



*While Release 1.0 of the Web Applications System
Was Successfully Deployed, Several Factors
Contributed to Implementation Delays*

September 7, 2017

Reference Number: 2017-20-057

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HIGHLIGHTS

WHILE RELEASE 1.0 OF THE WEB APPLICATIONS SYSTEM WAS SUCCESSFULLY DEPLOYED, SEVERAL FACTORS CONTRIBUTED TO IMPLEMENTATION DELAYS

Highlights

**Final Report issued on
September 7, 2017**

Highlights of Reference Number: 2017-20-057
to the Internal Revenue Service Chief
Information Officer.

IMPACT ON TAXPAYERS

In November 2013, a task force of IRS executives convened to develop a Future State Vision designed to transform IRS operations in order to modernize the taxpayer experience, make filing simpler for taxpayers, and increase voluntary compliance. The Web Applications Program Management Office was initiated to drive innovation and create digital services to meet taxpayer needs. Its primary purpose was to establish an online account for individual taxpayers that links the taxpayer to various IRS services.

WHY TIGTA DID THE AUDIT

This audit was initiated to determine whether the IRS adequately developed and tested the functionality of the taxpayer's online account provided by Release 1.0 of the Web Applications system. This release was designed to deliver an online account for individual taxpayers along with the ability to:

- See a Balance Due.
- See the Payment Status/History.
- Make a Payment.
- View/Download Tax Transcripts.

TIGTA evaluated policies, procedures, and processes for developing and testing Release 1.0 of the Web Applications system that included functional business requirements, project management, and security testing.

WHAT TIGTA FOUND

Development and deployment of Release 1.0 of the Web Applications system was significantly delayed. A lack of funding caused a delay in the Web Applications Program Management Office obtaining the necessary staffing resources. Similarly, inconsistent governance contributed to project delays. The Web Applications Program Management Office was transferred to various executive steering committees and governance boards that were responsible for approving the funding for the system's staffing resources.

In addition, an incompatible work request process caused delays in receiving products and services for the development of Release 1.0 of the Web Applications system. These deficiencies in resources caused the program to re-focus its priorities to first develop the *See a Balance Due* and *Make a Payment* functionality.

The Web Applications Program Management Office and its delivery partners designed, developed, and tested these two functionalities. They were deployed in November 2016 and were available for taxpayers to use during the 2017 Filing Season. The remaining two functionalities, *See the Payment Status/History* and *View/Download Tax Transcripts*, were deployed in June 2017.

WHAT TIGTA RECOMMENDED

TIGTA recommended that the Chief Information Officer ensure that all Project Management Offices operate with an oversight function that is aligned with the organization's governance model. In addition, the IRS should streamline the current Unified Work Request process by incorporating processes that support the needs of the Agile development methodology.

The IRS agreed that all Program Management Offices should operate with an oversight function that is aligned with the organization's governance model, but disagreed that the Web Applications Program Management Office did not have appropriate governance. The IRS also plans to establish an incremental approach to define and pilot a more effective way to accomplish demand management.



TREASURY INSPECTOR GENERAL
FOR TAX ADMINISTRATION

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

September 7, 2017

MEMORANDUM FOR CHIEF INFORMATION OFFICER

FROM: Michael E. McKenney
Deputy Inspector General for Audit

SUBJECT: Final Audit Report – While Release 1.0 of the Web Applications System Was Successfully Deployed, Several Factors Contributed to Implementation Delays (Audit # 201620020)

This report presents the results of our review to determine whether the Internal Revenue Service (IRS) adequately developed and tested the functionality of the taxpayer's online account provided by Release 1.0 of the Web Applications system. This review is included in our Fiscal Year 2017 Annual Audit Plan and addresses the major management challenge of Improving Tax Systems and Online Services.

Management's complete response to the draft report is included as Appendix V.

Copies of this report are also being sent to the IRS managers affected by the report recommendations. If you have any questions, please contact me or Danny R. Verneuille, Assistant Inspector General for Audit (Security and Information Technology Services).



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Abbreviations

ELC	Enterprise Life Cycle
IRS	Internal Revenue Service
IT	Information Technology
PMO	Program Management Office
UWR	Unified Work Request
Web Apps	Web Applications



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Background

In November 2013, a cross-functional task force of executives convened to develop a vision for the future of the Internal Revenue Service's (IRS) customer service. The task force developed a Future State Vision designed to transform IRS operations in order to modernize the taxpayer experience and empower its workforce to operate more efficiently. These efforts were designed to make filing simpler for taxpayers and increase voluntary compliance. The goals of this vision are to allow taxpayers to be able to:

- Find information quickly and efficiently.
- Adjust accounts independently.
- Resolve cases faster, usually within one year of filing.
- Have a high rate of compliance year after year.
- Be satisfied with IRS interactions.

