Regulatory Services	1995	Economy/ Efficiency	95-003
Strategic Tax Application Redesign (STAR)	Texas Employment Commission	1996	Financial/ Compliance	Not reported yet
		1995	Economy/ Efficiency	95-090
Integrated Employees Benefit System (IEBS)	Employees Retirement System of Texas	1995	Economy/ Efficiency	95-090
Texas Child Support Enforcement System (TXCSES)	Office of the Attorney General	1995	Economy/ Efficiency	95-090
Electronic Benefits Transfer System (EBT)	Department of Human Services	1996	Financial/ Compliance	Planning Phase
		1995	Economy/ Efficiency	95-090
Accounts Receivable Tracking System (ARTS)	Department of Human Services	1995	Economy/ Efficiency	95-090
Early Warning	Texas Department of Insurance	Various	Various	89-065 91-015
Uniform Statewide Payroll System (USPS)	Comptroller of Public Accounts	1995	Financial/ Compliance	95-149
Uniform Statewide Accounting System (USAS)	Comptroller of Public Accounts	1995	Financial/ Compliance	95-046
		1995	Economy/ Efficiency	96-037
State Property Accounting System (SPA)	Comptroller of Public Accounts	1995	Financial/ Compliance	Reporting Phase
Human Resource Information System (HRIS)	Comptroller of Public Accounts	1995	Economy/ Efficiency	95-129

Figure 5

System Development Projects Monitored by the Quality Assurance Team

Report: <i>Quality Assurance Review of Information Resources Projects</i> , report by the Quality Assurance Team, January 1995.	
Objective: To determine if adequate project status reporting and other key project management processes were in place and functioning. The review of the project status reporting process determined if a detailed work plan, budgets, and a progress monitoring system were present.	
Systems:	Agency:
Electronics Benefit Transfer	Department of Human Services
Child and Adult Protective System	Department of Protective and Regulatory Services
Integrated Client Encounter System	Department of Health
Women, Infants and Children System	Department of Health
Digital Image Drivers License System	Department of Public Safety
Administrative Computing Upgrade	Lamar University
Industrial Manufacturing Information System	Texas Department of Criminal Justice
Early Warning	Texas Department of Insurance
Financial Resource Management System	Texas Education Agency
Report: <i>Quality Assurance Team Progress Report</i> , report by the Quality Assurance Team, December 1995.	
Objective: To report issues and the status of projects reviewed by the Quality Assurance Team in the FY 1994/1995 biennium in accordance with Art. IX, Rider 39, of the General Appropriations Act.	
Systems Monitored:	Agency:
Digital Image Driver's License System	Department of Public Safety
Administrative License Revocation	Department of Public Safety
Integrated Database Network	Health and Human Services Commission
Administrative Computing Upgrade Project	Lamar University
Texas Child Support Enforcement System	Office of the Attorney General
Industrial Manufacturing	Texas Department of Criminal Justice
Integrated Client Encounter System	Department of Health
Women, Infants, and Children's System	Department of Health
Immunization Tracking System	Department of Health
Electronic Benefits Transfer System	Department of Human Services
Accounts Receivable Tracking System	Department of Human Services

Figure 5 (continued)

System Development Projects Monitored by the Quality Assurance Team

Child Care Management System	Department of Human Services
Early Warning Information System	Texas Department of Insurance
Child and Adult Protective Services	Department of Protective and Regulatory Services
Primary Education Information Management System	Texas Education Agency
Financial Resources Management	Texas Education Agency
Integrated Funds Management System	Texas Education Agency
Texas School Telecommunications Access Resource	Texas Education Agency
Benefit System Redesign	Texas Education Agency
Federal Clean Air Act	Texas Natural Resources and Conservation Commission
Integrated Information System	Parks and Wildlife Department
Registration and Title System	Texas Department of Transportation

List of Systems Included in Survey

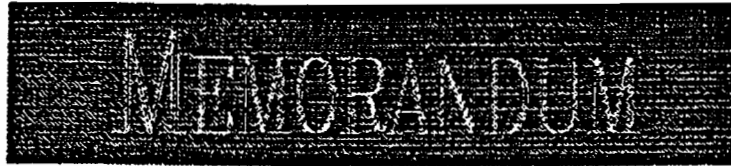
Systems Costing More Than \$1 Million Included:

Textual Oil Spill Information System	General Land Office
Automated Records Storage Management Systems	Texas State Library and Archives Commission
Fourth Generation Programming Project	Texas Commission for the Blind
Accounts Receivable Tracking System	Department of Human Services
Integration of Licensing	Texas Department of Agriculture
Patient Care System	Patient Care System
Radiology/Laboratory Information System	The University of Texas Southwestern Medical Center
Integrated Library Expansion	University of Houston
Library Automation	Texas Tech University

Systems Costing Less Than \$1 Million Included:

Refugee Data Center Project	Department of Human Services (formerly at the Governor's Office)
Administrative License Revocation System	State Office of Administrative Hearings
Agents Licensing System	Texas Department of Insurance
Child Nutrition Programs	Texas Employment Commission
Financial Information System	The University of Texas Medical Branch in Galveston
Library Management System	Stephen F. Austin State University
Cash Flow System	Texas Higher Education Coordinating Board
Report Writing Systems	University of Houston System
Electronic Scheduling System	University of Houston System
Administrative Systems/Student Records	University of Houston - Downtown

Agency Responses to Audits of *Post-Implementation Evaluation Reports*



Texas Department of Insurance

TO: Dennis Veit, Director of Internal Audit

FROM: Stan Wedel
Chief of Staff *SW*

DATE: December 5, 1995

RE: Response to State Auditor's Review of SB1 Project

Andy has coordinated the responses of the Information Services, Technical Analysis, and Regulation and Safety Divisions for this audit. We are pleased to provide responses to the State Auditor's Office draft report dated 11/21/95. Our responses are as follows:

There are four issues raised by the SAO with respect to the process by which TDI conducts post-implementation evaluation reviews of automated systems going into production: non-utilization of specific quantifiable outcome measures; non-use of the agency System Development Lifecycle Methodology to evaluate completed projects; non-inclusion of user costs; and failure to keep relevant project management documentation.

We generally agree with their assessment and offer the following responses:

1. ***Finding:*** *The Department did not utilize specific quantifiable outcome measures.*
Recommendation: *The Department should develop appropriate outcome measures for system development projects, perform benchmark measurements, track the measures, and report them in the post-implementation review.*

Response: TDI agrees that appropriate and quantifiable outcome measures were not defined prior to the development of the automation supporting SB1. Although the system was a Legislatively mandated development effort and therefore was required to be done, it should be noted that these systems were completed in 1993 under supervision of the now defunct State Board of Insurance. Current TDI management agrees that it is incumbent on a developing agency to measure whether or not the state achieves desired outcomes, and whether or not its preferred solution was cost/beneficial.

To that end, TDI has been in the process of defining, and will put into place by the end of the second quarter of FY 1996, a new cost/benefit analysis process under the purview of the Business Planning and Redesign Division. This new process will define appropriate outcomes and baseline measures as recommended by the State Auditor's Office prior to initiating a development effort. Once a project is approved, the Information Services Division's application development process will then focus on these outcomes as primary goals of the development effort, and will more fully develop the baseline measurements.

2. ***Finding:*** *The Department is not following their own System Development Methodology procedures for preparing Post-Implementation Reviews.*
Recommendation: *The Department should follow appropriate steps from their own system development methodology. If they are subsequently asked to provide the Quality Assurance Team with a post-implementation evaluation report, the information should be easily extracted from the existing agency post-implementation review.*

Response: The automation in support of SB1 had long since been completed at the time of the QAT's request for a post-implementation evaluation review (PIER review) of the project. TDI complied with the QAT's request using DIR's guidelines in lieu of using our own well-established Stradis methodology-based evaluation process.

TDI continued to follow DIR guidelines for the next several completed projects because the projects requested to be reviewed by the QAT had already been completed or had been underway for some time when Stradis was implemented. We continued to adhere to DIR's guidelines instead of using our own Stradis evaluation process in order to avoid tasking agency staff to use two different post-implementation evaluation review methodologies simultaneously.

The Department welcomes the State Auditor's recommendation on the issue. It serves to clarify the precedence of TDI's internal post-implementation review process over that of the statewide project monitoring oversight body (Quality Assurance Team), defines the interaction between the two evaluation processes, and reasonably seeks to avoid duplication of effort between the QAT evaluation process and TDI's. Since the audit, we have amended our process to reflect the SAO's recommendation.

3. ***The Department does not include user costs, such as user time, travel, and training in its Final Project Costs.*** ***Recommendation:*** *The Department's post-implementation reviews should include all costs incurred for the system developed.*

Response: The agency would welcome the opportunity to work with the State Auditor's Office and the Department of Information Resources in clarifying reporting requirements to the point of implementation by defining statewide standards for capturing and reporting appropriate project cost information.

