

This is the accessible text file for Library of Congress Office of the Inspector General's Final Evaluation Report National Library Service for the Blind and Print Disabled's Information Technology Modernization Evaluation, Report No. 2020-IT-105 on September 10, 2021.

Office of the Inspector General
Library of Congress
Memo

Date September 10, 2021
To Dr. Carla Hayden
Librarian of Congress
From Kimberly Byrd
Acting Inspector General

Subject Final Evaluation Report National Library Service for the Blind and Print Disabled's Information Technology Modernization Evaluation, Report No. 2020-IT-105
The attached final report presents the results of Kearney & Company's (Kearney's) evaluation of the National Library Service for the Blind and Print Disabled's (NLS's) Information Technology (IT) Modernization. The objective was to determine whether NLS's modernization projects were executed on schedule, within budget, and in accordance with technical requirements and best practices.

IT Modernization continues to be a top management challenge for the Library. Kearney concluded that the NLS IT Modernization projects it reviewed were not executed on schedule or within budget, but were in accordance with technical requirements. Kearney also found that projects were not executed in accordance with key best practices for cost estimating and project scheduling and made 15 recommendations to assist the Library with project management.

Based on management's written response to the draft report, we consider all of the recommendations resolved. Your responses provided an action plan for the implementation of each recommendation, in accordance with LCR 9-160, Rights and Responsibilities of Library Employees to the Inspector General, 6.A. This report will be made publicly available on our website. We appreciate the cooperation and courtesies extended by NLS and the Office of the Chief Information Officer.

cc Principal Deputy Librarian Acting Director, NLS Chief Information Officer
Deputy Chief Information Officer General Counsel

OIG Appendix: Kearney & Company's Evaluation Report

EXECUTIVE SUMMARY

The Library of Congress (Library) National Library Service for the Blind and Print Disabled (NLS) service unit offers free braille and talking book services for individuals with a disability that prevents them from using standard library facilities or products. The NLS is currently working to modernize its technical infrastructure associated with its mission with the assistance of the Office of the Chief Information Officer (OCIO), an initiative that has been comprehensively named the NLS IT Modernization Initiative. This initiative includes the specific

projects to expand service offerings through five individual projects, including the Braille and Audio Reading Download (BARD), the Braille eReader, Smart Phone, Smart Speaker, and Stop Gap Player.

The purpose of this report is to deliver the results of our evaluation of the NLS Information Technology (IT) Modernization Initiative and NLS's adherence to available Government Accountability Office (GAO) project management best practice guides, namely the GAO Cost Estimating and Assessment Guide,[Footnote 1] the GAO Schedule Assessment Guide,[Footnote 2] and the exposure draft of the GAO Agile Assessment Guide.[Footnote 3]

Our evaluation found that there are significant gaps between the NLS IT Modernization Initiative practices and the GAO Cost Estimating and Assessment Guide and GAO Schedule Assessment Guide. Further, the NLS IT Modernization Initiative was either over budget or the budget variances could not be determined. Additionally, all NLS IT Modernization Initiatives are behind schedule from original project plans. Overall, this report contains seven findings and 15 recommendations, as follows:

1. Lack of Policies and Consistent Processes for Tracking Actual Costs Through the Life of a Project for all NLS IT Modernization Initiative Projects (three recommendations)
2. Lack of Consistent Risk Monitoring by NLS for the Braille eReader and Digital Talking Book Machine (DTBM) Projects (two recommendations)
3. Lack of Life Cycle Cost Estimates (LCCE) by NLS for the Braille eReader and DTBM Projects (one recommendation)
4. Lack of Consistent Work Breakdown Structure (WBS) and Earned Value Management (EVM) Procedures (three recommendations)
5. Lack of Consistent Project Status Reporting (two recommendations)
6. Lack of Integrated Master Schedule (IMS) and Inconsistent Processes for Updating Individual Project Schedules (three recommendations)
7. Lack of Consideration for All Pertinent Elements of Scheduling (one recommendation).

