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March 29, 2018

TO: David S. Ferriero
Archivist of the United States

FROM: James Springs 
Inspector General

SUBJECT: *Audit of NARA's Legacy Systems*

Attached for your action is our final report, *Audit of National Archives and Records Administration's Legacy Systems (OIG Audit Report No. 18-AUD-06)*. We incorporated the formal comments provided by your office.

The report contains ten recommendations aimed at improving NARA's Legacy Systems. Your office concurred with the recommendations. Based on your March 27, 2018 response to the draft report, we consider all the recommendations resolved and open. Once your office has fully implemented the recommendations, please submit evidence of completion of agreed upon corrective actions so that recommendations may then be closed.

Consistent with our responsibility under the *Inspector General Act, as amended*, we may provide copies of our report to congressional committees with oversight responsibility over the National Archives and Records Administration.

Please call me with any questions, or your staff may contact Jewel Butler, Assistant Inspector General of Audits, at (301) 837-3000.



Audit of NARA's Legacy Systems

March 29, 2018

OIG Audit Report No. 18-AUD-06

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Executive Summary

Audit of NARA's Legacy Systems

OIG Audit Report No.18-AUD-06

March 29, 2018

Why Did We Conduct This Audit?

According to a recent Government Accountability Office (GAO) report, the federal government invests more than \$80 billion on Information Technology (IT) annually, with much of this amount reportedly spent on operating and maintaining existing (legacy) IT systems. GAO goes on to state given the magnitude of these investments, it is important that agencies effectively manage their operations and maintenance (O&M). According to the Office of Management and Budget (OMB), overall IT investments in steady state assets have increased in each year since 2003. In 2008, we issued an advisory report regarding National Archives and Records Administration's (NARA) reliance on legacy systems for day- to- day operations, and to accomplish its strategic goal to "Make Access Happen." We performed this audit to determine if NARA has controls in place to identify, track, and monitor its use and maintenance of legacy IT systems.

What Did We Recommend?

NARA needs to implement greater controls over the tracking and monitoring of legacy systems to ensure these systems are identified and upgraded, or replaced before the technology becomes out of date and outlives its usefulness, and the cost to operate these systems outweigh its intended benefits.

This report includes 10 recommendations intended to strengthen controls over NARA's legacy systems.

What Did We Find?

NARA does not have adequate controls in place to identify, track, and monitor its use and maintenance of legacy IT systems. We found NARA has not defined what systems are considered legacy; has not documented the age of their systems; does not know the true cost of all its systems; and does not have a centralized process to track legacy systems. NARA has not implemented adequate and effective internal and management controls to track and monitor its use of legacy systems. Until such controls are implemented, NARA's oversight of its IT investments will continue to be impaired and spending may be wasteful; and NARA may be unnecessarily devoting a large portion of its small IT budget to operating and maintaining legacy systems.

NARA cannot properly account for the total costs of its Information Systems. This condition exists because Information Services does not have appropriate visibility into all of NARA's information systems and does not have appropriate authority to enforce requirements and needed changes throughout the agency. Information Services is not able to accurately report the costs associated with NARA's information systems to OMB. Without providing the appropriate oversight of information systems, NARA may be constrained in their ability to assess how effectively they are adopting provisioned services.

NARA continues to spend appropriated funds to operate and maintain legacy systems whose functionality should have been subsumed by the original Electronic Records Archives (ERA). Although NARA did not integrate the functionality of those legacy systems into the original ERA system (primarily due to OMB's decision to end ERA development early), the agency did not identify and implement compensating controls over all legacy systems associated with ERA. As a result, NARA has already spent approximately \$33 million in O&M and another \$12 million to develop a new system. Until NARA integrates the functionality for these systems into ERA 2.0 or other systems, NARA will continue to accrue approximately \$5 million per year on O&M of legacy systems that could be put to better use.

Information Services does not assess the cost and benefits of each alternative or conduct operational analysis during its Capital Planning and Investment Control (CPIC) process. It also does not conduct risk assessments for all information systems. NARA's policies and procedures do not require documentation of cost and benefits and NARA has not made conducting risk assessments a priority. As a result, the Investment Review Board may not have all of the necessary information to determine the investment alternative that is in the best interests of NARA. Additionally, NARA runs the risk of managing large dollar acquisitions that may result in cost and schedule overruns, while falling short of meeting user's needs.

Background

According to a recent GAO report, the federal government invests more than \$80 billion on IT annually, with much of this amount reportedly spent on operating and maintaining existing (legacy) IT systems. GAO goes on to state given the magnitude of these investments, it is important that agencies effectively manage their O&M. According to Office of Management and Budget (OMB), overall IT investments in steady state¹ assets have increased in each year since 2003. During this same period, investments in development, modernization, and enhancements have trended downward. Given the magnitude of IT investments (legacy systems²), it is important that agencies effectively manage them. This is especially true at NARA where the agency is engaged in a multiyear effort to transform into a dynamic and modern agency. In order to do this, NARA needs modern systems that will allow them to make this transformation happen. One of NARA's transformational outcomes from its strategic plan is to embrace the primacy of electronic information in all facets of their work and position NARA to lead accordingly. In addition, NARA's strategic plan has a goal to "Make Access Happen", which has several initiatives that would be aided by modern information systems. These initiatives include digitizing analog archival records to make them available online and accelerate processing of analog and digital records to make them available to the public.

