

**Modernized e-File Project Integration  
Difficulties Have Delayed Its Deployment**

**March 2004**

**Reference Number: 2004-20-072**

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DEPARTMENT OF THE TREASURY  
WASHINGTON, D.C. 20220

INSPECTOR GENERAL  
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ADMINISTRATION

March 31, 2004

MEMORANDUM FOR CHIEF INFORMATION OFFICER

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FROM: Gordon C. Milbourn III  
Acting Deputy Inspector General for Audit

SUBJECT: Final Audit Report - Modernized e-File Project Integration  
Difficulties Have Delayed Its Deployment  
(Audit # 200320040)

This report presents the results of our review of the Internal Revenue Service's (IRS) efforts to develop and deploy the Modernized e-File (MeF) Project. The overall objective of this review was to determine whether the IRS will timely and effectively deliver the MeF Release 1 requirements, which are to provide Internet-based tax form filing for corporations and tax exempt organizations. This review is the first in a series of reviews of MeF Project development and deployment activities and is part of our Fiscal Year 2004 audit plan for reviews of the IRS' modernization efforts.

In summary, the MeF Project is the future of electronic filing with the IRS. The Project's goal is to replace the current filing technology with a modernized, Internet-based electronic filing platform<sup>1</sup> for any IRS form. The MeF Project has plans for five releases and is currently in Release 1. The first three releases will develop an electronic filing system for forms filed by corporations and tax exempt organizations. The MeF Release 4 will add forms filed by partnerships, estates, and trusts, and Release 5 will add forms and schedules filed by individuals.

The IRS Business Systems Modernization Office (BSMO) and the MeF Project's contractor have made significant progress in developing the MeF Release 1. Overall, the Project's development plans included the desired capabilities. When implemented, the MeF will increase the use of electronic filing through a system that is efficient and easy to access, use, and maintain. This goal supports the President's initiative for the Federal Government's use of an Internet-based technology.

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<sup>1</sup> A platform is a computer system on which application programs can run.

Although the MeF Release 1 application and design development has incorporated the desired capabilities, incompatibilities exist between the application and the modernization program's infrastructure.<sup>2</sup> This divergence needs to be resolved to allow Internet access to the MeF Release 1 by taxpayers, practitioners, and the IRS.

The divergence was created because the BSMO project team did not effectively communicate the modernized infrastructure requirements to its contractor. Details in the documentation of the MeF system's physical design were not used to ensure the Internet filing application development was in line with the modernized infrastructure. This divergence has contributed to a delay in the deployment of the MeF Release 1 that may minimize the benefits planned for the Tax Year 2003 corporate and tax exempt organization tax returns with filing due dates in 2004. Also, the IRS is incurring additional costs to modify the modernized infrastructure to accept the MeF Release 1 application.

To assess project management controls for the MeF Project development, we reviewed 32 project defect<sup>3</sup> reports that had a change in their severity ratings. Of these, 6 ratings were changed in error and 26 reports did not include any approval documentation for the change in the rating. Without appropriate approval, these changes could cause significant defects to miss the attention needed for resolution, possibly delaying Project deployment.

To help the IRS proceed in modernizing its programs and avoid future difficulty in migrating projects to its modernization program, we recommended the Chief Information Officer (CIO) update the Enterprise Life Cycle (ELC)<sup>4</sup> to ensure it has provisions to migrate projects into the modernization program, including assessments of ELC and Enterprise Architecture<sup>5</sup> compatibility and the ability to manage existing contracts; deliver a project's physical design documentation prior to the project development activities; and certify that a project's physical design is in compliance with the Enterprise Architecture. To help ensure adequate control for managing defect reports, the CIO should also update the ELC to designate personnel with the authority to approve a change in the severity ratings of defect reports and require documentation to show the approval for the changes.

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<sup>2</sup> The modernized infrastructure under development is geographically dispersed over various sites and includes numerous pieces of hardware and software, which must effectively communicate and interact with each other as they support projects that provide benefits to taxpayers and IRS employees.

<sup>3</sup> System components that fail a test are known as defects. Defects are given a severity rating to denote the significance of the defect, with Critical (Level 1) indicating a problem that is critical to the system and Low (Level 4) being a cosmetic or other problem that does not affect the performance of the system.

<sup>4</sup> The ELC establishes a set of repeatable processes and a system of reviews, checkpoints, and milestones that reduce the risks of systems development and ensures alignment with the overall business strategy. All IRS and PRIME contractor personnel involved in modernization are required to follow the ELC. The PRIME contractor is the Computer Sciences Corporation, which heads an alliance of leading technology companies brought together to assist with the IRS' efforts to modernize its computer systems and related information technology.

<sup>5</sup> The Enterprise Architecture guides the organization of the modernization effort and provides a detailed roadmap for modernization systems. Out of that Enterprise Architecture, projects can be defined, chartered, governed, and run.

Management's Response: The CIO agreed with most of the recommendations presented and has mandated that all projects migrating to the modernization program conform to the Enterprise Architecture and follow an appropriate variant of the ELC. The CIO agreed that a project's physical design needs to be documented prior to development activities and plans to establish an ELC Milestone 4a process to formally reflect such a requirement. The BSMO plans to use Milestone 4a to incorporate a review to determine whether a project's physical design is in compliance with the Enterprise Architecture. The BSMO has also taken action to improve controls over changes to defect severity designations. However, the CIO does not believe it is necessary to update the ELC with these process enhancements or additions. Management's complete response to the draft report is included as Appendix V.

Office of Audit Comment: Although the corrective actions generally addressed the recommendations, it is unclear where the procedures to migrate projects and to improve the documentation of changes to the severity of the defects will be recorded, since the ELC is not being changed. Because the ELC provides direction to IRS project managers, we believe procedures to migrate projects and controls for changing the severity of reported testing defects should be incorporated into the ELC for future reference. While we still believe our recommendations are worthwhile, we do not intend to elevate our disagreement concerning them to the Department of the Treasury for resolution.

