



*Initial Efforts to Develop an Enterprise Case
Management Solution Were Unsuccessful;
Other Options Are Now Being Evaluated*

July 27, 2018

Reference Number: 2018-20-043

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HIGHLIGHTS

INITIAL EFFORTS TO DEVELOP AN ENTERPRISE CASE MANAGEMENT SOLUTION WERE UNSUCCESSFUL; OTHER OPTIONS ARE NOW BEING EVALUATED

Highlights

Final Report issued on July 27, 2018

Highlights of Reference Number: 2018-20-043 to the Commissioner of Internal Revenue.

IMPACT ON TAXPAYERS

In January 2015, the IRS formally established the Enterprise Case Management (ECM) program to consolidate many case management systems across the IRS. The ECM program planned to: 1) standardize system design for increased taxpayer information security; 2) reduce the risk for system failures that would impede revenue collection; and 3) provide cost savings by reducing information technology hardware, software, and system maintenance costs.

WHY TIGTA DID THE AUDIT

Tax administration is currently supported by more than 90 different case management systems that vary in complexity and size, and are in some cases customized. There is a need for the IRS to modernize and upgrade these aging case management systems. This audit was initiated to review the IRS's efforts to implement an enterprise-wide case management solution.

WHAT TIGTA FOUND

After establishing the ECM program in January 2015, the IRS did not search for a software product that would enable the ECM program to meet its enterprise-wide requirements. The IRS used entellitrak® to develop the ECM solution despite problems reported from prior case management projects, e.g., the software product had not proven it could be scalable to the IRS's needs and did not have continuous integration capability. In November 2016, the IRS provided the vendor a

list of 37 operational problems. However, the IRS had concerns with the vendor's proposed solutions. In addition to the software problems, ECM requirements were not agreed upon prior to the start of the ECM projects.

In February 2017, the IRS Commissioner was informed that the software product that the IRS had selected was not viable for developing the ECM solution. The IRS suspended the last ECM project's development activities in April 2017. The IRS spent \$85.4 million on approximately two and a half years of work that was unsuccessful.

In March 2017, the IRS initiated a product assessment process to evaluate the industry's case management software products and identify the best solution for the ECM. The IRS issued two requests for information to obtain input from the industry concerning how its current approach aligns with existing product capabilities. In addition, the Information Technology organization and business partners are working together to develop requirements.

WHAT TIGTA RECOMMENDED

TIGTA recommended that the IRS Chief Information Officer ensure that: 1) information technology projects follow the Internal Revenue Manual Technical Solution Process; 2) an ECM solution is selected that will enable the IRS to consolidate the majority of the legacy case management systems; and 3) the base and mission-critical ECM program requirements are determined and all initial planning and program-level activities are completed prior to the technical solution procurement and the start of ECM projects.

The IRS agreed with two recommendations and plans to identify a viable ECM solution, and determine program requirements and complete all initial planning activities prior to the start of ECM projects. The IRS disagreed with one recommendation and believes that the prior product assessment was applicable and addressed the Internal Revenue Manual requirement to perform a Commercial-Off-the-Shelf product assessment for projects. TIGTA disagrees that the prior product assessment was applicable because it did not include the requirements needed by the ECM program.



TREASURY INSPECTOR GENERAL
FOR TAX ADMINISTRATION

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

July 27, 2018

MEMORANDUM FOR COMMISSIONER OF INTERNAL REVENUE

FROM: Michael E. McKenney
Deputy Inspector General for Audit

SUBJECT: Final Audit Report – Initial Efforts to Develop an Enterprise Case Management Solution Were Unsuccessful; Other Options Are Now Being Evaluated (Audit # 201720025)

This report presents the results of our review to assess the Internal Revenue Service's (IRS) efforts to implement an enterprise-wide case management solution. This review is included in our Fiscal Year 2018 Annual Audit Plan and addresses the major management challenge of Improving Tax Compliance.

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

COTS	Commercial-Off-the-Shelf
ECM	Enterprise Case Management
IRS	Internal Revenue Service
IT	Information Technology
PMO	Program Management Office
TASIS	Taxpayer Advocate Service Integrated System



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Background

Case management is the process that addresses the resolution of tax administration issues through the management of case creation, execution, maintenance, and closure. It describes the activities required to manage the life cycle of an individual case. The Internal Revenue Service's (IRS) case management environment is characterized by many challenges that are driven by the complexity of the tax laws and tax administration, the diversity of the customers the IRS serves, the large number and variety of IRS programs and services, and the need to modernize and upgrade aging IRS case management systems.

Tax administration is supported by more than 90 different case management systems that vary widely in complexity and size and how they are customized. These case management systems were implemented over many years to support the individual needs of multiple business units. As a result, the IRS is maintaining various Commercial-Off-the-Shelf (COTS)¹ products that use different hardware and software. The lack of standardization has created the following issues:

- High costs associated with operating and maintaining many different and aging case management systems.
- Redundant case management processes.
- Inability to electronically transfer work between systems, and to track the end-to-end life cycle of a case.

The IRS began planning for the Enterprise Case Management (ECM) program in 2014. In January 2015, the IRS formally established the ECM program as a joint effort between the Information Technology (IT) organization and the business units to consolidate case management systems across the IRS. In support of the ECM program, the IRS also established the ECM IT Program Management Office (PMO) and the ECM Business PMO. The ECM PMOs' aim was to streamline case management processes across the business units and consolidate IRS case management systems into one common solution. In January 2015, the IRS reported that the IRS Commissioner approved the high-level approach to developing the ECM program. This included using entellitrak[®] to develop the ECM solution. The ECM solution will provide core case management capabilities that are commonly used (*e.g.*, create case, assign case, close case) across all business units. The IRS expects the ECM will provide the following benefits:

¹ See Appendix IV for a glossary of terms.