Once this Future State Vision was developed, an analysis determined there was a need for a new Program Management Office (PMO) to centrally manage digital services for the taxpayer. As a result, the Services and Enforcement Executive Steering Committee approved the Web Applications (hereafter referred to as Web Apps) project in January 2015. The Web Apps PMO officially began operations on February 5, 2015, with a focus to drive innovation and create digital services to meet taxpayer needs. The Web Apps PMO is required to operate across multiple business and delivery partners in the IRS in order to deliver web-based applications. The Web Apps PMO has the responsibility to:

- Manage the execution of the program and be accountable for overall program success.
- Act as the front door between the Information Technology (IT) organization and the business and delivery partners.
- Manage and execute the product roadmap and release plan.
- Communicate and integrate across the enterprise.
- Execute the governance framework.
- Manage the scope, schedule, and cost associated with application delivery.
- Coordinate resource and risk management.

The Deputy Commissioner for Services and Enforcement identified objectives for the Web Apps system to deliver over the course of three system releases. Release 1.0 of the Web Apps system



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is focused on the taxpayer's online account functionality. Future releases are not fully scoped, but the IT organization has approved plans for the integration of an IRS2Go mobile application, third-party access to a taxpayer's online account, and additional website enhancements. Third-party access would allow tax practitioners to access client tax data, make payments, and resolve compliance issues.

Development of Release 1.0 of the Web Apps system

The primary purpose of the Web Apps PMO is to establish an online account for individual taxpayers that links the taxpayer to various IRS services. The Services and Enforcement Executive Steering Committee provides oversight for the Web Apps PMO and established the original scope for Release 1.0 of the Web Apps system to be delivered by September 30, 2015. There were four capabilities to be delivered for individual taxpayers:

- 1. See a Balance Due.**
- 2. See the Payment Status/History.**
- 3. Make a Payment.**
- 4. View/Download Tax Transcripts.**

Release 1.0 of the Web Apps system was chosen to be a pilot for using the Agile¹ Enterprise Life Cycle (ELC) development methodology, which is an update to the traditional development ELC paths available to be used by other IRS system development projects. Traditional development models need a large amount of time and resources during the planning stages of the project because they require a clearly defined solution with full requirements before the team can begin developing the system. The Agile ELC development methodology allows development teams to spend less time planning and developing requirements and more time developing systems and generating business value. Commercial software development projects have long benefited from the use of Agile methods to reduce risk and to successfully develop applications that deliver capabilities that add value and meet critical business needs. The Agile ELC development methodology focuses on only activities that are certain to be part of the solution and not on activities in the future that might be part of the solution. The elimination of non-value-added work in the Agile ELC development methodology is intended to create a more efficient and lean development process.

This review was performed at the IT organization's Enterprise-PMO at the New Carrollton Federal Building in Lanham, Maryland, during the period November 2016 through May 2017. Information also was obtained from the Cybersecurity organization and the Strategy and Planning organization's Business Planning and Risk Management division. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to

¹ See Appendix IV for a glossary of terms.



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provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. Detailed information on our audit objective, scope, and methodology is presented in Appendix I. Major contributors to the report are listed in Appendix II.



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Results of Review

The Web Applications Program Management Office Deployed Two of the Four Planned Functionalities for Release 1.0 of the Web Applications System in November 2016

During the initial development of Release 1.0 of the Web Apps system, the Web Apps PMO recognized resource and staffing constraints were impacting its ability to deliver all four of the system's planned functionalities in one deployment. The Web Apps PMO adjusted its development schedule to first deliver a Minimum Viable Product that included two functionalities, 1) *See a Balance Due* and 2) *Make a Payment*, as well as an account snapshot page. The Web Apps PMO planned to deliver the remaining functionalities of Release 1.0 of the Web Apps system, *i.e.*, *See the Payment Status/History* and *View/Download Tax Transcripts*, in later deployments. This plan to first deliver what the IRS calls a "Minimum Viable Product" was approved by the Interim Governance Authority during the Milestone Exit Review in September 2015. A Milestone Exit Review occurs when a project has completed a life cycle phase and needs to determine whether the project should be allowed to continue to the next phase. The Chief Technology Officer² established the Interim Governance Authority to make governance decisions for the Web Apps system until an appropriate governance board with IT organization and business representatives could be established.

The Web Apps PMO was tasked with delivering this release while piloting the Agile ELC development methodology. IRS organizational processes for project development are aligned with more traditional development methodologies, such as Waterfall project development. The Web Apps PMO had to pioneer process changes at an organizational level to help the delivery partners adapt to the Agile ELC development methodology. The Web Apps system delivery partners included members from the Strategy and Planning, Enterprise Services, Applications Development, Enterprise Operations, and Cybersecurity organizations.

The Web Apps PMO and its delivery partners designed, developed, and tested the Minimum Viable Product's two functionalities through a series of five sprints. Each sprint was a subset of the project's functionality that was developed and tested prior to production. Based on the functionalities to be developed, the Web Apps PMO developed user stories, which are the basic work units of both planning and execution. Each user story represents a piece of functionality that is testable, independent, and small enough that a number of user stories can be developed within a sprint. The Web Apps PMO developed 86 user stories for the Minimum Viable

² In June 2016, the Chief Technology Officer/Chief Information Officer left the IRS. As of July 2016, the IRS announced a new Chief Information Officer and no longer used the title of Chief Technology Officer.