The CIO's response also indicates that the MeF Project went live only 7 weeks later than the early January target date set over 18 months ago. Documentation we reviewed during the audit indicated the IRS promised the software developers they could test their products beginning November 3, 2003. Due to the physical design problems cited above, software developers were not able to start testing until February 4, 2004, over 13 weeks later than originally promised. In addition, the registered user portal that allows Internet access to the MeF system was not available to the public until March 17, 2004, resulting in a delay of approximately 11 weeks in the actual implementation date.

The CIO's response further stated that the BSMO did ensure compliance with the modernized infrastructure, and ensuring this compliance was a significant factor leading to the several weeks delay. However, our review indicated that the BSMO did not initially comply with the modernized infrastructure requirements, which led to delays because changes had to be made to the modernized infrastructure to accept the MeF system application. If the BSMO had ensured the MeF Project complied with the modernized infrastructure before development began, the delays would not have occurred.

Copies of this report are also being sent to the IRS managers affected by the report recommendations. Please contact me at (202) 622-6510 if you have questions or Margaret E. Begg, Assistant Inspector General for Audit (Information Systems Programs), at (202) 622-8510.

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## Modernized e-File Project Integration Difficulties Have Delayed Its Deployment

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### Background

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The Internal Revenue Service (IRS) has offered electronic filing options to individual taxpayers since the 1980s. In June 2000, the IRS approved two separate nonmodernization (non-PRIME<sup>1</sup>) electronic filing projects. One project was for corporate forms; the other project was for tax exempt organization forms. As the projects progressed, the IRS decided to combine the projects to eliminate duplication of effort and oversight and bring the combined project into the larger IRS/PRIME modernization effort. The project was renamed the Modernized e-File (MeF) Project and was initiated September 1, 2002.

The MeF Project is the future of electronic filing with the IRS. The Project's goal is to replace the current filing technology with a modernized, Internet-based electronic filing platform<sup>2</sup> for any IRS form.

Providing the capability for Internet-based filing of 330 forms through the MeF system supports and facilitates the IRS' commitment to achieve the IRS Restructuring and Reform Act of 1998 (RRA 98)<sup>3</sup> goal of receiving "at least 80 percent of all tax returns in electronic form by the year of 2007." Available data show that in 2001 about 31 percent of the individual tax returns were filed electronically and in 2002 about 36 percent were filed electronically.

The U.S. Corporation Income Tax Return (Form 1120), U.S. Income Tax Return for an S Corporation (Form 1120S), and Return of Organization Exempt From Income Tax (Form 990) do not use the current electronic filing system. Successfully implementing the MeF system for filing these returns (plus schedules and attachments) will give the IRS the capability to achieve the RRA 98 goals. The U.S. Individual Income Tax Return (Form 1040), U.S. Income Tax Return for Estates and Trusts (Form 1041), and U.S. Return of Partnership Income (Form 1065) can be

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<sup>1</sup> The PRIME contractor is the Computer Sciences Corporation, which heads an alliance of leading technology companies brought together to assist with the IRS' efforts to modernize its computer systems and related information technology.

<sup>2</sup> A platform is a computer system on which application programs can run.

<sup>3</sup> Pub. L. No. 105-206, 112 Stat. 685 (codified as amended in scattered sections of 2 U.S.C., 5 U.S.C. app., 16 U.S.C., 19 U.S.C., 22 U.S.C., 23 U.S.C., 26 U.S.C., 31 U.S.C., 38 U.S.C., and 49 U.S.C.).

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electronically filed now, but the current process has file size and standardization limitations that hinder achieving an 80 percent submission rate. Without the MeF system, the IRS does not have the means available to meet this mandated goal.

The MeF Project has plans for five releases and is currently in Release 1. The first three releases will develop an electronic filing system for forms filed by corporations and tax exempt organizations. The MeF Release 4 will add forms filed by partnerships, estates, and trusts, and Release 5 will add forms and schedules filed by individuals.

This review was performed at the Business Systems Modernization Office (BSMO) facilities in New Carrollton, Maryland, during the period October 2003 through January 2004. The audit was conducted in accordance with *Government Auditing Standards*. Detailed information on our audit objective, scope, and methodology is presented in Appendix I. Major contributors to the report are listed in Appendix II. Appendix IV presents an overview of the components of the Enterprise Life Cycle (ELC).<sup>4</sup>

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### **The Modernized e-File Project Development Progress Has Been Significant**

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The BSMO and the contractor have made significant progress in developing the MeF Release 1. Overall, the Project's development plans included the desired capabilities. These capabilities include the use of an Extensible Markup Language (XML)<sup>5</sup>-based system to receive returns over the Internet. The MeF system will also be able to accept multiple tax return types and multiple tax returns submitted in the same transmission.

Some other benefits of the MeF system include:

- The IRS will realize a reduced effort associated with receiving, processing, manually entering data, and resolving data entry errors from paper returns.
- The IRS will reduce system maintenance costs with the use of XML as the electronic means for filing.

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<sup>4</sup> The ELC establishes a set of repeatable processes and a system of reviews, checkpoints, and milestones that reduce the risks of systems development and ensures alignment with the overall business strategy.

<sup>5</sup> The XML is the universal format for structured documents and data on the Internet.

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- Taxpayers, tax practitioners, and the IRS will no longer have to provide the same amount of storage space that was needed for paper returns.
- Taxpayers and tax practitioners will save time and money associated with copying, assembling, and mailing a return.
- State agencies will be able to electronically share tax and information return data.
- Taxpayers, tax practitioners, and IRS employees will benefit from the increased amount of data available to customer support personnel.

Another significant aspect of the MeF system's goal is to increase the use of electronic filing through a system that is efficient and easy to access, use, and maintain. This goal supports the President's initiative for the Federal Government's use of an Internet-based technology. Also, the MeF system has benefits beyond the IRS functions. For disclosable information from filings of exempt organizations (Form 990), it will provide more accurate and timely electronic data for both public use and Federal and state law enforcement agency review.

