

May 2010

# BUSINESS SYSTEMS MODERNIZATION

## Internal Revenue Service's Fiscal Year 2010 Expenditure Plan





Highlights of [GAO-10-539](#), a report to congressional committees

## Why GAO Did This Study

The Internal Revenue Service's (IRS) Business Systems Modernization (BSM) program is a multi-billion dollar, high risk, highly complex effort that involves the development and delivery of a number of modernized systems that are intended to replace the agency's aging business and tax processing systems. As required, IRS submitted its fiscal year 2010 expenditure plan in November 2009 to the House and Senate appropriations committees, requesting approximately \$254 million from the BSM account.

GAO's objectives in reviewing the expenditure plan were to (1) determine whether it satisfies the applicable legislative conditions, (2) determine IRS's progress in implementing prior expenditure plan review recommendations, and (3) provide additional observations about the plan and the BSM program. To accomplish the objectives, GAO analyzed the plan, reviewed related documentation, and interviewed IRS officials.

## What GAO Recommends

GAO is recommending that the Commissioner of Internal Revenue take several actions to improve program management capabilities and controls, including ensuring that underlying causes for project cost and schedule variances are consistently provided in the expenditure plan. In commenting on a draft of this report, IRS stated it would review the recommendations and provide a detailed corrective action plan to address them.

View [GAO-10-539](#) or [key components](#). For more information, contact David A. Powner at (202) 512-9286 or [pownerd@gao.gov](mailto:pownerd@gao.gov).

# BUSINESS SYSTEMS MODERNIZATION

## Internal Revenue Service's Fiscal Year 2010 Expenditure Plan

### What GAO Found

IRS's expenditure plan satisfies five of the six legislative conditions, and partially satisfies the condition to comply with acquisition rules, requirements, guidelines, and systems acquisition management practices used by the federal government. IRS has initiated an effort to improve its software acquisition and development practices, but does not expect to have changes in place until November 2010, at the earliest.

IRS has addressed two of GAO's prior recommendations to improve its management capabilities and controls. Specifically, IRS has completed a plan with specific time frames for implementing the initiatives supporting its information technology human capital strategy and has defined procedures for determining when to grant conditional milestone exits. However, work remains in order to fully implement GAO recommendations to develop long-term plans for completing the BSM and developing a quantitative measure of scope. GAO made the following observations about the expenditure plan and the BSM program:

- GAO's analysis of reported project costs and completion dates shows that 6 of the 10 project milestones planned for fiscal year 2009 were completed early or within 10 percent of cost and schedule estimates and 3 milestones were completed on schedule but were more than 10 percent over planned cost. IRS did not include underlying causes for these cost variances in its expenditure plan. Further, GAO was not able to determine cost and schedule variances for a milestone of the Modernized e-File—the system intended to provide a single standard for filing electronic tax returns—because IRS had not identified planned cost and schedule information for it in the fiscal year 2009 expenditure plan. IRS also did not report completing this milestone in its expenditure plan, and Congress therefore was not provided with information on the system's progress.
- IRS began development of a new strategy for managing individual taxpayer accounts to address several challenges confronting the Customer Account Data Engine, which was intended to replace the antiquated Individual Master File containing the repository of individual taxpayer information. While much has been done to define the strategy's transition states—or key phases—IRS has not identified time frames for completing key planning activities for fiscal year 2010 for the second transition state.
- IRS has identified several risks associated with defining and implementing the new strategy (e.g., the ability to deliver capabilities could be jeopardized if the scope is not rigorously managed) and has classified these risks into five categories. IRS reported that it has developed mitigation strategies for the risks that it has identified.
- Information security weaknesses continue to affect IRS's modernization environment. As GAO recently reported, IRS continues to have weaknesses in its information security controls. Additionally, while IRS reported that it had corrected about 40 percent of previously reported weaknesses, GAO found that it had not fully implemented the remedial actions it had reported for at least a third of those that it considered corrected.

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## Abbreviations

AMS	Accounts Management Services
BSM	Business Systems Modernization
CADE	Customer Account Data Engine
CADE 2	Customer Account Data Engine 2
CIO	Chief Information Officer
CMMI	Capability Maturity Model Integration
CTO	Chief Technology Officer
EA	enterprise architecture
ELC	enterprise life cycle
IMF	Individual Master File
INF	infrastructure
IPM	integrated production model
IRS	Internal Revenue Service
LOE	level of effort
MCL	maintaining current levels
MeF	Modernized e-File
MER	Milestone Exit Review
MITS	Modernization and Information Technology Services
MV&S	Modernization Vision and Strategy
OMB	Office of Management and Budget
PMO	Program Management Office
SEI	Software Engineering Institute
TIGTA	Treasury Inspector General for Tax Administration

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United States Government Accountability Office  
Washington, DC 20548

May 10, 2010

The Honorable Richard J. Durbin  
Chairman  
The Honorable Susan Collins  
Ranking Member  
Subcommittee on Financial Services and  
General Government  
Committee on Appropriations  
United States Senate

The Honorable José E. Serrano  
Chairman  
The Honorable Jo Ann Emerson  
Ranking Member  
Subcommittee on Financial Services and  
General Government  
Committee on Appropriations  
House of Representatives

As required, the Internal Revenue Service (IRS) submitted its fiscal year 2010 expenditure plan in November 2009 to the House and Senate appropriations committees, requesting approximately \$254 million from the Business Systems Modernization (BSM) account, which funds IRS's efforts to modernize its business and tax processing systems.<sup>1</sup> Our objectives in reviewing the plan were to (1) determine whether the plan satisfies the applicable legislative conditions,<sup>2</sup> (2) determine IRS's

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<sup>1</sup>BSM funds (except labor costs) are unavailable until IRS submits a modernization expenditure plan to the congressional appropriations committees and obtains their approval. See the *Consolidated Appropriations Act, 2010*, Pub. L. No. 111-117, Division C, Title I, Dec. 16, 2009, 123 Stat. 3034, 3164.

<sup>2</sup>This plan must (1) meet the Office of Management and Budget's (OMB) capital planning and investment control review requirements; (2) comply with IRS's enterprise architecture; (3) conform with IRS's enterprise life cycle methodology; (4) comply with federal acquisition rules, requirements, guidelines, and systems acquisition management practices; (5) be approved by IRS, the Department of the Treasury, and OMB; and (6) be reviewed by GAO. These conditions for BSM funding availability have been in effect for several years, including the immediately preceding fiscal year. At the time of this report, the latest appropriation was provided under the *Consolidated Appropriations Act, 2010*, Pub. L. No. 111-117, Division C, Title I, Dec. 16, 2009.

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progress in implementing our prior recommendations, and (3) provide any other observations about the plan and IRS's BSM program.

This report transmits the information we provided to congressional appropriations subcommittee staffs during our March 9, 2010, briefing and provides the recommendations that we made to the Commissioner of Internal Revenue. The full briefing materials, including our scope and methodology, are included as appendix I.

We conducted this performance audit from November 2009 to March 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In summary, we made the following major points:

- IRS's fiscal year 2010 plan satisfies five of the six legislative conditions, and partially satisfies the condition to comply with acquisition rules, requirements, guidelines, and systems acquisition management practices used by the federal government.<sup>3</sup> IRS has not fully established disciplined practices for software acquisition.<sup>4</sup> IRS has initiated an effort to improve its software acquisition and development practices, but does not expect to have disciplined processes in place until November 2010, at the earliest.
- IRS has addressed two of our prior recommendations to improve its management capabilities and controls, including our recommendation to complete a plan with specific time frames for implementing the initiatives supporting IRS's information technology human capital strategy and define procedures for determining when to grant conditional milestone exits. However, work remains to fully implement our recommendations to

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<sup>3</sup>For this condition, we did not determine whether the expenditure plan comports with the Federal Acquisition Regulation or other federal requirements beyond those encompassed by the Software Engineering Institute's Capability Maturity Model Integration (CMMI).

<sup>4</sup>We are referring to the practices defined in the CMMI model. CMMI is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University's Software Engineering Institute. It is the process model that describes how to develop the processes needed for software development and specific practices that organizations should follow.

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develop long-term plans for completing BSM and develop a quantitative measure of scope.

- Of 10 project milestones<sup>5</sup> planned for fiscal year 2009, 6 were completed early or within 10 percent of cost and schedule estimates and 3 were completed on schedule but were more than 10 percent over cost. For 1 of the milestones, we could not determine cost or schedule variances because IRS had not identified planned cost and schedule information in the fiscal year 2009 expenditure plan. A release<sup>6</sup> of the Customer Account Data Engine<sup>7</sup> (CADE) intended to implement legislative changes for filing season 2010 completed the detailed design phase on cost and schedule; by contrast, the release of the Accounts Management Services (AMS) system<sup>8</sup> intended, among other things, to provide for the conversion of the Correspondence Imaging System (a legacy system) to a new platform for inventory management, completed the development phase 127 percent over cost. In its expenditure plan, IRS attributed the variances for the milestones over planned cost to the need to fund the projects in excess of planned amounts. However, the agency did not include underlying causes for the variances in the plan. Finally, we were not able to determine cost or schedule variances of a milestone of Modernized e-File<sup>9</sup> release 6.1, because IRS had not identified planned cost and schedule information for it in the fiscal year 2009 expenditure plan. IRS also did not report completing this milestone in its expenditure plan, and Congress therefore was not provided with information on progress in delivering functionality.

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<sup>5</sup>IRS's Enterprise Life Cycle Guidance defines seven milestones, each occurring at the end of one of the phases of the life cycle. Milestone 0- at the end of vision and strategy or enterprise architecture; 1- project initiation; 2- domain architecture; 3- preliminary design; 4- development, test, and integration; and 5- system deployment. The development, test, and integration phase is sometimes split into two phases, each corresponding to a different milestone: 4a- detailed design and 4b- system development.

<sup>6</sup>Releases are software versions that provide a subset of the total planned project functionality.

<sup>7</sup>CADE was intended to replace the antiquated Individual Master File containing the repository of individual taxpayer information. It is currently being used to provide for daily processing of tax returns for approximately 40 million taxpayers.

<sup>8</sup>AMS is intended to enhance customer support by providing applications that enable IRS employees to access, validate, and update individual taxpayer accounts on demand. While IRS has stated that AMS will also be part of the new strategy for managing individual taxpayer accounts that is currently being implemented, it has not requested any funding for this project for fiscal year 2010.

<sup>9</sup>Modernized e-file is the system intended to provide a single standard for filing electronic tax returns.

