TREASURY INSPECTOR GENERAL FOR TAX ADMINISTRATION

Management and Implementation of Information Technology Software Tools Needs Improvement

February 21, 2019

Reference Number: 2019-20-005

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MANAGEMENT AND IMPLEMENTATION OF INFORMATION TECHNOLOGY SOFTWARE TOOLS NEEDS IMPROVEMENT

Highlights

Final Report issued on February 21, 2019

Highlights of Reference Number: 2019-20-005 to the Commissioner of Internal Revenue.

IMPACT ON TAXPAYERS

The IRS uses tools for software development and software asset management. Efficient and cost-effective management and implementation of the IRS's software assets is crucial to ensure that information technology services continue to support the IRS's business operations and help provide services to taxpayers efficiently.

WHY TIGTA DID THE AUDIT

This audit was initiated to determine the effectiveness and efficiency of the IRS's implementation of software tools acquired to address its software asset management and software development needs. Federal regulations require agencies to 1) manage, identify, and report software asset inventory; 2) determine the cost of each purchase; and 3) determine the cost for maintenance of these assets.

WHAT TIGTA FOUND

The IRS is successfully implementing the migration of IBM® Legacy Rational® tools to the Rational Collaborative Lifecycle Management tools solution. For example, in March 2018, the IRS timely completed the migration from one legacy tool used by 135 projects with 268 repositories. TIGTA attributed this success to the IRS's development of policies, procedures, and effective communication. However, the IRS has not developed policy directives that outline the required use and exceptions for not using IBM Rational tools.

The IRS did not effectively manage the IBM Legacy Rational tools software licenses and did not actively monitor the costs associated with

purchasing the software licenses and software subscription and support. As a result, the IRS purchased software licenses that it never deployed and purchased software subscription and support for licenses it did not use. TIGTA estimates that the IRS wasted approximately $3.4 million between Fiscal Years 2015 and 2017 on unused software licenses and support. The IRS may have violated the *bona fide* needs rule by not using licenses purchased in Fiscal Years 2015 and 2016. In addition, TIGTA estimates that the IRS overutilized software licenses and support worth between $851,708 and $2.8 million.

The IRS did not follow the Federal Acquisition Regulations and IRS guidance when purchasing the IBM BigFix® product. As a result, the IRS improperly identified the BigFix product as a viable solution to meet its need for a software asset management tool. Finally, the IRS had no formal acquisition process for using software credits to purchase the BigFix product, and the process used lacked internal controls.

WHAT TIGTA RECOMMENDED

TIGTA recommended that the Chief Information Officer: issue policy directives on the mandatory use and exceptions for not using Rational tools; implement a process that will improve license utilization and enhance license compliance; review software maintenance renewals to ensure that coverage is purchased only for the number of licenses that show measured usage over the prior contract period; develop and implement controls to prevent system administrators from installing more licenses than acquired; request that the IRS Chief Counsel determine if the *bona fide* needs rule was violated; ensure that required planning procedures are completed prior to purchasing software tools; and document and implement policies for software and service credit purchases.

The IRS agreed with all seven recommendations. The IRS plans to implement processes and tools to support increased utilization of available software licenses and establish policy for the review of license, subscription, and maintenance purchases.

DEPARTMENT OF THE TREASURY

WASHINGTON, D.C. 20220

**TREASURY INSPECTOR GENERAL
FOR TAX ADMINISTRATION**

February 21, 2019

MEMORANDUM FOR COMMISSIONER OF INTERNAL REVENUE

FROM: Michael E. McKenney
                 Deputy Inspector General for Audit

SUBJECT: Final Audit Report – Management and Implementation of Information
                 Technology Software Tools Needs Improvement (Audit # 201720032)

This report presents the results of our review to determine the effectiveness and efficiency of the
Internal Revenue Service's (IRS) implementation of the software tools acquired by the
Information Technology organization to address its software development and software asset
management needs. This review is included in our Fiscal Year 2019 Annual Audit Plan and
addresses the major management challenge of Achieving Program Efficiencies and Cost Savings.

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

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

BPA	Blanket Purchase Agreement
CLM	Collaborative Lifecycle Management
DNG	DOORS Next Generation
FAR	Federal Acquisition Regulations
FY	Fiscal Year
GSA	General Services Administration
IRS	Internal Revenue Service
IT	Information Technology
RTI	Rational Tools Initiative
S&S	Subscription and Support
SAM	Software Asset Management
SSM	Strategic Supplier Management
TIGTA	Treasury Inspector General for Tax Administration

Background

Software Asset Management (SAM)[1] is a process for tracking and reporting the use and ownership of software assets. Forrester Research Inc. defines SAM as:

> *The systematic automation of processes to reconcile software licenses and statements of entitlement, maintenance contracts, and original media with installed software and those processes for discovering deployed software assets; to reconcile the assets to their licenses, maintenance contracts, and definitions of entitlement; and to report on compliance and discrepancies in such a way as to minimize the risk of legal action by software vendors as well as loss of service to users or of reputation in the wider world.*

A critical part of SAM is software license management. The objective of software license management is to manage, control, and protect an organization's software assets, including management of the risks arising from the use of those software assets. Proper management of software licenses minimizes risks and ensures that licenses are in compliance with licensing agreements and are cost-effectively deployed and that software purchasing and maintenance expenses are properly controlled. Software license management can be difficult because:
1) a large amount of information on software and hardware must be discovered and stored;
2) the data need to be kept current on more than an annual basis; 3) identifying installed software and software license use may be affected by the complexities in software installation; and
4) licensing models and definitions may significantly differ depending on the software tool and vendor.

Federal requirements established by Executive Orders,[2] the National Institute of Standards and Technology,[3] and the Department of the Treasury[4] as well as recommended industry best practices, such as the Information Technology Infrastructure Library, govern the use and management of software licenses. These sources provide guidance to ensure that software licenses are: 1) efficiently purchased, deployed, and not underdeployed; 2) used in compliance with copyright laws; and 3) inventoried using adequate recordkeeping systems that control and track the use of licenses.

The Information Technology (IT) organization's Office of Strategy and Planning, Strategic Supplier Management (SSM) office's primary goal is to identify significant opportunities to

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[1] See Appendix VII for a glossary of terms.
[2] Exec. Order 13103, *Computer Software Piracy* (1998), and Exec. Order 13589, *Promoting Efficient Spending* (2011).
[3] National Institute of Standards and Technology, Special Publication 800-53, *Security and Privacy Controls for Federal Information Systems and Organizations* (April 2013).
[4] *Treasury IT Security Program* (Nov. 3, 2016).

improve the IT organization's procurement capabilities. The Requirements Engineering Program Office in the Office of Strategy and Planning is the Internal Revenue Service's (IRS) authority on providing standards and guidance to requirements engineering activities, process modeling, and requirements-related solutions. It oversees requirements development and requirements management efforts on all business change, software development, system integrations, and legacy system upgrades throughout the IT organization.