The MeF system has been designed to integrate with the capabilities offered by the e-Services Project. This Project provides mechanisms for registered Electronic Return Originators (ERO)<sup>6</sup> to sign up for Internet capabilities offered by the IRS.

Although the MeF Release 1 application and design development has incorporated the desired capabilities, incompatibilities exist between the application and the modernization program's infrastructure.<sup>7</sup> This divergence has contributed to a delay in the deployment of the

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### Ineffective Coordination About the Project Design Has Delayed Deployment

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<sup>6</sup> The EROs originate the electronic submission of income tax returns to the IRS. An ERO may originate the electronic submission of income tax returns that are either prepared by the ERO firm or collected from taxpayers.

<sup>7</sup> The modernized infrastructure under development is geographically dispersed over various sites and includes numerous pieces of hardware and software, which must effectively communicate and interact with each other as they support projects that provide benefits to taxpayers and IRS employees.



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MeF Release 1 that may minimize the benefits planned for the Tax Year (TY) 2003 corporate and tax exempt organization tax returns with filing due dates of March 15, 2004, and May 15, 2004, respectively. Also, the IRS is incurring additional costs to modify the modernized infrastructure to accept the MeF Release 1 application.

The MeF Release 1's Internet filing application provides the ability to file tax returns via the Internet. The modernized infrastructure is designed to use a single Java Virtual Machine®<sup>8</sup> to run the Internet filing application. The MeF Project contractor designed the Internet filing application to use multiple Java Virtual Machines®. This difference between the application and the modernized infrastructure needs to be resolved to allow Internet access to the MeF Release 1 for deployment to taxpayers, practitioners, and the IRS.

### **The BSMO accepted integration responsibilities to meet its accelerated project development schedule**

The MeF Project moved from an in-house IRS development initiative to a modernization project in October 2002. Because it was not initiated as a modernization project, the in-house IRS development team used a project development process different from the ELC process, which is required for all modernization projects. The contractor assigned to design and develop the MeF system was engaged while the Project was an in-house initiative.

In anticipation of the MeF Project's migration to the modernization program, the PRIME contractor conducted a feasibility assessment that led it to a decision not to bid for the role as integrator (the entity responsible for coordinating development projects into the modernized IRS systems). It was not willing to accept the risk to deliver the MeF Release 1 for the TY 2003 corporate and tax exempt organization tax return filings. IRS senior management decided to move forward with the concept of the BSMO

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<sup>8</sup> A Java Virtual Machine® interprets compiled Java binary code for a computer's processor (or "hardware platform") so that it can perform a Java program's instructions. Java software was designed to allow application programs to be built that could be run on any platform without having to be rewritten or recompiled by the programmer for each separate platform.

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being the integrator, believing it was in a better position to direct and coordinate the overall project activities for delivery (i.e., incorporating the MeF Project into the modernization program).

The BSMO accepted this role, in part, to satisfy previous commitments to external stakeholders (taxpayers, practitioners, and software developers) that the MeF Release 1 would be operational for the filing of the TY 2003 corporate and tax exempt organization tax returns. It also believed that having the PRIME contractor manage the work of the application contractor was not necessary and would have added substantial overhead costs.

### **The BSMO project team did not effectively communicate the modernized infrastructure requirements to its contractor**

The IRS conducted a review in December 2002 to certify the MeF Project's logical design with the Enterprise Architecture.<sup>9</sup> Normally, the PRIME contractor conducts the Enterprise Architecture certification for modernization projects. Although it was invited to participate, the PRIME contractor declined because the project documentation was not updated to be in compliance with the ELC.

IRS executives decided not to update the existing project documentation because they did not believe it was the best use of resources and would potentially delay the Project. Taking the steps to update the MeF Project's documentation and to have the PRIME contractor participate in the certification process using its experience with the modernized infrastructure may have provided an opportunity to identify technical problems with the MeF Project.

Although the modernized infrastructure prescribes that applications should run on a single Java Virtual Machine®, the contractor's April 30, 2003, physical design of the Internet filing application required the use of multiple Java Virtual Machines®. The contractor provided the finalized physical design to the IRS on May 13, 2003. This version

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<sup>9</sup> The Enterprise Architecture guides the organization of the modernization effort and provides a detailed roadmap for modernization systems. Out of that Enterprise Architecture, projects can be defined, chartered, governed, and run.

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of the Internet filing application design did not specify the use of single or multiple Java Virtual Machines®.

On June 3, 2003, the contractor conducted a final walk-through of the MeF Release 1 Internet filing application's physical design with the IRS and the PRIME contractor. Although the plan to use multiple Java Virtual Machines® was evident during the walk-through, neither the BSMO nor the PRIME contractor recognized this divergence between the Internet filing application design and the modernized infrastructure.

According to the contractor, the information it received necessitated the use of multiple Java Virtual Machines®. This occurred because the BSMO did not provide adequate guidance about these requirements to the contractor and did not ensure the application's design was compliant with the modernized infrastructure specification to use a single Java Virtual Machine®.

### **The MeF Project engineering review performed by the IRS and the PRIME contractor encountered project documentation problems**

The BSMO initiated an engineering review as part of its project development process to assess the adequacy of the MeF Project's physical design. On June 19, 2003, the PRIME contractor and IRS staff conducted the engineering review. While the use of infrastructure design artifacts helped the review team understand how key information flows through the MeF system, the team reported that this information did not sufficiently describe the design of the MeF system components.

The review team further noted that the application and infrastructure design documents were not only separate but also were different in format and content. As a result, the team related it was likely that some important issues were not identified during the review session. In addition, they reported that the absence of a coherent, integrated set of design documentation will cause significant problems downstream after MeF Release 1 has been placed into production and becomes the responsibility of the IRS to maintain and enhance.