As we documented in advisory report 12-08 *The National Archives and Records Administration's Reliance on Legacy Systems to Meet Electronic Records Mission Needs* dated March 30, 2012, NARA's reliance on legacy systems still exists. NARA continues to rely on legacy systems to "Make Access Happen". It has been five years since the advisory report was issued and NARA still relies on six of the systems³ mentioned in the report to process electronic records and make them available to the public. While, NARA has a plan in place to subsume these systems, it will take several years for these systems to be subsumed by NARA's Electronic Records Archive (ERA) 2.0 project or other systems. Electronic records systems are not the only legacy systems NARA relies on. Legacy systems are incorporated in every facet of NARA's day-to-day operations from managing the research rooms to tracking the performance of various NARA offices. These systems and others are a critical component of making access happen.

¹ O&M also known as steady state (GAO report GAO-16-468 *Federal Agencies Need to Address Aging Legacy Systems*).

² Federal legacy systems are IT investments that have become increasingly obsolete: many use outdated software languages and hardware parts that are unsupported (GAO report GAO-16-468).

³ The six legacy systems still in production include: (1) Accessions Management Information System (AMIS), (2) Archival Electronic Records Inspection and Control (AERIC), (3) Archival Preservation System (APS), (4) Presidential Electronic Records Library (PERL), (5) Archival Declassification Review and Redaction System (ADRRES), and (6) Unclassified Redaction and Tracking System (URTS).

Objectives, Scope, Methodology

The audit objective was to determine NARA's use and maintenance of legacy systems. Specifically, we determined if NARA has controls in place to identify, track, and monitor its use and maintenance of legacy systems. To accomplish this objective, we reviewed the following guidance:

- NARA's 2014-2018 Strategic Plan;
- National Institute of Standards and Technology (NIST) 800-53A Revision 4 "Assessing Security and Privacy Controls in Federal Information Systems and Organizations";
- OMB Circular A-94 "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs";
- Federal Information Security Modernization Act (FISMA) of 2014;
- NIST 800-30 revision 1 "Guide for Conducting Risk Assessments";
- OMB Circular A-11 "Capital Programming Guides" for 2015, 2016 and 2017;
- OMB Memorandum 10-27 "Information Technology Investment Baseline Management Policy";
- OMB Circular A-130 "Managing Information as a Strategic Resource"; and
- Interim Guidance NARA Directive 801-3, "Temporary Capital Planning and Investment Control (CPIC) Process"

Further, we conducted several surveys to identify the universe of legacy systems within NARA. Once the universe of systems was known, we judgmentally selected 10 systems⁴ to review. Our sampling methodology took into consideration the cost to maintain the systems, when the system last received a technology update, and whether or not the system was included in NARA's IT Portfolio, among other things. Results of the sample cannot be projected to the intended population. We obtained testimonial evidence from NARA personnel in the Office of Information Services, Research Services, Agency Services, and Office of the Chief Financial Officer. Testimonial evidence obtained was corroborated with documentary evidence when available, and was corroborated through confirmation from other NARA personnel.

To assess internal controls relative to our objectives, we reviewed Information Services' internal control reports for fiscal years (FY) 2016 and 2017. In the end-of-the-year reports, management reported there was reasonable assurance the management controls in effect, were adequate and

⁴ Those systems include Classified Interim System (CIS), Federal Records Center Program Document Conversion Units (FRCP DCU), Research Registration System (RRS), ADDRRES, Archival Records Center Information System (ARCIS), Case Management and Reporting System (CMRS), Expanding NARA Online Services/Holdings Management System (ENOS/HMS), Archival Electronic Records Inspection and Control (AERIC), Order Fulfillment and Accounting System (OFAS), and Performance Measurement and Reporting System (PMRS).

effective in ensuring (1) programs achieve their intended results; (2) resources were used consistent with NARA's mission; (3) programs and resources were protected from waste, fraud, and mismanagement; (4) laws and regulations were followed; and (5) reliable and timely information is obtained, maintained, reported and used for decision making. We assessed Information Services' control environment in accordance with Government Accountability Office's Standards for Internal Control in the Federal Government. We noted Information Services does not have any controls specific to legacy systems.

This performance audit was conducted in accordance with generally accepted government auditing standards between March 2017 and August 2017⁵ at Archives II in College Park, MD. The generally accepted government auditing standards require we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The audit was conducted by Andrew Clements, Senior IT Auditor.

⁵ This audit report was delayed due to higher priorities including work on the federally mandated FISMA review.

Audit Results

Finding 1. Lack of Controls over Legacy Systems

NARA does not have adequate controls in place to identify, track, and monitor its use and maintenance of legacy IT systems. We found NARA, has not defined what systems they consider legacy; has not documented the age of their systems; does not know the true cost of all its systems; and does not have a centralized process to track legacy system. These conditions exists because NARA has not implemented adequate and effective internal and management controls to track and monitor its legacy systems. Until such controls are implemented, NARA's oversight of such investments will continue to be impaired and spending may be wasteful. NARA may also be devoting a large portion of its small IT budget to operating and maintaining legacy systems without realizing how much they are spending on these systems. According to the GAO Green Book, "Management should design the entity's information system and related control activities to achieve objectives and respond to risks."