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Product. All 86 user stories were completed and traced back to test cases. No controls or errors were deferred or waived during testing before the system was deployed.

ELC artifacts for the Minimum Viable Product were completed and approved following an Integration Readiness Milestone Exit Review. The Web Apps PMO deployed an internal release of the system for IRS users to access on October 14, 2016. This internal release provided an additional layer of review and allowed the Web Apps PMO to identify and mitigate any issues or defects prior to deploying the system externally to taxpayers. The Web Apps PMO and its delivery partners reported the external deployment contained no defects in the system code.

Security testing was performed and audit trail security controls were used prior to deploying the Minimum Viable Product externally. The Cybersecurity organization completed a Security Controls Assessment, as well as other security validation activities, and granted the Authorization to Operate to the Minimum Viable Product in November 2016. Upon receiving the Authorization to Operate, the Web Apps PMO deployed the Minimum Viable Product, *i.e.*, *See a Balance Due* and *Make a Payment*, externally for taxpayers to use in November 2016. Within the first three weeks of being deployed, individual taxpayers were using the system and more than \$7.5 million in payments were processed through the Minimum Viable Product. As of February 18, 2017, 20,515 payments had been made through the Minimum Viable Product, totaling \$66.9 million.

Following the initial deployment, the Web Apps PMO continued to work on delivering the remaining two planned functionalities for Release 1.0 of the Web Apps system. As of June 2017, these two functionalities, *See the Payment Status/History* and *View/Download Tax Transcripts*, were added to the Web Apps system and made available for taxpayers to use.

Deployment of Release 1.0 of the Web Applications System Was Significantly Delayed

The Web Apps PMO was initially tasked with delivering its four original functionalities for Release 1.0 of the Web Apps system by September 30, 2015. The Web Apps PMO experienced delays in delivering Release 1.0 of the Web Apps system on schedule due to lack of funding and an incompatible work request process. These issues caused the Web Apps PMO to receive resources in an inefficient manner. The Web Apps PMO reported these resource issues to executive personnel, completed the Product Planning Review, and adjusted its schedule in an attempt to deploy all four functionalities by December 2016. However, these delays prevented taxpayers from being able to use any of Release 1.0 of the Web Apps system's planned functionalities for the 2016 Filing Season.



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Lack of resources caused delays to the deployment of Release 1.0 of the Web Apps System

Internal Revenue Manual 2.16.1.8³ defines governance as a process of putting structure around how the IT organization's strategy aligns with the IRS's business strategy, ensuring that it stays on track to achieve its goals, as well as implementing good ways to measure the IT organization's performance. The primary objective of IRS Governance is to ensure that assigned investment, program, and project objectives are met; risks are managed appropriately; and, enterprise expenditures are fiscally sound. The governance process includes review and concurrence of Office of Management and Budget and Department of the Treasury related submissions, business cases, and baseline change requests. IRS Governance is granted control for all investments, programs, and projects within its assigned portfolio. IRS Governance is required to make funding decisions for projects during Milestone Exit Reviews.

The Web Apps PMO did not have the staffing resources necessary to fully develop Release 1.0 of the Web Apps system timely and effectively. The lack of funding caused a delay in the Web Apps PMO obtaining the necessary staffing resources needed for development. In Fiscal Year 2015, the IRS received \$346 million less in funding than Fiscal Year 2014 operating levels. Due to the reduction in funding, the IRS enacted an external hiring freeze during Fiscal Year 2015. Fiscal Year 2016 funding continued to restrict hiring for Release 1.0 of the Web Apps system.

In addition, the Web Apps PMO was transferred to various executive steering committees and governance boards that were responsible for providing the funding authority for the Web Apps PMO resource needs. IRS governance boards provide direction on the information technology scope and schedule baseline based on established funding and targeted business results. A timeline of the executive steering committees and governance boards that provided oversight for the Web Apps PMO shows that:

- The Web Apps PMO was started without a governance board in February 2015.
- The Interim Web Apps Governance Authority was established to provide direct governance for the Web Apps PMO in September 2015.
- The Web Apps Governance Board was established under the IT organization's Enterprise Governance Committee to provide oversight to the Web Apps PMO in March 2016.
- The Web Apps Governance Board was transferred to the Strategic Development Executive Steering Committee in September 2016. As of June 2017, the Web Apps PMO remains under the oversight of this Executive Steering Committee.

The Web Apps PMO was started without a governance board, but functioned under the Services and Enforcement Executive Steering Committee. The Committee was chaired by the Deputy

³ Internal Revenue Manual 2.16.1, *Enterprise Life Cycle Guidance* (Dec. 22, 2015).