### **Actions to resolve the Internet filing application integration difficulties are in process**

On August 22, 2003, MeF Project staff first surfaced the integration difficulties with the Internet filing application during a regularly scheduled integration conference call between IRS and contractor personnel. Between September 3 and September 11, 2003, the contractor held meetings to work through technical issues, including the Internet filing application issue. During these meetings, the IRS and the contractor decided to modify the infrastructure for the MeF Release 1 to allow the application to use multiple Java Virtual Machines®. After the MeF Release 1 becomes operational, the BSMO plans to revisit the design to identify the best solution for the business needs of the IRS and to ensure both the Enterprise Architecture and MeF Project reflect that solution.

The IRS submitted a change request on October 14, 2003, to modify the Enterprise Architecture to support the use of multiple Java Virtual Machines®. The BSMO will not know the costs involved with reengineering the infrastructure to accept the Internet filing application until the IRS receives the billings from the contractors.

### **Several causes contributed to the integration difficulties associated with the MeF Project Internet filing application**

The integration difficulties presented above can be attributed to incomplete guidance in the ELC to promote adequate coordination in application development that ensures compliance with the Enterprise Architecture.

- There are no procedures for migrating IRS in-house development projects to the modernization program.
  - Requiring projects to become ELC-compliant, as part of the migration process, would necessitate involving the PRIME contractor in the Enterprise Architecture certification. If the PRIME contractor had conducted the certification, it may have identified the divergence related to the Internet filing application as early as December 2002.
  - The BSMO also encountered migration problems with the MeF Project's contracts. The Project had

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three contracts with two contractors when it migrated from an in-house project. Two additional contracts with the PRIME contractor were required for development as a modernization project. Because of the five separate contracts through three contractors associated with the Project's development, the BSMO encountered project management, coordination, and communication problems. This resulted in the BSMO spending more time than it preferred to manage the activities related to each contractor and contract provision.

- There is no guidance designating a point in the project life cycle for delivering a system's physical design. The physical design should be available before the development of the system so details are available to identify any possible issues between the application and the infrastructure.
- There is no requirement that a project be certified using the physical design to ensure compliance with the Enterprise Architecture.

Although the ELC does not provide the controls to ensure project design complies with the modernized infrastructure, the PRIME contract requires this compliance. Specifically, the contract states:

*The PRIME [contractor] will assume total responsibility and be singularly accountable for performance of the contract. Specific areas where the PRIME [contractor] will have lead performance responsibility include:*

- *Modernization infrastructure.*
- *Horizontal integration.*
- *Compliance with the modernization blueprint architecture and standards.*
- *Contractor operations and maintenance.*

Further, the modernization infrastructure contract provides that the PRIME Infrastructure Engineering organization is responsible for infrastructure integration. The contract includes the provision that during the development phase the PRIME Infrastructure Engineering organization will ensure architectural compliance of the infrastructure. New infrastructure requirements will be traced back to the Enterprise Architecture to ensure compliance and to identify

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differences with the existing Enterprise Architecture. This contract also specifies that the PRIME contractor is responsible for providing technical assistance and expertise to help enable MeF Project developers create and deploy the MeF system.

Because the BSMO did not ensure compliance with the modernized infrastructure, the MeF Release 1 deployment has been delayed. Although the BSMO took additional steps to provide quality control in the MeF Project development by instituting an engineering review, the review was not effective because proper documentation was not provided to the reviewers to prepare for the review.

The BSMO based the engineering review on the logical design documentation and an oral briefing about the physical design, even though the physical design documentation was available. Use of the physical design documentation may have allowed earlier identification of the Internet filing application issue. Even after the issue was identified in August 2003, closer attention to the significance of the difference between the operating requirements of the Internet filing application and the modernized infrastructure's design could have closed this divergence prior to project testing.

Taking actions to resolve this issue when it was identified could have minimized the effect on the MeF Project's schedule. Since the issue was identified late in the project development cycle, there has been a greater effect on the Project's schedule because testing has been delayed until the issue is resolved. Due to the delays in testing, the MeF Release 1 original deployment date of January 4, 2004, has been changed several times and, at the time we completed our fieldwork, was planned for February 13, 2004. However, the MeF Release 1 deployment activities are behind schedule, and deployment is not definite until the Internet filing application is operational. While planned for availability by November 3, 2003, the Internet filing application was not operational as of January 12, 2004.

### Recommendations

To help ensure the efficient and effective development of modernization projects, the Chief Information Officer (CIO) should update the ELC to include provisions to:

1. Migrate projects into the modernization program. The procedures should include:
  - An assessment of a project's compliance with ELC documentation requirements and consideration of the need for updating relevant documentation to effectively proceed with the development of the project.
  - An analysis of a project's compatibility with the Enterprise Architecture.
  - An analysis of existing contract requirements and the impact of these contracts on the management of a project throughout its life cycle. Consideration should be given, if feasible, to consolidating the contracts. Consolidating the contracts as part of the migration may help with the efficiency and effectiveness of the project management. The contract assessment should also ensure provisions include requirements to follow the ELC and to comply with the Enterprise Architecture.

Management's Response: The CIO responded that the IRS will ensure the procedures outlined above are implemented for any future projects migrating to the modernization program and has mandated that all systems development projects conform to the Enterprise Architecture and follow an appropriate variant of the ELC. The CIO stated an update to the ELC is not necessary at this time.

Office of Audit Comment: Although the CIO indicated that the above procedures will be followed, it is unclear where these procedures will be documented, since the ELC is not being changed. Because the ELC provides direction to project managers, we believe the procedures for migrating projects into the modernization program should be incorporated into the ELC for future reference and to prevent delays similar to those experienced by the MeF Project.

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The CIO's response also indicates that the MeF Project went live only 7 weeks later than the early January target date set over 18 months ago. Documentation we reviewed during the audit indicated the IRS promised the software developers they could test their products beginning November 3, 2003. Due to the physical design problems cited above, software developers were not able to start testing until February 4, 2004, over 13 weeks later than originally promised. In addition, the registered user portal that allows Internet access to the MeF system was not available to the public until March 17, 2004, resulting in a delay of approximately 11 weeks in the actual implementation date.