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- IRS began development of a new strategy for managing individual taxpayer accounts, but time frames for completing key planning activities scheduled to occur during fiscal year 2010 have not yet been defined. In August 2008, IRS began defining the strategy to address several challenges confronting CADE, including that the approach to develop the system was more complex and taking longer than initially anticipated, and also take advantage of the availability of new technologies. IRS expects the strategy, generally referred to as CADE 2, to deliver benefits, including faster refunds for all individual taxpayers, in two transition states—or key phases—beginning in filing season 2012.<sup>10</sup> While much has been done to define these transition states, IRS has not identified time frames for completing key planning activities during fiscal year 2010 for the second transition state.<sup>11</sup>
  - IRS has identified several risks associated with defining and implementing CADE 2 (e.g., the ability to deliver capabilities could be jeopardized if the scope is not rigorously managed). IRS has classified these risks into five categories: delivery, program, people, technology and complexity, and management. The Department of the Treasury’s Inspector General for Tax Administration (TIGTA) also recently identified several challenges that IRS needs to address to effectively manage identified risks including, among other things, developing contingency plans in the event that CADE 2 cannot be fully implemented. IRS reported that it has developed mitigation strategies for the risks it has identified and stated that it found TIGTA’s assessment to be valid.
  - Information security weaknesses continue to affect IRS’s modernization environment. In November 2009<sup>12</sup> and March 2010,<sup>13</sup> we reported that, while IRS continued to make progress in correcting previously reported information security weaknesses, weaknesses in internal controls over

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<sup>10</sup>IRS has stated that it does not yet have any plans for modernizing the Business Master File, which stores tax data and related information on business taxpayers. IRS officials, however, have told us that they expect to be able to replicate the CADE 2 approach to modernize the Business Master File.

<sup>11</sup>We recently initiated a review of CADE 2.

<sup>12</sup>GAO, *Financial Audit: IRS’s Fiscal Years 2009 and 2008 Financial Statements*, [GAO-10-176](#) (Washington, D.C.: Nov. 10, 2009).

<sup>13</sup>After we provided our expenditure plan review results to the subcommittees, we issued a report focusing on IRS’s information security program: GAO, *Information Security: IRS Needs to Continue to Address Significant Weaknesses*, [GAO-10-355](#) (Washington, D.C.: Mar. 19, 2010).



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information security continue to place IRS systems at risk. Additionally, while IRS had informed us that it corrected about 40 percent of the previously reported weaknesses, we found that it had not fully implemented the remedial actions it reported for at least a third of those that it considered corrected. Further, in August 2009,<sup>14</sup> TIGTA reported that while IRS had taken steps to address several CADE system security vulnerabilities it had identified in a previous audit, some had been fully resolved and others could not be resolved until actions were completed to ensure controls are effectively in place or have been approved as deviations to IRS policy. IRS is taking steps to address recommendations from GAO and TIGTA and has stated that it expects CADE 2 to fully address the security weaknesses that are currently confronting CADE. While current and planned actions to improve its security posture are positive steps, IRS's modernization environment will continue to be at risk until the agency has fully addressed its information security weaknesses.

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## Conclusions

During fiscal year 2009, IRS continued to deliver BSM projects, although work on planned releases of CADE and AMS was either modified or suspended pending completion of efforts to define the agency's new strategy to manage individual taxpayer accounts. IRS generally made progress in addressing outstanding recommendations from our prior expenditure plan reviews. However, the expenditure plan explanations for significant project cost variances did not always provide information on root causes, limiting Congress's insight into areas that need improvement. Further, because IRS did not report one completed project milestone for which it had not identified specific plans in the fiscal year 2009 expenditure plan, Congress did not receive information on progress in delivering key functionality. Finally, while much has been done to define the transition states of the CADE 2 strategy for managing individual taxpayer accounts, specific time frames for addressing key planning activities for the second transition state, including defining core requirements, have not been defined. Having these time frames would guide progress in completing activities that are foundational to the transition state.

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<sup>14</sup>TIGTA, *Customer Account Data Engine Release 4 Includes Most Planned Capabilities and Security Requirements for Processing Individual Tax Account Information*, 2009-20-100 (Washington, D.C., Aug. 28, 2009).

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## Recommendations for Executive Action

To improve the program management capabilities and controls that are critical to the effective management of the BSM program, we are recommending that the Commissioner of Internal Revenue direct the IRS Chief Technology Officer to take the following three actions:

1. Ensure that explanations of project cost and schedule variances provided in the expenditure plan consistently include underlying causes.
2. For individual milestones that have been combined, report available performance information in the expenditure plan to provide Congress with information on progress in delivering functionality.
3. Define specific time frames for CADE 2 transition state 2 planning activities, including defining a core set of requirements, to guide progress.

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## Agency Comments

IRS's Deputy Commissioner for Operations Support provided written comments on a draft of this report (reprinted in app. II). He stated that IRS appreciated that the report recognizes progress made to improve its program management capabilities and controls. He also stated that IRS would review the recommendations to ensure its actions include assuring that underlying causes for project cost and schedule variances are consistently provided in the expenditure plan. Additionally, IRS stated that it would provide the detailed corrective action plan addressing each of the recommendations.

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We are sending copies of this report to the Chairmen and Ranking Members of the Senate and House committees and subcommittees that have appropriations, authorization, and oversight responsibilities for IRS. We are also sending copies to the Commissioner of Internal Revenue, the Secretary of the Treasury, the Chairman of the IRS Oversight Board, and the Director of the OMB. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

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Should you and your offices have questions on matters discussed in this report, please contact me at (202) 512-9286 or at [pownerd@gao.gov](mailto:pownerd@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

A handwritten signature in cursive script that reads "David A. Powner". The signature is written in black ink and is positioned above the printed name and title.

David. A. Powner  
Director, Information Technology  
Management Issues

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# Appendix I: Briefing Slides from the March 9, 2010, Briefing to the Senate and House Appropriations Subcommittee Staffs

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## **Review of IRS's Fiscal Year 2010 Business Systems Modernization Expenditure Plan**

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Briefing for Staff Members of the

Subcommittee on Financial Services and General Government, Committee on  
Appropriations, U.S. Senate

and the

Subcommittee on Financial Services and General Government, Committee on  
Appropriations, House of Representatives

March 9, 2010

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## Introduction and Objectives

The Internal Revenue Service's (IRS) Business Systems Modernization (BSM) program is a multi-billion-dollar, high-risk, highly complex effort that involves the development and delivery of a number of modernized tax administration and internal management systems, as well as core infrastructure projects, that are intended to replace the agency's aging business and tax processing systems and provide improved and expanded service to taxpayers and internal business efficiencies for IRS. Initiated in fiscal year 1999, BSM is IRS's current effort to modernize its systems. IRS contracted with Computer Sciences Corporation as the prime systems integration support contractor to assist with designing, developing, and integrating the new set of information systems comprised by BSM. In fiscal year 2006, IRS developed a new Modernization Vision and Strategy (MV&S) in response to our recommendation to fully revisit the vision and strategy for the BSM program and develop a new set of long-term goals, strategies, and plans consistent with the budgetary outlook and IRS's management capabilities.<sup>1</sup> The MV&S represented a new approach to modernizing IRS's information technology environment. For example, while at the outset the BSM program assumed complete replacement of existing systems, the MV&S among other things provides for leveraging existing systems where appropriate. Other principles of the MV&S include involving joint business and IT leadership throughout the process, and delivering smaller, incremental releases more frequently.

<sup>1</sup>GAO, *Business Systems Modernization: Internal Revenue Service's Fiscal Year 2005 Expenditure Plan*, GAO-05-774 (Washington, D.C.: July 22, 2005).



## Introduction and Objectives

Prompted by several challenges confronting the Customer Account Data Engine (CADE)—including that the approach to develop the system was more complex and taking longer than initially anticipated—the IRS Commissioner initiated a study of IRS’s IT systems modernization efforts from an overall portfolio perspective, which included operations of existing systems, new system developments, and information security. The results of the study led to the decision to refocus modernization efforts on the accelerated completion of the modernized taxpayer account database that has been under development since 2002. The resulting strategy, generally referred to as CADE 2, is expected to deliver key benefits beginning in filing season 2012. IRS has reported that CADE 2 is central to its vision for ongoing improvements to its tax administration systems. Specifically, through CADE 2, IRS expects to (1) accelerate delivery of a relational taxpayer account database from at least 7 years under the initial approach to approximately 2 years and (2) more quickly move to a single tax processing environment (instead of the two environments that currently exist). It is expected that CADE 2 will result in faster refunds, improved customer service, elimination of notices based on out-of-date information, faster resolution of taxpayer account issues, and better online tools and services for taxpayers.



## Introduction and Objectives

The Consolidated Appropriations Act, 2010,<sup>2</sup> provides appropriations for IRS for fiscal year 2010, including for BSM. The act prohibits IRS from obligating funds (excluding labor costs) for the BSM program until IRS submits a modernization expenditure plan to the relevant congressional appropriations committees.<sup>3</sup>

This plan must

- meet the capital planning and investment control review requirements established by the Office of Management and Budget (OMB);
- comply with IRS's enterprise architecture;<sup>4</sup>
- conform with IRS's enterprise life cycle methodology;<sup>5</sup>
- comply with federal acquisition rules, requirements, guidelines, and systems acquisition management practices;
- be approved by IRS, the Department of the Treasury, and OMB; and
- be reviewed by GAO.

Since mid-1999, IRS has submitted a series of expenditure plans for BSM appropriations. To date, IRS has received about \$2.8 billion for the BSM effort.

On November 4, 2009, IRS submitted its fiscal year 2010 expenditure plan to the Subcommittees on Financial Services and General Government of the Senate and House of Representatives Committees on Appropriations, seeking release of approximately \$254 million from the BSM account.<sup>6</sup>

<sup>2</sup>Consolidated Appropriations Act, 2010, Pub. L. No. 111-117, Division C, Title I, Dec. 16, 2009, 123 Stat. 3034, 3164.

<sup>3</sup>These funds support IRS's efforts to modernize its business systems. Other systems efforts, including the maintenance of legacy applications, are supported by funding that is not subject to the BSM program legislative conditions.

<sup>4</sup>An enterprise architecture is an institutional blueprint that defines how an enterprise operates today, in both business and technology terms, and how it intends to operate in the future. An enterprise architecture also includes a road map for transitioning between these environments.

<sup>5</sup>IRS refers to its life cycle management program as the enterprise life cycle (ELC).

<sup>6</sup>The amount appropriated for the BSM program for fiscal year 2010 was approximately \$264 million.





## **Introduction and Objectives**

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As agreed with IRS's appropriations subcommittees, our objectives were to

- determine whether IRS's fiscal year 2010 expenditure plan satisfies the applicable legislative conditions;
- provide an update on IRS's progress in implementing our prior expenditure plan review recommendations; and
- provide any other observations about the expenditure plan and IRS's BSM program.