4. *The Department has not kept relevant documentation for the SB1/Workers' Compensation automation project. **Recommendation:** The Department should define project file content and reexamine the retention schedule. The examination should include an analysis of the date used to start the retention period. Project files should include an analysis of the date used to start the retention period. Project files should be retained according to the schedule.*

Response: TDI agrees with this finding and recommendation. In fact, before this audit began, the Information Services Division had already started implementing a new project management process that has now defined the content of project management and system documentation files and confirmed retention schedules for those files. Repetition of this incident will not happen under the new automated project management process. Unfortunately, the SB1 system's *project management* file had been disposed of years before the new process was put into effect. However, *SB1 system documentation files and manuals*, are currently held in Information Services' technical library.

xc: Edna Butts
CH Mah
Gloria Hunt
Ann Woody
Philippe Cadoul
Andy Robinson

STEVE ROBINSON
Executive Director

JAY LINDGREN
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December 7, 1995

Ms. Judy Anderson Hatton, CISA
Project Manager
Office of State Auditor
Two Commodore Plaza
206 East Ninth Street, Suite 1900
Austin, Texas 78701

Dear Ms. Anderson Hatton,

Enclosed please find the Texas Youth Commission's response to the audit conducted on TYC's Post Implementation Evaluation Review of the Automated Case Management System(ACMS).

The agency has begun to implement new procedures within the project design as a result of the audit recommendations. These new procedures should insure that the information system management and user department management will be more unified and user driven.

We appreciate the cooperation and concern given to this audit.

Sincerely,

A handwritten signature in cursive script that reads "Steve Robinson".

Steve Robinson
Executive Director

TEXAS YOUTH COMMISSION

ACMS POST IMPLEMENTATION AUDIT RESPONSE

THE OFFICE OF THE STATE AUDITOR REPORT SUMMARY: PROJECT CONTROLS OVER ACMS NEED TO BE IMPROVED

The Texas Youth Commission's (the Commission) Automated Case Management System (ACMS) resulted in a large number of PC computers being installed in the Commission's field sites and has resulted in a new automated case management system. However, ACMS has not been installed at all Commission field sites, nor is it used by all targeted personnel at sites where the system has been installed. Therefore, the project has not met all of its intended benefits yet.

The Commission's Response:

TYC has delayed expansion of ACMS until corrective actions necessary to address the concerns stated in the Post Implementation Audit of TYC's Automated Case Management System are implemented. The primary actions outline tasks in system's development methodology and software development methodology which will allow TYC to begin to accurately evaluate project performance.

By implementating the strategies listed, TYC will be able to improve the ACMS project development plan, evaluate system performance, and improve user training and project controls.

TYC's Chief of Casework, as manager of this project, will be responsible for planning and implementation.

The State Auditor's Finding and Recommendation #1:

There was no System Development Methodology in place for the ACMS project

Determine if it would be productive to incorporate components of a system development methodology into the ACMS project, knowing that the project is in the implementation stage. Such a methodology should be used whether the software is developed or purchased. For purchased software, the phases of needs analysis, selection, testing, implementation, and post-implementation are still the same.

The Commission's Response:

TYC has developed the following actions to begin a system's development methodology for ACMS. This will allow TYC to accurately track the schedule of implementation, costs and responsiveness to user needs.

1. *Project goals and objectives have been clearly defined.*
2. *Project plan timelines will be measured and reported against actual progress.*
3. *The current system to track and report ACMS project development and implementation costs will be expanded including:*
 - *system maintenance*
 - *programming person-hours*
 - *training*
 - *related travel*
 - *hardware and software purchases*

**The State Auditor's Finding and Recommendation #2:
The Software Development Methodology should be expanded**

Include all Quality Assurance Review guideline components for post-implementation reviews in the Commission's methodology. The post implementation review should include some objective measure of user satisfaction and user verification of information reported. The methodology should require inclusion of all appropriate costs as well as performance measurements.

The Commission's Response:

The Management Information System Department for TYC implemented a software development methodology in 1993. This methodology includes a Post Implementation review. By including a cost tracking system (as listed above) for the ACMS project, we will be expanding the current software methodology as recommended. These modifications will enable cost-benefit analyses. TYC will expand its current Software methodology by developing a user feedback system based on management reports, surveys and site visits. This information will be reported to the direct care users group, which has been meeting regularly for over a year. ACMS project reviews became a part of the scheduled meeting agenda in November 1995. This strategy should address the user dissatisfaction issue.