The CIO's response further stated that the BSMO did ensure compliance with the modernized infrastructure, and ensuring this compliance was a significant factor leading to the several weeks delay. However, our review indicated that the BSMO did not initially comply with the modernized infrastructure requirements, which led to delays because changes had to be made to the modernized infrastructure to accept the MeF system application. If the BSMO had ensured the MeF Project complied with the modernized infrastructure before development began, the delays would not have occurred.

2. Deliver a project's physical design documentation prior to the start of project development activities.

Management's Response: The CIO responded that this is already called for in the ELC. However, the BSMO is in the process of establishing an ELC Milestone 4a to formally reflect such a requirement.

3. Certify that a project's physical design is in compliance with the Enterprise Architecture.

Management's Response: The CIO responded that the BSMO currently certifies that a project's logical design is in compliance with the Enterprise Architecture as one of the ELC's Milestone 3 exit criteria. While the BSMO does not intend to call it a certification, a review of whether the physical design has implemented the certified logical design will be conducted as a Milestone 4a exit requirement.



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### **Reassessments of Defect Severity Did Not Include Approval Documentation**

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Problems, also known as defects, may be found in software, hardware, documents, or other controlled products.

Typically, defects are identified during testing or by the end user of a product. The BSMO and the PRIME contractor adopted procedures for identifying, reporting, and resolving defects.

Defect reports are given severity ratings that are used to determine the urgency in correcting the defects. There are four levels of priority to identify the severity of a defect report: Critical, High, Medium, and Low. Defect reports with a Critical or High severity are more serious and require immediate attention.

To assess project management controls for the MeF system development, we reviewed all 32 defect reports with a change in the severity rating from a universe of 774 defect reports. Of these, 6 ratings were changed in error and the remaining 26 reports did not include any approval documentation for the change in the rating. All but one of the changes reduced the severity rating. All ratings that were reduced were changed to a Medium or Low severity rating.

The ELC does not include procedures to approve and document a change in the severity rating of defect reports. The Defect Report Coordinator changed the rating of the majority of the selected defect reports, even though the ELC does not delegate the Coordinator this responsibility. The ELC does provide that the Defect Review Board should resolve issues about defect report severity. However, the BSMO did not have documentation to show that the Defect Review Board approved the changes in severity rating for the selected defect reports.

The absence of specific guidance in the ELC allows for defect report severity rating changes without sufficient consideration of the effect on deployment. These changes could cause significant defect reports to be moved to a lower severity rating and result in their not getting the attention needed for resolution. Without timely resolution, the defect reports in question could delay deployment.

### Recommendation

To help ensure adequate control over defect reporting, resolution, and closure for future modernization projects, the CIO should:

4. Update the ELC procedures to designate personnel with the authority to approve a change in the severity rating of a defect report and require documentation to show the approval for a change in severity rating.

Management's Response: The CIO agreed that there has not been adequate documentation of the Defect Review Board's actions in changing the severity of defects. The Defect Report Tracking System provides a comments section in which such documentation could be provided, but it has been inconsistently used for such a purpose. Based on this audit, the BSMO has changed two procedures. Now, all severity changes performed by the IRS Defect Report Coordinator are documented, as are all comments made by the Defect Review Board. However, the CIO did not believe an update to the ELC is necessary because the Defect Reporting Tracking and Resolution process is controlled by the PRIME contractor's configuration management procedures.

Office of Audit Comment: Although the actions taken by the CIO will improve the documentation of changes to the severity of the defects, it is unclear where these procedures will be documented for IRS use, since the ELC is not being changed. Because the ELC provides direction to IRS project managers, we still believe controls for changing the severity of reported testing defects should be incorporated into the ELC for future reference.

**Detailed Objective, Scope, and Methodology**

The overall objective of this review was to determine whether the Internal Revenue Service (IRS) will timely and effectively deliver the Modernized e-File (MeF) Release 1 requirements, which are to provide Internet-based tax form filing for corporations and tax exempt organizations. This review is the first in a series of reviews of MeF Project development and deployment activities and is part of our Fiscal Year 2004 audit plan for reviews of the IRS' modernization efforts. To accomplish our objective, we:

- I. Determined the status of the MeF Release 1 and the impact that risks and issues will have on the Project in meeting its Tax Year (TY) 2003 corporate and tax exempt organization tax return filing requirement.
  - A. Determined the status of the Internet filing application solution for the architectural mismatch between the MeF system and the modernized infrastructure.<sup>1</sup>
  - B. Determined the impact that combined System Integration Testing and System Acceptance Testing activities will have on the MeF Project schedule.<sup>2</sup>
    - 1. Assessed the adequacy of the resolution of problems identified during project testing.
    - 2. Reviewed all 32 defect<sup>3</sup> reports with a change in severity rating from a population of 774 identified defect reports as of November 14, 2003.
  - C. Determined the status of the scope of MeF Release 1 capabilities planned for the TY 2003 corporate and tax exempt organization tax returns with filing due dates of March 15, 2004, and May 15, 2004, respectively.
- II. Determined the impact that cross-project dependencies had on the timely delivery of the MeF Release 1 and on other modernized projects.

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<sup>1</sup> The modernized infrastructure under development is geographically dispersed over various sites and includes numerous pieces of hardware and software, which must effectively communicate and interact with each other as they support projects that provide benefits to taxpayers and IRS employees.

<sup>2</sup> Integration testing ensures that all system components (hardware and software) are working correctly and collectively with other related or dependent systems. Acceptance testing determines whether a system meets user and contract requirements and objectives.

<sup>3</sup> System components that fail a test are known as defects. Defects are given a severity rating to denote the significance of the defect, with Critical (Level 1) indicating a problem that is critical to the system and Low (Level 4) being a cosmetic or other problem that does not affect the performance of the system.