However, Kearney & Company, P.C. (defined as Kearney, we, and our in this report) acknowledges per the Memorandum of Agreement (MOA) for the resolution of Audit Report 2019-IT-104, there is an Implementation Plan, IMS, and Project Management Office (PMO) Execution Roadmap being developed by the OCIO to plan the path forward, including building and executing to established PMO guidelines.

Kearney notes that the GAO Agile Assessment Guide was in exposure draft form at the time of fieldwork and the Library does not require the use of agile practices. Therefore, Kearney did not present our evaluation of the agile criteria as findings in this report. However, we concluded that the NLS IT Modernization Initiative projects did not meet the majority of the criteria within the exposure draft of the GAO Agile Assessment Guide.

OBJECTIVES

As requested by the Library's Office of Inspector General (OIG), Kearney evaluated the NLS IT Modernization Initiative. We conducted this engagement in accordance with the Quality Standards for Inspection and Evaluation, issued by the Council of the Inspectors General on Integrity and Efficiency (CIGIE).

The objectives of the evaluation were to determine whether:

1. NLS IT Modernization Initiative projects are executed on schedule, within budget, and in accordance with technical requirements (Note: Objective I is a pass or fail objective. The processes in place and thus any recommendations for improvement pertaining to Objectives II to IV directly contribute to NLS's ability to pass Objective I).
2. NLS IT Modernization Initiative projects' cost estimates are executed in accordance with key best practices in GAO's Cost Estimating and Assessment Guide.
3. NLS IT Modernization Initiative projects' schedules are executed in accordance with key best practices in GAO's Schedule Assessment Guide.
4. NLS IT Modernization Initiative projects are being developed in accordance with key best practices in the exposure draft of the GAO Agile Assessment Guide, where applicable.

See Appendix A Scope and Methodology of the Evaluation of this report for the scope and methodology of the evaluation.

BACKGROUND

About NLS [Footnote 4]

NLS administers a free national library program that provides braille and recorded materials to people who cannot see regular print or handle print materials. Established by an Act of Congress in 1931 to serve blind adults, the program was expanded in 1952 to include children, in 1962 to provide music materials, in 1966 to include individuals with other physical disabilities that prevent reading regular print, and in 2016 to permit NLS to provide refreshable braille displays. The NLS program is funded annually by Congress, and books and materials are mailed as Free Matter for the Blind or Handicapped through a separate appropriation to the United States Postal Service. Cooperating network libraries are funded through a combination of state, local, and/or Federal sources. Under a special provision of the United States Copyright Law, and with the permission of authors and publishers of works not covered by that provision, NLS selects books and magazines for full-length publication in braille, ebraille, and digital audio format. Reading materials are circulated through a network of libraries across the United States and its territories and to American citizens living abroad. The materials and free playback equipment needed to read audiobooks (called talking books) and magazines are circulated to patrons by libraries by postage-free mail. Digital audio and ebraille materials also are available through the NLS BARD service and the BARD Mobile app.

About OCIO [Footnote 5]

The purpose of the OCIO is to provide the IT leadership, services, and capabilities that support the Library's current and future mission requirements. The OCIO, including its IT PMO, maintains the Project Management Life Cycle (PMLC) Rules and Regulations to effectively manage and deliver IT projects at the Library and support the individual service units.

About the NLS IT Modernization Initiative

Collectively, there are five individual projects comprising the NLS IT Modernization Initiative: DTBMs (Stop Gap Player, Smart Phone, and Smart Speaker), Braille eReader, and BARD.

The DTBMs can further be divided in two subareas: the Stop Gap Player (also referred to as the Interim Stop Gap Player) and the Next Generation Talking Books Machines, which includes the Smart Speaker and Smart Phone projects.

The NLS IT Modernization Initiative project structure is shown in Exhibit 1.

Exhibit 1: NLS IT Modernization Initiative Project Structure

Illustration of the NLS modernization structure:

NLS IT Modernization Initiative includes the Braille eReader and Bard

Digital Talking Book Machines includes Stop Gap Player

Next Generation Talking Book Machines includes Smart Speaker and Smart Phone

NLS leads projects that relate to the development of physical media for use by NLS patrons. This includes the Stop Gap Player and Braille eReader projects. While led by NLS, both NLS and OCIO are involved with the Smart Phone and Smart Speaker projects as they include both hardware and software components. OCIO leads projects related to the development of software that is used by NLS physical media devices, namely the BARD project.