**The State Auditor's Finding and Recommendation #3:
There is no formal ACMS project development plan**

Ensure that a requirement for project development plans is included in the Commission's system development methodology. The criteria for the plans should include the plan components from the Quality Assurance Review guidelines. Ensure that current and future efforts for ACMS are guided by updated comprehensive project development plans.

The Commission's Response:

As stated in our responses to Recommendations #1 and #2 above, TYC has developed the corrective action necessary to respond to this concern.

**The State Auditor's Finding and Recommendation #4:
There are indications of user dissatisfaction with ACMS**

The Commission should evaluate the adequacy of system performance and user training and take corrective action to resolve resistance to the new system.

The Commission's Response:

The corrective action that TYC is taking regarding user dissatisfaction will be addressed through the software development methodology enhancement outlined in response to Recommendation #2.



School of Medicine
Graduate School of Biomedical Sciences
School of Allied Health Sciences
School of Nursing

Marine Biomedical Institute
Institute for the Medical Humanities
UTMB Hospitals and Clinics

Office of the
Vice President for Business Affairs

December 4, 1995

Ms. Judy Anderson Hatton, CISA
Project Manager
Office of the State Auditor
Two Commodore Plaza
206 East Ninth Street, Suite 1900
Austin, TX 78701

Dear Ms. Hatton,

Thank you for your letter dated November 21, 1995 regarding your post implementation review of the Student Information System. As you found in your review, UTMB is very pleased with implementation of the Student Information System. It has resulted in a much more efficient process of interviewing and registering potential applicants to our four schools as well as generating management information within the schools regarding their operation.

In regard to the Quality Assurance Review recommendations identified in your letter, UTMB is in the process of implementing the following guidelines.

1. UTMB will continue to follow its formal system development methodology which is called STRADIS. This methodology will be utilized in all major system development projects. If it is determined that a vendor methodology lends itself more appropriately to implementation of their product, this will be identified in writing and included into the formal project plan. A copy of the formal project plan will be routed to my office and the Office of Internal Audit.
2. A post implementation evaluation will be performed after implementation of every major project. All appropriate costs associated with the project, including both software development, hardware, and user participation costs, will be identified in this post-implementation review.
3. UTMB management will continue the process of developing agency-wide performance measures and goals. All major projects will have quantifiable performance goals and benchmarks identified with the project so that we may properly measure final outcomes.

Again, thank you for your review of the Student Information System. If I may be of further assistance in this matter, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard S. Moore", written over a horizontal line.

Richard S. Moore
Vice President for Business Affairs
UTMB

cc: Thomas N. James, M.D.
President
John M. McGowan
Betsy Valentine

THE UNIVERSITY OF TEXAS
MD ANDERSON
CANCER CENTER

December 8, 1995

Department of Internal Audit

MEMORANDUM

TO: Judy Anderson Hatton, CISA
Project Manager, State Auditor's Office

FROM: *JWO* Gary W. O'Neal
Director, Internal Audit

SUBJECT: Post-Implementation Evaluation Review of the CARE System

As per your request, enclosed is our response to the recommendation contained in the above referenced report.

If you require any additional information, please do not hesitate to contact us.

GWO:kk

Enclosure

cc: Charles A. LeMaistre, M.D., w/enclosure
David J. Bachrach, w/enclosure
Charles C. Emery, Jr., Ph.D., w/enclosure
Michael J. Best, w/enclosure

TEXAS MEDICAL CENTER
1515 HOLCOMBE BOULEVARD • HOUSTON, TEXAS 77030 • (713) 792-2121
A Comprehensive Cancer Center Designated by the National Cancer Institute

The University of Texas M.D. Anderson Cancer Center Information Services Response to Recommendations in the Post-Implementation Review of the CARE system

A Standard Development Methodology (SDM) is currently utilized by the M.D. Anderson Cancer Center. The SDM was written in 1993 and revised in 1994. It is a series of logically organized activities with ten discrete, results-oriented phases. The SDM is a particularly useful concept for large systems development and major enhancement projects to help ensure successful achievement of stated and planned objectives. Formal documents are included in the SDM and a review process of the documents produced by each phase is required. During each phase, management has the opportunity to review project status and current economics and to agree with commencement of the next phase. In order to ensure an audit trail for the project, written management authorization is required. Successively larger resource commitments can be withheld until all the requirements in the current phase, including adequate planning of subsequent activities, have been satisfactorily met.