## **Modernized e-File Project Integration Difficulties Have Delayed Its Deployment**

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- III. Determined the impact of delays of MeF Release 1 deployment on external stakeholders: software developers, tax practitioners, corporations, and tax exempt organizations.

**Major Contributors to This Report**

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## Enterprise Life Cycle Overview

The Enterprise Life Cycle (ELC) defines the processes, products, techniques, roles, responsibilities, policies, procedures, and standards associated with planning, executing, and managing business change. It includes redesign of business processes, transformation of the organization, and development, integration, deployment, and maintenance of the related information technology applications and infrastructure. Its immediate focus is the Internal Revenue Service (IRS) Business Systems Modernization (BSM) program. Both the IRS and the PRIME contractor<sup>1</sup> must follow the ELC in developing/acquiring business solutions for modernization projects.

The ELC framework is a flexible and adaptable structure within which one plans, executes, and integrates business change. The ELC process layer was created principally from Computer Sciences Corporation's Catalyst® methodology.<sup>2</sup> It is intended to improve the acquisition, use, and management of information technology within the IRS; facilitate management of large-scale business change; and enhance the methods of decision making and information sharing. Other components and extensions were added as needed to meet the specific needs of the IRS BSM program.

### ELC Processes

A process is an ordered, interdependent set of activities established to accomplish a specific purpose. Processes help to define what work needs to be performed. The ELC methodology includes two major groups of processes:

**Life-Cycle Processes**, which are organized into phases and subphases and which address all domains of business change.

**Management Processes**, which are organized into management areas and which operate across the entire life cycle.

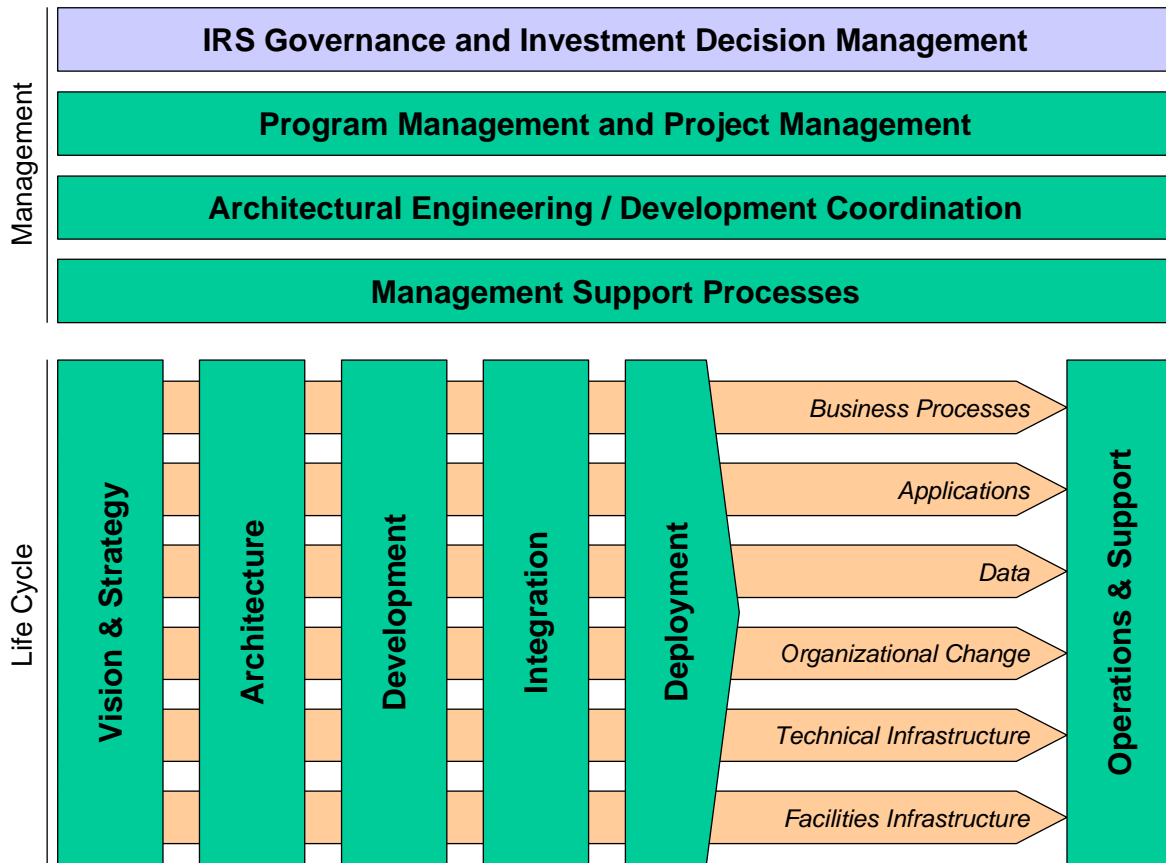
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<sup>1</sup> The PRIME contractor is the Computer Sciences Corporation (CSC), which heads an alliance of leading technology companies brought together to assist with the IRS' efforts to modernize its computer systems and related information technology.

<sup>2</sup> The IRS has acquired a perpetual license to Catalyst® as part of the PRIME contract, subject to certain restrictions. The license includes rights to all enhancements made to Catalyst® by the CSC during the contract period.

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### Enterprise Life-Cycle Processes



Source: ELC Guide, Page 2-16.

### Life-Cycle Processes

The life-cycle processes of the ELC are divided into six phases, as described below:

- **Vision and Strategy** - This phase establishes the overall direction and priorities for business change for the enterprise. It also identifies and prioritizes the business or system areas for further analysis.
- **Architecture** - This phase establishes the concept/vision, requirements, and design for a particular business area or target system. It also defines the releases for the business area or system.