In September 2014, the IRS's IBM® Rational® tools subject matter experts met to identify issues that were preventing the IRS from effectively using Rational tools programs. On March 2, 2015, the IRS established the Rational Governance Board. At that time, the board approved the mission, scope, and operating model for the Rational Tools Initiative (RTI). The RTI is part of the Emerging Programs and Initiatives organization within the Enterprise Program Management Office. In addition to Rational tools adoption, the Emerging Programs and Initiatives organization leads the IT Infrastructure Currency team and assists programs as they begin analyses to develop the scope, cost estimates, and staffing needs to deliver future programs. The mission of the RTI is to implement standard processes and automated bidirectional traceability to enable consistent, integrated usage of the IBM Rational Collaborative Lifecycle Management[5] (CLM) tools solution throughout the IT organization.

Between June 2013 and September 2014, the Treasury Inspector General for Tax Administration (TIGTA) issued three reports[6] related to the IRS's SAM practices. These reports covered the desktop and laptop, server, and mainframe environments and reported the following findings: 1) the IRS needs to create written policy and procedures that establish specific roles and responsibilities for IRS management; 2) the IRS needs to establish an accurate inventory to comply with Federal regulations and policy; and 3) the IRS needs to identify, manage, and control the use of software licenses. TIGTA made 14 recommendations in these three audit reports regarding software license management.

In June 2014, the IRS identified IBM BigFix® as the product[7] to resolve the IRS's SAM issues reported by TIGTA. In response to recommendations from a TIGTA report,[8] the IRS stated that BigFix provides functionality for hardware and software inventory, software usage analysis, package deployment, and patch management. An additional tool is required for the mainframes. May 31, 2015, was the initial date cited for the scheduled completion of BigFix deployment. The IRS subsequently determined that the product would only address the software management

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[5] Appendix V provides a CLM tools solution overview.
[6] TIGTA, Ref. No. 2013-20-025, *Desktop and Laptop Software License Management Is Not Being Adequately Performed* (June 2013); TIGTA, Ref. No. 2014-20-002, *The Internal Revenue Service Should Improve Mainframe Software Asset Management and Reduce Costs* (Feb. 2014); TIGTA, Ref. No. 2014-20-042, *The Internal Revenue Service Should Improve Server Software Asset Management and Reduce Costs* (Sept. 2014).
[7] BigFix is an IBM product with several components. See Appendix VI for the components.
[8] TIGTA, Ref. No. 2013-20-025, *Desktop and Laptop Software License Management Is Not Being Adequately Performed*, p. 19 (June 2013).

needs of IBM products. IRS management still maintains that no one tool will be successful in addressing the findings related to SAM.

In October 2016, the IRS reported that it had taken the necessary steps to address several of the previously reported recommendations and closed 11 of the 14 corrective actions. In September 2017,[9] TIGTA issued a report that followed up on the three prior reports. In the follow-up report, TIGTA agreed with closing the last three open SAM recommendations because they were being incorporated into new recommendations.

SSM office management stated that the IRS is looking to a new tool, CA IT Asset Manager,® to collect the software attributes to address the need to report software licensing issues. The IRS would use several tools to feed into the CA IT Asset Manager, including BigFix. The IRS continues to use both electronic and manual methods to compile a software and hardware inventory. However, the IRS is without any methods to verify the accuracy of these results. The IRS is still trying to identify the combination of commercial off-the-shelf tools that will enable it to be compliant with Federal regulations for SAM.

We performed this review at the IT organization's Enterprise Operations and Strategy and Planning offices in Denver, Colorado, and at the New Carrollton Federal Building in Lanham, Maryland, and during the period January through December 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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[9] TIGTA, Ref. No. 2017-20-062, *The Internal Revenue Service Is Not in Compliance With Federal Requirements for Software Asset Management* (Sept. 2017).

Results of Review

The Initial Scope of the Rational Tools Migration Is Being Implemented Successfully

ISACA[10] develops and maintains the best practices contained in the COBIT® 5 information technology framework that provides enterprise governance and management techniques and provides globally accepted principles, practices, and analytical tools and models to help increase the trust in, and value from, information systems.

COBIT 5 provides guidance on organizational change enablement to maximize the likelihood of successfully implementing sustainable enterprise-wide organizational change quickly and with reduced risk, covering the complete lifecycle of the change and all affected stakeholders in the business and the IT organization.[11] COBIT 5 breaks down this guidance into several processes that include:

- Establish the desire to change.

- Form an effective implementation team.

- Communicate desired vision.

- Empower role players and identify short-term wins.

- Enable operation and use.

- Embed new approaches.

- Sustain changes.

COBIT 5 provides that policies should be part of an overall governance and management framework. As part of the policy framework, the following items need to be described: scope and validity, the consequences of failing to comply with policy, and the means for handling exceptions.

The IRS estimated that it has been using IBM Legacy Rational tools for at least 12 years. The CLM tools solution replaces several IBM Legacy Rational tools and delivers requirements management, quality management, change and configuration management, project planning, and tracking. These integrated capabilities foster greater communication, collaboration, and

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[10] An independent, nonprofit, global association that engages in the development, adoption, and use of globally accepted leading knowledge and practices for information systems.
[11] ISACA, *COBIT 5: A Business Framework for the Governance and Management of Enterprise IT* (2012).

visibility to accelerate delivery, improve quality, and support better development decisions. Figure 1 compares the IBM Legacy Rational tools and the Rational CLM tools solution.

Figure 1: IBM Legacy Rational Tools Versus the CLM Tools Solution

IBM Legacy Rational Tools	Rational CLM Tools Solution	IRS Usage
Rational RequisitePro	Rational DOORS Next Generation (DNG) • Capture Requirements. • Complete Traceability. • Collaborate and Review. • Generate Reports.	Manage requirements and business rules.
Rational ClearCase, Rational ClearQuest	Rational Team Concert • Work Item Management. • Project Planning. • Source Code Management. • Build Management (Automation).	Track defects for testing, changes for requirements, source code management, project planning, and build management.
Rational Test Manager	Rational Quality Management • Comprehensive Test Plans. • Streamlined Manual Testing. • Reporting With Purpose. • Requirements-Driven Testing.	Manage test cases, defect reporting, and traceability.

Source: IRS RTI management.

The IRS Rational Governance Board reaffirmed on December 9, 2016, that IRS employees who are part of a project would use IBM's Rational CLM tools solution to manage tasks across the development lifecycle.

The RTI initial scope focuses on facilitating the IT organization's adoption of the following CLM tools:

- Rational DNG.

- Rational Team Concert.

- Rational Quality Management.

The solution includes implementation of usage model templates for each tool that provide an IRS standard way of capturing project assets across all projects. The IRS is successfully implementing the initial scope of the Rational tools migration. The migration from legacy Rational Test Manager to Rational Quality Management was completed in Fiscal Year (FY) 2015.

During our review, the IRS was in the process of migrating Rational RequisitePro to Rational DNG. In March 2018, the IRS met its deadline for completing the migration of 135 projects with 268 repositories from Rational RequisitePro to Rational DNG. This can be attributed to the IRS developing policies and procedures for the migration and effective communication with employees. To ensure that employees stayed informed of their role during the migration, the IRS developed the Rational Resource Center web page designated to help employees with the migration from the IBM Legacy Rational tools to the CLM tools solution. The web page included links to the migration guides, sprints timelines, Rational Executive Oversight Team, Rational Governance Board, Rational Integrated Project Team, training, and frequently asked questions.