Since there was no formalized SDM in 1988, baseline data required for the Post-Implementation Review was not sufficiently documented in the initial planning of the project. We agree that this impacted the analysis of outcomes and benefits realized from the CARE system. This was corrected by the SDM currently in use which produces documents in the first four phases containing the project's objectives (expected outcomes), scope, costs, benefits, resource requirements and other information required for baseline data. For example: Phase 1 is the Project Identification and Initial Survey Phase. The Project Proposal is the output document and is used to determine whether to commit resources to the project. The Proposal contains a description in business terms of the relative importance of the project, a summary of benefits, any potential clinical impact on the quality of care, a statement of need and plans for the Feasibility Study in Phase 2. The Feasibility Study determines the scope, costs, benefits and impacts of the project. As the project progresses through the phases Three and Four, and more resources are committed to the project, the requirements and objectives are further refined.

The SDM documents in the first four phases address the finding and recommendation for performance measure data and benchmarks. Implemented systems and projects can be compared to review criteria (including client satisfaction and total project costs). These documents ensure that the extent to which the new system has met its planned objectives can be evaluated and that the results from the evaluation are available to be shared with others to facilitate improvements in future projects.

Prepared by Cynthia Schultz December, 1995



TEXAS EMPLOYMENT COMMISSION

101 E. 15TH STREET, ROOM 656
AUSTIN, TEXAS 78778-0001

WILLIAM GROSSENBACHER
Administrator
(512) 463-2652

December 8, 1995

GEORGE W. BUSH
Governor

Ms. Judy Anderson Hatton, CISA
Project Manager
State Auditor's Office
206 East Ninth Street, Suite 1900
Austin, Texas 78701

Dear Ms Hatton:

We have reviewed your finding and recommendations and provide the following response.

We concur with the finding and recommendations. Attached are draft copies of two standards currently being developed by the Application Development & Maintenance (AD&M) Department. Page 2, paragraph 1, of the *Software Quality Control Plan (SQCP)* states the applicability of the SQCP standard and section 6.2 and 6.2.10 addresses the requirement of conducting the Post Implementation Review. The standards in *Post Implementation Review* document defines the process for conducting the review. Sections 5 and 6 address the procedure for verification and confirmation of the information produced by the review.

Once these standards have been accepted and adopted, they will become part of the AD&M Procedures and Standards manual.

We appreciate the professionalism of your staff.

Sincerely,

A handwritten signature in black ink that reads "William D. Grossenbacher".

William D. Grossenbacher
Administrator

mc: Internal Audit, Almaraz
Administrative, Fernandez



Texas Department of Health

David R. Smith, M.D.
Commissioner

Carol S. Daniels
Deputy Commissioner for Programs

Roy L. Hogan
Deputy Commissioner for Administration

1100 West 49th Street
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January 12, 1996

Mr. James Story
State Auditor's Office
Two Commodore Plaza
206 East Ninth Street, Suite 1900
Austin, Texas 78701

Dear Mr. Story:

An audit of the Post-Implementation Evaluation Review of the Integrated Client Encounter System (ICES) has been completed, and the following recommendations were submitted.

Recommendation "1"

The Department should apply post-implementation reviews to pilot project implementations as well as to final project implementations. The Department can evaluate intermediate performance measures against baseline measures, adequacy of project development controls, impact on the business services, and costs for installation, personnel, operations, and capital purchases. Such an evaluation can lead to improvements before a full scale roll-out is undertaken.

TDH agrees with recommendation and will implement a post evaluation review of pilot projects.

Mr. James Story
Page 2
January 12, 1996

Recommendation "2"

We recommend that ICES project incorporate an appropriate system development methodology for its future development and installation, beginning with need identification for the next major phase. This methodology should include a post-implementation review which will result in a final system evaluation. We would expect the post-implementation review to address at least the criteria in the Quality Assurance Review PIER guidelines. Such a methodology should be applied to all other system development projects.

TDH agrees with recommendation and will implement a development methodology with ICES future development.

If additional information is needed please contact Mr. Steve Wischer at 836-0828.