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- **Development** - This phase includes the analysis, design, acquisition, modification, construction, and testing of the components of a business solution. This phase also includes routine planned maintenance of applications.
- **Integration** - This phase includes the integration, testing, piloting, and acceptance of a release. In this phase, the integration team brings together individual work packages of solution components developed or acquired separately during the Development phase. Application and technical infrastructure components are tested to determine if they interact properly. If appropriate, the team conducts a pilot to ensure all elements of the business solution work together.
- **Deployment** - This phase includes preparation of a release for deployment and actual deployment of the release to the deployment sites. During this phase, the deployment team puts the solution release into operation at target sites.
- **Operations and Support** - This phase addresses the ongoing operations and support of the system. It begins after the business processes and system(s) have been installed and have begun performing business functions. It encompasses all of the operations and support processes necessary to deliver the services associated with managing all or part of a computing environment.

The Operations and Support phase includes the scheduled activities, such as planned maintenance, systems backup, and production output, as well as the nonscheduled activities, such as problem resolution and service request delivery, including emergency unplanned maintenance of applications. It also includes the support processes required to keep the system up and running at the contractually specified level.

### Management Processes

Besides the life-cycle processes, the ELC also addresses the various management areas at the process level. The management areas include:

- **IRS Governance and Investment Decision Management** - This area is responsible for managing the overall direction of the IRS, determining where to invest, and managing the investments over time.
- **Program Management and Project Management** - This area is responsible for organizing, planning, directing, and controlling the activities within the program and its subordinate projects to achieve the objectives of the program and deliver the expected business results.
- **Architectural Engineering/Development Coordination** - This area is responsible for managing the technical aspects of coordination across projects and disciplines, such as managing interfaces, controlling architectural changes, ensuring architectural compliance, maintaining standards, and resolving issues.

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- **Management Support Processes** - This area includes common management processes, such as Quality Management and Configuration Management, that operate across multiple levels of management.

### Milestones

The ELC establishes a set of repeatable processes and a system of milestones, checkpoints, and reviews that reduce the risks of systems development, accelerate the delivery of business solutions, and ensure alignment with the overall business strategy. The ELC defines a series of milestones in the life-cycle processes. Milestones provide for “go/no-go” decision points in the project and are sometimes associated with funding approval to proceed. They occur at natural breaks in the process where there is new information regarding costs, benefits, and risks and where executive authority is necessary for next phase expenditures.

There are five milestones during the project life cycle:

- **Milestone 1 – Business Vision and Case for Action.** In the activities leading up to Milestone 1, executive leadership identifies the direction and priorities for IRS business change. These guide which business areas and systems development projects are funded for further analysis. The primary decision at Milestone 1 is to select BSM projects based on both the enterprise-level Vision and Strategy and the Enterprise Architecture.
- **Milestone 2 – Business Systems Concept and Preliminary Business Case.** The activities leading up to Milestone 2 establish the project concept, including requirements and design elements, as a solution for a specific business area or business system. A preliminary business case is also produced. The primary decision at Milestone 2 is to approve the solution/system concept and associated plans for a modernization initiative and to authorize funding for that solution.
- **Milestone 3 – Business Systems Design and Baseline Business Case.** In the activities leading up to Milestone 3, the major components of the business solution are analyzed and designed. A baseline business case is also produced. The primary decision at Milestone 3 is to accept the logical system design and associated plans and to authorize funding for development, test, and (if chosen) pilot of that solution.
- **Milestone 4 – Business Systems Development and Enterprise Deployment Decision.** In the activities leading up to Milestone 4, the business solution is built. The system is integrated with other business systems and tested, piloted (usually), and prepared for deployment. The primary decision at Milestone 4 is to authorize the release for enterprise-wide deployment and commit the necessary resources.
- **Milestone 5 – Business Systems Deployment and Post-Deployment Evaluation.** In the activities leading up to Milestone 5, the business solution is fully deployed, including delivery of training on use and maintenance. The primary decision at Milestone 5 is to authorize the release of performance-based compensation based on actual, measured performance of the business system.

Management's Response to the Draft Report



CHIEF INFORMATION OFFICER

DEPARTMENT OF THE TREASURY  
INTERNAL REVENUE SERVICE  
WASHINGTON, D. C. 20224

RECEIVED  
MAR 22 2004

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MEMORANDUM FOR ACTING DEPUTY INSPECTOR GENERAL FOR AUDIT

FROM: W. Todd Grams *WTG*  
Chief Information Officer

SUBJECT: Draft Audit Report – Modernized e-File Project Integration  
Difficulties Have Delayed Its Deployment (Audit # 200320040)

Thank you for the opportunity to review the subject draft audit report. We appreciate the opportunity to discuss an early draft of this report with your audit team.

On February 23, 2004, first release of the Modernized e-File (MeF) project went into production, enabling large corporations and tax-exempt organizations to electronically file, either via the Internet or dial-up, for the first time in history. As of March 15, 2004, six software providers are certified to provide this electronic filing service, over 2,300 Electronic Return Originators (EROs) are participating in MeF and over 16,144 returns have been electronically received. MeF went live only seven weeks later than the early January target date set over 18 months ago.

The attachment contains responses to each of your recommendations. However, I would like to provide some clarification to the following statements in your report:

**The MeF Project moved from an in-house IRS development initiative to a modernization project in October 2002. Because it was not initiated as a modernization project, the in-house IRS development team used a project development process different from the ELC process, which is required for all modernization projects.**

I would like to clarify your reference to "in-house". MeF existed as two coordinated projects under the Tier B systems development program, which is for smaller, non-Business Systems Modernization (BSM) type applications. Over time, we concluded that these two initiatives would best be managed as a single BSM project due to:

- the decision to use the new BSM technical infrastructure;
- recognition that the size of the project would far exceed Tier B intent;
- recognition that these two projects would best be managed as a single integrated project which we renamed MeF; and

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- o recognition that we wanted to follow the EA and that this release was just the start of building out a much larger part of the entire EA, eventually replacing all electronic filing systems.