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- A standardized enterprise-wide solution for case management.
- Reduced risk for system failures that impede revenue collection.
- Standardized system design for increased taxpayer information security.
- Reduced information technology hardware, software, and systems maintenance costs through replacement of numerous, antiquated case management systems.
- Improved information sharing between the various business units and the IT organization.

Prior to initiating the ECM program, the IRS had started three other case management projects: Information Reporting and Document Matching Case Management system, Taxpayer Advocate Service Integrated System (TASIS), and the Affordable Care Act² Case Management system. The Treasury Inspector General for Tax Administration conducted audits of all three case management projects.³ The audits reported that all three projects were closed or suspended prior to completion. Both the Information Reporting and Document Matching Case Management project and the TASIS project failed because of insufficient system requirements. The Affordable Care Act Case Management project was closed in order to free up resources and funding for other information technology projects. In total, the IRS spent \$33,256,603 and dedicated significant resources toward development of the three systems. Figure 1 shows the funds spent on each system prior to cancellation.

² Patient Protection and Affordable Care Act (Affordable Care Act), Pub. L. No. 111-148, 124 Stat. 119 (2010) (codified as amended in scattered sections of the Internal Revenue Code and 42 U.S.C.), as amended by the Health Care and Education Reconciliation Act of 2010, Pub. L. No. 111-152, 124 Stat. 1029.

³ Treasury Inspector General for Tax Administration, Ref. No. 2014-20-088, *The Information Reporting and Document Matching Case Management System Could Not Be Deployed* (Sept. 2014); Treasury Inspector General for Tax Administration, Ref. No. 2014-20-071, *Information Technology: Improvements Are Needed to Successfully Plan and Deliver the New Taxpayer Advocate Service Integrated System* (Sept. 2014); Treasury Inspector General for Tax Administration, Ref. No. 2016-23-066, *The Affordable Care Act Case Management System Release 1.0* (Aug. 2016).



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**Figure 1: System Development Costs of
Recent Case Management Projects**

Case Management Project	Cost
Affordable Care Act Case Management system	\$4,833,616
Information Reporting and Document Matching Case Management system	\$8,759,309
Taxpayer Advocate Service Integrated System	\$19,663,678
Total	\$33,256,603

Source: Costs provided by the IRS from the Integrated Financial System and the Department of the Treasury's SharePoint Investment Knowledge Exchange.

This review was performed with information obtained from the IT organization's ECM IT PMO and the Enterprise Services organization in the New Carrollton Federal Building in Lanham, Maryland; the Small Business Self-Employed Division in the IRS National Headquarters in Washington, D.C.; and the IT organization's Applications Development organization in Farmers Branch, Texas, during the period December 2016 through March 2018. 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 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

**Work Was Performed to Determine the Potential Legacy Systems to
Be Consolidated Into the Enterprise Case Management Solution**

The ECM Program Charter states that the objective of the ECM program is to consolidate IRS case management systems into a single solution. The ECM solution will either partially or fully replace the functionality of identified legacy case management systems. As the business units analyze the ECM landscape using a prioritization tool, they will determine which systems will be partially or fully replaced. The IRS stated that systems were identified for consolidation if they met one of the following criteria.

- The system had to have one of the parameters of a case management system, which include the ability to create cases, work cases, and close cases, or was considered a critical business process.
- The system was part of the ECM Tracking project.
- The system was built in entellitrak.

The ECM Business and IT PMOs worked together and jointly identified 61, of the more than 90, systems as of April 2016 to potentially transfer to the ECM solution. The IRS had operations and maintenance cost information for only 20 of the 61 systems that totaled about \$104.3 million.⁴ The identified systems were scored using a prioritization model which considered the age, number of users, software language, number of interfaces, and operation and maintenance costs. We reviewed the spreadsheets and determined that these factors were used in the scoring, but did not perform further analysis due to the IRS decision to suspend system development discussed later in the report. The IRS said that until a product is selected, it will not know which legacy case management systems or processes will be transferred, the criteria that will be used to determine these systems, or how the systems or processes not transferred will interface with the ECM solution.

⁴ We did not validate the accuracy of the costs the IRS provided.



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Entellitrak Was Used to Develop the Enterprise Case Management Solution Despite Problems Reported From Prior Case Management Projects

The following Internal Revenue Manuals apply to all projects following the Enterprise Life Cycle. Internal Revenue Manual 2.120.1, *Engineering Policy* (Sept. 16, 2014), states that the Technical Solution Process shall be used to select, design, and implement solutions to requirements. Internal Revenue Manual 2.120.2, *Technical Solution Process Description* (Oct. 20, 2015), lists the activities performed and work products created during the Technical Solution Process. These work products are required unless the project is a maintenance project. Examples of work products are:

- Alternative solution screening criteria.
- Evaluation reports of new technologies.
- Selection criteria for final selection.
- Evaluation reports of COTS products.
- Solution component selection decisions and rationale.

In June 2013, the Enterprise Services organization concluded a formal study, *i.e.*, an Alternative Analysis, to analyze the case management software products available and identify a COTS product and an alternative open source product for IRS use. The case management software products included in the analysis were selected from the following: 1) best in class product recommendations from studies conducted by Forrester, Gartner, and MITRE (industry leaders); and 2) products already used in or recommended by specific IRS case management projects. Entellitrak and Nuxeo were not among the products recommended by the industry leaders, but were included in the analysis because they were products already used in or recommended by specific IRS case management projects. The IRS selected these two products even though industry leaders did not recommend them. Entellitrak was selected for the COTS product and Nuxeo for the alternative open source product.