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Commissioner for Services and Enforcement and functioned at a level too high to provide direct oversight and funding authority for a PMO. During the planning and development phases, the Web Apps PMO lacked sufficient staffing resources that severely constrained its ability to accomplish planned goals. In July 2015, the Web Apps PMO elevated the lack of staffing resources as a critical risk for Release 1.0 of the Web Apps system to the Chief Technology Officer. The lack of staffing resources continued as delays in corporate governance transitions required the Web Apps PMO to operate without a governance board until September 2015, when the Interim Web Apps Governance Authority was established to provide direct governance for the Web Apps PMO. This Interim Web Apps Governance Authority was established to determine if the Web Apps PMO could exit the Product Planning Review Phase and begin development activities.

Upon exiting the Product Planning Review Phase in September 2015, the Web Apps PMO decided to deliver two of the four functionalities, *i.e.*, *See a Balance Due* and *Make a Payment*, in an initial deployment named Minimum Viable Product. The remaining two functionalities were scheduled to be delivered after the initial deployment. On October 1, 2015, the delivery schedule for the initial deployment of the Minimum Viable Product was extended beyond September 2015 to May 2016. In addition, all functionalities included in Release 1.0 of the Web Apps system were scheduled to be delivered by December 2016. In December 2015, the Web Apps PMO and its delivery partners had only 38 full-time equivalent staff. The Web Apps PMO and partners identified and reported to executive personnel a resource need of 53 additional full-time equivalent staff. This deficiency in resources caused the program to re-focus its priorities to first develop the *See a Balance Due* and *Make a Payment* functionalities. The development of the Web Apps system's *See the Payment Status/History* as well as *View/Download Tax Transcripts* functionalities would be delivered once resources became available.

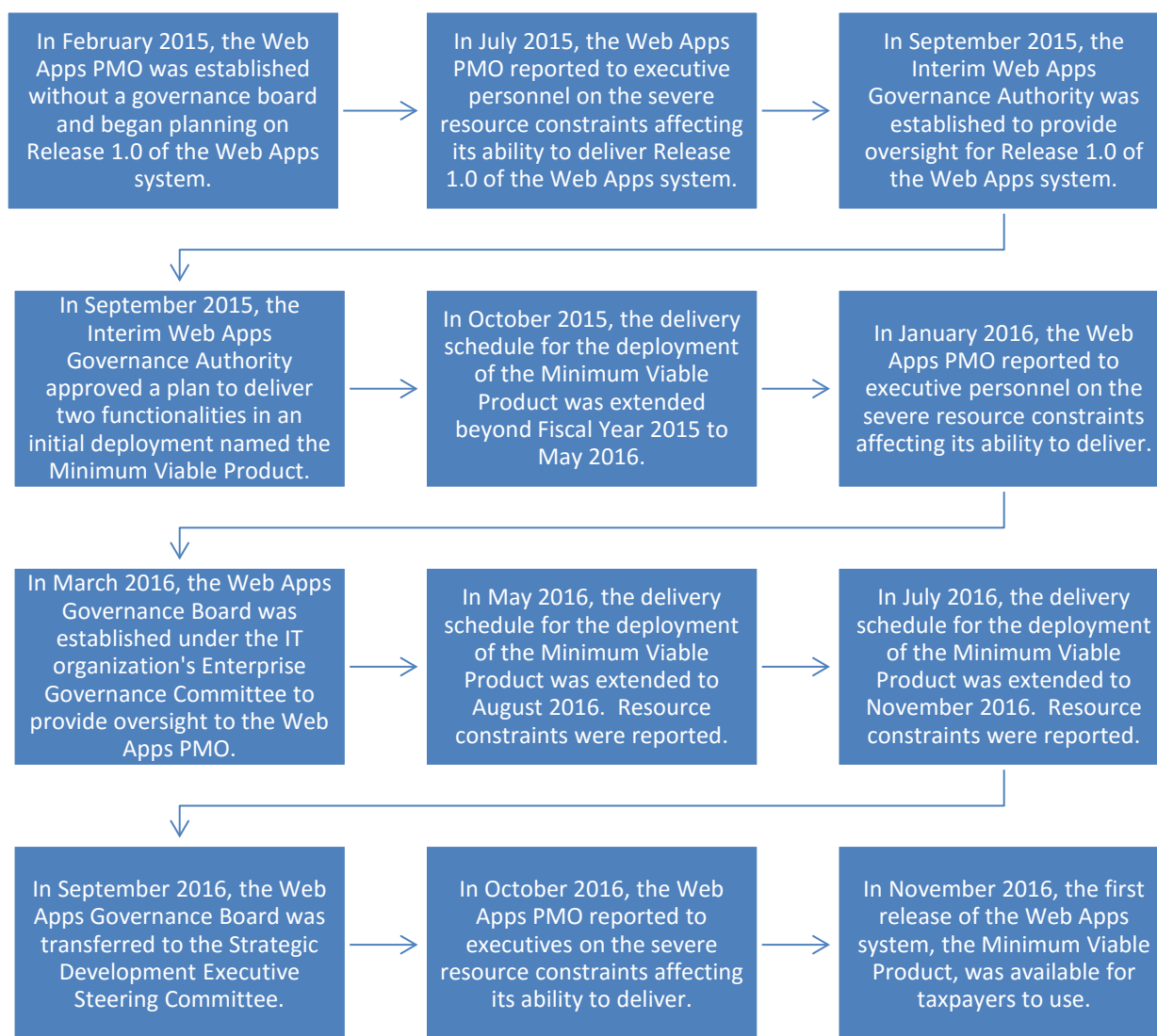
In March 2016, a formal Web Apps Governance Board was established under the IT organization's Enterprise Governance Committee to provide oversight to the Web Apps PMO. The IT organization's Enterprise Governance Committee was co-chaired by the Chief Technology Officer and the Deputy Commissioner, Wage and Investment Division. During this time, the Web Apps PMO and its delivery partners lost full-time equivalent staff as program demands required resources to be used elsewhere in the IRS. The Web Apps PMO and its delivery partners had 29.5 full-time equivalent staff and temporary resources devoted to developing the Minimum Viable Product and identified and reported to executive personnel an additional need of 54.5 full-time equivalent staff. In May 2016, the delivery schedule for the initial deployment of the Minimum Viable Product was extended to August 2016. In July 2016, the delivery schedule for the initial deployment of the Minimum Viable Product was extended again to November 2016. The Web Apps PMO continued to report the need for resources throughout Calendar Year 2016 and indicated that schedule delays would result. The Web Apps PMO operated under severe resource constraints and has had to leverage contract resources on an ad-hoc basis. In September 2016, the Web Apps Governance Board was transferred to the