Legacy System Definition

NARA employees had differing views of what should be considered a legacy system. This exists because NARA has not developed and documented a standard definition for a legacy system. When the term "legacy system" was used, individuals had their own interpretation of what the term meant. In one instance, points of contact (POC) for two different systems that reside on the same platform had differing views as to whether their systems were legacy. One considered the system to be in its infancy even though it had been around for over 8 years. The other individual considered their system a legacy due to how old the system was and the technology used. Without a standard definition of a legacy system, it may be difficult for the individuals to come to the same conclusion that these systems are legacy and need replacing.

Age of NARA Systems

According to a recent GAO report, not all agencies track systems and their associated ages in the same manner—some track individual systems and others track by investment⁶. We found NARA does not document the age of the system or investment. This condition exists because NARA does not have a process in place to document the age of a system. During the audit, we met with the POC for systems in our sample and asked them the age of the system under their responsibility. In each case, no documentation was provided to support the age of the system. The POC could only estimate the age of the system but could not confirm the exact age. Without

⁶ An investment may be made up of several systems and infrastructure (GAO report GAO-16-468).

knowing the age of the system, NARA may have difficulty determining whether a system should be considered a legacy system.

Cost of a System

We found NARA does not track the overall spending of a system over a period of time to determine if spending has increased or decreased. For example, NARA's AAA (AERIC, APS and AMIS) contract with Phacil cost NARA over \$5.3 million dollars between FY 2013 and FY 2017. However, NARA does not know how much it cost to maintain each individual system because all three systems are lumped together in one contract. One system could be taking up the majority of the contractor's time thus cost more to maintain, which is a sign that it may be time to replace the system.

In another example, we were informed that Researcher Registration System (RRS) is a system that does not have any costs associated with it. While the system does not have a maintenance agreement with a vendor, the system does incur costs such as the emergency maintenance calls to a vendor to fix the system when it goes down. In these instances, a Government purchase card is used for the purchase; however, these costs are not associated with the RRS. Other costs exist that are associated with the time the research room employees take to fix the system when it goes down before calling the vendor.

Finally, ADRRES is managed by both contractors and government employees. CACI, a contractor, manages the software and the help desk while the National Declassification Center (NDC) employees manage the hardware and operating system. While NARA does know how much the CACI contract costs, it does not know how much it costs for the NDC staff to maintain the infrastructure for that environment. According to the OMB A-11 Capital Programming guide, "the cost of a capital asset is its full life-cycle cost, including all direct and indirect costs for planning, procurement (purchase price and all other costs incurred to bring it to a form and location suitable for its intended use), O&M (including service contracts), and disposal." Without knowing the exact cost of a system, NARA may be maintaining systems that could be replaced with cheaper systems, thus benefiting from potential cost savings.

Centralized Tracking of Legacy Systems

Once a legacy system is identified, the next step is to track those systems. As previously mentioned, the Office of Inspector General (OIG) requested a list of systems whose IT investment costs NARA has identified as falling under O&M⁷ for FY 2014 through FY 2017. However, NARA was not able to provide us a list of legacy systems. Instead we received a list of 39 systems, which were all the systems included in the IT Portfolio submitted to OMB. We subsequently discovered, another list of 71 systems, 32 of which were not on the IT Portfolio list

⁷ O&M (also known as steady state) costs refer to the expenses required to operate and maintain an IT asset in a production environment (GAO report GAO-16-468).

that could include legacy systems. Without a mechanism to track legacy systems, Information Services is not able to closely monitor legacy systems thus running the risk of maintaining systems that outlive their usefulness and cost too much to operate and maintain; and will continue to report incomplete and potentially erroneous data to OMB.

Recommendations

We recommend the Chief Information Officer (CIO)...

Recommendation 1: Develop a definition of a legacy system.

Management Response

Information Services will adopt the definition for a legacy system as defined by the House of Representatives in H.R. 2227, the Modernizing Government Act of 2017. This definition will be documented in the revised NARA 801, *Interim Guidance 801-3, Temporary Capital Planning and Investment Control (CPIC) Process*.

Target Completion Date: September 30, 2019

OIG Analysis

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Recommendation 2: In coordination with the program offices, document when the system was put into production and the life expectancy of each system.

Management Response

Information Services will coordinate with program offices to capture production cutover dates for all systems. Information Services is unable to determine life expectancy dates for deployed systems.

Target Completion Date: September 30, 2018

OIG Analysis

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Recommendation 3: In coordination with the program offices, document the total cost to operate and maintain each system on an annual basis.

Management Response

Information Services in coordination with the Chief Financial Officer will establish materiality thresholds for tracking system costs. Information Services will incorporate tracking thresholds into the policy developed for recommendation 5b and will coordinate with program offices to document the total cost to operate and maintain each system. Total costs will include all current federal employee and contractor labor costs, licenses, maintenance, and support costs that are above the materiality threshold.

Target Completion Date: December 31, 2018

OIG Analysis

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Recommendation 4: Create a centralized process to track legacy systems.

Management Response

Information Services will develop and implement a process for centralized tracking of all systems via the master systems inventory.

Target Completion Date: September 30, 2018

OIG Analysis

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Finding 2. Accounting for Information Systems

NARA cannot properly account for the total costs of its information systems. Information Services was unable to provide a complete list of legacy systems within the agency nor did they know the costs of all systems. This condition exists because Information Services does not have appropriate visibility into all of NARA's information systems and does not have appropriate authority to enforce needed changes throughout the agency. Without proper authority and insight, the CIO is not able to monitor the performance of information technology programs of the agency, evaluate the performance of those programs on the basis of the applicable performance measurements, and advise the head of the agency regarding whether to continue, modify, or terminate a program or project as required by Title 40, Section 11315 of the United States Code (40 U.S.C. §11315). Without providing the appropriate oversight of information systems, NARA may be constrained in their ability to assess how effectively they are adopting provisioned services.