Even though the IRS is successfully migrating to Rational DNG, it has not developed and issued policy directives to employees requiring the use of and defining any exceptions to the use of Rational DNG as recommended in COBIT 5. According to RTI management, it may not be efficient for smaller projects to use Rational DNG. For example, the cost of the Rational DNG licenses and their associated subscription and support (S&S) may not be justified when other, less expensive alternatives such as the Requirement Engineering Program Office spreadsheet would meet the requirement traceability needs. Additionally, there are times when contractors are working on projects and it is not feasible for them to use Rational DNG, *e.g.*, contractors working off-site without access to IRS laptops containing Rational DNG. Policy directives addressing these types of issues will ensure that the project owners are aware of when and under what circumstances they must use Rational DNG.

The IRS has defined the scope of work required for the migration of 170 Rational ClearCase projects to Rational Team Concert. The RTI team is currently developing a migration strategy and a time frame. However, some project owners may not convert to Rational Team Concert if they are successfully using Rational ClearCase. This would result in the IRS paying for two different tools that perform the same function. Issuing a policy directive, as recommended by COBIT 5, to employees requiring the migration and use of Rational Team Concert would prevent the IRS from paying for and servicing two Rational tools with similar functionality.

Recommendation

Recommendation 1*:* The Chief Information Officer should ensure that the Rational Governance Board develops and issues policy directives on the mandatory use and exceptions for not using Rational CLM and its components.

> *Management's Response:* The IRS agreed with this recommendation. The RTI has developed a policy directive and is routing it for final approval and issuance.

IBM Rational Tools Software Licenses Are Not Being Effectively Managed

Executive Orders;[12] Department of the Treasury Directive 85-02, *Software Piracy Policy*;[13] and Internal Revenue Manual 10.8.2[14] require and the Information Technology Infrastructure Library® recommends creating and maintaining accurate enterprise-wide inventories of installed software and licenses. These inventories should contain licensing models applicable to each software tool and link the data on licenses bought and deployed, including costs. This will help ensure that purchased software is deployed but not underdeployed and that software is used in compliance with copyright laws.

In accordance with Federal Acquisition Regulation (FAR) 8.405-3,[15] ordering activities may establish Blanket Purchase Agreements (BPA) under any General Services Administration (GSA) schedule contract. GSA schedules simplify the filling of recurring needs for supplies and services while leveraging ordering activities and buying power by taking advantage of quantity discounts. This can save administrative time and reduce paperwork. The IRS established a five-year BPA for IBM tools and services on December 31, 2012, valued at more than $265 million. The IRS subsequently restructured the BPA on December 31, 2013, to be compliant with GSA guidance. However, the original period of performance and costs remained unchanged.

The BPA established that the IRS may, at the beginning of any contract year, and at its discretion, suspend maintenance payments of unused software tool licenses that the IRS previously purchased and entitled. The IRS may reinstitute maintenance on such licenses, by resuming maintenance payments, without incurring a reinstatement fee. Those tools will at that time be brought up to current state via updates by the contractor. The IRS will make the first resumed payment on a pro-rata basis for the fiscal year in which it purchased the maintenance. BPAs do not obligate funds. The Government is obligated only to the extent of authorized task orders under the BPA.

SSM office management stated that GSA contract rules prevented the IRS from being able to reduce S&S on an annual basis even though the signed BPA clearly allowed for this action. The IRS provided documentation from IBM showing that there was a disagreement with the wording of the signed BPA.

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[12] Exec. Order 13103, *Computer Software Piracy* (1998), and Exec. Order 13589, *Promoting Efficient Spending* (2011).
[13] Treasury Directive 85-02, *Software Piracy Policy*, March 23, 2016.
[14] Internal Revenue Manual 10.8.2 *Information Technology (IT) Security – IT Security Roles and Responsibilities* (Sept. 30, 2016).
[15] FAR, 48 C.F.R. § 8.405-3 (2017).

IBM pointed out the following language from the GSA contract:

> *For the authorized use of each IBM program installed and in service at a government customer site, government customer has the option to maintain IBM software subscription and support for either (a) all of the authorized use or (b) none of the authorized use. There is not an option for maintaining IBM software subscription and support coverage for only a portion of authorized use installed in service for an IBM program at a customer site.*

More than a century ago, the Comptroller of the Treasury stated, "An appropriation should not be used for the purchase of an article not necessary for the use of a fiscal year in which ordered merely in order to use up such an appropriation."[16] According to the Government Accountability Office's Principles of Federal Appropriations Law, "a fiscal year appropriation may be obligated only to meet a legitimate, or *bona fide*, need arising in, or in some cases, arising prior to but continuing to exist in, the fiscal year for which the appropriation was made."[17]

The SSM office is keeping track of license and S&S usage for the IBM Rational tools. However, the Contracting Officer Representative and personnel from the SSM office are not actively keeping track of license and S&S costs for the IBM Rational tools and told us on multiple occasions that they were unable to provide this information. During the audit, SSM office management eventually had a contractor perform an analysis of the IRS license position concerning the IBM contract for FYs 2015, 2016, and 2017. The contractor developed a report that showed the current licenses the IRS owned, the amount of S&S the IRS paid, and the amount of licenses and S&S that were required.

We estimated that the IRS wasted a significant amount of money during FYs 2015, 2016, and 2017 when it purchased licenses and S&S that it did not need. The GSA catalog price for these licenses and support services totaled $11.4 million. The IRS commented that the estimated costs we provided were inflated because the IRS is a large purchaser of IBM software and it pays less than the GSA price. The IRS was able to provide an e-mail from IBM stating that the estimated discount was approximately 70 percent of the GSA price. Because the IRS could not provide documentation of a specific discount percentage, Figure 2 shows our calculations of the amount of potential waste of $3.4 million at the estimated 70 percent discount rate.

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[16] Government Accountability Office, GAO-04-261SP (3rd edition), *Principles of Federal Appropriations Law*, pp. 5–11 (Jan. 2004).
[17] 31 U.S.C. § 1502 (a).

**Figure 2: Rational Tools Software License and S&S Waste
(70 Percent Discount Off GSA Price List)**

Type of Waste	2015	2016	2017	Total
S&S Purchased for Unused Installed Software	$199,699	$396,242	$290,185	$886,126
S&S Purchased for Licenses Not Deployed	$577,485	$364,936	$0	$942,421
New Licenses Purchased, Deployed, and Not Used	$488,701	$370,424	$0	$859,125
New Licenses Purchased and Not Deployed	$746,538	$0	$0	$746,538
Total	**$2,012,423**	**$1,131,602**	**$290,185**	**$3,434,210**

*Source: IRS contractor Effective License Position report, GSA Price List, and e-mail from IBM stating
that there was an estimated 70 percent discount.*

Personnel from the SSM office stated that they were unable to reduce the S&S on an annual basis because the GSA contract terms did not allow them to reduce S&S once it was purchased for a software tool. In FY 2015, the SSM office negotiated with IBM to reduce S&S that the IRS was not using. As such, the IRS was able to save $1.2 million. However, the same effort was not completed in subsequent years of FY 2016 and 2017. SSM personnel stated the effort taken in FY 2015 was a one-time opportunity, but could not provide documentation to support this circumstance.