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Strategic Development Executive Steering Committee. Figure 1 presents a timeline of the development of Release 1.0 of the Web Apps system under its various governance boards.

Figure 1: Timeline of Development for Release 1.0 of the Web Apps System



Sources: Web Apps briefings to the Chief Information Officer and the Web Apps governance boards from March 2015 through December 2016.

Throughout the development process, the Web Apps PMO reported these staffing shortages and resource constraints to the responsible steering committees and governance boards. In these reports, the Web Apps PMO reported these staffing shortages as critical risks to the program and that they were severely constraining its ability to accomplish its goals. These staffing shortages were reported to executive personnel who established the Interim Web Apps Governance



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Authority. In an effort to mitigate these staffing shortages, executive personnel provided the Web Apps PMO with additional funding. Funding was provided from user fees collected by the IRS to help the Web Apps PMO augment its staff in Fiscal Year 2016 and Fiscal Year 2017. The Web Apps PMO continued to operate under large staffing deficits due to the hiring restrictions despite the additional funding provided by executive personnel.

The Unified Work Request (UWR) process is not compatible with the needs of the new Agile development methodology

Internal Revenue Manual 2.22.1⁴ gives the IT organization the responsibility to increase customer satisfaction through effective registration and efficient response to demand for information technology products and services. The UWR process focuses on collecting requests for information technology products and services from the IT organization into a single system using a common set of processes and procedures. The UWR process recommends that data requests be made approximately one year in advance. The Requirements and Demand Management Division was responsible for oversight of the IRS IT organization demand management program and the UWR process. The Business Planning and Risk Management Division took over responsibility for the UWR process in March 2017. The primary goal of the program is to register all demand for information technology products and services, and provide transparency for data driven decision making for resource commitments. This includes collecting all related detailed business requirements to enable the IT organization's suppliers to properly review, assign, analyze, and respond (approve/deny) to the request. A supplier is any IT organization that provides information technology products and services to another organization. For the Web Apps system requests, the UWR process has to work with multiple delivery partners and requires several layers of review prior to approval.

The UWR process is a legacy process that is designed for traditional system development methodologies that gather all of the requirements at the beginning of the process during its planning stages. However, Release 1.0 of the Web Apps system is a pilot for using the Agile ELC development methodology that allows development teams to spend less time planning and developing requirements and more time developing systems. Therefore, all requirements are not known before beginning system development work. Without initially knowing all of the requirements, the Requirements and Demand Management Division, following the UWR process, struggled to meet the needs, *e.g.*, timely provide development information technology products and services, of the Web Apps PMO and its delivery partners. This contributed to the delayed development of Release 1.0 of the Web Apps system.

For example, the UWR process took more than a year after submission of the initial request to setup a server environment that allowed the Web Apps PMO to perform testing. For a development methodology focused on delivering application functionality frequently, these types

⁴ Internal Revenue Manual 2.22.1, *Requirements and Demand Management, Unified Work Request Process* (Sept. 11, 2012).



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of delays inhibit the project's chances of timely delivery. The Business Planning and Risk Management team identified the issues caused by this process and started to recognize the need to use Agile methodologies in its operations. The Business Planning and Risk Management team conducted lessons learned sessions with the Web Apps PMO to identify ways to improve the UWR process and adapt Agile methodologies.