44 U.S.C. §3506(a) states the head of each agency shall designate a CIO who shall report directly to such agency head to carry out the responsibilities of the agency under title 44's subchapter on Federal Information Policy. Other responsibilities of the CIO, documented in 40 U.S.C. §11315 are monitoring the performance of information technology programs of the agency, evaluating the performance of those programs on the basis of the applicable performance measurements, and advising the head of the agency regarding whether to continue, modify, or terminate a program or project.

Information Services provided an inventory of the information systems included in the IT portfolio instead of an inventory of legacy systems. We noted the inventory had 32 fewer systems than the one received during a concurrent Continuity of Operations Audit being conducted by the OIG. According to NARA, the reason the systems were not included on the IT portfolio was because either Information Services did not have any knowledge of how much it cost to maintain those 32 systems or there were no costs associated with them. In addition to not having knowledge into the costs of the systems, Information Services indicated they did not know who maintains or provides oversight for some of the systems.

As an example, Information Services indicated they do not have insight into systems managed by Business Support Services and Facilities such as the Closed Circuit Television (CCTV) or badging and access systems. According to staff, systems such as Information Security Oversight Office (ISOO) Redax do not have funding and therefore were not included on the inventory.

The current reporting structure may be a contributing factor to Information Services not having visibility into all of NARA's IT systems and continuing information technology weaknesses. Subordinating the CIO position to a second-tier report may send an unintended message to NARA employees and other stakeholders that undermines the urgency of corrective actions to address serious and long-standing IT weaknesses.

Recommendation

We recommend...

Recommendation 5: NARA ensure the CIO has visibility and access to all of NARA's systems. Specifically, we recommend the CIO:

- a. Coordinate with program offices to ensure visibility into all NARA systems;

Management Response

Information Services will develop a methodology to ensure all program offices are reporting on information systems not owned and operated by Information Services. This methodology will be incorporated in the policy developed for recommendation 5b.

Target Completion Date: September 30, 2018

OIG Response

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

- b. Develop, document, and implement a policy to require program offices to annually report Information Systems to Information Services;

Management Response

Information Services will develop a policy document that requires program offices to annually report information systems to the CIO for inclusion in NARA's master inventory of systems.

Target Completion Date: September 30, 2018

OIG Response

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

- c. Document all NARA systems in the IT portfolio that is reported to OMB; and

Management Response

Upon completion of recommendations 5a and 5b, Information Services will update its master systems inventory list, and ensure it is current for all systems reported to OMB. The systems will then be reviewed for inclusion in the IT Portfolio submission to OMB, subject to and in conformity with OMB Circular A-11 and annual reporting guidance.

Target Completion Date: September 30, 2019

OIG Response

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

- d. Ensure the total operation and maintenance costs of each system is documented, and reported to OMB.

Management Response

Closure of this recommendation is dependent on completion of recommendations 3, 5a, 5b, and 5c. As systems are identified for inclusion in the IT Portfolio,

Information Services will document total operation and maintenance of each system (subject to materiality thresholds) and subject to and in conformity with OMB Circular A-11 and annual reporting guidance.

Target Completion Date: September 30, 2019

OIG Response

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Finding 3. Cost of Legacy Systems

NARA continues to spend appropriated funds to operate and maintain legacy systems whose functionality should have been subsumed by the original ERA. Although NARA did not integrate the functionality of those legacy systems into the original ERA system (primarily due to the OMB's decision to end ERA development early), the agency did not identify and implement compensating controls over all legacy systems associated with ERA. As a result, NARA has already spent approximately \$33 million to operate and maintain these systems.⁸ Until NARA integrates the functionality for these systems into ERA 2.0 or other systems, NARA will continue to accrue approximately \$5 million per year on O&M of legacy systems that could be put to better use.

According to OMB A-130, agencies should phase out unsupported information systems and system components as rapidly as possible, and planning and budgeting activities for all IT systems and services incorporate migration planning and resourcing to accomplish this requirement.

In FY 2012, the OIG published Advisory Report No. 12-08 that informed NARA management of their continued reliance on outdated legacy systems is coming at a considerable cost to the agency. The report identified eight legacy systems for which NARA did not implement the functionality for those systems to be subsumed. NARA has made some progress in the 5 years since the report was published by replacing Archival Research Catalog (ARC) with Description and Authority Services (DAS) system and subsuming Access to Archival Databases (AAD) into the original ERA system. However, had ARC been subsumed by the original ERA project as planned, NARA would have never spent over \$12 million dollars developing DAS. As of FY

⁸ This total includes the approximate \$7 million identified in Advisory Report No. 12-08 plus the approximate \$26 million used to operate and maintain ARC (FY 2013 only), AMIS, AERIC, APS, ADRRES, DAS, URTS, and PERL from FY 2013 through FY 2017.

The numbers referenced in this report came from Information Services. The OIG was not able verify the accuracy of these numbers.

2017, NARA is still relying on six legacy systems plus one system, DAS, which should not have been developed to process electronic records. The seven systems include (1) AMIS, (2) AERIC, (3) APS, (4) Presidential Electronic Records Library (PERL), (5) ADRRES, (6) DAS, and (7) Unclassified Redaction and Tracking System (URTS).