After formally establishing the ECM program in January 2015, the IRS did not perform a search for a software product that would enable the ECM program to meet its enterprise-wide information technology and business requirements. The IT organization's Enterprise Services management stated that technical analyses are usually conducted on a five-year cycle – having done one in June 2013, they would not have repeated it in one or two more years. When the IRS decided to create the ECM solution, it believed the information from the June 2013 analysis was still relevant, which led to the 2014 decision to use entellitrak for the ECM solution. Furthermore, in October 2015, the Associate Chief Information Officer, Enterprise Services, stated that entellitrak is the IRS's ECM standard and the IRS has zero plans to move away from entellitrak for all case management projects. This decision was made even though problems with



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entellitrak were identified and reported in prior case management projects. For example, in September 2014, the IRS performed a technical demonstration for case assignment functionalities for the TASIS. The Technical Issues/Concerns and Lessons Learned Overview for that demonstration reported that entellitrak:

- Had not proven it could be scalable to the IRS's needs.
- Did not have the ability to customize the entellitrak user interface for a particular user.
- Did not have continuous integration capability, which is the capability that allows developers to integrate working copies of software into a shared repository one time or more each day.
- Did not entirely protect a developer's work from changes made by other developers.

IRS management stated that resolving the entellitrak problems was an ongoing effort from the time they were identified. Starting in October 2014, an IRS development team began working with MicroPact (the entellitrak vendor) to resolve these problems, but they were not resolved by the time the ECM program began in January 2015.

In July 2015, without solicitation from management, IRS IT organization staff involved in the development process of IRS case management projects completed a report on entellitrak and Nuxeo documenting critical concerns with entellitrak. Specifically, the report:

1. Stated that the Affordable Care Act Case Management and ECM development teams performed independent analyses of their use cases and after attempting to apply them to entellitrak, determined that entellitrak was a poor fit for the Affordable Care Act Case Management project. The report noted that this conclusion was based on proof of concepts, actual implementations, and independent third party sources. However, this finding was not well received by some areas within the IT organization.
2. Raised concerns about whether entellitrak was capable of providing a cost-effective and flexible framework given its propriety nature and expensive licensing model.
3. Stated that the TASIS team anticipated using programming code from the E-TRAK project to begin its development efforts. The TASIS project was the first attempt at building a large-scale implementation on entellitrak within the IRS. However, after review, it was determined that using the E-TRAK programming code was not a viable option due to the entellitrak version used, and the size, scope, and complexity differences between the projects. As a result, the TASIS team had to create a new case management implementation using entellitrak.
4. Stated that the ECM development team evaluated the resulting TASIS implementation for reusable components for inclusion into the ECM solution. Again, it was found that there were no opportunities to leverage from this solution, further raising concerns with the product's design limitations.



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5. Strongly recommended *“that the IT senior leadership perform serious consideration to stop using entellitrak, and instead, support IT teams in focusing on Nuxeo and to empower them to be successful in achieving the Technology Roadmap vision. At the very least, we request further independent verification of these findings should this document’s information not be deemed valid enough for this decision to be supported.”*

The ECM IT PMO stated that the IRS did not verify the findings detailed in the report.

The ECM IT PMO acknowledged that there were serious concerns with the ability of entellitrak to meet the IRS’s needs. IRS management stated that they have worked with MicroPact since 2014 to resolve specific problems and they relied on MicroPact’s assurance that the problems would be fixed. In March 2016, the ECM Integrated Technology Working Group was established to facilitate discussion among the key ECM delivery partners and stakeholders, with a focus on establishing a way to plan technical requirements across the ECM program. In addition, the group would act as a forum to raise awareness on technical challenges that needed to be resolved prior to and during release cycles. For example, the Integrated Technology Working Group planned to review Item Tracking, Reporting, and Control reports to identify product enhancements for the entellitrak product. The ECM IT PMO Director stated that the Group met with MicroPact weekly, but issues were not being resolved as quickly as needed. In July 2016, the concerns surrounding entellitrak escalated, so the IRS created a team with MicroPact and experts from across the IRS to evaluate the challenges with the product. The team focused on determining permanent solutions and interim workarounds to address the immediate issues with concurrent development. It provided daily progress reports to the ECM leadership team.

At the IRS’s request, MITRE began its assessment of the IRS’s ECM efforts in September 2016. In December 2016, MITRE delivered its results in a report titled *ECM – Fraud Assessment Results and Recommendations Summary*.⁵ This report stated that the entellitrak technical deficiencies had already been well documented in the IRS report and would not be expounded upon in its report. In addition, MITRE cited several challenges that could prevent the IRS from accomplishing its ECM goals for Fiscal Year 2017. MITRE’s assessment concluded that without immediately addressing significant challenges such as the technical deficiencies with entellitrak, the IRS would not be able to achieve its ECM goals.

In November 2016, the IRS sent MicroPact a list of 37 operational problems related to using entellitrak to develop the ECM solution and requested that MicroPact address the problems. By January 2017, only seven of the 37 problems were closed. Figure 2 shows the 37 problems separated into five categories based on the level of impact each had on system development.

⁵ MITRE, *IRS ECM – Fraud Assessment Results and Recommendations Summary, Version 1.0* (Dec. 2016).