Due to the delayed deployment of the two Web Apps system functionalities, the IRS missed an opportunity for greater success in its efforts to improve taxpayer access to information and reduce taxpayer burden. As a result, at the start of the 2017 Filing Season, taxpayers were unable to use the Web Apps system to see payment status and history or view and download transcripts. To acquire this information, taxpayers had to use the separate Get Transcript Online Service, IRS2GO mobile phone app, call, mail, fax, or visit an IRS taxpayer assistance center, which does not achieve its goals to "modernize the taxpayer experience" and increase its efficiency. The separate Get Transcript Online Service provides access to all transcript types and available years for users to view, print, or download from a browser. In Fiscal Year 2016, the IRS provided taxpayer assistance to more than 76.2 million taxpayers through its toll-free telephone helpline or at walk-in sites. The Transcript Delivery System fulfilled 38.2 million requests in Fiscal Year 2016. The Transcript Delivery System enables authorized tax practitioners to order tax account, tax return transcript, and other tax information for their business and individual clients. These requests could have been provided in a more timely and direct manner by Release 1.0 of the Web Apps system if it had been deployed on schedule.

Recommendations

The Chief Information Officer should:

Recommendation 1: Ensure that all future project management offices are established and operate with an oversight function that is aligned with the organization's governance model and encompasses the project life cycle.

Management's Response: The IRS agreed with the intent of this recommendation, but disagreed with the implication that the Web Apps PMO did not have appropriate governance or that the evolution of the IT governance model contributed to development or delivery delays for Release 1.0 of the Web Apps system. The IRS stated that though the governance model was evolving, the Web Apps PMO had appropriate and effective management and oversight since inception in January 2015, including that of the Services and Enforcement Executive Steering Committee. The Web Apps PMO transitioned from its previous governance to the new governance structure in September 2016. In January 2017, the IRS completed implementing its new information technology Governance model with established processes for ongoing project life cycle oversight.

Office of Audit Comment: As presented in this report, the Web Apps PMO was established without a governance board in February 2015, an interim governance board



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was not established until September 2015, and a formal Web Apps Governance Board was finally established in March 2016. While the PMO may have been placed under the Services and Enforcement Executive Steering Committee at the beginning of the project, this executive committee operated at a level too high to provide the direct oversight a new system under development would need to meet resource and schedule milestones. This recommendation intends to prevent this circumstance from recurring in the future.

Recommendation 2: Streamline the current UWR process by incorporating processes that support the needs of the Agile development methodology.

Management's Response: The IRS agreed with this recommendation. The IRS plans to establish an incremental approach to define and pilot a more effective way to accomplish demand management for programs using Agile methodologies by September 2018, depending on availability of required funding and resources.



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Appendix I

Detailed Objective, Scope, and Methodology

The overall objective was to determine whether the IRS adequately developed and tested the functionality of the taxpayer's online account provided by Release 1.0 of the Web Apps system. To accomplish our objective, we:

- I. Obtained and reviewed criteria documentation – standards, policies, and procedures.
 - A. Obtained and reviewed standards for systems development using the Agile Modified-Iterative Path.
 - B. Obtained and reviewed system testing policies, procedures, and standards, such as Internal Revenue Manuals and ELC guidance.
 - C. Obtained and reviewed Internal Revenue Manual, National Institute of Standards and Technology, and other Cybersecurity best practices for determining security testing requirements that must be met prior to a system receiving a security authorization to operate and being placed into production.
- II. Determined the adequacy of Release 1.0 of the Web Apps system, requirements development, and testing.
 - A. Obtained Web Apps planning documentation to determine all functional business requirements of Release 1.0 of the Web Apps system.
 - B. Reviewed the project design specification report and determined if functional business requirements were designed into Release 1.0 of the Web Apps system.
 - C. Reviewed Release 1.0 of the Web Apps system sprint testing results.
 1. Determined if functional business requirements had been tested and are traceable to test results.
 2. Reviewed end of sprint test reports to determine if failed tests were properly resolved and key controls were not deferred or waived before approving the sprint results and advancing.
- III. Determined if security testing was performed and if security control vulnerabilities were corrected prior to Release 1.0 of the Web Apps system receiving a security authorization to operate and being placed into production.
 - A. Obtained and reviewed Release 1.0 of the Web Apps system's Cybersecurity concurrence memorandum, the security authorization memorandum signed by the system owner, and Cybersecurity testing reports.



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- B. Reviewed the security testing requirements and testing documentation to determine if the Cybersecurity security assessment was properly completed prior to Release 1.0 of the Web Apps system receiving a security authorization and being placed into production.
 - C. Reviewed security testing results to determine if vulnerabilities existed with audit trail security controls at the time Release 1.0 of the Web Apps system received a security authorization and was placed into production.
- IV. Evaluated the actions taken to meet sprint testing and deployment deadlines and on-board staff.
- A. Reviewed actions taken to speed up the Web Apps development process to meet schedule deadlines and system deployment prior to Calendar Year 2017.
 - B. Determined why the Web Apps PMO has rotated between various executive steering committees and governance boards and the impact on the Web Apps system development process.
 - C. Reviewed the impact of the UWR process on Release 1.0 of the Web Apps system development process.