While NARA has a plan to integrate the functionality of those legacy systems into ERA 2.0, the earliest the classified and unclassified versions of these systems will be subsumed would be 2020 depending on the budget. NARA has planned different scenarios depending on the budget as well as uncertainty surrounding the cloud storage costs once ERA 2.0 goes into production. However, they were not consistent in their estimation. The low estimate of funding for the ERA development costs did not include subsuming the functionality within the seven systems mentioned above, while the highest level of funding did include the seven systems. As a result, uncertainties still exist as to whether the seven systems would be subsumed anytime in the near future.

Since the issuance of our Advisory Report No. 12-08 on March 30, 2012 (which identified almost \$7 million a year to operate and maintain eight legacy systems and almost \$2 million planned for development, modernization, and enhancements), NARA has spent approximately \$26 million⁹ on operating and maintaining the 7 systems mentioned above. In addition, NARA has also spent over \$350,000 in upgrades to these systems¹⁰.

Recommendation

We recommend the CIO in coordination with System Owners:

Recommendation 6: Ensure all seven systems are adequately tracked, monitored, and the proper security controls are in place until they are subsumed within the ERA 2.0 project or other systems as planned.

Management Response

Information Services will, in coordination with System Owners, ensure all seven systems are adequately tracked, monitored, and the proper security controls are in place until subsumed within ERA 2.0 or other systems.

Target Completion Date: September 30, 2019

OIG Response

⁹ Total approximate cost to operate and maintain ARC (FY 2013 only), AMIS, AERIC, APS, ADRRES, URTS, DAS, and PERL from FY 2013 through FY 2017.

¹⁰ This includes technology refreshes for ADRRES, URTS, AMIS, APS, AERIC, and PERL.

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Finding 4. IT Capital Planning and Investment Control (CPIC) Process

Information Services does not assess the cost and benefits of each alternative during the selection phase of the IT Capital Planning and Investment Control (CPIC)¹¹ process and is not conducting an operational analysis during the evaluation phase of the CPIC process. NARA 801-3 does not require the costs and benefits of each alternative to be documented and an operational analysis to be conducted on each investment. As a result, the Investment Review Board¹² may not have all of the necessary information to determine the investment alternative that is in the best interests of NARA. NARA also runs the risk of managing large dollar acquisitions that may result in cost and schedule overruns, that fall short of meeting user's needs. Until NARA updates the CPIC process, they run the risk of continuing to maintain systems that are past their effectiveness and are consuming more resources than the benefits they may provide.

According to 40 U.S.C. §11312(b)(3), the head of each executive agency shall design and implement a process for maximizing the value and assessing and managing the risks of the information technology acquisitions of the executive agency. 40 U.S.C. §11312(b)(3) goes on to state the process shall include minimum criteria to be applied in considering whether to undertake a particular investment in information systems, including criteria related to the quantitatively expressed projected net, risk-adjusted return on investment and specific quantitative and qualitative criteria for comparing and prioritizing alternative information systems investment projects. OMB A-11 also states selecting an alternative without adequate analysis has resulted too often in large dollar acquisitions that have significantly overrun both cost and schedule, while falling short of expected performance.

For any new IT investment or upgrade to a current investment to be authorized, it must go through NARA's CPIC process. The CPIC process is comprised of four phases (see figure 1 below).

¹¹ CPIC is a governance process that is legislatively mandated by the Clinger-Cohen Act of 1996, and provides a structured approach to selecting and managing IT investments.

¹² The Investment Review Board is comprised of Information Services senior leaders as well as representatives from internal records management, privacy, and acquisitions.

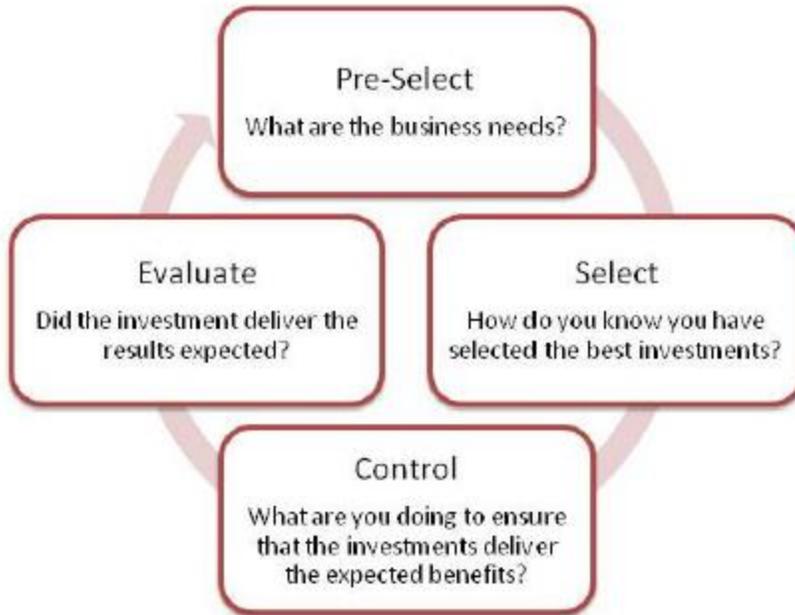


Figure 1 CPIC Process

Each phase of the CPIC process should have been designed to have controls in place to ensure NARA is maximizing the value, assessing, and managing the risks of the information technology acquisitions. However, Information Services has not consistently designed or implemented some of these controls.