The IRS may have violated the *bona fide* needs rule when it purchased software licenses in FY 2015 and S&S in FY 2016 but did not deploy the software or use S&S in those years. Actively keeping track of license and S&S costs will allow the SSM office to make informed decisions on an annual basis when it is time to renew or suspend annual S&S at the end of the contract period of performance. This will prevent the IRS from paying for new licenses and S&S that it does not need and from potentially violating the *bona fide* needs rule.

We also determined that the IRS overutilized software licenses and S&S. Figure 3 shows how the IRS overutilized licenses and S&S worth between $851,708[18] and $2.8 million during FYs 2015, 2016, and 2017.

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[18] This amount was derived by applying a 70 percent discount to the GSA Price List amount of $2,839,028.

Figure 3: Rational Tools Software License and S&S Overutilization

Type of Overutilization	FY 2015	FY 2016	FY 2017	Total
License	$160,700	$1,370,759	$210,987	$1,742,446
S&S	$213,264	$524,531	$358,787	$1,096,582
Total	**$373,964**	**$1,895,290**	**$569,774**	**$2,839,028**

Source: IRS contractor Effective License Position report and GSA Price List.

SSM office management stated that the IRS overutilized licenses and S&S because no controls were in place to prevent system administrators from installing more licenses and S&S than were purchased under the contract. Overutilizing licenses and S&S could result in the contractor charging penalties and an audit fee.

Recommendations

The Chief Information Officer should:

Recommendation 2*:* Direct the SSM office to implement processes that will improve license utilization and enhance license compliance.

> ***Management's Response:*** The IRS agreed with this recommendation. The SSM office, as part of its SAM role, will implement processes and tools to support increased utilization of available licenses and enhanced license compliance.

Recommendation 3: Direct the SSM office on an annual basis to review software maintenance renewals to ensure that coverage is purchased only for the number of licenses that show measured usage over the prior contract period.

> ***Management's Response:*** The IRS agreed with this recommendation. The SSM office, as part of its SAM role, will establish policy for the review of software license, subscription, and maintenance purchases. Software subscription and maintenance renewal quantities will be adjusted based on measured usage and verified requirements within applicable contract terms and conditions.

Recommendation 4: Request a review by the IRS's Office of Chief Counsel to determine if the purchase of the Rational tools software licenses and their S&S violated the *bona fide* needs rule and take any action required by law.

> ***Management's Response:*** The IRS agreed with this recommendation. On October 3, 2018, the Chief Information Officer requested a review by the Office of Chief Counsel to determine if the purchase of the Rational tools software licenses and their S&S violated the *bona fide* needs rule. Upon completion of Chief Counsel's response, the IRS will take any actions required.

Recommendation 5*:* Direct the SSM office to develop and implement controls that prevent system administrators from installing more licenses than were purchased under the contract.

> ***Management's Response:*** The IRS agreed with this recommendation. The IRS agrees that controls must be implemented for improved license management. As part of its SAM role, the SSM office is implementing processes and tools that will achieve this and that will support maintaining compliance with license agreements.

Federal Acquisition Regulations Were Not Followed When the IBM BigFix Product Was Purchased

In June 2014, the IRS initially identified the IBM BigFix product as the SAM tool that provides the functionality for hardware and software inventory, software usage analysis, package deployment, and patch management. However, in March 2017, IRS management stated that the BigFix metering processes would not meet the IRS requirements and, therefore, it would be used only as a replacement for the existing IBM Tivoli software, in place as an inventory system. IT organization management further stated there is no one commercial off-the-shelf tool that will monitor all types of software asset licenses.

The IRS's SAM processes lack an enterprise-wide view of deployments. Coupled with a lack of organizational ownership, many of the IRS's current SAM processes are manual and performed on an ad hoc basis. IRS management stated that they are looking to a new tool, CA IT Asset Manager, to collect the software attributes to address the need to report software licensing issues. They added that the IRS would use several tools to feed into CA IT Asset Manager, including BigFix. The IRS continues its efforts to purchase another commercial off-the-shelf tool that will better suit all its requirements.

FAR 10 states,[19] *Ensure that legitimate needs are identified and trade-offs evaluated to acquire items that meet those needs.* FAR 12.2 states,[20] *The description of agency need must contain sufficient detail for potential offers of commercial items to know which commercial tools or services may be suitable. Generally, an agency's statement of need for a commercial item will describe the type of tool or service to be acquired and explain how the agency intends to use the tool or service in terms of function to be performed, performance requirement or essential physical characteristics.* COBIT 5 states, *Identify solutions and analyze requirements before acquisition or creation to ensure that they are in line with enterprise strategic requirements covering business processes, applications, information/data, infrastructure and services.* Internal Revenue Manual 2.21.1[21] outlines the requirement to identify business needs, verify these needs, and document the purchase prior to actual submission for purchase. The Internal

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[19] FAR, 48 C.F.R. § 10.001 (2017).
[20] FAR, 48 C.F.R. § 12.201-202 (2017).
[21] Internal Revenue Manual 2.21.1, *Requisition Processing for IT Acquisition Products and Services, Introduction to Requisition Processing for Information Technology* (Apr. 11, 2017).

Revenue Manual's required Requisition Checklist is a guide/tool for preparing requisitions for all information technology tools and services and has been designed to help the initiator/requester easily check that all requisition requirements have been met. In addition, specific questions assist in completing the requisition process.

SSM office management stated that the BigFix purchase was not required to adhere to procurement regulations because the IRS was obliged to make the purchase in order to use subcapacity licensing and because BigFix was purchased with IBM software credits. Subcapacity licensing provides the IRS with the ability to license an eligible software tool for less than the full capacity of their servers. It provides the licensing detail needed to leverage various multicore chip and virtualization technologies. This allows the IRS to pay for what it uses. In order to use subcapacity licensing, IBM requires its customers to purchase one of two IBM tools: BigFix Inventory or Tivoli Asset Discovery for Distributed.

The IRS did not follow established planning procedures, such as preparing a Requisition Checklist, prior to the purchase of the BigFix product as required by the Internal Revenue Manual and recommended by the FAR and COBIT 5 industry standards. While in 2012 the IRS did a limited comparison of BigFix and a product from Hewlett Packard, the IRS did not conduct significant analysis of BigFix nor was any testing performed prior to implementation of any BigFix component.

The IRS is using some components of the BigFix product, including BigFix Lifecycle, BigFix Inventory, and BigFix Compliance. However, the IRS software environment has more than 500 different software licensing metrics, and BigFix is not capable of performing many required aspects of SAM because it supports limited license metrics. Additionally, it does not accommodate contract/license particulars describing many licensing scenarios and includes very limited license reconciliation and optimization functions.

Further, BigFix Inventory is unable to provide adequate software metering functionality needed by the IRS. SSM office management stated that IBM removed software license tracking, measuring, storing, or calculating usage or license position from BigFix Inventory after the IRS purchase. Those functions would have provided the ability for BigFix to manage multiple licensing metrics. Documentation provided by SSM office management was not sufficient to support this claim. SSM office management stated that BigFix is limited to being able to identify licensing metrics for IBM software only, which makes up approximately 20 percent of the IRS software environment cost.