Please see Appendix E for a summary of the projects, lead offices, project purposes, and expected outputs/outcomes of the NLS IT Modernization Initiative.

During discussions with NLS about the DTBMs, Kearney learned that the Smart Phone, Smart Speaker, and Stop Gap Player are all being produced concurrently. The goal of the Stop Gap Player project is to provide NLS patrons a DTBM in the interim while the Smart Phone and Smart Speaker projects are being assessed as viable products. At the completion of the Next Generation Talking Book Machine projects, NLS will determine whether the Smart Phone or Smart Speaker is the most effective product to fulfill NLS patron needs. One of the two projects will be chosen.

Similar to the DTBM projects, the Braille eReader is the responsibility of the NLS. Kearney was informed the Braille eReader was created in 2012 and NLS received approval in 2020 to update the devices. During the time of our fieldwork, NLS was piloting devices created by two vendors for the Braille eReader portion of the project.

About the GAO Assessment Guides

GAO is responsible for assisting Congress in its oversight of the Federal Government, including, but not limited to, agencies' stewardship of public funds and assessing Federal agencies' management of IT systems. As a result of audits conducted across Federal Government agencies, GAO developed assessment guides covering different areas to provide a consistent methodology based on best practices that can be used by Federal agencies. Relevant to this evaluation, Kearney assessed the NLS IT Modernization Initiative against GAO's best practices for Cost Estimating, Scheduling, and Agile practices.

GAO's Cost Estimating and Assessment Guide presents best practices associated with developing a reliable, high-quality cost estimate and the best practices associated with effective management of program costs using earned value management (EVM).

[Footnote 6] The guide also describes a cost estimate as the summation of individual cost elements, using established methods and valid data, to estimate the future costs of a program, based on what is known today.

GAO's Scheduling Assessment Guide presents best practices associated with the effective measurement of government program performance. This guide serves as a companion to GAO's Cost Estimating and Assessment Guide. A cost estimate cannot be considered credible if it does not account for the cost effects of schedule slippage. Moreover, a well-planned schedule is a fundamental management tool that

can help Government programs use public funds effectively by specifying when work will be performed in the future and measuring program performance against an approved plan.

Currently in exposure draft form, GAO's Agile Assessment Guide presents best practices associated with agile software development. The guide was developed with the assistance of specialists in the field of Agile and other incremental software development methods to aid Federal agencies, department, and auditors in assessing an organization's readiness to adopt Agile methods. GAO is seeking input and feedback on the exposure draft through September 27, 2021.

This guidance is essential to the NLS IT Modernization Initiative because without effective processes in place, there is an increased risk of improper scheduling and budgeting that could result in missed deadlines, project slowdowns, and failed products.

CONCLUSION

Kearney concludes that:

a) Objective 1: NLS IT Modernization Initiative projects are not executed on schedule or within budget, but are in accordance with technical requirements.

Based on the analysis of available current budgets and schedules against project charters, plans, and schedules, Kearney concluded the NLS IT Modernization Initiative was not completed on time or within budget, or budget variances could not be determined. Please see Exhibit 2 in the Evaluation Results section of this report.

Kearney noted the failure of Objective 1 is due to the findings related to Objectives II to III, as well as conclusions on Objective 4.

b) Objective 2: NLS IT Modernization Initiative projects' cost estimates are not executed in accordance with key best practices in GAO's Cost Estimating and Assessment Guide.

Kearney noted five findings that warrant the attention of management and those charged with governance pertaining to this objective. NLS and OCIO lack practices for consistent tracking of actual costs through the life of projects, consistent risk monitoring, LCCEs, consistent WBS and EVM procedures, and consistent project status reporting. There is an overall risk the NLS IT Modernization projects are unable to capture, evaluate, and estimate costs incurred. Moreover, there is an increased risk that projects underestimate costs to be incurred and may lead to unplanned incremental funding requests, delayed project completion, incomplete projects, costly resource alignments, and an inability to accurately estimate future needs.

c) Objective 3: NLS IT Modernization Initiative projects' schedules are not executed in accordance with key best practices in GAO's Schedule Assessment Guide.