Internal controls methodology

Internal controls relate to management's plans, methods, and procedures used to meet their mission, goals, and objectives. Internal controls include the processes and procedures for planning, organizing, directing, and controlling program operations. They include the systems for measuring, reporting, and monitoring program performance. We determined that the following internal controls were relevant to our audit objective: the Web Apps PMO policies, procedures, and processes for developing and testing Release 1.0 of the Web Apps system and the IRS IT organization's security policies and guidance. We evaluated these controls by interviewing Web Apps PMO personnel, delivery partners, security, and testing management about Release 1.0 of the Web Apps system functions, development and testing activities, security testing, and defects management. We reviewed policies and procedures on system development, testing, security testing, and the IRS systems development life cycle. We interviewed Business Risk and Planning Division personnel on the UWR process. We also interviewed IRS Cybersecurity organization management and reviewed the security controls assessment and system authorization requirements.



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Appendix II

Major Contributors to This Report

Danny R. Verneuille, Assistant Inspector General for Audit (Security and Information
Technology Services)
John Ledford, Director
Myron Gulley, Audit Manager
Kasey Koontz, Lead Auditor
Corey Brown, Senior Auditor



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Appendix III

Report Distribution List

Commissioner
Office of the Commissioner – Attn: Chief of Staff
Deputy Commissioner for Operations Support
Deputy Commissioner for Services and Enforcement
Deputy Chief Information Officer for Operations
Associate Chief Information Officer, Applications Development
Associate Chief Information Officer, Cybersecurity
Associate Chief Information Officer, Enterprise-Program Management Office
Associate Chief Information Officer, Strategy and Planning
Director, Business Planning and Risk Management
Director, Security Risk Management
Director, Web Applications
Director, Office of Audit Coordination



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Appendix IV

Glossary of Terms

Term	Definition
Agile Development Methodology	Software development methodology based on iterative and incremental development, in which requirements and solutions evolve through collaboration between self-organizing, cross-functional teams. Agile promotes development, teamwork, collaboration, and process adaptability throughout the life cycle of the project.
Authorization to Operate	The official management decision given by a senior organizational official to authorize operation of an information system and to explicitly accept the risk to organizational operations (including mission, functions, image, or reputation), organizational assets, individuals, other organizations, and the Nation based on the implementation of an agreed-upon set of security controls.
Cybersecurity organization	An organization within the IRS IT organization responsible for ensuring IRS compliance with Federal statutory, legislative, and regulatory requirements governing confidentiality, integrity, and availability of IRS electronic systems, services, and data.
Defect	An error in coding or logic that causes a program to malfunction or to produce incorrect/unexpected results.
Enterprise Life Cycle	The approach used by the IRS to manage and effect business change. The ELC provides the direction, processes, tools, and assets for accomplishing business change in a repeatable and reliable manner.
Enterprise Life Cycle Artifacts	The output of an activity performed in a process/procedure. Artifacts are created throughout the lifecycle of a project and can support either project management or the information technology technical solution such as the design.



*While Release 1.0 of the Web Applications System
Was Successfully Deployed, Several Factors
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Term	Definition
Executive Steering Committee	A committee that oversees investments, including validating major investment business requirements and ensuring that enabling technologies are defined, developed, and implemented.
Filing Season	The period from January 1 through April 15 when most individual income tax returns are filed.
Full-Time Equivalent	A measure of labor hours in which one full-time equivalent is equal to eight hours multiplied by the number of compensable days in a particular fiscal year. For Fiscal Year 2016, one full-time equivalent was equal to 2,096 staff hours.
Information Technology organization	The IRS organization responsible for delivering information technology services and solutions that drive effective tax administration to ensure public confidence.
Milestone	Usually occurs at the end of a life cycle phase, and provides natural breakpoints at which new information regarding costs, benefits, and risks may be evaluated. Milestones also serve as executive management decision points at which IRS executives make go/no-go decisions for continuation of a project. Project funding decisions are often associated with milestones. A milestone is an investment management decision point placed at a natural breakpoint in the life cycle which allows the project to proceed to the next phase.
Minimum Viable Product	An Agile concept in which a product or application is developed with sufficient features to satisfy initial users. It is comprised of the most basic features of a product to satisfy functionality, impact, and value when the product is released.
Product Planning Review	The milestone at the end of the Product Planning Phase. Its purpose is to finalize and approve the product scope and ensure that development and test environments have been established.
Release	A specific edition of software that is deployed into a production environment. A release requires governance board approval prior to deployment.