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Figure 2: Entellitrak Problems By Impact Levels As of January 25, 2017

Impact Level	Impact Description	Total Issues	Open Issues	Closed Issues
Major	Major problems are “showstoppers,” <i>i.e.</i> , problems that prevent the IRS from continuing the ECM development if they are not resolved timely. Note: The continuous integration capability and the scalability problems are included in this group.	7	6	1
High	Significant impact requiring development of automated solutions.	20	17	3
Moderate	Impact requiring automated or minimal manual solutions to resolve.	4	3	1
Nominal	Impact requiring assessment of manual vs. automated solutions to ensure that ECM development can move forward.	4	2	2
Minor	Minor impact that can be addressed with a manual solution.	2	2	0
Total		37	30	7

Source: IRS ECM/entellitrak Product Operational Constraints dated November 21, 2016, and ECM IT PMO Briefing for the Chief Information Officer: Preliminary entellitrak Operational Constraints Analysis dated January 25, 2017.

The ECM IT PMO reviewed MicroPact’s set of solutions and determined that the majority were complex and shifted implementation responsibility to the IRS. In addition, implementation of MicroPact’s solutions would increase risk by requiring a change in processes, increasing manual recurring processes, and expanding potential maintenance and operational costs.

The IRS contracted with MITRE to conduct an ECM market research study to obtain information for consideration in making a decision, at the end of January 2017, on how to proceed with the technical solution for the ECM program. The IRS requested:

- Information about the vendor landscape and a small set of leading viable software options.
- A comparative analysis of the options to inform the decision on how to proceed with the technical solution.
- Contacts for the vendors and key users.
- Implementation considerations and insights gained during the study.



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In early February 2017, MITRE delivered the results of the ECM Market Research Study in a document titled *ECM Tool Analysis*. Later that month, the ECM IT PMO informed the IRS Commissioner that entellitrak is not viable for the ECM solution or to support the Enterprise Fraud Case Management system, but could be used for lower complexity solutions. In March 2017, the ECM IT PMO proposed and the IRS Commissioner approved the following two parallel activities recommended by MITRE.

1. Perform a COTS product assessment to evaluate the industry's best case management software. The COTS product assessment approach engages with the industry early through an initial posting (no response is required). The process is iterative with multiple requests for information to allow the IRS to understand the current COTS product capabilities while the IRS refines its case management requirements. Once requirements are refined, the IRS will commence the formal procurement process.
2. Develop case management prototypes using the Nuxeo open source software. The purpose of this work is to learn what can be accomplished by the development teams with a more flexible solution.

In April 2017, due to the Office of Procurement's concerns about how the Nuxeo prototype could potentially affect the COTS product assessment effort, the IRS cancelled the prototype work and focused on the COTS product assessment.

As of September 2017, the IRS had spent \$85.4 million on approximately two and a half years of work that ultimately had to be suspended because the efforts were unsuccessful (the IT organization spent \$74.7 million;⁶ the ECM Business PMO spent \$10.7 million⁷). The ECM IT PMO believes that there are benefits derived from the initial effort because a significant amount of the work conducted between 2015 – 2017 is being used to inform and guide the current product assessment effort. For example, the work from the program strategy, program requirements, and architecture was used to prepare the requests for information.

Nevertheless, because of the problems with its initial effort, there will be substantial delays in migrating case management processes from legacy case management systems. As a result, for the time being, the IRS will not be able to realize the cost savings from reducing information technology hardware, software, and system maintenance costs for the numerous, antiquated case management systems. Moreover, using antiquated systems runs the increased risk of system failures.

⁶ From the Department of Treasury's SharePoint Investment Knowledge Exchange as of September 2017: Total actual cost is \$76.77 million minus the Fiscal Year 2017 actual cost for the product assessment activities of \$2.04 million. PMO costs are no longer reported after September 2016.

⁷ The amount spent during Fiscal Years 2015 - 2017 as of May 30, 2017. We did not validate the accuracy of the ECM Business PMO costs.



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Recommendations

The Chief Information Officer should:

Recommendation 1: Ensure that information technology projects follow the Internal Revenue Manual Technical Solution Process.

Management's Response: The IRS disagreed with this recommendation, which is based on the assertion that the Service did not follow appropriate guidelines regarding information technology programs and the technical solution process. The IRS believes that the July 2013 Enterprise Services organization's formal study of the field of case management solutions was valid and current for decisionmaking in 2015 (when Enterprise Services management decided to use MicroPact's entellitrak software to build ECM), and met the Internal Revenue Manual guidelines on product evaluation. In its current acquisition effort, the IRS believes that the two requests for information from industry, information exchanges with other Government agencies, and a draft request for quotations already completed, as well as a future challenge-based scenario evaluation, exceed the Internal Revenue Manual guidelines for product evaluation and selection.

Office of Audit Comment: We disagree that the July 2013 Enterprise Services organization's formal study of the field of case management solutions was a valid study for the ECM solution because it did not include the case management requirements needed for the ECM solution. The IRS stated that its intent was to use a case management product (*i.e.*, entellitrak) that it had used successfully for several years. However, the IRS did not consider the September 2014 entellitrak issues identified in the TASIS project that were still unresolved when it decided to use entellitrak for the ECM solution. Some of those same issues occurred during the development of the ECM solution. Furthermore, the IRS response to the draft audit report acknowledges that it experienced challenges with enterprise-level use of the technical solution and has redirected its focus toward procurement of an enterprise solution. We believe an enterprise focus was needed when the ECM program began in January 2015 and the selected case management product should have been re-evaluated based on enterprise requirements.

Recommendation 2: Ensure that an ECM solution is selected that will enable the IRS to consolidate the majority of the legacy case management systems.