Cost and Benefits of IT Investments

Information Services has not consistently documented the costs and benefits of each alternative documented in the Business Case. Most of the business cases we reviewed did include the benefits and costs for the recommended solution but not the benefits and costs for all of the alternatives. NARA’s policies and procedures do not require documentation of cost and benefit for each alternative. As a result, the Investment Review Board does not have complete information when making decisions on IT investments, which may lead to large dollar acquisitions that have significantly overrun both cost and schedule, while falling short of meeting user’s needs.

During the Select phase of the CPIC process, a business case is developed to document the market research, business need, strategic alignment, and alternatives considered as well as anticipated costs and benefits associated with each IT investment. Within each Business Case, the program office is supposed to document the costs and benefits for each alternative as well as costs and benefits for the recommended alternative. 40 U.S.C. §11312(b)(3) states the process of an executive agency shall include minimum criteria to be applied in considering whether to undertake a particular investment in information systems, including criteria related to the quantitatively expressed projected net, risk-adjusted return on investment and specific

quantitative and qualitative criteria for comparing and prioritizing alternative information systems investment projects.

Operational Analysis

We determined NARA had not conducted an Operational Analysis (OA) on any of the 10 systems in our sample. NARA also did not conduct an OA on their operational/steady state investments. Although NARA 801-3 states an OA should be conducted periodically to determine if the investment continues to support mission and business requirements, that policy does not require them to be completed and also it does not go into any details on how to conduct them. As a result of not conducting an operational analysis, NARA may not be able to determine if further investment is required to update, replace, or continue to maintain a system. While Information Services has created an OA form, it does not have a policy that requires Information Services in coordination with System Owners to conduct OA on IT investments.

OMB Memorandum 10-27 states agencies shall establish a policy for performing OA on operational/steady state investments to measure how well the investment is achieving expected cost, schedule, and technical and customer performance goals. According to the capital programming guides for FY 2015, FY 2016, and FY 2017, a formal OA is warranted for every steady-state project.

Without conducting an OA, NARA does not have a way of determining if a system is meeting the performance measures when it was originally developed. For example, NARA's RRS was developed around 1997. It is designed to track researchers as they enter and leave research rooms at some NARA facilities. When the system breaks or when the research room runs out of cards, Research Services switches to a paper process to track researchers while in the rooms. According to Research Services, in the first part of 2017 the system was down approximately 72 out of 85 possible days. When Research Services utilizes the manual process there is no guarantee a researcher signs in or out when going to a research room. Without an adequate OA, NARA lacks knowledge of the risks associated with this system and cannot adequately plan for its replacement. Further, the lack of information may hinder investigations on researchers if the OIG or others cannot rely on RRS to provide accurate tracking of a researcher while visiting a NARA facility.

Recommendations

We recommend the CIO...

Recommendation 7: Adhere to 40 U.S.C. §11312(b)(3) and require the cost and benefits of each alternative be documented and reviewed during the CPIC process.

Management Response

Information Services will revise the “Select” Phase of the CPIC process to require the completion of the Business Case form to identify and document the associated costs and benefits for each alternative.

Target Completion Date: September 30, 2018

OIG Response

We consider NARA’s proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Recommendation 8: Develop and implement an operational analysis policy as required by OMB 10-27.

Management Response

Information Services will revise the “Evaluate” phase of the CPIC process to require an operational analysis on each investment. The Operational Analysis form will be required to document the analysis.

Target Completion Date: September 30, 2018

OIG Response

We consider NARA’s proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Recommendation 9: Coordinate with each Program Office to conduct and document an operational analysis for IT investments currently in production in accordance with the policy in recommendation 8.

Management Response

Information Services will work with the Program offices, per the revised NARA 801, to conduct and document operational analysis for IT investments currently in production.

Target Completion Date: December 31, 2019

OIG Response

We consider NARA’s proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Finding 5. Risk Assessments Not Performed

NARA has not conducted risk assessments¹³ for some of its information systems. This condition exists because Information Services has not made it a priority to ensure all systems have a risk assessment. As a result, System Owners cannot ensure information security protections are in place commensurate with the risk to the confidentiality, integrity, and availability of NARA's information systems. According to the FISMA of 2014, the head of each agency shall ensure that senior agency officials provide information security for the information and information systems that support the operations and assets under their control. This includes assessing the risk and magnitude of the harm that could result from the unauthorized access, use, disclosure, disruption, modification, or destruction of such information or information systems.

According to NIST 800-30 revision 1, the purpose of a risk assessment and subsequent risk assessment reports¹⁴ is to inform decision makers and support risk responses identifying: (i) relevant threats to organizations or threats directed through organizations against other organizations; (ii) vulnerabilities both internal and external to organizations; (iii) impact (i.e., harm) to organizations that may occur given the potential for threats exploiting vulnerabilities; and (iv) likelihood that harm will occur.

We requested a copy of risk assessment reports for the systems in our sample. We received risk assessment reports for five of 10 systems. However, the risk assessments report for two systems (OFAS and FRCP DCU) had not been reviewed and/or updated since 2015 and 2011 respectively. Without conducting risk assessments for all NARA systems, NARA cannot adequately determine, and effectively address and document the risks associated with each individual system, nor do they know the residual risks to NARA's Information Technology environment.

Recommendations

We recommend the CIO...

Recommendation 10: Ensure risk assessments and risk assessment reports are completed and/or reviewed annually and updated accordingly for all NARA systems.