We developed a version of the ELC for smaller projects, called "ELC Lite" that retains all the essential features of the ELC, especially the Pre-Milestone 4 work. The two Tier B projects that became MeF followed the ELC Lite. The biggest changes in becoming a BSM project were in the areas of governance and in some of the management process areas, such as configuration management and risk management.

**Because the BSMO did not ensure compliance with the modernized infrastructure, the MeF Release 1 deployment has been delayed.**

BSMO did ensure compliance with the modernized infrastructure. Indeed, ensuring compliance was a significant factor leading to the several weeks delay in deployment.

If you have any questions, please contact me at (202) 622-6800, or Fred Forman, Associate Chief Information Officer, Business Systems Modernization, at (202) 622-2475.

Attachment

## Modernized e-File Project Integration Difficulties Have Delayed Its Deployment

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Draft Audit Report – Modernized e-File Project Integration Difficulties have Delayed Its Deployment (Audit # 200320040)

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**TO HELP ENSURE THE EFFICIENT AND EFFECTIVE DEVELOPMENT OF MODERNIZATION PROJECTS, THE CHIEF INFORMATION OFFICER (CIO) SHOULD UPDATE THE ELC TO INCLUDE PROVISIONS TO:**

**IDENTITY OF RECOMMENDATION 1:** Migrate projects into the modernization program. The procedures should include:

- An assessment of the project's compliance with ELC documentation requirements and consideration of the need for updating relevant documentation to effectively proceed with the development of the project.
- An analysis of the project's compatibility with the Enterprise Architecture.
- An analysis of existing contract requirements and the impact of these contracts on the management of the project throughout its life cycle. Consideration should be given, if feasible, to consolidating the contracts. Consolidating the contracts as part of the migration may help with the efficiency and effectiveness of the project management. The contract assessment should also ensure provisions include requirements to follow the ELC and to comply with the Enterprise Architecture.

**CORRECTIVE ACTION 1: Partially agree with this recommendation.** We will ensure that the procedures outlined above are implemented for any future projects migrating to the modernization program.

However, we have mandated that all systems development projects conform to the Enterprise Architecture and follow an appropriate variant of the ELC. Therefore, we believe that an update to the ELC is not necessary at this time.

**IMPLEMENTATION DATE:**

**COMPLETED:** N/A

**PROPOSED:** N/A

**RESPONSIBLE OFFICIAL:** N/A

**CORRECTIVE ACTION MONITORING PLAN:** N/A

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**IDENTITY OF RECOMMENDATION 2:** Deliver the project's physical design documentation prior to the start of project development activities.

**CORRECTIVE ACTION 2: Agree with this recommendation.** This is what is already called for in the ELC. However, as we have noted in prior reviews, we are in the process of establishing Milestone 4a to formally reflect such a requirement.

**IMPLEMENTATION DATE:**

**COMPLETED:** N/A

**PROPOSED:** October 1, 2004

**RESPONSIBLE OFFICIAL:** Deputy Associate CIO for Business Integration

**CORRECTIVE ACTION MONITORING PLAN:** We enter accepted corrective actions into the Item Tracking, Reporting and Control System (ITRAC). These corrective actions are monitored on a monthly basis until completion.

**IDENTITY OF RECOMMENDATION 3:** Certify that the project's physical design is in compliance with the Enterprise Architecture.

**CORRECTIVE ACTION 3: Agree with this recommendation.** We currently certify that the logical design conforms to the Enterprise Architecture as one of the Milestone 3 exit criteria. We are establishing a new Milestone (4a) at the end of physical design. While we are not calling it a certification, a review of whether the physical design has implemented the certified logical design will be conducted as a Milestone 4a exit requirement. Any deviations will either require approval or waiver or have to be fixed to conform with the certified design.

**IMPLEMENTATION DATE:**

**COMPLETED:** N/A

**PROPOSED:** July 1, 2004

**RESPONSIBLE OFFICIAL:** Deputy Associate CIO for Business Integration

**CORRECTIVE ACTION MONITORING PLAN:** We enter accepted corrective actions into the Item Tracking, Reporting and Control System (ITRAC). These corrective actions are monitored on a monthly basis until completion.

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Draft Audit Report – Modernized e-File Project Integration Difficulties have Delayed Its Deployment (Audit # 200320040)

**TO HELP ENSURE ADEQUATE CONTROL OVER DEFECT REPORTING, RESOLUTION, AND CLOSURE FOR FUTURE MODERNIZATION PROJECTS, THE CIO SHOULD:**

**IDENTITY OF RECOMMENDATION 4:** Update the ELC procedures to designate personnel with the authority to approve a change in the severity rating of a defect report and require documentation to show the approval for the change in severity rating.

**CORRECTIVE ACTION 4:** Partially agree with this recommendation. We do not believe such an update to the ELC is necessary. Defect Reporting Tracking and Resolution process is controlled by PRIME-CMO-PR-DR, revision 3.

The tester sets the initial severity when a defect is first detected and a defect report is submitted. After the defect report is evaluated, the Defect Review Board (DRB) determines the final severity. A defect may be downgraded, for example, if there is a workaround solution or testing is not blocked. In the absence of a DRB change, the initial severity is not changed. If a change in a defect's severity is approved by the DRB, the Coordinator (who is a member of the DRB) updates the Defect Report Tracking System (DRTS). Currently the Coordinator is the only one with the permissions necessary to change the defects severity level.

We agree that there has not been adequate documentation of the DRB's actions in changing the severity of defects. The DRTS provides a comments section where such documentation could be provided but it has been used inconsistently for such a purpose. Based on an early draft report of this audit, we have changed two procedures. Now, all severity changes performed by the IRS Defect Coordinator are documented, as are the comments made in the DRB. This process is also being followed by PRIME.

### **IMPLEMENTATION DATE**

**COMPLETED:** December 22, 2003

**PROPOSED:** N/A

**RESPONSIBLE OFFICIAL:** Deputy Associate CIO for Program Management

**CORRECTIVE ACTION MONITORING PLAN:** N/A