Kearney noted five findings that warrant the attention of management and those charged with governance pertaining to this objective. NLS and OCIO lack practices in

place for consistent risk monitoring, consistent project status reporting, consistent WBS and EVM procedures, consistent processes for updating project schedules, and considering all pertinent elements of project schedules. There is an overall risk that NLS IT Modernization Initiative projects cannot adequately communicate schedule interdependencies, allocate resources and costs, and meet overall IT Modernization goals in an effective, efficient, and timely manner. Moreover, NLS and OCIO are unable to adequately determine if projects are on schedule and are unable to adequately communicate and accurately quantify project delays to Library management. Lack of communication of project schedule interdependencies may lead to project delays, project overruns, or incomplete projects. Further, miscommunication and lack of dependency relationships may lead to further misallocation of costs as critical projects may not receive resources needed for completion. This could further impact all dependent projects and risks compromising the completion of the NLS IT Modernization Initiative as a whole.

d) Objective IV: NLS IT Modernization Initiative projects are not being developed in accordance with best practices in the exposure draft of the GAO Agile Assessment Guide, where applicable. One of the five projects has not adopted Agile. Three of the NLS IT Modernization Initiative projects have adopted a hybrid methodology of Agile and Waterfall, which follows a specified precedence network for activities to be executed and lists interdependencies, but does not meet the principles of Agile adoption within the exposure draft of the GAO Agile Assessment Guide. In these projects, where Agile components are present, NLS solicited the preferred Agile methodology from contractor services, and does not perform Agile for in-house activities. Per inquiry and interviews, OCIO utilizes the Agile methodology on the BARD project; however, documentation was not provided to sufficiently show adoption in accordance with the exposure draft of the GAO Agile Assessment Guide.

EVALUATION RESULTS

We conducted this engagement as an evaluation in accordance with CIGIE Quality Standards for Inspection and Evaluation. Those standards require that we plan and perform the evaluation to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings, and conclusions based on our objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our objectives.

Our evaluation found that there are significant gaps between the NLS IT Modernization Initiative practices and the GAO Cost Estimating and Assessment Guide, GAO Schedule Assessment Guide, and the exposure draft of the GAO Agile Assessment Guide. Further, the NLS IT Modernization Initiative was either over budget or the budget variances could not be determined. Additionally, all NLS IT Modernization Initiatives are behind schedule from original project plans. Overall, this report contains seven findings and 15 recommendations, as follows:

1. Lack of Policies and Consistent Processes for Tracking Actual Costs Through the Life of a Project for all NLS IT Modernization Initiative Projects (three recommendations)
2. Lack of Consistent Risk Monitoring by NLS for the Braille eReader and DTBM Projects (two recommendations)
3. Lack of LCCEs by NLS for the Braille eReader and DTBM Projects (one

recommendation)

4. Lack of Consistent WBS and EVM Procedures (three recommendations)
5. Lack of Consistent Project Status Reporting (two recommendations)
6. Lack of IMS and Inconsistent Processes for Updating Individual Project Schedules (three recommendations)
7. Lack of Consideration for All Pertinent Elements of Scheduling (one recommendation).

Objective 1: Determine whether NLS IT Modernization Initiative projects are executed on schedule, within budget, and in accordance with technical requirements

Kearney determined each project within the NLS IT Modernization Initiative was either over budget or the budget variances could not be determined. Additionally, all NLS IT Modernization Initiative projects are behind schedule from original project plans/charters. Please see Exhibit 2 below.

Exhibit 2: NLS IT Modernization Initiative Project Status

Project Name followed by the Initial Estimated Completion Date followed by Project Status followed by Documented Estimated Cost followed by Last Documented Actual Costs Incurred (dates and costs are subject to the issues discussed in the Schedule of Findings and Recommendations.)