Management Response

¹³ The process of identifying, estimating, and prioritizing risks to organizational operations (including mission, functions, image, reputation), organizational assets, individuals, other organizations, and the Nation, resulting from the operation of an information system (NIST 800-30 revision 1).

¹⁴ A risk assessment report is a report, which contains the results of performing a risk assessment or the formal output from the process of assessing risk (NIST 800-30 Revision 1).

Information Services will ensure risk assessment reports are completed and/or reviewed annually and updated for all NARA systems.

Target Completion Date: December 31, 2019

OIG Response

We consider NARA's proposed actions responsive to our report recommendations. This recommendation will remain open and resolved, pending completion of corrective actions identified above.

Appendix A – Summary of Monetary Results

Finding NO.	Recommendation	Description	Amount	Category	Agency Response	OIG Response
3	6	NARA continues to spend appropriated funds to operate and maintain legacy systems whose functionality should have been subsumed by the original ERA.	\$45,350,000 ¹⁵	Funds Put to Better Use, No Recovery	Management disagrees with the estimate of “funds put to better use” included in this report. The estimate is the total cost to operate and maintain seven systems for six years, plus some development and enhancement costs relating to those systems. The estimate does not offset or discount those costs by the cost to develop and alternative solution and maintain it over the same period. The functionality provided by the systems in question is essential to	We agree with management that the funds be put to better use identified in this report were not offset or discounted by the cost to develop and maintain non-legacy systems that would provide the functionality of the legacy systems in question. However, according to the IG Act of 1978, a “‘recommendation that funds be put to better use’ means a recommendation by the Office that funds could be used more efficiently if management of an establishment took actions to implement and complete the recommendation.” The funds be put to better use here are not addressing the cost of providing the functionality, but instead address the efficiency of how that functionality is provided. In general, the functionality of these systems was supposed to have already been subsumed by the ERA System, however, the ERA Base System was put into production without

¹⁵ This number includes the \$7 million in O&M from report 12-08, \$26 million in O&M from FY 2013 to FY 2017, \$12 million in development costs for DAS, and \$350,000 in upgrade costs.

				<p>processing and providing public access to electronic archival records. NARA cannot provide that functionality through any other means without incurring significant costs. The estimate does not capture the costs that NARA must incur in order to adopt an alternative approach and, as a result, overstates the amount of funds that were available to be put towards a better use.</p>	<p>approximately half of the original requirements being implemented.</p> <p>While the cost of replacements is certainly greater than zero and may even be more than the funds be put to better use, determining such costs is outside the scope of this audit. Instead, this audit has found NARA has inefficiently spent funds on maintaining, and in some cases improving, legacy systems that are known to need total replacement. Thus the funds be put to better use addressed in this report are funds could have been used more efficiently towards developing non-legacy systems instead of maintaining systems that have already been decided to be replaced. Funds be put to better use include recommendations that funds be redirected to achieve greater efficiency even though not necessarily monetized as savings.</p>
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Appendix B – Acronyms

AAD	Access to Archival Databases
ADRRES	Archival Declassification Review and Redaction System
AERIC	Archival Electronic Records Inspection and Control System
AMIS	Accessions Management Information System
APS	Archival Preservation System
ARC	Archival Research Catalog
ARCIS	Archival Records Center Information System
CCTV	Closed Circuit Television
CIO	Chief Information Officer
CIS	Classified Interim System
CMRS	Case Management and Reporting System
CPIC	Capital Planning and Investment Control
DAS	Description and Authority Services
ENOS/HMS	Expanding NARA Online Services/Holdings Management System
ERA	Electronic Records Archive
FRCP DCU	Federal Records Center Program Document Conversion Unit
FISMA	Federal Information Security Modernization Act
FY	Fiscal Year
GAO	Government Accountability Office
ISOO	Information Security Oversight Office
IT	Information Technology
NARA	National Archives and Records Administration
NIST	National Institute of Standards and Technology
NDC	National Declassification Center
OA	Operational Analysis
OFAS	Order Fulfillment and Accounting System
OIG	Office of Inspector General
O&M	Operation and Maintenance
OMB	Office of Management and Budget
PERL	Presidential Electronic Records Library
PMRS	Performance Measurement and Reporting System
POC	Point of Contact
RRS	Researcher Registration System
URTS	Unclassified Redaction and Tracking System
U.S.C.	United States Code

Appendix C – Management Response



Date: MAR 27 2018
To: James Springs, Inspector General
From: David S. Ferriero, Archivist of the United States
Subject: Management's Response to OIG Report 18-AUD-06, *Audit of NARA's Legacy Systems*

Thank you for the opportunity to provide comments on this final report. We appreciate your willingness to meet with us and to clarify language in the report.

Management disagrees with the estimate of "funds put to better use" included in this report. The estimate is the total cost to operate and maintain seven systems for six years, plus some development and enhancement costs relating to those systems. The estimate does not offset or discount those costs by the cost to develop an alternative solution and maintain it over the same period. The functionality provided by the systems in question is essential to processing and providing public access to electronic archival records. NARA cannot provide that functionality through any other means without incurring significant costs. The estimate does not capture the costs that NARA must incur in order to adopt an alternative approach and, as a result, overstates the amount of funds that were available to be put towards a better use.