Testing the BigFix product prior to purchasing and implementing the software, as required by Internal Revenue Manual 2.21.1, would have allowed the IRS to determine if it would meet its SAM needs. As a result, the IRS is still searching for a tool capable of performing SAM nearly three years after the IRS's initial planned implementation date of May 31, 2015.

The acquisition process of using credits for purchases lacks internal controls

In FY 2015, SSM office management developed two guidance documents for using IBM credits. One document is for software credits and only applies to software tools. The other document is for service credits and applies to service contracts for software or hardware. These documents require the same information, but only the service credit document requires any preapproval by a manager. The IRS was unable to provide final approved and signed versions of these documents. SSM office management stated that these documents simply serve as standard operating procedure guidelines for the contract submitters to either use or reference when submitting their contract requests to SSM office management for review. However, these documents are not included in any authorized formal IRS policies and procedures.

The SSM office management stated that they purchased BigFix without following approved procurement policy because they used IBM software credits. In addition, SSM office management stated that they created their own requisition guidance regarding IBM software for which they control the approval process for any requisitions up to $100,000. Requests exceeding this amount are being sent to the Executive Software Governance Board for approval. However, this board was decommissioned in December 2015. We were unable to find any IRS policies governing the use of software credits to make information technology purchases. It appears this process has been in place since FY 2015, sufficient time for policy to be developed, accepted, and included in official authorized documents. This lack of control can cause the IRS to purchase software tools that are not sufficient to meet the needs of the IRS.

Recommendations

The Chief Information Officer should:

Recommendation 6*:* Direct the Associate Chief Information Officer, Strategy and Planning, to ensure that required planning procedures are completed prior to purchasing any software tools.

> ***Management's Response:*** The IRS agreed with this recommendation. The Associate Chief Information Officer, Strategy and Planning, will issue a communique emphasizing the requirement to follow the information technology acquisition procedures as documented in Internal Revenue Manual 2.21.1, as applicable, to ensure that required planning procedures are completed prior to purchasing any software tools.

Recommendation 7: Direct the Associate Chief Information Officer, Strategy and Planning, to formally document and implement policies and procedures for acquisitions that use software and service credit purchases and include these policies in official authorized documents.

> ***Management's Response:*** The IRS agreed with this recommendation and has defined, documented, and implemented a process for acquisitions using software and service credits as acknowledged in the report. The IRS will formalize the review and approval process for use of software and service credits.

Detailed Objective, Scope, and Methodology

The overall objective of this review was to determine the effectiveness and efficiency of the IRS's implementation of the software tools acquired by the IT organization to address its software development and SAM needs. To accomplish our objective, we:

I. Researched, identified, and reviewed Government criteria and requirements and non-Government best practices related to the acquisition and implementation of software development and SAM tools.

    A. Identified Government criteria and requirements from sources such as the National Institute of Standards and Technology.

    B. Identified non-Government best practices from sources such as ISACA, COBIT® 5, and the Information Technology Infrastructure Library.®

    C. Reviewed, analyzed, and summarized the criteria and requirements found that are relevant to the IRS's management of software development and SAM tools.

II. Determined if the IRS effectively purchased and adequately utilized software development tools.

    A. Determined how long the IRS has owned and used the software development tools (IBM® Legacy Rational® tools and CLM tools solution).

    B. Determined if the IRS wasted money during its ownership of the software development tools (IBM Legacy Rational tools and the CLM tools solution) by purchasing more licenses than it utilized.

        1. Compared the licenses purchased with how many were used.

        2. Determined how much money was potentially wasted on unused licenses for the software development tools.

III. Determined if the internal controls, policies, and procedures for transitioning from IBM Legacy Rational tools (RequisitePro, ClearCase, ClearQuest, and Test Manager) to the CLM tools solution are effective.

    A. Reviewed documentation to determine if the policies and procedures for the transition from the IBM Legacy Rational tools to the CLM tools solution were approved by the Rational Governance Board.

    B. Determined if the IRS is following the policies and procedures that have been developed and if those procedures are effective.

C. Determined if the IRS is providing training to program owners who are transitioning programs to the CLM tools solution.

IV. Reviewed the implementation of the IBM BigFix® product to determine if it is being managed effectively.

   A. Determined the IRS's current and future use of the BigFix product.

   B. Reviewed the tests/analysis performed to determine the limitations of the BigFix product.

   C. Analyzed the extent of IRS programs that will be able to be included in the BigFix functions.

V. Computed and analyzed the cost of the BigFix product from introduction/implementation until the current time.

   A. Verified that the BigFix purchase was made to satisfy the IBM requirement for subcapacity licensing.

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: IT organization policies, procedures, and processes for managing the migration of the IBM Legacy Rational tools to Rational CLM tools solution, managing and tracking IBM Rational tools software licenses, and the purchase of BigFix. We evaluated these controls by interviewing IT organization management and identifying Federal requirements and industry best practices for purchasing and managing software licenses. We obtained and reviewed Rational and IBM tool information, software licensing best practice documentation, and the IT organization's actions taken to address prior TIGTA audit recommendations.

Major Contributors to This Report

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Director, Office of Audit Coordination

Outcome Measure

This appendix presents detailed information on the measurable impact that our recommended corrective action will have on tax administration. This benefit will be incorporated into our Semiannual Report to Congress.

Type and Value of Outcome Measure:

Inefficient Use of Resources – Potential; $3,434,210 between FYs 2015 and 2017 on unused software licenses and S&S (see page 7).

Methodology Used to Measure the Reported Benefit:

On behalf of the IRS, a third-party contractor performed a review of the IRS's software license agreements associated with its IBM software contract. The review produced lists of software with data on the number of licenses and S&S that had not been deployed, were underdeployed, or were overdeployed. The IBM contract in effect did not provide itemized pricing information for S&S. Therefore, we used the IBM GSA Price List to estimate the cost with the exception of a small number of software tools for which we could not match to a GSA price. In addition, IRS management stated that, because it is a large purchaser of IBM software, the IRS pays 70 percent less than the GSA price, which could potentially affect the estimated value of licenses not deployed, underdeployed, and overdeployed. The IRS was unable to provide sufficient documentation showing that such discounts occurred for the software in our analysis. Based on the contractor review, GSA prices, and IRS comments, we determined that the IRS had purchased but not deployed software licenses and S&S.