## Scope and Methodology

To accomplish our objectives, we

- reviewed the fiscal year 2010 expenditure plan submitted by IRS in November 2009;
- analyzed the plan for compliance with the applicable legislative conditions;
- interviewed IRS program and project management officials to corroborate our understanding of the plan and other BSM activities;
- analyzed available evidence on recent agency efforts to implement our prior recommendations, including progress on improving its modernization management controls and capabilities;
- reviewed and analyzed modernization program review and project management briefings and related documentation to assess program and project status and associated issues and risks;
- reviewed program management reports to assess the progress IRS has made in completing actions and implementing program management improvements; and
- reviewed related reports by the Treasury Inspector General for Tax Administration (TIGTA).

To assess the reliability of the cost and schedule information contained in this expenditure plan, we interviewed IRS officials in order to gain an understanding of the data and discussed our use of the data in this briefing. In addition, we confirmed that information in the plan was consistent with information contained in internal IRS briefings and other governance process artifacts. We did not, however, assess the accuracy and reliability of the information contained in these documents.

We conducted this performance audit from November 2009 to March 2010 in Washington, D.C., in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.



## Results in Brief

IRS's fiscal year 2010 expenditure plan satisfies five of the six legislative conditions, and partially satisfies the condition to comply with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the federal government. IRS has not fully established disciplined practices for software acquisition.<sup>7</sup> While IRS has initiated an effort to improve its software acquisition and development practices, it stated that it does not expect to have these in place until November 2010 at the earliest.

IRS has implemented two of our four previous recommendations to improve its management capabilities and controls. Specifically, IRS has completed a plan with specific time frames for implementing the initiatives supporting its IT human capital strategy and has defined procedures for determining when to grant conditional milestone exits. However, steps remain to implement our recommendations to (1) develop long-term plans for completing BSM and consolidating and retiring legacy systems and (2) develop a quantitative measure of progress in delivering systems' planned functionality (scope). Regarding the long-term plans for completing BSM, IRS began working on a new strategy in 2008, and, at the conclusion of our review, provided us with key planning documents. Regarding the quantitative measure of progress for delivering planned functionality, IRS expects to have a measure developed by the end of this month. Fully developing long-term plans and developing a quantitative measure will help IRS in managing and controlling BSM.

<sup>7</sup>We are referring to the practices defined in the Capability Maturity Model Integration (CMMI®) model. CMMI is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University's Software Engineering Institute. It is the process model that describes how to develop the processes needed for software development and specific practices that organizations should follow.



## Results in Brief

We have four observations related to the BSM program and fiscal year 2010 expenditure plan:

- *Of 10 project milestones<sup>8</sup> planned for fiscal year 2009, 6 were completed within 10 percent of cost and schedule estimates or early, and 3 were completed on schedule but more than ten percent over cost. For 1 of the milestones, we could not determine cost or schedule variances because IRS had not identified planned cost and schedule information in the fiscal year 2009 expenditure plan. A release<sup>9</sup> of CADE intended to implement legislative changes for filing season 2010 completed the detailed design phase on cost and schedule; by contrast, the release of the Account Management Services intended, among other things, to provide for the conversion of the Correspondence Imaging System to a new platform for inventory management, completed the development phase 127 percent over cost. In its expenditure plan, IRS attributed the variances for the milestones over planned cost to the need to fund the projects in excess of planned amounts. However, the agency did not include underlying causes for the variances in the plan. Finally, we were not able to determine cost or schedule variances of a milestone of Modernized e-File, release 6.1, because IRS had not identified planned cost and schedule information for it in the fiscal year 2009 expenditure plan. IRS also did not report completing this milestone in its expenditure plan, and Congress therefore was not provided with information on progress in delivering functionality.*
- *IRS began development of a new modernization strategy, but time frames for completing key planning activities to be completed during fiscal year 2010 have not yet been defined. In August 2008, IRS began to define a new strategy for managing individual taxpayer accounts that was to address several challenges confronting its Customer Account Data Engine and also take advantage of the availability of new technologies. IRS expects the strategy, generally referred to as CADE 2, to deliver benefits, including faster refunds for all individual taxpayers, in two transition stages beginning in filing season 2012.*

<sup>8</sup>IRS's Enterprise Life Cycle Guidance defines seven milestones, each occurring at the end of one of the phases of the life cycle. Milestone 0- at the end of vision and strategy/enterprise architecture, 1- project initiation, 2- domain architecture, 3- preliminary design, 4- development, test, and integration, 5- system deployment. The development, test, and integration phase is sometimes split into two phases, each corresponding to a different milestone: 4a- detailed design and 4b - system development.

<sup>9</sup> Releases are software versions that provide a subset of the total planned project functionality.



## Results in Brief

While much has been done to define these stages, IRS has not identified time frames for completing key planning activities during fiscal year 2010 for the second transition stage.

- *CADE 2 faces several risks.* IRS has identified several risks associated with defining and implementing CADE 2 (e.g., the ability to deliver capabilities could be jeopardized if the scope is not rigorously managed). IRS has classified these risks into five categories: delivery, program, people, technological and complexity, and management. Treasury's Inspector General for Tax Administration also recently identified several challenges that IRS needs to address to effectively manage identified risks, including, among other things, developing contingency plans in the event that CADE 2 cannot be fully implemented. IRS reported that it has developed mitigation strategies for the risks it has identified and stated that it found TIGTA's assessment to be valid.
- *Information security weaknesses continue to affect IRS's modernization environment.* In November 2009, we reported that while IRS continued to make progress in correcting previously reported information security weaknesses, weaknesses in internal controls over information security continue to place IRS systems at risk. Additionally, while IRS had informed us that it corrected about 40 percent of the previously reported weaknesses, we found that it had not fully implemented the remedial actions it reported for at least a third of those that it considered corrected. Further, in August 2009, TIGTA reported that while IRS had taken steps to address several CADE system security vulnerabilities it had identified in a previous audit, some had been fully resolved and others could not be resolved until actions are completed to ensure controls were effectively in place or had been approved as deviations to IRS policy. IRS is taking steps to address recommendations from GAO and TIGTA and has stated that it expects to fully address the security weaknesses that are currently confronting CADE in Transition State 2 of CADE 2. While current and planned actions to improve its security posture are positive steps, IRS's modernization environment will continue to be at risk until the agency has fully addressed its information security weaknesses.



## Results in Brief

We are recommending that IRS:

- consistently include underlying causes in the explanations of project cost and schedule variances provided in the expenditure plan;
- for individual milestones that have been combined, report available performance information in the expenditure plan to provide Congress with information on progress in delivering functionality; and
- define time frames for completing key planning activities for a key transition stage of CADE 2.

In e-mail comments and subsequent oral comments from the IRS's Chief Technology Officer (CTO) on a draft of these briefing slides, the CTO agreed with much of the information presented but disagreed with two of our findings and with two of our recommendations. Specifically, he disagreed with our finding that IRS partially complies with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the government, stating that there is no requirement for federal agencies to use the cited practices. While not required, it is recognized that, without these practices, software acquisition processes are typically ad hoc and chaotic. The CTO also disagreed with our finding that IRS had not fully implemented our recommendation to develop a long-term plan for BSM, stating that it believed that it had addressed this by providing the Modernization Vision and Strategy (MV&S) in fiscal year 2006. We acknowledge IRS's recent update of the MV&S with the CADE 2 strategy and plan to review recently provided key planning documents to determine if IRS has now fully implemented this recommendation.



## Results in Brief

Regarding our recommendation to ensure that the explanations of project cost and schedule variances provided in the expenditure plan include underlying causes, IRS stated that the expenditure plan consistently provides narrative explanations of all project segment cost and schedule variances, in addition to the attribution of those variances. Our point is that the underlying causes for the cost variances for three AMS milestones were not in the plan, in accordance with IRS's own guidance, although IRS subsequently provided us with these causes in response to our queries. Regarding our recommendation to report on project milestones delivered for which specific cost and schedule estimates were not identified in the previous year's expenditure plan (due to milestones being combined), the CTO commented that, when milestones are combined within a project segment, IRS generally does not develop or track specific cost and schedule estimates for the individual project milestones and that, given this, only the overall cost and schedule estimate for the combined milestone segment is reported in the expenditure plan. However, in the case of MeF, IRS developed and tracked some of this information but did not report it. Reporting this information would improve the transparency of IRS's progress in delivering functionality. IRS also provided technical comments which we have addressed as appropriate.



## Background

Since 1999, we have reviewed and reported on numerous BSM expenditure plans. In particular, we have reported on program management capabilities and controls that are critical to the effective management of the BSM program. They include

- cost and schedule estimates: IRS did not have effective procedures for validating contractor-developed cost and schedule estimates;<sup>10</sup>
- requirements development and management: IRS did not have adequate policies and procedures in place to guide its system modernization projects in developing and managing requirements;<sup>11</sup>
- post-implementation reviews: post-implementation reviews conducted were incomplete and did not follow IRS procedures;<sup>12</sup>
- quantitative measures of progress in scope: IRS expenditure plans did not have a quantitative measure of progress in meeting project scope expectations;<sup>13</sup> and
- conditional milestone exits: IRS did not have documented procedures for determining when projects were allowed to proceed to the next milestone with outstanding issues remaining to be addressed (i.e., conditional milestone exits).<sup>14</sup>

We have made recommendations aimed at strengthening IRS's program management controls and capabilities. Over the years, IRS has addressed several of these recommendations. However, more work remains for key capabilities and controls to be fully institutionalized or implemented.

<sup>10</sup>GAO, *Business Systems Modernization: IRS Has Made Significant Progress in Improving Its Management Controls, but Risks Remain*, GAO-03-768 (Washington, D.C.: June 27, 2003).

<sup>11</sup>GAO, *Business Systems Modernization: IRS Needs to Complete Recent Efforts to Develop Policies and Procedures to Guide Requirements Development and Management*, GAO-06-310 (Washington, D.C.: Mar. 20, 2006).

<sup>12</sup>GAO, *Business Systems Modernization: IRS's Fiscal Year 2004 Expenditure Plan*, GAO-05-46 (Washington, D.C.: Nov. 17, 2004).

<sup>13</sup>GAO, *Business Systems Modernization: Internal Revenue Service's Fiscal Year 2007 Expenditure Plan*, GAO-07-247 (Washington, D.C.: Feb. 15, 2007).

<sup>14</sup>GAO, *Business Systems Modernization: Internal Revenue Service's Fiscal Year 2009 Expenditure Plan*, GAO-09-281 (Washington, D.C.: Mar. 11, 2009).





## Background

As previously noted, the BSM program is driven by IRS's Modernization Vision and Strategy (MV&S).<sup>15</sup> However, the CADE 2 strategy that is currently being defined will redefine the approach for elements of the MV&S.