We concur with the ten recommendations in this audit, and in response, the attachment provides a summary of our proposed actions. As each recommendation is satisfied, we will

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provide documentation to your office. If you have questions about this action plan, please contact Kimm Richards at kimm.richards@nara.gov or by phone at 301-837-1668.



DAVID S. FERRIERO
Archivist of the United States

Attachment

**Action Plan Response to OIG Report 18-AUD-06,
Audit of NARA's Legacy Systems**

Recommendation 1: We recommend the Chief Information Officer (CIO) develop a definition of a legacy system.

Planned Action: Information Services will adopt the definition for a legacy system as defined by the House of Representatives in H.R. 2227, the Modernizing Government Act of 2017. This definition will be documented in the revised NARA 801, *Interim Guidance 801-3, Temporary Capital Planning and Investment Control (CPIC) Process*.

Target Completion Date: September 30, 2019

Recommendation 2: We recommend the CIO, in coordination with the program offices, document when the system was put into production and the life expectancy of each system.

Planned Action: Information Services will coordinate with program offices to capture production cutover dates for all systems. Information Services is unable to determine life expectancy dates for deployed systems.

Target Completion Date: September 30, 2018

Recommendation 3: We recommend the CIO, in coordination with the program offices, document the total cost to operate and maintain each system on an annual basis.

Planned Action: Information Services, in coordination with the Chief Financial Officer, will establish materiality thresholds for tracking system costs. Information Services will incorporate tracking thresholds into the policy developed for recommendation 5b and will coordinate with program offices to document the total cost to operate and maintain each system. Total costs will include all current federal employee and contractor labor costs, licenses, maintenance, and support costs that are above the materiality threshold.

Target Completion Date: December 31, 2018

Recommendation 4: We recommend the CIO create a centralized process to track legacy systems.

Planned Action: Information Services will develop and implement a process for centralized tracking of all systems via the master systems inventory.

Target Completion Date: September 30, 2018

Recommendation 5a: We recommend NARA ensure the CIO has visibility and access to all NARA's systems. Specifically, we recommend the CIO coordinate with program offices to ensure visibility into all NARA systems.

Planned Action: Information Services will develop a methodology to ensure all program offices are reporting on information systems not owned and operated by Information Services. This methodology will be incorporated in the policy developed for recommendation 5b.

Target Completion Date: September 30, 2018

Recommendation 5b: We recommend NARA ensure the CIO has visibility and access to all NARA's systems. Specifically, we recommend the CIO develop, document, and implement a policy to require program offices to annually report Information Systems to Information Services.

Planned Action: Information Services will develop a policy document that requires program offices to annually report information systems to the CIO for inclusion in NARA's master inventory of systems.

Target Completion Date: September 30, 2018

Recommendation 5c: We recommend NARA ensure the CIO has visibility and access to all NARA's systems. Specifically, we recommend the CIO document all NARA systems in the IT portfolio that is reported to OMB.

Planned Action: Upon completion of recommendations 5a and 5b, Information Services will update its master systems inventory list, and ensure it is current for all systems reported to OMB. The systems will then be reviewed for inclusion in the IT Portfolio submission to OMB, subject to and in conformity with OMB Circular A-11 and annual reporting guidance.

Target Completion Date: September 30, 2019

Recommendation 5d: We recommend NARA ensure the CIO has visibility and access to all NARA's systems. Specifically, we recommend the CIO ensure the total operation and maintenance costs of each system is documented and reported to OMB.

Planned Action: Closure of this recommendation is dependent on completion of recommendations 3, 5a, 5b, and 5c. As systems are identified for inclusion in the IT Portfolio, Information Services will document total operation and maintenance of each system (subject to materiality thresholds) and subject to and in conformity with OMB Circular A-11 and annual reporting guidance.

Target Completion Date: September 30, 2019

Recommendation 6: We recommend the CIO in coordination with System Owners ensure all seven systems are adequately tracked, monitored, and the proper security controls are in place until they are subsumed within the ERA 2.0 project or other systems as planned.

Planned Action: Information Services will, in coordination with System Owners, ensure all seven systems are adequately tracked, monitored, and the proper security controls are in place until subsumed within ERA 2.0 or other systems.

Target Completion Date: September 30, 2019

Recommendation 7: We recommend the CIO adhere to 40 U.S.C. §11312(b)(3) and require the cost and benefits of each alternative be documented and reviewed during the CPIC process.

Planned Action: Information Services will revise the "Select" phase of the CPIC process to require the completion of the Business Case form to identify and document the associated costs and benefits for each alternative.

Target Completion Date: September 30, 2018

Recommendation 8: We recommend the CIO develop and implement an operational analysis policy as required by OMB 10-27.

Planned Action: Information Services will revise the "Evaluate" phase of the CPIC process to require an operational analysis on each investment. The Operational Analysis form will be required to document the analysis.

Target Completion Date: September 30, 2018

Recommendation 9: We recommend the CIO coordinate with each Program Office to conduct and document an operational analysis for IT investments currently in production in accordance with the policy in recommendation 8.

Planned Action: Information Services will work with the Program offices, per the revised NARA 801, to conduct and document operational analysis for IT investments currently in production.

Target Completion Date: December 31, 2019

Recommendation 10: We recommend the CIO ensure risk assessments and risk assessment reports are completed and/or reviewed annually and updated accordingly for all NARA systems.

Planned Action: Information Services will ensure risk assessment reports are completed and/or reviewed annually and updated for all NARA systems.

Target Completion Date: December 31, 2019

Appendix D – Report Distribution List

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