Management's Response: The IRS agreed with this recommendation. The IRS will use an innovative Product Assessment approach with a challenge-based evaluation to identify a viable ECM solution that is capable of consolidating the majority of legacy case management systems. The IRS's current product acquisition plan, based on two requests for information from industry, information exchanges with other Government agencies, draft and final requests for quotations, and a challenge-based scenario evaluation, will ensure that the IRS selects a solution that will satisfy this recommendation.



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Analysis of the challenge-based scenario evaluation will be completed and a product award issued in the third quarter of Fiscal Year 2019.

**Enterprise Case Management Requirements Were Not Agreed Upon
Prior to the Start of the Projects**

Programs are a means of executing corporate strategies and achieving business or organizational goals and objectives. Programs are comprised of various components—the majority of which are the individual projects within the program. The Program Management and Integration Plan, dated January 2017, is the primary source for information on how a program is planned, executed, monitored, and controlled. The ECM Program Management and Integration Plan states that the ECM program will deliver enterprise-level functionality using a multi-project approach.

Programs and projects begin with identifying the scope and requirements. The ECM Agile Requirements Plan provides a single reference source for all key requirements development and management topics. It states that the ECM Business PMO is responsible for approving and prioritizing requirements. While the ECM Business PMO is ultimately responsible for prioritization, it must collaborate with the ECM IT PMO, Business Subject Matter Experts, IT organization delivery partners, and affected stakeholders to understand the risk, costs, and dependencies involved.

The ECM Program Management and Integration Plan included the following ECM projects.

- Enterprise Fraud Case Management – This ECM project was scheduled for deployment in December 2017 and would have developed case management functionalities for fraud case management.
- ECM Tracking – The purpose of this ECM project was to establish one solution to achieve the conversion of existing IRS tracking systems⁸ to entellitrak.
- ECM Correspondence – The purpose of this ECM project was to track and report on correspondence between the IRS and taxpayers in support of cases being managed.

In June 2015, the Services and Enforcement Executive Steering Committee approved the plan to make the existing Affordable Care Act Case Management project and the new Enterprise Fraud Case Management project the first two ECM projects. The purpose of the Affordable Care Act Case Management project was to allow IRS employees to create, manage, and track Employer Shared Responsibility cases to ensure employer compliance. Because system development began before the ECM program was established, the project was expected to deliver the first wave of the ECM capabilities and serve as the foundation for the ECM solution.

⁸ Used for managing and tracking case information.



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In August 2016, the IRS stated that Enterprise Fraud Case Management was the number one priority for the ECM and that it would set the technology foundation for the ECM. At the same time, the IRS was in the process of attempting to retire the Electronic Fraud Detection System. However, the IRS could not completely retire the Electronic Fraud Detection System until all components, including case management, had been decommissioned.

None of the four ECM projects have been completed.

- As stated earlier, the Affordable Care Act Case Management project was closed in order to free up resources and funding for other information technology projects.
- The IRS suspended the ECM Correspondence project in October 2016 to reallocate resources to the Enterprise Fraud Case Management project.
- The IRS suspended the ECM Tracking project in February 2017 due to lack of resources.
- After determining that entellitrak was not viable for the ECM solution or the Enterprise Fraud Case Management project, the IRS suspended Enterprise Fraud Case Management development in April 2017 to focus on the ECM product assessment and procurement efforts.

As stated earlier in this report, the Affordable Care Act Case Management project cost \$4.8 million. The information technology and business costs for the remaining three ECM projects were \$74.7 million and \$10.7 million, respectively.

The Affordable Care Act Case Management and Enterprise Fraud Case Management projects illustrate the IRS's early attempts to develop the ECM based on specific business needs, *e.g.*, Affordable Care Act and fraud case management, rather than taking time to define ECM program requirements. In addition, the ECM IT PMO provided documentation that states the ECM Correspondence and ECM Tracking projects were being developed at the request of senior executives before the ECM solution was implemented. In the ECM lessons learned document, the IRS stated that development for ECM projects started prior to completing and obtaining agreement for the ECM program requirements and before completing the development of the ECM solution.

In October 2016, the IRS reported that not having agreed upon baselined ECM requirements was a risk in its Item Tracking, Reporting, and Control system. Specifically, the risk statement reported that if the correct ECM requirements were not consistently adopted by all ECM stakeholders, then the ECM IT PMO would not have a consistent understanding of the requirements and the enterprise solution architecture could require maintenance.

In December 2016, MITRE completed an assessment of the ECM program's progress. Following MITRE's assessment, IRS management held a two-day workshop in February 2017 to address the challenges that hindered the progress of the ECM program. One of the challenge categories was scope/requirements. This category listed five challenges which included alignment between enterprise capabilities and the Enterprise Fraud Case Management minimum



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viable product. The resolution of this challenge was dependent on several items, for example, the Enterprise Fraud Case Management minimum viable product and the ECM minimum viable product. However, the ECM minimum viable product was not within the scope of the activities to resolve the challenge. According to MITRE, defining a minimum viable product is absolutely critical to any large-scale development effort because it sets the vision for the end state. Without agreed upon ECM program requirements, a minimum viable product that meets the program's needs cannot be developed.

By April 2017, the IRS suspended development activities for all ECM projects. However, the IRS continued to gather requirements from information technology delivery partners and refined existing requirements for the ECM program in preparation of requests for information and a request for quotations for the COTS product assessment.