IRS's Modernization and Information Technology Services (MITS) organization has primary responsibility for managing and delivering the BSM program. Headed by a Chief Technology Officer<sup>16</sup> who is supported by, among others, the Deputy Chief Information Officer (CIO) for Strategy/Modernization and the Chief Information Officer, MITS is comprised of eight Associate CIO-level organizations, including

- *Applications Development*, which delivers applications for the MV&S and other applications to support the filing season and maintains legacy systems;
- *Enterprise Services*, which sets enterprise technology and process standards to promote compatibility and common practices across the IT organization;
- *Strategy and Planning*, which was established in August 2009 to facilitate the alignment of information technology and business through strategic planning and financial management practices that provide visibility into the overall demand for supply, and value of IT investments; and
- *CADE 2 Program Management Office*, which was established in July 2009 to oversee the implementation of CADE 2.

<sup>15</sup>An initial cycle of the MV&S was completed in fiscal year 2006, and the strategy was updated a year later. IRS, *Internal Revenue Service: IT Modernization Vision & Strategy* (Washington, D.C: October 2007).

<sup>16</sup>IRS's Chief Technology Officer, who was appointed in November 2008, reports to the Deputy Commissioner for Operations Support.



## Background

IRS's fiscal year 2010 expenditure plan describes the agency's efforts to develop modernized systems and supporting infrastructure.<sup>17</sup> They include

- continuing ongoing program-level initiatives (e.g., architecture and integration and program management) and core infrastructure projects (e.g., infrastructure shared services),
- continuing two tax administration project releases to their next milestones, and
- continuing to define and starting to implement the new strategy for managing individual taxpayer accounts.

Key tax administration projects include

- *Modernized e-File (MeF)*, which is to provide a single standard for filing electronic tax returns;
- *Customer Account Data Engine (CADE)*,<sup>18</sup> which was intended to provide the modernized database foundation to replace the existing Individual Master File (IMF) processing system, containing the repository of individual taxpayer information. It will continue with daily processing of tax returns for approximately 40 million taxpayers and implementing new tax law changes; and
- *CADE 2*, which is IRS's new revised approach intended to provide the modernized database foundation and leverage applications, database structures, files, and business logic from both CADE and IMF<sup>19</sup> to provide a daily processing capability for moving all individual taxpayer accounts to a faster refund cycle and address IRS's long-term modernization plans and goals.

<sup>17</sup>Efforts to maintain and enhance legacy applications are funded from a different source not subject to the BSM expenditure plan appropriations restriction.

<sup>18</sup>CADE refers to the prime contract development efforts that began in 2002 to replace the legacy Master File and to date have resulted in a series of five CADE releases and sub-releases. IRS refers to the system as "Current CADE" in its expenditure plan.

<sup>19</sup>IRS has stated that it does not yet have any plans for modernizing the Business Master File, which stores tax data and related information on business taxpayers. IRS officials, however, have told us that they expect to be able to replicate the CADE 2 approach to modernize the Business Master File.



## Background

CADE 2 will also include projects such as:

- *Accounts Management Services (AMS)*,<sup>20</sup> which is intended to enhance customer support by providing applications that enable IRS employees to access, validate, and update individual taxpayer accounts on demand; and
- *Integrated Production Model (IPM)*, which is intended to serve as a central repository for corporate data and make those data available to several client systems.

Details on these and other BSM projects and program-level initiatives identified in the fiscal year 2010 plan are provided in appendix 1.

Table 1 shows a financial summary of the plan.

<sup>20</sup>While IRS has stated that AMS will also be part of CADE 2, it has not requested any funding for this project for fiscal year 2010.



Background

Table 1: Summary of IRS's Fiscal Year 2010 BSM Expenditure Plan<sup>a</sup>

	Amount (in thousands)
<b>Tax administration projects</b>	
Modernized e-File	\$50,000
Current CADE	38,000
Customer Account Data Engine 2 <sup>b</sup>	47,654
<b>Subtotal—tax administration projects</b>	<b>135,654</b>
<b>Core infrastructure projects</b>	
Development, Integration, and Testing Environments	14,500
Infrastructure Shared Services	17,500
<b>Subtotal—core infrastructure projects</b>	<b>32,000</b>
<b>Architecture, integration, and management</b>	
Architecture and Integration	13,745
Business Integration	4,206
Business Rules and Requirements Management	3,160
Management Processes	3,539
Federally Funded Research and Development Center	7,396
Project Management	2,954
<b>Subtotal—architecture, integration, and management</b>	<b>35,000</b>
<b>Management Reserve</b>	<b>5,020</b>
<b>BSM Capital Total</b>	<b>207,674</b>
<b>BSM Labor Total</b>	<b>44,666</b>
<b>Maintaining Current Levels (MCL)<sup>c</sup></b>	<b>1,334</b>
<b>Total</b>	<b>\$253,674</b>

Source: GAO analysis of IRS data.

<sup>a</sup>See appendix II for additional details on the plan. According to IRS's Chief Technology Officer, the agency is currently preparing an update to the expenditure plan to address the higher enacted level (about \$264 million) for the BSM appropriation.

<sup>b</sup>The amount for CADE 2 includes \$2.6 million for the Integrated Production Model project.

<sup>c</sup>Maintaining Current Levels (MCL) is the inflationary factor for the BSM labor cost.



**Results**  
Legislative Conditions

**Objective 1: IRS’s fiscal year 2010 BSM expenditure plan fully satisfies five of the six legislative conditions, and partially satisfies the condition that the plan comply with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the federal government.**

**Table 2: Status of Fiscal Year 2010 Expenditure Plan Provisions for Satisfying Legislative Conditions<sup>21</sup>**

Legislative conditions	Satisfied	Partially satisfied
1. Meets OMB capital planning and investment control review requirements	√	
2. Complies with IRS’s enterprise architecture (EA)	√	
3. Conforms with IRS’s enterprise life cycle (ELC) methodology	√	
4. Complies with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the federal government		√
5. Approved by IRS, the Department of the Treasury, and OMB	√	
6. Reviewed by GAO	√	

Source: GAO analysis of IRS data.

<sup>21</sup> See Consolidated Appropriations Act, 2010, Pub. L. No. 111-117, Division C, Title I, Dec. 16, 2009, 123 Stat. 3034, 3164.



## Results Legislative Conditions

### 1. Meets OMB capital planning and investment control review requirements

OMB requires agencies to develop capital planning and investment control review processes that help ensure that projects are being implemented at an acceptable cost and within reasonable and expected time frames, and that they are contributing to observable improvements in mission performance. The BSM expenditure plan met this condition. Specifically, as noted in the plan, IRS has established a structured governance and decision-making process framework that includes various levels of governing bodies to manage its projects under a standardized approach. The framework includes policies and procedures to select, control, and evaluate investments that are generally consistent with OMB capital planning and investment control review requirements. IRS also recently developed additional procedures to augment its governance and decision-making processes:

- In November 2008, the agency developed an *Enterprise Governance Authority and Operations Directive* that describes a set of guiding principles and roles and responsibilities for IRS governance functions.
- In April 2009, IRS issued an *Enterprise Control Authority and Operations Directive* that provides requirements, guiding principles, roles, and responsibilities for institutionalizing a comprehensive set of IRS enterprise control processes and a *Tiered Program Management Escalation Guide* that provides information for institutionalizing a comprehensive set of enterprise escalation guidelines.

IRS has also conducted training of governance board coordinators and secretariats as well as ongoing work groups to provide a venue for sharing lessons learned and internal best practices. In addition, officials stated that IRS has established a single repository to house the data for its Governance IT portfolio. We recently initiated a review to assess IRS's capital planning and investment control practices against best practices identified in our IT Investment Management Framework.



**Results**  
Legislative Conditions

**2. Complies with IRS's enterprise architecture**

IRS's BSM expenditure plan provides for compliance with the enterprise architecture (EA). Specifically, OMB requires that IRS document and submit an initial EA that is consistent with the principles identified within OMB Circular A-130. Additionally, IRS is required to submit updates to OMB when significant changes to the EA occur. Consistent with this requirement, IRS has developed a number of documents, including its *Enterprise Transition Plan*, which provides information about IRS's overall plan to evolve information technology and facilitate the investment decision-making process. In addition, IRS has outlined general processes that projects are to follow in order to ensure their compliance with the IRS EA. Specifically these processes discuss the activities and documentation required to ensure compliance with the EA. For example, at milestone 3—which is the phase where a project's preliminary design is developed—IRS requires projects to submit an EA compliance checklist which is used to help ensure that the project design has been checked for compliance.

IRS's BSM expenditure plan also identifies funding for continued definition and implementation of the EA. For example, the plan identifies funding needed for

- performing architecture, engineering, and integration activities to ensure that the IRS EA provides the information and guidance necessary for modernization projects;
- supporting the performance of EA compliance certification activities; and
- finalizing and publishing updates to the EA based on change requests.



## Results Legislative Conditions

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Additionally, in September 2009, IRS updated its *Enterprise Transition Plan* to include a number of enhancements. For example, the plan reflects the latest decisions made regarding the new strategy for managing individual taxpayer accounts and includes improvements for the integration of infrastructure and security services and privacy strategies. IRS has also developed a *Preliminary Solution Architecture* for the new strategy that discusses the current processes used to handle taxpayer accounts and the target architecture, such as requirements for accepting and validating taxpayer account information. Additionally, IRS's *2009 Enterprise Architecture* provided information on the processes associated with creating taxpayer identification numbers, updating accounts and taxpayer information, posting tax returns, and providing account information to downstream processes. IRS has also developed a *Customer Account Data Engine Preliminary Program Roadmap* which defines the approach for delivering CADE 2.





**Results**  
Legislative Conditions

**3. Conforms with IRS's enterprise life cycle methodology**

The BSM expenditure plan conforms to IRS's enterprise life cycle methodology (ELC), which defines a set of processes that are to be used throughout the program's life cycle, including processes for managing system investments, configuration, and risks. Specifically, the plan calls for the following, as required by the ELC management program:

- continuing to provide centralized guidance, administration, mitigation, and closure of risks and issues throughout the life cycle of each project;
- maintaining and enhancing the ELC (consistent with this, IRS has developed a *Milestone Exit Review* procedure for inclusion in the ELC to more effectively determine whether projects have met the necessary conditions to exit a milestone and to prevent premature exit of milestones); and
- incorporating requirements for industry best practices into the ELC to help ensure consistent systems development processes.