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Term	Definition
Security Controls Assessment	The testing and evaluation of the management, operational, and technical security controls in an information system to determine the extent to which the controls are implemented correctly, operating as intended, and producing the desired outcome with respect to meeting the security requirements for the system.
Sprint	A process that develops a piece of functionality of the system with repeated cycles of requirements discovery, planning, design, development, and testing. The goal of each sprint is to get a subset of the project's functionality to a "production-ready" state.
User Story	A simple, brief, and concise statement written in the language of the users to represent a piece of software functionality that is testable, independent, and small enough so that a number of user stories can be developed within a sprint.
Waterfall Project Development	A rigorous method for system development characterized by serial performance of work with frequent breakpoints at which the solution must be formally approved prior to any additional work being performed. This method has defined requirements, sequential progression through the phases, and uses a developmental technical approach for its solution.



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Appendix V

Management's Response to the Draft Report



CHIEF INFORMATION OFFICER

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

AUG 15 2017

MEMORANDUM FOR DEPUTY INSPECTOR GENERAL FOR AUDIT

FROM:

S. Gina Garza 
Chief Information Officer

SUBJECT:

Draft Audit report – "While Release 1.0 of the Web Applications System Was Successfully Deployed, Several Factors Contributed to Implementation Delays" (TIGTA Audit # 201620020). (etrak # 2017-94605)

Thank you for the opportunity to review the draft audit report. The Internal Revenue Service (IRS) is proud of what we have accomplished on behalf of the taxpayers through the Web Applications (WebApps) Program. Release 1.0 of WebApps provided taxpayers access to a secure on-line account through which they can see a balance due, see payment status and history, make a payment, and view or download their tax transcripts. In its first eight months of operation, On-line account has enabled \$302 million in voluntary compliance and supported over 1 million taxpayer accesses to check account balances.

Despite significant funding and hiring constraints, through this program, we are transforming the way we develop and deploy new business functionality; bringing value to market in shorter periods of time. As an example, through the WebApps Program, we broke new ground in establishing our Agile practices. As mentioned in the audit report, the WebApps program was delivering the release while piloting the Agile development methodology. This Agile approach enabled the IRS to deploy quality software every nine weeks; incrementally providing value to taxpayers and business customers. These new practices are being leveraged by other programs and are foundational to our efforts to establish a collaborative Agile culture.

At the same time we were standing up the WebApps Program Management Office and were creating new Agile processes, we were engaged in an effort to improve and streamline the IRS Information Technology (IT) governance approach. Though the governance model was evolving, from inception, the WebApps program had appropriate and effective management and oversight, including that of the Services and Enforcement Executive Steering Committee. We do not share the audit team's opinion that the evolution of the IT governance model contributed to development or delivery delays for Release 1.0 of WebApps.



*While Release 1.0 of the Web Applications System
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These delays were a result of insufficient funding and hiring constraints as well as the challenges that arise when installing new infrastructure and piloting new processes or modifying existing processes.

The IRS values the insight your organization provides in our shared objective of improving IT systems and business processes. If you have any questions, please contact me at 202-317-5000 or contact Carmelita White at (240) 613-2191.

Attachment



*While Release 1.0 of the Web Applications System
Was Successfully Deployed, Several Factors
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Attachment

Draft Audit Report – While Release of 1.0 of the Web Applications Systems Was Successfully Deployed, Several Factors Contributed to Implementation Delays (Audit # 201620020)

RECOMMENDATION #1: Ensure that all future project management offices are established and operate with an oversight function that is aligned with the organization's governance model and encompasses the project life cycle.

CORRECTIVE ACTION #1: While the Internal Revenue Service (IRS) agrees with the tenants of this recommendation, we disagree with the implication that WebApps did not have appropriate governance or that the evolution of the Information Technology (IT) governance model contributed to development or delivery delays for Release 1.0 of WebApps. Though the governance model was evolving, the WebApps program had appropriate and effective management and oversight since inception in January 2015, including that of the Services and Enforcement Executive Steering Committee. WebApps transitioned from its previous governance to the new governance structure in September 2016. In January 2017, the IRS completed implementing its new IT Governance model with established processes for on-going project life cycle oversight. This recommendation is closed.

IMPLEMENTATION DATE: N/A

RESPONSIBLE OFFICIAL: Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN: We will enter the accepted corrective action into the Joint Audit Management Enterprise System (JAMES), along with the proper documentation to close this item.

RECOMMENDATION #2: Streamline the current UWR process by incorporating processes that support the needs of the Agile development methodology.

CORRECTIVE ACTION #2: The Internal Revenue Service (IRS) agrees that the current Unified Work Request (UWR) process does not efficiently support programs using Agile methodologies. We will establish an incremental approach to define and pilot a more effective way to accomplish demand management, for programs using Agile methodologies, by September 2018, depending on availability of required funding and resources.

IMPLEMENTATION DATE: September 30, 2018

RESPONSIBLE OFFICIAL: Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN: We will enter accepted corrective actions into the Joint Audit Management Enterprise System (JAMES) and monitor them on a monthly basis until completion.