Due to the rush to show results and the plan to deliver the first version of the Enterprise Fraud Case Management project by December 2017, the IRS started ECM projects before the ECM program was ready with defined processes and agreed upon program requirements and infrastructure. Rather than focusing on an enterprise solution for case management, the IRS prioritized the Enterprise Fraud Case Management project to be able to support the retirement of the Electronic Fraud Detection System before the start of Filing Season 2018. The risk that ECM projects will not adhere to the ECM program requirements is increased if sufficient ECM program requirements are not identified and agreed upon prior to starting new ECM projects.

Recommendation

Recommendation 3: The Chief Information Officer should ensure that the base and mission-critical ECM program requirements are determined and all initial planning and program-level activities are completed prior to the technical solution procurement and the start of ECM projects.

Management's Response: The IRS agreed with the recommendation that it should confirm that mission-critical ECM program requirements are determined and all initial planning and initial activities at the program level are completed prior to the solution procurement and the start of ECM projects. The IRS request for quotations contains 18 minimum mandatory requirements and more than 300 technical and business requirements with which to evaluate and select a product. The Business, IT, and Procurement organizations worked together to ensure that a robust request for quotations was published in May 2018. The Chief Information Officer will confirm that all initial planning and program-level activities are completed prior to the final product acquisition, which is currently targeted for the third quarter of Fiscal Year 2019.



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**Other Options Are Now Being Evaluated for the Enterprise Case
Management Solution**

The IRS has taken several positive steps to address our audit findings since the IRS Commissioner was informed in February 2017 that entellitrak was not viable for the ECM solution. For example, in March 2017, the IRS initiated a COTS product assessment to evaluate the industry's best case management software. By performing an assessment of current case management products in the marketplace, the IRS can identify and select the best products for the ECM solution. In addition, the IRS has removed the Enterprise Fraud Case Management project from the ECM program. This decision eliminated the timeline constraint which was previously driving the ECM program.

As part of the new ECM program focus, the IRS issued requests for information in May 2017 and August 2017 to obtain input from the industry concerning how the IRS's current approach aligns with existing COTS capabilities. The IRS continues to collect information about existing case management systems, but is not focused on revising or validating a specific count of legacy systems. Instead, these efforts are focused on understanding current-state business process needs as well as capability gaps. The IRS stated that this information is critical for preparing a comprehensive request for a quotation to ensure that the IRS identifies and selects a COTS solution that provides the most complete functionality and the greatest value. In February 2019, the IRS is scheduled to select a COTS product that will be used for the ECM solution. Once a COTS product is selected, the IRS will focus on migrating systems and processes to the new ECM solution.

The ECM Business PMO, ECM IT PMO, and the Procurement organization are currently working together to gather information for the upcoming selection of the ECM COTS products. Some of the notable work the IRS has recently performed is detailed as follows:

- The IRS contracted with MITRE for assistance in gathering project requirements. So far, more than 200 information technology requirements shared by the IT organization delivery partners have been collected. These requirements are grouped into four themes: workflow management, data management, implementation/infrastructure, and user and security management. Questions relating to these four themes were submitted to potential vendors in the request for information.
- In an effort to avoid the same issues encountered with entellitrak, the IRS included the operational constraints encountered with entellitrak in the request for information.
- The IRS conducted cross-functional working sessions with the business units that assisted in gathering input to understand ECM customers' high-priority needs, business processes, and how they interact with taxpayers.



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- The IRS reviewed U.S. Government Accountability Office and Inspector General reports to reduce the risk of encountering similar obstacles as other Government agencies when procuring COTS products for case management systems.
- The Director Leadership Team and the Commissioner's ECM Executive Steering Committee were established in February 2017 and April 2017, respectively. Both Committees meet monthly. The Director Leadership Team serves as the forum through which issues, concerns, and challenges across the organization can be addressed. The Commissioner's ECM Executive Steering Committee ensures program and project objectives are well designed and met, risks are identified and managed appropriately across the enterprise, and enterprise resources are aligned with program needs.

The ECM program would have benefited from these steps if they had been performed at the inception of the ECM program in 2015. However, the IRS's current efforts show positive steps toward the development of the ECM solution because it is specifically focused on ECM development rather than a specific project under the ECM such as the Enterprise Fraud Case Management. In addition, we believe these steps are critical to developing the basic foundation and requirements for the ECM solution.



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Appendix I

Detailed Objective, Scope, and Methodology

Our overall objective was to assess the IRS's efforts to implement an enterprise-wide case management solution. To accomplish our objective, we:

- I. Evaluated prior cancelled IRS case management projects (specifically, the TASIS and the Affordable Care Act Case Management system) to understand the reasons for non-completion.
 - A. Reviewed prior audit reports and relevant IRS documents that include information about the cancellation of the projects.
 - B. Obtained development cost documentation for the cancelled case management projects from IRS management.
 - C. Used the information from Steps I.A. and I.B. to report the reasons for the projects being cancelled and the total funds expended.
- II. Evaluated the IRS's process and status for identifying enterprise-wide requirements and functionality for an ECM solution.
 - A. Interviewed ECM IT PMO staff and reviewed relevant documents to determine the status of identifying enterprise-wide case management requirements and functionality.
 - B. Determined which legacy systems and tools were selected to convert to the ECM solution (in scope versus out of scope for the ECM solution).
- III. Determined the issues that caused the IRS to suspend the ECM development, when they were identified, why they occurred, and how the IRS mitigated the issues.
 - A. Interviewed IT organization management and reviewed relevant documents to determine the process for selecting software for an ECM solution.
 - B. Interviewed IT organization management and reviewed relevant documents to determine how the IRS confirmed that entellitrak[®] was the appropriate software for the ECM solution.
 - C. Interviewed IRS IT organization management involved with the development of the ECM solution (specifically, Applications Development, Enterprise Services organizations, and others) to determine when and how the IRS identified the issues with entellitrak and the root cause. We obtained information needed to prepare a