**Results**  
Legislative Conditions

**4. Complies with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the federal government<sup>22</sup>**

The plan partially complies with best practices for software development/acquisition because IRS does not yet have in place disciplined practices as called for by Carnegie Mellon University's Software Engineering Institute (SEI)<sup>23</sup>; however, IRS is taking steps to implement SEI's Capability Model Integration (CMMI®)<sup>24</sup> processes. The quality of software is governed largely by the quality of the processes involved in developing or acquiring it and maintaining it. SEI, recognized for its expertise in software processes, has developed models and methods that define and determine organizations' software process maturity, including the CMMI® model used to develop processes needed for software development and acquisition and specific practices that agencies should follow to mature these processes. IRS officials stated that, in June 2009, the agency initiated a CMMI® implementation project to improve its software acquisition and development practices by conducting a gap analysis—which compares actual performance with potential performance—and performing benchmarking activities. As a result of these activities, IRS developed process improvement recommendations, including, among other things, updating the existing project management plan template, expanding performance monitoring, and establishing a communications management plan. Additionally, according to IRS officials, the agency developed a governance structure to oversee the implementation of these recommendations. IRS officials also stated that a sample of projects from across the Applications Development organization will be used to pilot the CMMI® changes, and mentoring teams will be established to coach and provide training to the pilot projects to ensure institutionalization of the newly created and modified process assets.

<sup>22</sup> These key process areas are acquisition planning, solicitation, requirements development and management, project management, contract tracking and oversight, evaluation, and transition to support. For this condition, we did not determine whether the expenditure plan comports with the Federal Acquisition Regulation or other federal requirements beyond those encompassed by the Software Engineering Institute's Capability Maturity Model.

<sup>23</sup> SEI is a federally funded research and development center operated by Carnegie Mellon University and sponsored by the Department of Defense. Its objective is to provide leadership in software engineering and in the transition of new software engineering technology into practice.

<sup>24</sup> CMMI is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University. The CMMI® is SEI's model that describes how to develop the processes needed for software development and specific practices that organizations should follow.



## Results Legislative Conditions

IRS stated it has a number of reviews planned throughout calendar year 2010 to assess progress in improving its practices and expects to have CMMI level 2<sup>25</sup> practices, that is, disciplined processes, by November 2010 at the earliest. Until IRS has these processes in place, it will run the risk of encountering problems in meeting its performance, schedule, and cost objectives for the BSM program.

<sup>25</sup>The CMMI® ranks organizational maturity according to five levels. Maturity levels 2 through 5 require verifiable existence and use of certain key process areas. CMMI level 2, known as the “managed” level is characterized by processes that, among other things are planned and executed in accordance with policy; provide adequate resources; ensure the designated work products are under the appropriate levels of configuration management; involve relevant stakeholders; and are monitored, controlled, and reviewed.



**Results**  
Legislative Conditions

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**5. Approved by IRS, the Department of the Treasury, and OMB**

The expenditure plan was reviewed and approved by IRS on August 11, 2009; Treasury on September 10, 2009; and OMB on October 8, 2009.

**6. Reviewed by GAO**

We completed review of the plan in March 2010.



**Results**

Prior Recommendation Status

**Objective 2: IRS has implemented two of our previous recommendations to improve its modernization management controls and capabilities, but steps remain to fully implement the remaining recommendations.**

IRS implemented our recommendations to complete a plan with specific time frames for implementing the initiatives supporting its human capital strategy and to define procedures for determining when to grant conditional milestone exits. However, steps remain to fully implement the remaining recommendations, including developing a quantitative measure of progress in meeting project scope expectations.

**Table 3: Status of IRS’s Progress in Implementing Prior GAO Recommendations**

Prior GAO recommendations	Implemented	In progress
<i>Human capital strategy</i> —Complete a plan with specific time frames for implementing the initiatives supporting IRS’s IT human capital strategy.	√	
<i>Conditional milestone exits</i> —Define procedures for determining when to grant conditional milestone exits.	√	
<i>Modernization vision and strategy</i> —Fully revisit the vision and strategy for the BSM program and develop a new set of long-term goals, strategies, and plans that are consistent with the budgetary outlook and IRS’s management capabilities		√
<i>Quantitative measures of progress in meeting scope expectations</i> —Ensure that future expenditure plans include a quantitative measure of progress in meeting project scope expectations		√

Source: GAO analysis of IRS data.



**Results**  
Prior Recommendation Status

**Human Capital Strategy**

In March 2008, we reported that IRS had developed a human capital strategy for its Application Development organization that addressed hiring critical personnel, employee training, leadership development, and workforce retention and identified several initiatives it planned to undertake in these areas. However, the agency did not have a specific plan, including time frames, for addressing these initiatives. Accordingly, we recommended that the agency develop such a plan.<sup>26</sup> IRS agreed with our recommendation, and, in response, identified a timeline for addressing these initiatives, including addressing the IT corporate hiring challenge, succession planning, and coaching and mentoring, in its *Applications Development Strategic Plan for 2007-2011* and its *2008-2010 Modernization Information Technology Services Corporate Strategies* document. IRS officials also noted that human capital initiatives are planned (and therefore updated) on an annual basis. Recently, IRS's Human Capital Management Branch developed the *MITS Recruitment and Training Strategies and Projected Activity* document for fiscal years 2010 through 2013 to further address staffing issues within the MITS organization, including staffing associated with the new strategy for modernizing individual taxpayer accounts. Effectively performing these activities should allow IRS to acquire and retain the staff resources it needs to effectively support BSM.

<sup>26</sup> GAO, *Business Systems Modernization: Internal Revenue Service's Fiscal Year 2008 Expenditure Plan*, GAO-08-420 (Washington, D.C.: Mar. 7, 2008).



**Results**  
Prior Recommendation Status

**Conditional Milestone Exits**

In March 2009, we reported that IRS's use of conditional milestone exits (whereby projects are allowed to continue with outstanding issues needing to be addressed) was not supported by documented procedures and, as a result, the conditional exit process could potentially be used to mask cost and schedule overruns and result in projects exiting milestones prematurely. Accordingly, we recommended that such procedures be defined. IRS agreed with our recommendation and, in response, developed a Milestone Exit Review (MER) Procedure to emphasize the prevention of premature milestone exits with outstanding issues. The MER procedure describes the activities required for a project to enter and exit the MER process. It also requires that the governance board members review the project's cost, schedule, performance, risks, and conditions, in addition to the MER artifacts, to determine whether to (1) grant a conditional exit, (2) grant an unconditional exit, (3) disapprove the exit, (4) recommend suspending the project, or (5) terminate the project. By developing this procedure, IRS has reduced the likelihood that the conditional exit process will be used to mask cost and schedule overruns or result in projects exiting milestones prematurely.



## Results Prior Recommendation Status

### Modernization Vision and Strategy

In July 2005, we recommended that IRS fully revisit the vision and strategy for the BSM program and develop a new set of long-term goals, strategies, and plans consistent with the budgetary outlook and IRS's management capabilities.<sup>27</sup> We also noted that the vision and strategy should include time frames for consolidating and retiring legacy systems. IRS agreed with our recommendation, and, in response, developed an initial cycle of its Modernization Vision and Strategy (MV&S) in fiscal year 2006<sup>28</sup> to guide IT investment decisions during fiscal years 2007 through 2011. IRS also developed a high-level strategy and 5-year schedule for retiring and consolidating systems, which it began implementing.<sup>29</sup>

In 2008, IRS began working on a new strategy, referred to as CADE 2 that, among other things, addresses the management of individual taxpayer accounts as well as several long-term goals to enhance IRS's systems. Specifically, the strategy's initial phase is to create a modernized taxpayer database and to move the processing of individual taxpayer accounts from a weekly processing cycle to a daily processing cycle by the January 2012 filing tax season. In support of this new strategy, in July 2009, IRS developed a *Preliminary Solution Architecture* document which describes the characteristics of the strategy in both business and technical terms. IRS also developed a *Preliminary Program Roadmap* which defines the approach for delivering the new strategy and provides general time frames for delivering key phases known as transition states. IRS also established a program management office and defined a program management framework that would guide the strategy from initiation to completion. IRS provided us with key planning documents for the new strategy, including cost and schedule estimates and final *Solution Architecture* and *Program Roadmap* documents, at the conclusion of our review. We plan to review these documents in a CADE 2 review we have underway and determine if IRS has implemented our recommendation.

<sup>27</sup> GAO-05-774.

<sup>28</sup> IRS's MV&S initiative is intended to be an annual process through which the agency integrates the strategic plans, business concepts of operations, IT planning roadmaps, and proposed investments into a set of integrated strategies and investment proposals for each domain and ultimately into a proposed IT investment portfolio.

<sup>29</sup> IRS, *Applications Development: 5-Year Plan, "A systems view" Projects – Programs – Retirements & Consolidations*.





**Results**  
Prior Recommendation Status

**Quantitative Measure of Progress in Meeting Scope Expectations**

In February 2007, we recommended that IRS ensure that future expenditure plans include a quantitative measure of progress in delivering systems' planned functionality (scope).<sup>30</sup> We also recommended that, in developing this measure, IRS consider using earned value management<sup>31</sup> since this is a proven technique required by OMB for measuring cost, schedule, and functional performance (i.e., scope of work) against plans. While IRS agreed with our recommendation to develop a quantitative measure of progress in meeting scope expectations, it stated at the time that it did not believe earned value management would provide this measure, given the manner in which the technique was being used at the agency. Instead IRS proposed a two-step approach to address our recommendation.<sup>32</sup> As an initial step, IRS developed a qualitative measure that indicated the difference between a project release's planned and delivered capabilities and began using it in the fiscal year 2008 expenditure plan. In March 2008, we reported that, as a second step, IRS planned to leverage its requirements management tools to assign quantitative values to the capabilities in order to develop a quantitative measure of scope in the fiscal year 2009 plan. IRS did not have the measurement of scope ready for the fiscal year 2009 expenditure plan as planned but stated that it was continuing to develop the metric and that a schedule for implementation and inclusion into the annual expenditure plan would depend on the outcome of pilot efforts. IRS stated that it is still in the process of analyzing the results of pilots conducted in August 2008 and February 2009 and plans to present a finalized process to its Application Development organization by March 31, 2010. Fully implementing a quantitative measure of progress in delivering systems' planned functionality will help IRS in managing and controlling BSM.

<sup>30</sup>GAO, *Business Systems Modernization: Internal Revenue Service's Fiscal Year 2007 Expenditure Plan*, GAO-07-247 (Washington, D.C.: Feb. 15, 2007).

<sup>31</sup>Earned value management is a project management tool that integrates the investment scope of work with schedule and cost elements for investment planning and control. This method compares the value of work accomplished during a given period with that of the work expected in the period. Differences between accomplishments and expectations are measured in both cost and schedule variances.

<sup>32</sup>In December 2007, the Associate Chief Information Officer for Applications Development stated that IRS uses earned value management to measure progress in completing ELC deliverables, not in delivering functionality, and consequently the agency's application of earned value management does not provide a quantitative measure of progress in meeting scope expectations.