This outcome was calculated by determining the total dollars wasted on Rational software licenses and S&S in FYs 2015 through 2017 ($11,447,368) and using the estimated 70 percent discount quoted by IBM (30% x $11,447,368) = $3,434,210.
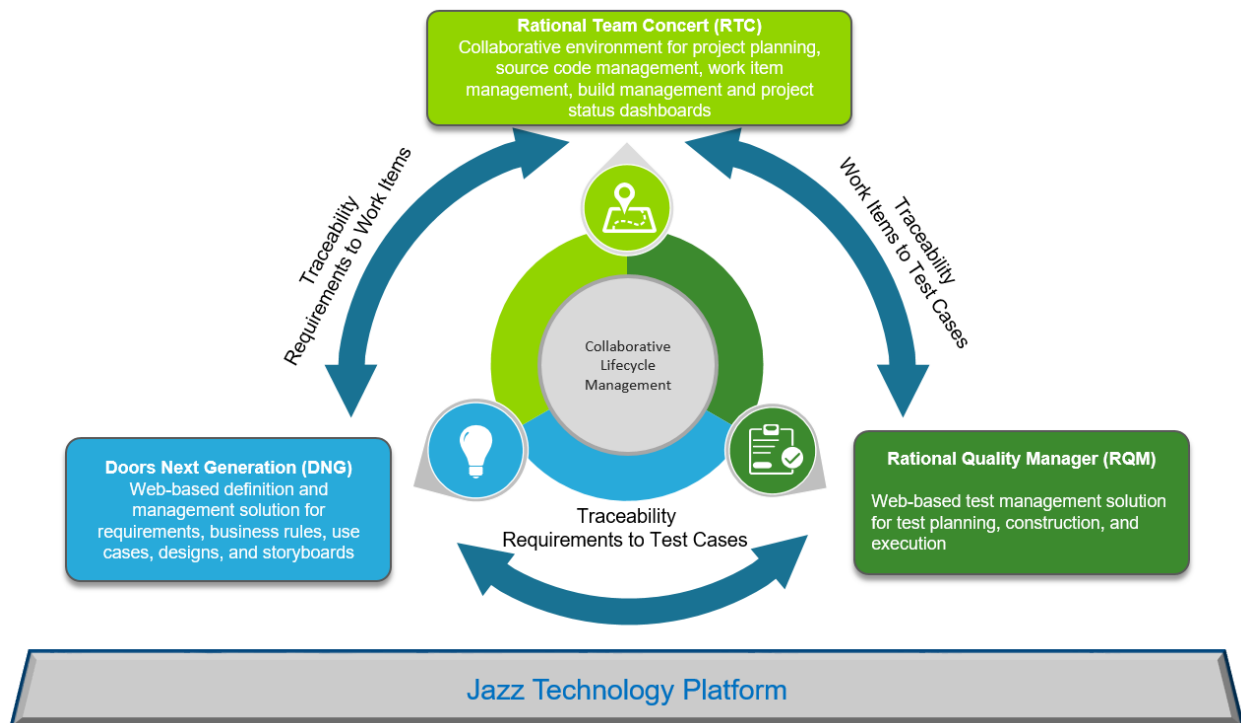
Collaborative Lifecycle Management
Tools Solution Overview

The CLM tools solution brings together requirements, change and configuration management, project planning, and quality management within a set of integrated tools on the common unified Jazz Technology Platform.

Source: RTI Rational Governance Board Meeting April 16, 2018.

IBM BigFix Components

1. IBM® BigFix® Lifecycle is a single-agent, single-console technology that helps find and fix problems in minutes across all endpoints – whether connected or not, fixed or mobile, virtual or physical:

   a. _Patch Management_ includes patches for Microsoft,® UNIX,® Linux,® and Macintosh® operating systems (workstations and servers).[1]

   b. _Remote Desktop Control_ provides the ability to monitor and control personal computers and servers.

   c. _Software Distribution_ provides a package library and automation toolkit for endpoint administrators.

   d. _Operating System Deployment_ provides imaging and provisioning of operating systems as well as operating system migration capabilities.

   e. _Asset Discovery and Inventory_ provides active hardware scanning and reporting.

   f. _Server Automation_ enables users to perform advanced automation tasks across servers, including task sequencing, and to create and reuse their own automation flows.

   g. _Power Management_ provides policy-driven power management to create and enforce conservation policies infrastructure-wide.

   h. _Archive Manager_ is a component of the BigFix Client that can collect files periodically or on command. Provides replacement for Tivoli commands.

2. IBM BigFix Inventory provides the foundation for software control and security risk mitigation, with embedded compliance and usage analysis, discovering all licensed and unlicensed software with in-depth granularity across all devices.

3. IBM BigFix Compliance provides common Security Technical Implementation Guides, Center for Internet Security, and third-party security baselines, network self-quarantine, and removable device control.

4. IBM BigFix Protection delivers anti-malware functionality via protection methods such as file and web reputation, personal firewall, and behavior monitoring. The Core Protection software helps protect physical and virtual endpoints from damage caused by viruses, Trojan

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[1] See Appendix VII for a glossary of terms.

horses, worms, spyware, rootkits, web threats, and their variants. This service is noted as having no requirement yet.

Glossary of Terms

Term	Definition
Best Practices	Proven activities or processes that have been successfully used by multiple organizations.
BigFix®	A set of products that leverage a single infrastructure, single agent, and console, enabling continuous monitoring, threat protection, and incident response across servers, laptops, and desktops regardless of their location. A dynamic, content-driven messaging and management system, this innovative technology distributes the work of managing information technology infrastructures out to the managed devices themselves, providing for unparalleled scalability and flexibility. The single, multipurpose agent controls multiple services regardless of where the endpoint is, optimizing configuration control and minimizing security risks.
Blanket Purchase Agreement	An excellent option for Federal agencies and schedule contractors alike, providing convenience, efficiency, and reduced costs. Contractual terms and conditions are contained in GSA Schedule contracts and are not to be renegotiated for GSA Schedule BPAs. Therefore, as a purchasing option, BPAs eliminate such contracting and open market costs as the search for sources, the need to prepare solicitations, and the requirement to synopsize the acquisition.
COBIT® 5	Best practice that provides a comprehensive framework that assists enterprises in achieving their objectives for governance and management of enterprise information technology assets.
Commercial Off-the-Shelf	A software and/or hardware tool that is commercially ready-made and available for sale, lease, or license to the general public.

Term	Definition
Contract	A mutually binding legal relationship binding the seller to furnish the supplies or services and the buyer to pay for them. It includes all types of commitments that obligate the Government to an expenditure of appropriated funds that, except as otherwise authorized, are in writing.
Contracting Officer Representative	The Government's principal program representative who provides technical input to the preaward and post-award phases of contracting.
Enterprise Governance	A set of responsibilities and practices exercised by the board or executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risk is managed appropriately, and verifying that the enterprise's resources are used responsibly.
Entitlement	Rights granted to the user of licensed software and are defined within the license agreement.
Executive Order	A legally binding order given by the President, acting as the head of the Executive Branch, to Federal administrative agencies. Executive Orders are generally used to direct Federal agencies and officials in their execution of congressionally established laws or policies.
Executive Order 13103, *Computer Software Piracy*	Requires Federal agencies to develop software license management policies and procedures. It also requires Federal agencies to prepare inventories of software present on computers to help ensure that software is used in compliance with copyright laws.
Fiscal Year	Any yearly accounting period, regardless of its relationship to a calendar year. The Federal Government's fiscal year begins on October 1st and ends on September 30th.
Forrester Research Inc.	A global research and advisory firm that provides research and guidance to the information technology industry.