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- timeline when major development issues occurred until the ECM development was suspended.
- D. Reviewed correspondence and other documentation between the IRS and the entellitrak vendor to determine whether the vendor was aware of the scalability issues that suspended the development of the ECM solution and whether those issues could be timely resolved.
 - E. Obtained and reviewed documents regarding the entellitrak issues to determine why the issues were not identified and mitigated earlier to prevent suspending the ECM solution development.
 - F. Obtained total actual expenditures for the ECM solution from the IT organization to determine the amount of funds expended prior to suspending the project.
 - G. Determined the effect of the ECM solution delay on the Electronic Fraud Detection System retirement strategy. Also, we determined part of the total annual costs to maintain the other systems that were to transition to the ECM solution.

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 policies and procedures for the Technical Solution Process and requirements development. We evaluated these controls by interviewing Applications Development and ECM IT and Business PMO management involved in the requirements development of the ECM solution. We reviewed the ECM Program Charter, the ECM Program Management and Integration Plan, Internal Revenue Manual 2.120.1, *Engineering Policy* (Sept. 16, 2014), and Internal Revenue Manual 2.120.2, *Technical Solution Process Description* (Oct. 20, 2015).



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Appendix II

Major Contributors to This Report

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Technology Services)
John Ledford, Director
Michael Mohrman, Audit Manager
Tina Wong, Lead Auditor
Ashley Weaver, Senior Auditor



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Appendix III

Report Distribution List

Deputy Commissioner for Operations Support
Deputy Commissioner for Services and Enforcement
Chief Information Officer
Commissioner, Small Business/Self-Employed Division
Associate Chief Information Officer, Applications Development
Associate Chief Information Officer, Enterprise-Program Management Office
Associate Chief Information Officer, Enterprise Services
Director, Compliance
Director, Enterprise Architecture
Director, Enterprise Case Management
Director, Operations Support
Director, Enterprise Case Management Program Management Office
Director, Solution Engineering
Director, Office of Audit Coordination



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Appendix IV

Glossary of Terms

Term	Definition
Business Process	The method that the enterprise must follow to conduct its business successfully.
Commercial-Off-the-Shelf	Pre-packaged, vendor-supplied software that will be used with little or no modification to provide all or part of the solution.
Continuous Integration	A software development practice in which developers integrate working copies of software into a shared repository one time or more each day, verifying code check-ins through an automated build process.
Entellitrak [®]	A COTS product created by MicroPact consisting of pre-configured applications that reflect best practices, business rules, and terminology for case management solutions.
Enterprise Life Cycle	Establishes a set of repeatable processes and a system of reviews, checkpoints, and milestones that reduce the risks of system development and ensure alignment with the overall business strategy.
E-TRAK	A system developed using entellitrak. The system includes several modules and submodules of case management and case tracking capabilities covering multiple IRS business functions. It includes a web interface that allows business requirements to be translated into a systemic configuration for case tracking.
Interface	Data exchange between one or more systems.
Item Tracking, Reporting, and Control	System used to track and report on issues, risks, and action items.
Iterative	A process for arriving at a desired result by repeating cycles of operations. The objective is to bring the desired result closer with each repetition.



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Term	Definition
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.
Open Source	Refers to a program in which the original programming code is available free of charge to the general public for use or modification from its original design.
Request for Quotation	As required by Federal Acquisition Regulation requirements, ordering activities must prepare a solicitation (which includes the evaluation criteria or the basis upon which the selection will be made) to schedule contractors that offer supplies or services that will meet the agency's needs.
Requirement	The formalization of a need and the statement of a capability or condition that a system, subsystem, or system component must have or meet to satisfy a contract, standard, or specification.
Risk	An uncertain event or condition that, if it occurs, has a negative effect on the project.
Scalable	The ability of a system, network, or process to handle a growing amount of work in a capable manner or its ability to be enlarged to accommodate that growth.
SharePoint Investment Knowledge Exchange	The Department of the Treasury's information technology capital planning tool to support data collection from the bureaus and direct reporting to the Office of Management and Budget. It provides management reporting for the proper oversight of the Treasury Department's information technology portfolio and includes reports provided to the Treasury Department's Chief Information Officer on a monthly basis.
Solution	An aggregation of products and services, as opposed to a single discreet system or piece of software, that helps solve a particular problem.
System	A set of interdependent components that perform a specific function and are operational. It may also include software, hardware, and processes.



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Term	Definition
Use Case	A document that attempts to describe system behavior from an end-user's perspective by outlining the flow of data, system behavioral interchanges, and corresponding end-user interactions in a sequential, step-by-step manner. It describes "who" can do "what" with the system in question and it should vary in detail based on the needs of the requirements.



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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

JUN 25 2018

MEMORANDUM FOR DEPUTY INSPECTOR GENERAL FOR AUDIT

FROM: S. Gina Garza 
Chief Information Officer

SUBJECT: Draft Audit Report – Initial Efforts to Develop an
Enterprise Case Management Solution Were
Unsuccessful; Other Options Are Now Being
Evaluated – Audit #201720025 (e-trak # 2018-
03550)

Thank you for the opportunity to review your draft audit report and to discuss draft report observations with the audit team.