## Results Observations

### Objective 3: Observations about IRS's BSM Program and Expenditure Plan

*Observation 1: Of 10 project milestones<sup>33</sup> planned for fiscal year 2009, 6 were completed within 10 percent of cost and schedule estimates or early, and 3 were completed on schedule but more than ten percent over cost. For 1 of the milestones, we could not determine cost or schedule variances because IRS had not identified planned cost and schedule information in the fiscal year 2009 expenditure plan.*

Our analysis of IRS's reported planned and actual milestone costs and completion dates showed that six milestones were completed within 10 percent of cost and schedule estimates or early and three were completed on schedule but more than ten percent over cost, although they were within ten percent of schedule estimates. Release 5 of CADE, intended to implement legislative changes associated with filing season 2010, completed detailed design (milestone 4a) at planned cost and on schedule; the release of AMS which is intended, among other things, to provide for the conversion of the Correspondence Imaging System to a new platform for inventory management, completed development 127 percent over planned cost. We were not able to determine cost or schedule variances of a milestone of MeF, release 6.1, because IRS had not identified planned cost and schedule information for it.<sup>34</sup>

Figure 1 depicts the detailed cost and schedule variances of the project milestones that were completed during fiscal year 2009.

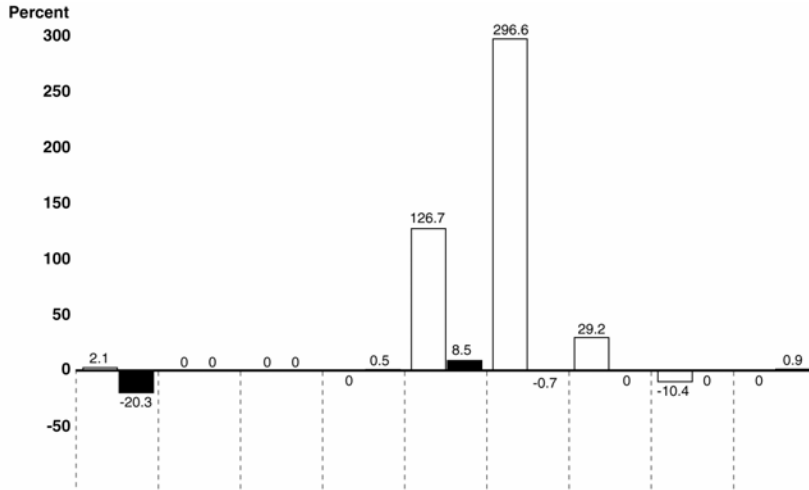
<sup>33</sup>IRS's Enterprise Life Cycle Guidance defines seven milestones, each occurring at the end of one of the phases of the life cycle. Milestone 0- at the end of vision and strategy/enterprise architecture, 1- project initiation, 2- domain architecture, 3- preliminary design, 4- development, test, and integration, 5- system deployment. The development, test, and integration phase is sometimes split into two phases, each corresponding to a different milestone: 4a- detailed design and 4b- system development.

<sup>34</sup>In the fiscal year 2009 expenditure plan, IRS requested funding for six milestones of AMS. IRS subsequently suspended these milestones pending completion of work to redefine its strategy for managing individual taxpayer accounts.



**Results  
Observations**

**Figure 1: Cost and Schedule Variances for Project Milestones Completed in Fiscal Year 2009**



Milestone	4	2-3	4a	5	4b	5	4a	4b	4b
Release	4.2	5	5	1.2	1.3	1.3	2.1	2.1	4
Program	CADE			AMS			IPM		

Cost variance  
 Schedule variance

Source: GAO analysis of IRS data.



## Results Observations

The following provides details for the six milestones that were completed within ten percent of cost and schedule estimates or early:

### CADE:

- Release 4.2, milestone 4: this release, intended to process decedent and surviving spouse returns, credit elect processing, receipt processing, criminal investigation refund hold, and last name changes, completed the development, test, and integration phase at a cost of \$28,848,000—about 2 percent over the estimated cost—and about 10 weeks (or 20 percent) earlier than planned. It should be noted, however, that according to the fiscal year 2010 expenditure plan, some functionality--the *credit election processing* and *criminal investigation refund hold*--was not completed as planned and was deferred to a subsequent release. When we followed up with IRS officials, they stated that the functionality that was deferred represented only some final testing that needed to be completed; however, without a quantitative measure of the scope, both planned and delivered, at each milestone, it is difficult to assess the impact of these deferrals. As noted earlier, IRS is continuing to work toward developing such a metric in response to our previous recommendation.
- Release 5, milestone 3: this release, intended to implement legislative changes associated with filing season 2010 and also complete the *credit elect* and *refund hold* capabilities that were deferred from the previous release, was reported to have completed preliminary design on March 17, 2009, within ten percent of cost and schedule estimates. (In our fiscal year 2009 BSM expenditure plan report, we noted that the initial plan for completing this milestone was September 30, 2008, and that, at that time, the milestone was already 10 percent over schedule. We also noted that IRS had reported stopping work on release 5 of CADE pending the results of its review of long-term plans for BSM. While IRS reported that the milestone was completed on March 17, 2009, 30 percent later than planned, the agency subsequently rebaselined the schedule for milestone 3 to show a March 17, 2009, completion date in response to strategic changes being made for the program). IRS reported spending \$6.025 million to complete this preliminary design phase, which represents a cost variance of zero.



## Results Observations

- Release 5, milestone 4a, completed the detailed design phase on April 30, 2009, and at a cost of \$11.5 million as planned.

### AMS:

- Release 1.2, milestone 5: this release, which was intended to include a new inventory and workflow that automates the assignment, research, resolution, and closure for entity and account transcripts, completed system deployment at planned cost and on schedule.
- Release 2.1, milestone 4b: this release, intended to provide, among other things, enhanced views of tax return information and correspondence images for taxpayer accounts as well as the ability to view and edit taxpayer name and contact information, completed development on schedule and about 10 percent under the budgeted cost.

### IPM:

- Release 4, milestone 4b: this release, intended to add new data sources (including data fields from the Individual Master File and the Information Returns Master File), completed development at planned cost and on schedule on December 16, 2008.



## Results Observations

The following provides details on the three AMS milestones that were significantly over cost but on schedule:

- Release 1.3, milestone 4b: this release, which is intended, among other things, to provide for the conversion of the Correspondence Imaging System to a new platform for inventory management, completed development 127 percent over planned cost.
- Release 1.3, milestone 5, completed deployment 297 percent over planned cost.
- Release 2.1, milestone 4a: this release, which, as previously noted, is intended to provide, among other things, enhanced views of tax return information and correspondence images for taxpayer accounts as well as the ability to view/edit taxpayer name and contact information, completed detailed design 29 percent over planned cost.

IRS's explanation of the cost variances for these AMS milestones in the expenditure plan did not include the underlying cause for these variances, as called for in IRS's own guidance. In the plan, IRS attributed the variances to the need to fund the projects in excess of planned amounts. When we followed up with IRS, it attributed the cost increases for these milestones to the number of software and infrastructure activities required to migrate to the system's long-term platform. IRS stated that, while these activities were initially estimated as part of the overall program, they had to be accomplished in this release in order to implement a usable solution that could then be used to implement the incremental changes in subsequent releases. Reporting on these underlying causes of variances in the expenditure plan in a consistent manner would provide Congress with insight into specific areas needing improvement.



## Results Observations

The following provides information on the milestone for which we could not calculate cost and schedule variances:

- IRS completed detailed design (milestone 4a) for release 6.1 of MeF, intended to include the rollout of electronic versions of Form 1040 and 22 other schedules, including Schedules A, B, and D, on December 4, 2008. IRS, however, did not report this milestone in the expenditure plan because it had not identified specific cost and schedule estimates for it in the fiscal year 2009 expenditure plan. Rather, IRS had reported estimates for combined milestones 4a to 5. While IRS has stated that its ELC allows for combining milestones to provide flexibility, the ELC also cautions that such combinations should be used to a limited extent since it poses greater risk than having separate milestones. This is because a longer period of time elapses, more work is performed, and more expense is incurred before the project receives management scrutiny. While we agree, consistent with IRS's policy, that combined milestones should be used to a limited extent, not reporting on individual milestones in the expenditure plan reduces transparency by not disclosing information on progress in delivering functionality to Congress in a timely manner.

It is important to note that the deployment of Release 6.1 of MeF represents a change in strategy whose net effect on the performance of the project is difficult to assess. Specifically, in response to schedule delays due to added complexities and requirements, IRS developed a new deployment strategy whereby the deployment of the 1040 series of forms is expected to be completed up to 2 years later than planned under the initial strategy and at a cost of nearly \$50 million more. However, a quantitative measure of progress in meeting scope expectations, which as previously noted, IRS expects to develop by the end of this month, would help more accurately assess the impact of this new strategy.



## Results Observations

*Observation 2: IRS has begun development of its new modernization strategy, but time frames for completing key planning activities for Transition State 2 have not yet been defined.*

IRS expects CADE 2, among other things, to

- establish a solid data foundation for the future by leveraging relational database processing capability;
- address financial material weaknesses;
- improve the agency's security and privacy posture by addressing identified weaknesses;
- continue the focus on moving away from 1960s technology (i.e., aging infrastructure and applications and sequential flat-file processing); and
- demonstrate progress toward achieving long-term viability.

In June 2009, IRS developed a *CADE Program Management Office (PMO) Operating Model and Roadmap* that identified high-level milestones for completing key activities associated with the development of the CADE 2 PMO. IRS has completed activities associated with standing up the PMO and developing the PMO operating model. For example, IRS assigned key program leadership positions; defined PMO requirements, scope, and objectives; and defined the organizational structures and PMO staffing needs. In July 2009, IRS established the CADE 2 PMO to guide the implementation of the new strategy.





**Results  
Observations**

IRS has identified two key phases, referred to as “transition states,” for delivering the new strategy. The key objectives of these transition states are summarized below:

**Table 4: Summarization of CADE 2 Transition States**

Transition State 1	Transition State 2
<ol style="list-style-type: none"> <li>1. Build an enterprise data model and establish the CADE 2 database that will house data on individual taxpayers and their accounts</li> <li>2. Enhance core IMF functionality, modify supporting systems and applications, and make required changes to upstream and downstream systems to support daily processing</li> <li>3. Make progress toward addressing financial material weaknesses by establishing a plan to create a baseline and identifying changes needed for Federal Financial Management System Requirements compliance</li> </ol>	<ol style="list-style-type: none"> <li>1. Core applications will directly access and update the CADE 2 database</li> <li>2. Address financial and security material weaknesses</li> <li>3. Restructure core tax processing applications by either leveraging current tax applications or building new ones</li> <li>4. Establish a single processing system - eliminating dual operating environments</li> </ol>

Source: GAO Analysis of IRS data.