Term	Definition
Governance	Ensures that stakeholder needs, conditions, and options are evaluated to determine agreed-on enterprise objectives to be achieved; setting directions through prioritization and decision-making; and monitoring performance and compliance against agreed-on directions and objectives.
Government Accountability Office	The audit, evaluation, and investigative arm of Congress that provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions.
IBM® S&S	A comprehensive tool upgrade and technical support solution. Delivers download access to fixes, feature packs, new releases, and new versions of license software.
Information Technology Infrastructure Library	A widely accepted set of concepts and practices for information technology service management derived from user and vendor experts in both private and public sectors. It focuses on the key service management principles pertaining to service strategy, service design, service transition, service operations, and continual service improvement with each principle being covered in a separate core publication. SAM is a key process described within the service transition core publication.
Information Technology Organization	The IRS organization responsible for delivering information technology services and solutions that drive effective tax administration to ensure public confidence.
Infrastructure	The fundamental structure of a system or organization. The basic fundamental architecture of any system (electronic, mechanical, social, political, *etc.*) determines how it functions and how flexible it is to meet future requirements.
License Metric	Used to measure the level of usage of software.
Mainframe	A powerful, multiuser computer capable of supporting many hundreds of thousands of users simultaneously.
Multicore Chip	Refers to central processing units that contain two or more processing cores. These cores operate as separate processors within a single chip.

Term	Definition
National Institute of Standards and Technology	A part of the Department of Commerce that is responsible for developing standards and guidelines for providing adequate information security for all Federal Government agency operations and assets.
Policy	Overall intention and direction as formally expressed by management.
Server	A computer that carries out specific functions (*e.g.*, a file server stores files, a print server manages printers, and a network server stores and manages network traffic).
Software Asset Management	A business practice that involves managing and optimizing the purchase, deployment, maintenance, utilization, and disposal of software assets within an organization throughout the lifecycle.
Software License Agreement	The legal contract between the owner and purchaser of a piece of software that establishes the purchaser's rights. A software license agreement provides details and limitations on where, how, how often, and when the software can be installed and used; it also provides restrictions that are imposed on the software. The agreement includes the license model that will be used for defining and measuring the use of the software. For example, a common simple license model could be based on how many people can use the software and on how many systems the software may be installed. The software companies also make special license agreements for large business and Government entities that may be different from those provided to the general consumer.
Tivoli	The IBM Tivoli desktop is the graphical user interface to managing Tivoli products. It is the system through which all Tivoli Enterprise products interact with Tivoli administrators.
Virtualization	Transforms physical hardware servers, hard drives, and networks into an infinitely flexible pool of computing, *e.g.*, storage, that businesses can expand, reallocate, and use as needed.

Management's Response to the Draft Report

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

DEC 14 2018

MEMORANDUM FOR DEPUTY INSPECTOR GENERAL FOR AUDIT

FROM: S. Gina Garza
                Chief Information Officer

SUBJECT: Draft Audit Report – Management and
                Implementation of Information Technology
                Software Tools Needs Improvement (Audit
                #201720032)

Thank you for the opportunity to review the draft audit report and to discuss its observations with the audit team. The IRS takes its obligation to manage taxpayer dollars in the most efficient and effective manner possible very seriously and is dedicated to meeting commitments to improving management of technologies that support delivery of taxpayer services.

We appreciate the progress that TIGTA has noted regarding use of Rational brand software products for the management of software development and delivery activities. As the software development lifecycle shrinks and requirements continue to expand, IRS is increasingly dependent on the effective use of automation tools to deliver reliable, capable business and tax processing applications.

The IRS completed the implementation of Rational Quality Manager from Rational Test Manager for testing and reporting in Fiscal Year 2015. Additionally, the IRS successfully completed the migration from RequisitePro to the Rational CLM Tool Suite using Doors Next Generation for the requirements repository in March 2018, decommissioning the RequisitePro servers in June 2018. In April 2018, we initiated the Pilot Phase for the migration of the Rational ClearCase to Rational Team Concert Source Code to assess the complexity and the level of effort.

Several of TIGTA's recommendations align with the IRS's Software Asset Management (SAM) program. The processes and tools being implemented will improve the management of software licenses and assist in maintaining compliance with license agreements. IRS agrees and is emphasizing the IT acquisition procedures as documented in IRM 2.21.1 to ensure that required planning procedures are completed prior to purchasing any software tools.

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However, we disagree with several of TIGTA's assertions regarding applicable contract terms, software maintenance requirements, license management, and acquisition of the tools discussed.

TIGTA states that IRS could have suspended and later resumed maintenance for Rational products on a pro-rated basis without incurring a reinstatement fee. The GSA Schedule 70 contract against which the Blanket Purchase Agreement (BPA) was awarded included terms stating that Subscription and Support (S&S) coverage can only be obtained for all the authorized use or none of the authorized use and a reinstatement fee shall apply for any uncovered use. The contract further states "there is no option for maintaining IBM subscription and support coverage for only a portion of authorized use for an IBM program at a Government customer site." The original and reissued contracts both clearly include this as a term of the contract. IRS provided additional correspondence between the contracting officer and the supplier reaffirming these license terms and the GSA schedule contract clauses in effect at the time. Last, a restatement of this restriction was provided directly from the supplier and TIGTA includes this language on page 8 of the report, clearly contradicting the assertion that IRS could partially cancel S&S coverage.

TIGTA also suggests that bona fide needs rules may have been broken. IRS fully understands a fiscal year appropriation may be obligated only to meet a legitimate or bona fide need arising in, or prior to, but continuing to exist in, the fiscal year for which the appropriation was made. The bona fide needs rule is an important and complex consideration for IRS as it executes its budget and acquisitions. As recommended by TIGTA, IRS has asked Counsel to review the acquisition of Rational software licenses and related S&S, and once their recommendations are received and evaluated, IRS will determine what further actions may be warranted.

IRS also believes the statement "federal acquisition regulations were not followed when the IBM BigFix product was purchased" is incorrect. The BPA was issued in accordance with FAR Part 8 and Treasury supplemental policies and the solicitation was publicly posted on GSA ebuy. IBM BigFix components were acquired under the terms of the contract over the course of several years and were thus acquired in compliance with applicable regulations.

It is also relevant that the principal use of BigFix within the IRS is for other than software asset management. As described in Appendix VI, BigFix consists of multiple components that support a wide range of capabilities. Many of the BigFix components

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were provided via substitution of Tivoli licenses, a product that was discontinued by IBM with the license rights migrated to BigFix per the contract terms. TIGTA states on page 12 "Testing the BigFix product prior to purchasing…would have allowed IRS to determine if it would meet its SAM needs." However, the IRS did not acquire BigFix with the expectation that it would meet all SAM needs and, as documented by TIGTA in Appendix VI, BigFix provides only limited SAM capabilities. Additional testing would thus have little impact on the acquisition or value that IRS is receiving from the BigFix tools.

In closing, IRS agrees that SAM capabilities must be improved, and we are making major strides to do so. Contrary to the stated findings, IRS believes that taxpayer dollars were saved due to the implemented license management approach and the outcome measure described by TIGTA was erroneously calculated by suggesting use of contractual rights that did not exist in the contracts.

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 Rodney Washington at (240) 613-2201.

Attachment

Draft Audit Report – Management and Implementation of Information Technology Software Tools Needs Improvement (Audit #201720032)

RECOMMENDATION 1: The Chief Information Officer should ensure that the Rational Governance Board develops and issues policy directives on the mandatory use and exceptions for not using Rational CLM and its components.

CORRECTIVE ACTION: The IRS agrees with this recommendation. The Rational Tools Initiative has developed a Policy Directive and is routing for final approval and issuance.