We appreciate TIGTA's acknowledgement that the IRS's current efforts show positive steps toward the development of an effective enterprise case management (ECM) solution. We firmly believe that an ECM solution is essential to modernizing IRS operations and to making long-term improvements in the tax experience for individuals, businesses and tax professionals. To accomplish this, we know we must be very strategic in the solution that we select. The IRS initially launched the ECM program in 2015 with the intent of using a case management product that we had used successfully for several years and had considered a viable solution for the enterprise. Through our efforts to extend the use of the product to serve as an enterprise solution, we discovered product limitations and paused our development efforts. We have made significant changes in our strategy and have dedicated resources to complete a renewed product assessment and acquisition strategy. Like the audit team, we believe our ECM program is on a solid path, forging new ground and leveraging the work that was accomplished since the initial launch of the program.

This audit focused primarily on the IRS' work from the time the ECM program was established in 2015 through our decision in 2017 to shift our efforts. During this period, we stood up the program management office, established a strategy for developing and implementing case management, created an initial architecture, explored requirements with our business customers, and refined a federated delivery team model.



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While we experienced challenges with an enterprise-level use of the technical solution, we have re-used most of the work created during this period. Additionally, we have used our experience to redirect our focus toward procurement of an enterprise solution. Some key areas of note include:

- **Development of a robust product assessment and acquisition strategy.** Our current strategy goes above and beyond the normal federal acquisition process, focusing on industry engagement, lessons learned from other government agencies implementing case management solutions, reviews of TIGTA and GAO audit reports, our own internal lessons learned from previous efforts, and an innovative procurement approach to ensure our ability to clearly state requirements for this acquisition.
- **Engagement with industry and other government agencies at an unprecedented level.** The IRS published two requests for information (RFIs) from industry that garnered 44 responses, conducted information exchanges with 5 other government agencies, participated in 14 product demonstrations, and issued a draft request for quotations to gather a large amount of product and experience-related data to inform our efforts.
- **Creation of a request for quotations (RFQ) package.** Our RFQ package is an objectives-based engagement approach to gather innovation from industry and contains 18 mandatory requirements and over 300 technical and business requirements with which to evaluate and select a solution. The Business, IT, and Procurement organizations worked together to publish a high quality RFQ in May 2018.
- **Evaluation of candidate case management solutions in simulated IRS environments.** Our current product assessment and acquisition effort will bring finalist candidates into simulated IRS environments for hands-on testing and evaluation later in 2018 using an innovative, challenge-based scenario approach. We want to ensure that any product we purchase will do the work we need in the complexities of our environments. We have learned that alternatives analysis or product evaluation reports cannot replace hands-on assessment for a major acquisition in a complex arena such as case management.

The IRS is encouraged that your report notes the many positive steps—beyond those elaborated on above—that we have already taken toward the development of an ECM solution. We have gained valuable knowledge over the last several years, both internally from our own development efforts, and externally from other government agencies who have faced similar challenges. We are also re-using the work we did earlier regarding requirements, architecture, design, and program management. We are confident that we have the correct approach in place to ensure a successful ECM program.



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We are committed to continuously improving our information technology strategies, systems, and processes. The continued support, assistance, and guidance your team provides is very valuable to us in this regard. Our corrective action plan for the recommendations is attached. If you have any questions, please contact me at (202) 317-5000 or a member of your staff may contact Carmelita White at (240) 613-2191.

Attachment



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Recommendation #1: The Chief Information Officer should ensure that information technology projects follow the Internal Revenue Manual Technical Solution Process.

Corrective Action #1: The IRS disagrees with this recommendation, which is based on the assertion that the Service did not follow appropriate guidelines regarding IT programs and the technical solution process. The IRS believes that the July 2013 Enterprise Services formal study of the field of case management solutions was valid and current for decision-making in 2015 (when Enterprise Services management decided to use MicroPact's entellitrak software to build ECM), and met the IRM guidelines on product evaluation. In our current acquisition effort, the IRS believes that the two requests for information from industry, information exchanges with other government agencies, and a draft request for quotations already completed, as well as a future challenge-based scenario evaluation, exceeds the IRM guidelines for product evaluation and selection.

Implementation Date: N/A

Responsible Official: N/A

Recommendation 2: The Chief Information Officer should ensure that an ECM solution is selected that will enable the IRS to consolidate the majority of the legacy case management systems.

Corrective Action #2: The IRS agrees with this recommendation. We will use an innovative Product Assessment approach with challenge-based evaluation to identify a viable ECM solution that is capable of consolidating the majority of our legacy case management systems. Our current product acquisition plan—based on two requests for information from industry, information exchanges with other government agencies, draft and final requests for quotations, and a challenge-based scenario evaluation—will ensure that the IRS selects a solution that will satisfy this recommendation. Analysis of the challenge-based scenario evaluation will be completed and a product award issued in quarter 3, FY19.

Implementation Date: June15, 2019

Responsible Official: Associate Chief Information Officer, Enterprise Program Management Office

Recommendation 3: The Chief Information Officer should ensure that the base and mission-critical ECM program requirements are determined and all initial planning and program-level activities are completed prior to the technical solution procurement and the start of ECM projects.

Corrective Action #3: The IRS agrees with the recommendation that we should confirm that mission-critical ECM program requirements are determined and all initial planning and initial activities at the program level are completed prior to the solution procurement



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and the start of ECM projects. Our request for quotations (RFQ) contains 18 minimum mandatory requirements and over 300 technical and business requirements with which to evaluate and select a product. The Business, IT, and Procurement organizations worked together to ensure that a robust request for quotations was published in May 2018. The CIO will confirm that all initial planning and program-level activities are completed prior to the final product acquisition, which is currently targeted for quarter 3, FY19.

Implementation Date: June 15, 2019

Responsible Official: Associate Chief Information Officer, Enterprise Program Management Office