Sincerely,



David R. Smith, M.D.
Commissioner of Health

Quality Assurance Team and Department of Information Resources Responses



Quality Assurance Team

*Department of Information Resources
Office of the State Auditor*

February 9, 1996

Ms. Judy A. Hatton
Project Manager
Office of the State Auditor
206 East Ninth Street, Suite 1900
Austin, Texas 78701

RE: Recommendations regarding the *Guidelines for Quality Assurance Review*

Dear Ms. Hatton:

We received and considered your recommendations regarding the *Guidelines for Quality Assurance Review*. The Quality Assurance Team appreciates the input and guidance based on the audit of the post-implementation evaluation reviews. We concur with the recommendations in your letter dated January 25, 1996, and we will change the guidelines by June 1.

The QAT appreciates your input and audit of the post-implementation evaluation reviews. If you have any questions, please contact the team.

Sincerely,

A handwritten signature in black ink, appearing to read "Martin J. Cassano".

Martin J. Cassano
Department of Information Resources
300 West 15th Street, Suite 1300
Austin, Texas 78701

A handwritten signature in black ink, appearing to read "Nancy Rainosek".

Nancy Rainosek
Office of the State Auditor
206 East 9th Street
Austin, Texas 78701



DEPARTMENT OF INFORMATION RESOURCES

Post Office Box 13564 ♦ Austin, TX 78711-3564

Tel: (512) 475-4700 ♦ Fax: (512) 475-4759

March 8, 1996

Ms. Judy A. Hatton
Project Manager
Office of the State Auditor
206 East Ninth Street, Suite 1900
Austin, Texas 78701

RE: Recommendations regarding the Audit Report on
Post-Implementation Evaluation Reviews (PIER)
of Automation Systems

Dear Ms. Hatton:

The Department of Information Resources (DIR) appreciates the opportunity to review recommendations being prepared for the audit report on post-implementation evaluation review (PIER) of major information resource projects. DIR agrees that, without adequate reporting, management and state leadership cannot properly make a comprehensive assessment about information system projects. The Quality Assurance Team (QAT) is an appropriate organization to monitor the PIERs to ensure that guidelines are followed. We acknowledge that this designation of oversight is appropriate; however, the QAT consists of staff from DIR and the Office of the State Auditor. Since DIR staff resources are tight, we have reservations about the staff commitments we are able to make at this time.

The recommendation about the need for adequate system development methodologies is also a very commendable one, but in light of the tight staff resources, DIR would again like to respond that we are unable to make the staff commitments at this time. We agree that we should promote the benefits of the PIER process and how it would contribute to improving the quality of projects statewide, but the resources to do this remain an issue.

DIR appreciates your consideration of the impact of these recommendations on our operations. If you have any questions, please contact me at (512) 475-4720 or Susan Tennison at (512) 475-2107.

Sincerely,

A handwritten signature in cursive script, appearing to read "Carolyn Purcell".

Carolyn Purcell
Executive Director

CP:ES:ST:eb

Agency Responses for Planned Systems

Executive Division
P.O. Box 12697
Austin, Texas 78711-2697



Antonio O. Garza, Jr.
Secretary of State

Office of the Secretary of State

January 5, 1996

Ms. Judy Anderson Hatton, CISA
Project Manager
Office of the State Auditor
P.O. Box 12067
Austin, Texas 78711-2067

Dear Ms. Hatton:

Attached are the responses from the Office of the Secretary of State to each recommendation of the State Auditor's Audit of the Voter Registration/Jury Wheel System.

If you have any questions, please contact Pat Thomas at 463-5640 or Ann McGeehan at 463-9871.

Thank you for reviewing our system.

Very truly yours,

A handwritten signature in black ink, appearing to read "Clark Kent Ervin".

Clark Kent Ervin

c: The Honorable Antonio O. Garza, Jr.
Mr. Don Archer
Mr. Jim Beck
Ms. Ann McGeehan
Mr. James Story, CISA
Ms. Pat Thomas

Recommendation: The Secretary of State's Office should augment the contractor's system development methodology with one that will provide continuing project structure for system implementation, and that will lead to the performance of a post implementation review. Development of the transition plan, included in the system contract, should provide an opportunity to engage the Secretary of State's Office system development methodology for the implementation and maintenance phases.

Response: The Office of the Secretary of State (SOS) will augment the contractor's development methodology with the SOS Project Management System, Spectrum, to ensure that the implementation and maintenance phases of the project will have continuing project structure.

Recommendation: Establish procedures for reporting all expenditures related to the VR/JWS project. The report should include a comparison of actual and budgeted project expenditures.

Response: The SOS will establish procedures to report all expenditures related to the VR/JWS project. Cost reports will be prepared on a monthly basis. The January report will capture all costs incurred for the project through January, 1996. These reports will be sent to the Secretary of State, the Assistant Secretary of State and the Deputy Assistant Secretary for Administrative Services.