IMPLEMENTATION DATE: January 15, 2019

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Enterprise Program Management Office

CORRECTIVE ACTION MONITORING PLAN: IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

RECOMMENDATION 2: Direct the SSM office to implement processes that will improve license utilization and enhance license compliance.

CORRECTIVE ACTION: The IRS agrees with this recommendation.

Strategic Supplier Management (SSM) as part of its Software Asset Management (SAM) role will implement processes and tools to support increased utilization of available licenses and enhanced license compliance.

IMPLEMENTATION DATE: December 15, 2019

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN:
IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

RECOMMENDATION 3: Direct the SSM office on an annual basis to review software maintenance renewals to ensure coverage is purchased only for the number of licenses that show measured usage over the prior contract period.

CORRECTIVE ACTION: The IRS agrees with this recommendation.

Strategic Supplier Management (SSM), as part of its SAM role, will establish policy for the review of software license, subscription and maintenance purchases. Software subscription and maintenance renewal quantities will be adjusted based on measured usage and verified requirements within applicable contract terms and conditions.

IMPLEMENTATION DATE: December 15, 2019

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Strategy and Planning

Draft Audit Report – Management and Implementation of Information Technology Software Tools Needs Improvement (Audit #201720032)

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CORRECTIVE ACTION MONITORING PLAN:
IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

RECOMMENDATION 4: Request a review by the IRS's Office of Chief Counsel to determine if the purchase of the Rational tools software licenses and their S&S violated the *bona fide* needs rule and take any action required by law.

CORRECTIVE ACTION: The IRS agrees to this recommendation.

On October 3, 2018, the Chief Information Officer requested a review by the Office of Chief Counsel to determine if the purchase of the Rational tools software licenses and their S&S violated the *bona fide* needs rule. Upon completion of Chief Counsel's response, the IRS will take any actions required.

IMPLEMENTATION DATE: Complete, October 3, 2018

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN:
IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

RECOMMENDATION 5: Direct the SSM office to develop and implement controls that prevent system administrators from installing more licenses than were purchased under the contract.

CORRECTIVE ACTION: The IRS agrees with this recommendation.

IRS agrees that controls must be implemented for improved license management. As part of its SAM role, SSM is implementing processes and tools that will achieve this and that will support maintaining compliance with license agreements.

IMPLEMENTATION DATE: November 15, 2019

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN:
IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

RECOMMENDATION 6: Direct the Associate Chief Information Officer, Strategy and Planning, to ensure that required planning procedures are completed prior to purchasing any software tools.

CORRECTIVE ACTION: The IRS agrees with this recommendation. The ACIO Strategy and Planning will issue a communique emphasizing the requirement to follow the IT acquisition

Draft Audit Report – Management and Implementation of Information Technology Software Tools Needs Improvement (Audit #201720032)

procedures as documented in IRM 2.21.1, as applicable, to ensure that required planning procedures are completed prior to purchasing any software tools.

IMPLEMENTATION DATE: March 15, 2019

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN: IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

RECOMMENDATION 7: Direct the Associate Chief Information Officer, Strategy and Planning, to formally document and implement policies and procedures for acquisitions that use software and service credit purchases and include these policies in official authorized documents.

CORRECTIVE ACTION: The IRS agrees with this recommendation.

The ACIO, Strategy and Planning, in conjunction with the IRS Chief Procurement Officer, has defined, documented and implemented a process for acquisitions using software and service credits as acknowledged in the report. The IRS will formalize the review and approval process for use of software and service credits.

IMPLEMENTATION DATE: December 15, 2019

RESPONSIBLE OFFICIAL(S): Associate Chief Information Officer, Strategy and Planning

CORRECTIVE ACTION MONITORING PLAN:
IRS enters accepted Corrective Actions into the Joint Audit Management Enterprise System (JAMES) and monitors them monthly until completion.

Office of Audit Comments on Management's Response

While IRS management agreed with all of the recommendations in the report, the response included assertions about the accuracy of the information in the audit report that we believe warrant additional comment.

Management's Response: *The GSA Schedule 70 contract against which the BPA was awarded included terms stating that S&S coverage can only be obtained for all the authorized use or none of the authorized use and a reinstatement fee shall apply for any uncovered use. The contract further states there is no option for maintaining IBM S&S coverage for only a portion of authorized use.*

> **Office of Audit Comment:** In FY 2013, the IRS established a five-year BPA for IBM tools and services valued at more than $265 million. The BPA established that the IRS may, at the beginning of any contract year, and at its discretion, suspend maintenance payments of unused software tool licenses that the IRS previously purchased and entitled. In 2015, the IRS re-negotiated with IBM to reduce S&S that the IRS was not using. As such, the IRS was able to save $1.2 million. However, a similar effort was not performed in FYs 2016 and 2017. SSM personnel stated the effort taken in FY 2015 was a one-time opportunity, but could not provide documentation to support this statement. Had the IRS taken similar steps in subsequent years, it could have potentially realized similar savings. In addition, the IRS agreed with Recommendation 3 in this audit report and once the corrective actions are implemented it may realize savings due to reducing the S&S quantities based on measured usage.

Management's Response: *IRS also believes the statement "federal acquisition regulations were not followed when the IBM BigFix product was purchased" is incorrect. The BPA was issued in accordance with FAR Part 8 and Treasury supplemental polices and the solicitation was publicly posted on GSA ebuy.*

> **Office of Audit Comment:** While the BPA may have been issued in accordance with FAR Part 8, the IRS did not follow FAR Part 10 when it failed to perform significant analysis of BigFix. Further, the IRS did not follow FAR Part 12.2 when it purchased BigFix without a defined statement of need that described the type of tool or service to be acquired and did not explain how the agency intended to use the tools or services in terms of functions to be performed, performance requirements, or essential physical requirements.

Management Response: *TIGTA states on page 12 "Testing the BixFix product prior to purchasing...would have allowed the IRS to determine if it would meet its SAM needs." However, the IRS did not acquire BigFix with the expectation that it would meet all SAM needs and, as documented by TIGTA in Appendix VI, BigFix provides only limited SAM capabilities.*

> **Office of Audit Comment:** In 2012, the IRS did a limited comparison of BigFix and a product from Hewlett Packard. However, the IRS did not conduct significant analysis of BigFix nor was any testing performed prior to implementation of any BigFix component. In June 2014, the IRS identified IBM BigFix as the product to resolve the IRS's SAM issues previously reported by TIGTA. The IRS identified BigFix as the SAM tool that provides the functionality for hardware and software inventory, software usage analysis, package deployment, and patch management. Testing the BigFix product prior to purchasing and implementing the software would have allowed the IRS to determine if it would meet its SAM needs. Instead, the IRS is still searching for tools capable of performing SAM nearly four years after the IRS's initial planned implementation date of May 31, 2015.

Management Response: *IRS believes that taxpayer dollars were saved due to the implemented license management approach and the outcome measure described by TIGTA was erroneously calculated by suggesting use of contractual rights that did not exist in the contract.*

> **Office of Audit Comment:** As outlined in our comments above, the IRS was able to re-negotiate with IBM to reduce S&S in 2015. TIGTA agrees with that approach. However, the IRS did not attempt to re-negotiate with IBM to reduce S&S in subsequent years. In addition, the IRS is inefficiently using resources by purchasing S&S that are not being used.