It is expected that CADE 2 will result in faster refunds, improved customer service, elimination of notices based on out-of-date information, faster resolution of taxpayer account issues, and better online tools and services for taxpayers. IRS currently estimates CADE 2 costs for Transitions States 1 and 2 through fiscal year 2014 at about \$700 million.



## Results Observations

IRS has made progress in defining the transition states. For example, in addition to the *Preliminary Solution Architecture*<sup>35</sup> and *Preliminary Program Roadmap*<sup>36</sup> mentioned earlier, IRS baselined the business and technical requirements for Transition State 1 at the end of January 2010. Further, IRS has begun developing four different prototypes to test the feasibility of technologies and solution approach and gain confidence in system viability and performance. These prototypes, three of which are expected to be completed in fiscal year 2010 and the last one when the target state is reached, will test the following: (1) Java's performance, scalability, and ability to handle high-performance batch processing; (2) moving taxpayer information on IMF from weekly to daily processing; (3) the penalty and interest calculation's ability to meet performance requirements; and (4) end-to-end performance for each of the major transition states and the target state.

IRS has taken several actions to increase the likelihood that CADE 2 will be successfully defined and implemented. For example, key business stakeholders have been involved in defining the overall vision and specific requirements; a program management office has been established to manage the program; a governance framework involving MITS and business representatives at multiple levels has been developed to oversee the program; independent assessments have been performed to validate IRS's approach and make recommendations for improvements as appropriate; and, as previously noted, efforts to improve IRS's software development and acquisition practices have been initiated.

<sup>35</sup>This document describes the characteristics of the new strategy in both business and technical terms. IRS provided us a final version at the conclusion of our review.

<sup>36</sup>This document defines a high-level approach for delivering the new strategy and describes high-level milestones for delivering the transition states. IRS provided us a final version at the conclusion of our review.



## Results Observations

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For Transition State 2, IRS plans to set up a team to work on requirements, design principles, a framework for applications and infrastructure, engineering analysis, and prototypes during fiscal year 2010. However, it has yet to define associated time frames for completing these key planning activities. These time frames are critical to guiding progress in laying the groundwork for achieving the transition state's objectives of (1) using the CADE 2 database to feed downstream systems; (2) addressing financial and security material weaknesses; (3) restructuring core tax processing applications by either leveraging current or building new tax applications; and (4) eliminating dual operating environments.



## Results Observations

### *Observation 3: CADE 2 faces several risks.*

IRS has identified many risks associated with defining and implementing CADE 2. The agency has classified these risks into five categories:

- Delivery (e.g., the ability to deliver capabilities could be jeopardized if the scope is not rigorously managed);
- Program (e.g., managing expectations in order to have adequate time for due diligence);
- People (e.g., staffing of the program management office to authorized staffing levels);
- Technology and complexity (e.g., successful processing of individual tax returns could be jeopardized if the target solution does not meet system performance requirements for peak volume and required throughput with reasonable capacity);
- Management (e.g., the ability to achieve Transition State 1 could be affected if the new collaborative operating model is not implemented successfully).

IRS has defined and reports that it is implementing mitigation strategies for each risk identified.<sup>37</sup> For example, IRS has stated that it will develop a knowledge transfer plan, a resource and staffing plan, and a training plan to update the skill set of current IRS employees to address the “critical skill constraints” risk, which it defines as having a limited number of people with the requisite knowledge and skills in current systems.

In December 2009,<sup>38</sup> TIGTA identified several challenges that IRS needs to address to effectively manage identified risks, including, among other things, implementing a governance structure for the Program Management Office to provide oversight and direction for the implementation of CADE 2, and developing contingency plans in the event that CADE 2 cannot be fully implemented. In its comments on TIGTA’s report, IRS stated that it found the assessment to be valid.

<sup>37</sup>We did not determine the effectiveness of IRS’s methodology for identifying and mitigating risks but plan to do so in a review we have underway of IRS’s CADE 2 strategy.

<sup>38</sup>TIGTA, *Reengineering Individual Tax Return Processing Requires Effective Risk Management*, 2010-20-001 (Washington, D.C., Dec. 7, 2009).



## Results Observations

*Observation 4: Information Security weaknesses continue to affect IRS's modernization environment.*

IRS continues to have information security weaknesses that affect its modernization environment. In November 2009,<sup>39</sup> we reported that while IRS continued to make progress in correcting previously reported information security weaknesses, previously identified and newly identified weaknesses in internal controls over information security continue to place IRS systems at risk. For example, managers did not always provide timely review of employee access to sensitive data center areas as required to ensure that access is limited only to employees who need it to perform their jobs. Additionally, while IRS had informed us that it had corrected about 40 percent of the previously reported weaknesses, we found that it had not fully implemented the remedial actions it reported for at least a third of those weaknesses that it considered corrected. In written comments on our report, IRS stated that improving information security continues to be a priority and noted accomplishments it made in this area during fiscal year 2009. For example, IRS stated that it limited access to a reduced number of authorized staff and implemented controls to enforce the use of strong passwords in accordance with *Internal Revenue Manual*.

<sup>39</sup>GAO, *Financial Audit: IRS's Fiscal Years 2009 and 2008 Financial Statements*, GAO-10-176 (Washington, D.C.: Nov. 10, 2009).



## Results Observations

Further, in August 2009,<sup>40</sup> TIGTA reported that while IRS had taken steps to address 16 CADE system security vulnerabilities it had identified in a previous audit, only 10 had been fully resolved and the remaining 6 could not be resolved until controls were effectively in place or had been approved as deviations to IRS policy. These vulnerabilities increase the risks that (1) management will pay less attention to unresolved problems, (2) resources required to fix problems will not be allocated, (3) vulnerabilities will not be corrected in a timely fashion, and (4) the Office of Management and Budget will be unable to obtain an accurate status of IRS security weaknesses. As a result, TIGTA recommended that IRS take actions to ensure CADE and mainframe computer system owners (1) appropriately enter and track system vulnerabilities on control systems and (2) verify that corrective actions are fully implemented before they are considered and reported as resolved. IRS agreed with TIGTA's recommendations and stated that the cybersecurity organization will continue to improve the process to ensure that system owners comply with IRS policy to enter and track all system vulnerabilities in IRS control systems.

In addition to the steps that IRS is taking to address security recommendations from GAO and TIGTA, IRS has stated that, in Transition State 2, CADE 2 will fully address the security weaknesses that are currently confronting CADE. While actions to address the identified report findings will help to improve its security posture, IRS's modernization environment will continue to be at risk until the agency fully implements its security programs.

<sup>40</sup>TIGTA, *Customer Account Data Engine Release 4 Includes Most Planned Capabilities and Security Requirements for Processing Individual Tax Account Information*, 2009-20-100 (Washington, D.C., August 28, 2009).



## Conclusions

During fiscal year 2009, IRS continued to deliver BSM projects, although work on planned releases of CADE and AMS was either modified or suspended pending completion of efforts to define the agency's new strategy to manage individual taxpayer accounts. IRS generally made progress in addressing outstanding recommendations from our prior expenditure plan reviews. However, the expenditure plan explanations for significant project cost variances did not always provide information on root causes, limiting Congress's insight into areas needing improvement. Further, because IRS did not report one completed project milestone for which it had not identified specific plans in the fiscal year 2009 expenditure plan, Congress did not receive information on progress in delivering key functionality. Finally, while much has been done to define the Transition States—or key phases—of the CADE 2 strategy for managing individual taxpayer accounts, specific time frames for addressing key planning activities for Transition State 2, including defining core requirements, have not been defined. Having these time frames would guide progress in completing activities that are foundational to the transition state.



## Recommendations for Executive Action

To improve the program management capabilities and controls that are critical to the effective management of the BSM program, we are recommending that the Commissioner of Internal Revenue direct the Chief Technology Officer to take the following three actions:

- ensure that explanations of project cost and schedule variances provided in the expenditure plan consistently include underlying causes;
- for individual milestones that have been combined, report available performance information in the expenditure plan to provide Congress with information on progress in delivering functionality; and
- define specific time frames for CADE 2 Transition State 2 planning activities, including defining a core set of requirements to guide progress.





## Agency Comments and Our Evaluation

In e-mail comments and subsequent oral comments on a draft of these briefing slides, the IRS's Chief Technology Officer (CTO) generally agreed with much of the information presented but disagreed with two of our findings and with two of our recommendations. Specifically, he disagreed with our finding that IRS partially complies with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the government, stating that there is no requirement for federal agencies to use the cited practices. We have previously reported that to effectively manage major IT programs, organizations must use sound acquisition and management processes to minimize risks and thereby maximize chances for success. Such processes have been identified by leading organizations such as the Software Engineering Institute, the Chief Information Officers Council, and in our prior work analyzing best practices in industry and government. In particular, the CMMI model defines a suite of key acquisition process control areas that are necessary to manage system acquisitions in a rigorous and disciplined fashion. We are focusing on level-2 practices because it is recognized that, without them, processes are typically ad hoc and chaotic. Since IRS is not yet level-2 compliant, the agency partially complies with the acquisition rules, requirements, guidelines, and systems acquisition management practices used by the government.

IRS also disagreed with our finding that it has not fully implemented our recommendation to develop a long-term plan for BSM, stating that it believed that it had addressed this by providing the Modernization Vision and Strategy (MV&S) in fiscal year 2006. We have previously reported that the MV&S did not fully address our recommendation.<sup>41</sup> We acknowledge IRS's recent update of the MV&S with the CADE 2 strategy. As previously stated, we received the key planning documents associated with this strategy at the conclusion of our review and plan to review them as part of a review of CADE 2 that is currently underway.

<sup>41</sup> GAO-09-281.



## Agency Comments and Our Evaluation

Regarding our recommendation to ensure the explanations of project cost and schedule variances provided in the expenditure plan include underlying causes, IRS stated that the expenditure plan consistently provides narrative explanations of all project segment cost and schedule variances, in addition to the attribution of those variances. While we agree with this statement, our point is that the underlying causes for the cost variances for three AMS milestones were not in the plan, in accordance with IRS's own guidance. IRS, however, provided us this information when we followed up with the agency.

Regarding our recommendation to report on project milestones delivered for which specific cost and schedule estimates were not identified in fiscal year 2009 the expenditure plan (due to milestones being combined), the CTO commented that, when milestones are combined within a project segment, IRS generally does not develop or track specific cost and schedule estimates for the individual project milestones and that since milestone-specific information is not available, only the overall cost and schedule estimate for the combined milestone segment is reported in the expenditure plan. However, in the case of MeF, IRS developed and tracked schedule information for milestone 4a but did not report it. Reporting this information would improve the transparency of IRS's progress in delivering functionality. IRS also provided technical comments which we have addressed as appropriate.