Recommendation: Develop additional appropriate outcome performance measures that represent impacts on user activities for the VR/JWS project. Upon project completion, a performance assessment should be conducted and documented in the post-implementation evaluation report.

Response: In cooperation with the nine pilot counties, the SOS will develop additional outcome performance measures by March 1, 1996. These outcome performance measures will be the standard upon which the post-implementation evaluation report will be based.

TEXAS DEPARTMENT OF PUBLIC SAFETY

5805 N. LAMAR BLVD. - BOX 4087 - AUSTIN, TEXAS 78773-0001
ACCIDENT RECORDS BUREAU 512 /424-7101



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January 18, 1996

Ms. Judy Anderson Hatton, CISA
Office of the State Auditor
P.O. Box 12067
Austin, TX 78701-2067

Re: Crash Records Information Systems (CRIS)

Dear Ms. Hatton:

On behalf of the Texas Department of Public Safety and Texas Department of Transportation Interagency Team responsible for overseeing the CRIS project, the following comments are provided in response to your January 8, 1996 draft findings.

Recommendation:

A formal system development methodology and established policies indicating the use of such a methodology should be implemented. Management should see that intentions to have the contractor supply and follow their own methodologies are carried through. The methodology should be reviewed for adequacy and the agency-wide methodology should be applied whenever the contractor's methodology is deficient. In addition, a post-implementation evaluation review phase should be planned and carried out. This will ensure that development progresses through a controlled phased approach and includes a final evaluation.

Response:

Both agencies have indicated that a formal project management methodology and supporting tools will be utilized in this project. This will result in a planned, phased approach to delivering a business process and product(s) which best meets the needs of the users. It should be noted that the DPS is also currently evaluating tools which support the methodologies described in this recommendation and is close to making a selection. Contractors methodologies will be scrutinized for compatibility with that chosen by the team. As stated by the team, a post-implementation analysis will be performed.

Ms. Judy Hatton
1/18/96
Page 2

Recommendation:

Formal project management procedures for identifying, scheduling, and monitoring resources and deliverables should be adopted and applied. Furthermore, procedures for tracking comprehensive CRIS project costs should be established.

Response:

As previously stated, the DPS is in the process of adopting a formal project management methodology and selecting tools which will support such a methodology. This will allow the scheduling of the phases, activities, and tasks which make up the project; identifying deliverables; assigning roles and responsibilities; and for tracking costs related to the project. Both the DPS and TxDOT will be able to use these tools to track costs and project progress.

Recommendation:

Management should continue developing appropriate outcome measures that represent business impacts on user activities for the CRIS project. Upon project completion, an assessment should be performed and documented in the post-implementation evaluation report.


Response:

As illustrated by the two measures cited in the draft findings, it is our intent to develop sound, measurable performance measures to determine success of the project. Both agencies are in the process of updating their BOP's with information on this project. The performance measures cited in this document are being modified in the BOP, and additional measures have been identified. As stated in the findings, we anticipate additional measures may be developed during the visioning/needs analysis/requirement specification phases of the project.

In closing, both the DPS and TxDOT are committed to using sound methodologies which will ensure delivery of a business process and related system(s) which will satisfy users needs. Team member's communications with your team and the DPS internal draft documents have clearly indicated the project will be managed in accordance with the recommendations you have made in this draft document.

Should you or your staff have any questions, please let me know.

Sincerely,


James G. Templeton, Manager
Accident Records Bureau

/jt

Research of Post-Implementation Review Methodologies

We found 11 discussions of post-implementation reviews during our research and we combined the results. The sources included the Information Systems Audit and Control Association, Data Management, the *CPA Journal*, and the International Conference on Information Systems Auditing on September 1983. They answer the basic questions of why, what, who, and when post-implementation reviews should be done.

Why Perform a Post-Implementation Review?

Essentially, the reasons for performing a post-implementation review are to measure the degree to which the system meets the original objectives, to identify ways to improve the system building/project management process, and to provide direction for the system's future. Research of post-implementation reviews offered the following detailed supporting reasons:

- Ensure the system meets user needs.
- Ensure the system meets the original objectives.
- Ensure the system delivers anticipated benefits.
- Ensure the system adheres to the requirements of the system development methodology.
- Ensure the system meets specified functional requirements.
- Validate cost/benefit analysis.
- Improve the skills of those involved in systems development.
- Improve the project development process.
- Determine the effectiveness of the feasibility study.
- Improve the system development methodology.
- Improve the planning process.
- Improve the design process.
- Identify changes which need to be made to the system.
- Provide direction for the future of the system.