**Appendix I**

Description of BSM Projects and Program-Level Initiatives

<b>Proposed modernization initiative</b>	<b>Description</b>
<b>Tax administration projects</b>	
Modernized e-File	Is to provide a single standard for filing electronic tax returns. Initial releases will address large corporations, small business, and tax-exempt organizations. Its ultimate goal is the conversion of IRS's 1040 e-file program.
Current Customer Account Data Engine (CADE)	Is to build the modernized database foundation to replace the existing Individual Master File (IMF) processing system that contains the repository of individual taxpayer information.
Customer Account Data Engine 2 (CADE 2)	Is intended to leverage Current CADE and the IMF, which contain the repository of individual taxpayer information, to provide timely access to authoritative individual taxpayer account information and enhance IRS's ability to address technology, security, financial material weaknesses, and long-term architectural planning and viability.
<b>Core infrastructure projects</b>	
Development, Integration, and Testing Environments	Is to provide oversight for laboratory environments that support evaluation, development, and testing of components from multiple projects: (1) Virtual Development Environment provides a software development environment and a standardized set of tools, and (2) Enterprise Integration and Test Environment provides an integration and testing environment for all projects.
Infrastructure Shared Services	Is to deliver, in incremental releases over multiple years, a fully integrated, shared IT infrastructure to include hardware, software, shared applications, data, telecommunications, security, and an enterprise approach to systems and operations management.
<b>Architecture, integration, and management</b>	
Architecture and integration	Is to ensure that systems solutions meet IRS business needs and that the development projects are effectively integrated into the business environment.



**Appendix I**

**Description of BSM Projects and Program-Level Initiatives**

<b>Proposed modernization initiative</b>	<b>Description</b>
Business integration	Is to ensure that IRS's BSM program is aligned with the business units' vision and delivers the desired business results. It provides support to key activities such as transition management, business rules enterprise management, and requirements development and management operations.
Business rules and requirements management	Is to provide support to business process analysis and redesign by harvesting and managing an enterprise set of business rules and developing business requirements.
Management processes	Is to provide sustaining support for program-level management processes, including quality assurance, risk management, program control and process management, and enterprise life cycle maintenance and enhancements.
Federally funded research and development center	Is to provide program management and systems engineering support.
Program management	Is to ensure programs achieve their objectives by providing the management information and IT infrastructure that supports risk management, project cost and schedule estimating, financial management, and procurement management for the prime contracts and associated task orders.

Source: GAO analysis of IRS data.



**Appendix II**  
Additional Detail on IRS's Fiscal Year 2010 BSM Expenditure Plan

Proposed modernization initiative	Release <sup>a</sup>	Milestone/ type of activity <sup>b</sup>	Amount Requested (in thousands)
<b>Tax administration projects</b>			
Modernized e-File (MeF)	6.2	3-5	\$17,000
MeF	7	3-4a	33,000
<b>Subtotal— MeF project</b>			<b>50,000</b>
<hr/>			
Current Customer Account Data Engine (CADE)	6.2	4b	22,000
Current CADE	operations and maintenance	Level of Effort (LOE)	16,000
<b>Subtotal—Current CADE project</b>			<b>38,000</b>
<hr/>			
CADE 2	Infrastructure	LOE	11,519
CADE 2	Program Management Office	LOE	4,846
CADE 2	Engineering and Analysis	LOE	9,100
CADE 2	Transition State 1	LOE	17,594
CADE 2	Transition State 2	LOE	1,941
CADE 2	Integrated Production Model	LOE	2,654
<b>Subtotal—CADE 2 project</b>			<b>47,654</b>
<b>Subtotal—tax administration projects</b>			<b>135,654</b>
<hr/>			
<b>Core infrastructure projects</b>			
Development, integration, and testing environment		Infrastructure (INF)	14,500
Infrastructure Shared Services		INF	17,500
<b>Subtotal—core infrastructure projects</b>			<b>32,000</b>



**Appendix II**  
Additional Detail on IRS's Fiscal Year 2010 BSM Expenditure Plan

Proposed modernization initiative	Release <sup>a</sup>	Milestone/ type of activity <sup>b</sup>	Amount Requested (in thousands)
<b>Architecture, integration, and management</b>			
Architecture and integration		LOE	13,745
Business integration		LOE	4,206
Business rules and Requirements Management		LOE	3,160
Management processes		LOE	3,539
Federally funded research and development center		LOE	7,396
Program management		LOE	2,954
<b>Subtotal—architecture, integration, and management</b>			<b>35,000</b>
<b>Management reserve</b>			<b>5,020</b>
<b>BSM Capital Total</b>			<b>207,674</b>
<b>BSM Labor Total</b>			<b>44,666</b>
<b>Maintaining Current Levels</b>			<b>1,334</b>
<b>Total fiscal year 2010 BSM program</b>			<b>\$253,674</b>

Source: GAO analysis of IRS data.

<sup>a</sup>Releases are software versions that provide a subset of the total planned project functionality.

<sup>b</sup>Milestones correspond to phases within IRS's enterprise life cycle (0 – vision and strategy/enterprise architecture, 1 – project initiation, 2 – domain architecture, 3 – preliminary design, 4a – detailed design, 4b – system development, 5 – system deployment). According to IRS, *level of effort* activities generally support the overall management of the program, such as contracting or risk management. They do not follow the ELC methodology nor do they directly create end user benefits. They do require the contractor to provide a specified level of effort, over a stated period, on work stated in general terms. *Infrastructure* projects follow many aspects of the ELC but differ from development projects in that they (1) do not have a separate business case, though they have definable costs and general broad benefits; (2) operate based on the support needs of the project, rather than end-user requirements; (3) cannot make changes that are independent from the projects they support, that is, the infrastructure projects must synchronize changes with the application projects and assess the impact; and (4) project teams have no direct control over external changes (e.g., a new requirement for an application project) that will drive cost fluctuations.

**Appendix I: Briefing Slides from the March 9,  
2010, Briefing to the Senate and House  
Appropriations Subcommittee Staffs**



**Appendix III**

**IRS Reported Cost and Schedule for Projects Scheduled for Completion in Fiscal Year 2009**

**This table shows the projects completed in fiscal year 2009.**

<b>Project segment</b>	<b>Estimated completion date and funding (in thousands)</b>	<b>Milestone exit and cost (in thousands)</b>	<b>Change (%)</b>	<b>IRS explanation of change</b>
AMS Release 1.2 Milestone 5	11/11/08 \$1,060	11/13/08 \$1,060	1 day (0.5%) \$0 (0%)	Exit was completed one day later than planned due to the scheduling of a Customer Service Executive Steering Committee meeting.
AMS Release 1.3 Milestone 4b	11/11/08 \$3,747	12/05/08 \$8,494	16 days (8.5%) \$4,747 (126.7%)	Technical complexity of the configurations and development of the environment resulted in approximately a 3-week delay in exiting this milestone. Additionally, cost variance was due to development costs significantly exceeding estimates and required realignment of AMS project funds to continue funding the development of this release.
AMS Release 1.3 Milestone 5	05/31/09 \$1,006	05/28/09 \$3,990	-1 day (-0.7%) \$2,984 (296.6%)	Completed one day earlier than planned. Additionally, cost variance was due to development costs significantly exceeding estimates and required realignment of AMS project funds to continue funding the development of this release.
AMS Release 2.1 Milestone 4a	12/09/08 \$2,522	12/09/08 \$3,258	0 days (0%) \$736 (29.2%)	Variance is due to the need for additional funding to complete software and infrastructure design activities.
AMS Release 2.1 Milestone 4b	08/05/09 \$4,402	08/05/09 \$3,946	0 days (0%) -\$456 (-10.4%)	Variance is due to slightly less funding needed for development activities than original planned amounts.
CADE Release 4.2 Milestone 4	03/31/09 \$28,265	01/15/09 \$28,848	-51 days (-20.3%) \$583 (2.1%)	Schedule variance resulted from exiting this milestone 10 weeks earlier than originally planned. However, some functionality deferred to subsequent release. Cost variance resulted from the need to fund development activities related to additional unplanned requirements and legislative changes associated with the filing season.



**Appendix III**

**IRS Reported Cost and Schedule for Projects Scheduled for Completion in Fiscal Year 2009**

Project segment	Estimated completion data and funding (in thousands)	Milestone exit and cost (in thousands)	Change (%)	IRS explanation of change
CADE Release 5 Milestones 2-3	03/17/09 \$6,025	03/17/09 \$6,025	0 days (0%) \$0 (0%)	Note: This planned exit date represents a rebaseline of an earlier estimate of 9/30/08.
CADE Release 5 Milestone 4a	04/30/09 \$11,500	04/30/09 \$11,500	0 days (0%) \$0 (0%)	Note: This planned exit date represents a rebaseline of an earlier estimate of 11/30/08.
IPM <sup>a</sup> Release 4 Milestone 4b	12/15/08 \$563	12/16/08 \$563	1 day (0.9%) \$0 (0%)	

Source: GAO Analysis of IRS data.

Note: Variances for projects through milestone 3 are based on rough order of magnitude estimates. Post-milestone-3 variances are based on more specific estimates.

<sup>a</sup> IRS also completed additional milestones for IPM. However, we are not reporting on these because funding for them was not requested in the fiscal year 2009 expenditure plan.



# Appendix II: Comments from the Internal Revenue Service



DEPUTY COMMISSIONER

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

April 27, 2010

Mr. David A. Powner  
Director, Information Technology Management Issues  
U.S. Government Accountability Office  
441 G Street, N.W.  
Washington, DC 20548

Dear Mr. Powner:

I reviewed the Government Accountability Office draft report titled "*Business Systems Modernization: Internal Revenue Service's Fiscal Year 2010 Expenditure Plan*," (Government Accountability Office 10-539). We appreciate that your draft report recognizes the progress that the Internal Revenue Service has made to improve our program management capabilities and controls.

We will review the three new recommendations the Government Accountability Office reported to ensure our actions include assuring that underlying causes for project cost and schedule variances are consistently provided in the expenditure plan. We will provide the detailed corrective action plan addressing each of the recommendations with our response to the final report.

We appreciate your continued support and the assistance and guidance from your staff.

If you have any questions or would like to discuss our response in more detail, please contact Terence V. Milholland, Chief Technology Officer, at (202) 622-6800.

Sincerely,

Mark A. Ernst  
Deputy Commissioner,  
Operations Support

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

David A. Powner, (202) 512-9286 or [pownerd@gao.gov](mailto:pownerd@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, Sabine R. Paul, Assistant Director; Neil Doherty; Mary D. Fike; Nancy Glover; Lee McCracken; Paul B. Middleton; and Krzysztof Pasternak made key contributions to this report.

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