What Should Occur in the Post-Implementation Review?

Below is a list of steps used in conducting a generic post-implementation review. Application of all of these steps may not be appropriate and should be done within the context and scope of the information system. Also, the cost of the review should not outweigh its added value.

- Early in the project initiation phase, prepare a post-implementation review plan.

- At the appropriate time in the implementation phase, conduct a kick-off meeting to discuss the purpose of the study, outlining areas to be covered and establishing schedules.
- Obtain and review background information on the project including:
 - user requirements
 - project budgets
 - project time lines
 - objectives and projected benefits
 - user documentation
 - system documentation
 - expected operating costs
 - project deliverables
 - status reports
 - change control log
 - project action plan
 - actual project expenditures
 - actual operating costs
- Review problems encountered since implementation and the remedies proposed for those problems.
- Review actual system operations.
- Interview user department staff, Information System staff, selected management, and the quality assurance group.
- Evaluate level of user satisfaction with system and determine whether user requirements were met.
- Compare budgeted development costs with actual development costs and identify sources of deviation, if any.
- Compare projected operational costs to actual operational costs and identify sources of deviation, if any.
- Compare projected benefits with achieved benefits and identify sources of deviation, if any.
- Analyze project staffing, communications and organization, and identify improvements for future projects.
- Prepare draft of the report of the post-implementation review with summary of findings and recommendations.
- Obtain report sign-off from user and developer management personnel.
- Publish and distribute a final report.
- Implement recommendations.
- Follow-up on implementation of recommendations.

Several important points can be added to this list of steps.

- **Management support is key.** The post-implementation review process requires the participation of many individuals. Management can contribute

significantly by creating an environment supportive of cooperation and quality improvement.

- **User satisfaction is critical.** The importance of user involvement in the post-implementation review cannot be emphasized enough.
- **The post-implementation review should be built into the system development methodology.** The consistent use of a systems development methodology makes the post-implementation review a routine activity included in the overall development process. The post-implementation review is significantly more difficult to conduct when a methodology has not been followed.

Who Should Conduct a Post-Implementation Review?

The post-implementation review should be an impartial evaluation of the information system. The reviewer(s) must be unbiased. Project leaders and those responsible for system development should not direct the review.

Candidates for leading such a review may come from the internal audit group (especially EDP auditors), the quality assurance group, or potentially, Information Systems or user personnel other than those involved in the system development. For objectivity and independence purposes, the audit group is often selected.

Who Should Receive a Post-Implementation Review Report?

The post-implementation review process culminates in a report that should be submitted to top management, client/user department management, and information systems management.

When Should a Post-Implementation Review be Performed?

The post-implementation review should be conducted approximately six months after the system is implemented. This timeframe is long enough to allow costs and benefits to stabilize, while short enough to ensure that the original scope and objectives of the system will still be applicable.

Additional post-implementation reviews may be conducted periodically during the life of the system. Although the system may have been well-designed and met its original objectives, there is no guarantee that the system will continue to provide benefits for the duration of its life. Several factors such as heavy maintenance/user change requests, the acquisition of new hardware/software, and new business requirements may significantly change the system or its environment so that it no longer provides the level of benefits it once did. A post-implementation review may help identify shortcomings in the system and suggest appropriate modifications.

Is a System Too Small for a Post-Implementation Review?

For smaller and less costly systems, less formal and less structured a post-implementation review could be. Certainly, the review should be cost-beneficial and reasonable in proportion to the cost of the system.

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Copies of this report have been distributed to the following:

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Honorable Bob Bullock, Lieutenant Governor, Vice Chair
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Senator Kenneth Armbrister, Chair, Senate State Affairs Committee
Representative Robert Junell, Chair, House Appropriations Committee
Representative Tom Craddick, Chair, House Ways and Means Committee

Various Legislative Committees

Senator Chris Harris, Chair, Senate Administration Committee
Mr. John Opperman, Director of Finance, Senate Finance Committee
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Texas Commission for the Blind	The University of Texas at Austin
TX Higher Education Coordinating Board	The University of Texas Medical Branch in TX Galveston
TX Department of Criminal Justice	The University of Texas M.D. Anderson Cancer Center
Office of the Comptroller of Public Accounts	The University of Texas Southwestern Medical Center
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