Stop Gap Player	09/30/2019	(a)	On-going, behind schedule	\$5,000.00	(a)	Not Available	(g)
Smart Phone	09/29/2020	(b)	On-going, behind schedule	\$329,739.96	(b)	Not Available	(g)
Smart Speaker	06/30/2019	(c)	On-going, behind schedule	\$130,000.00	(c)		
				\$263,699.59	(h)		
Braille eReader	07/31/2021	(d)	On-going, behind schedule	\$1,273,930.00	(d)		
						Not Available	(g)
BARD	03/01/2020	(e)	11/23/2020 (f)	On-going, behind schedule	\$1,108,563.88	(e)	
						\$7,420.77	(i)

Source:

- a) Stop Gap Player Project Charter
- b) Contract number LCNLS19D0030
- c) Smart Speaker Project Charter
- d) Braille eReader Project Charter
- e) BARD Project Charter
- f) BARD Project Schedule, revised 10/27/2020
- g) NLS did not provide actual costs incurred towards this project
- h) Year to Date costs incurred are per internal Program Manager invoice tracking
- i) Actual costs incurred are per OCIO s plan versus actuals reported. However, per OCIO response, the report does not account for actual costs incurred towards the project.

Kearney noted this is a pass or fail objective. Determinations of Objectives II to IV being met impact NLS s ability to meet Objective 1. Therefore, there are not specific findings relating to Objective 1. See also the Conclusion section of this report.

Objective 2: Determine whether NLS IT Modernization Initiative projects cost estimates are executed in accordance with key best practices in GAO's Cost Estimating and Assessment Guide

Exhibit 3 below lists the summarized results of the evaluation criteria from the GAO guide for best practices over cost estimating and assessment that resulted in reportable findings. The criteria serve as industry best practices or benchmarks against which performance is evaluated.

Exhibit 3: Summary of Findings Impacting Objective 2 Criteria

Evaluation Objective and GAO Guide followed by Criteria followed by NLS Results and then OCIO Results.

Objective 2 Cost Estimating and Assessment Guide

The cost estimate includes all life cycle costs. Finding 3. None

The cost estimate WBS is product-oriented, traceable to the Statement of Work (SOW), and at an appropriate level of detail to ensure that cost elements are neither omitted nor double-counted. Finding 4. Finding 4.

The estimate documents all cost-influencing ground rules and assumptions. Finding 3. None.

The estimate is based on a historical record of cost estimating and actual experiences from other comparable programs. The estimate is adjusted properly for inflation. Finding 3. None.

The cost model is developed by estimating each WBS element using the best methodology from the data collected. The estimate contains few, if any, minor mistakes. Major cost elements are cross-checked to see if results are similar. An independent cost estimate is conducted by a group outside the acquiring organization to determine whether other estimating methods produce similar results. Finding 4. Finding 4.

The cost estimate includes a sensitivity analysis that identifies a range of possible costs based on varying major assumptions and parameters. Finding 3. None. A risk and uncertainty analysis is conducted that quantifies the imperfectly understood risks and identifies the effects of changing key cost driver assumptions and factors. Finding 2. None.

The documentation shows the source data used, the reliability of the data, and the estimating methodology used to derive each element's cost. Finding 3. None.

The documentation describes how the estimate was developed so that a cost analyst unfamiliar with the program could understand what was done and replicate it. The documentation discusses the technical baseline description and the data in the technical baseline are consistent with the cost estimate. Finding 3. None.

The documentation provides evidence that the cost estimate is reviewed and accepted by management. Finding 3. None.

The cost estimate is regularly updated to ensure it reflects program changes and actual costs. Variances between planned and actual costs are documented, explained, and reviewed. Findings 1, 4, and 5. Findings 1 and 4.

See the Schedule of Findings and Recommendations section of this report for additional detail on the findings identified.

Objective 3: Determine whether NLS IT Modernization Initiative projects schedules are executed in accordance with key best practices in GAO's Schedule Assessment Guide

Exhibit 4 lists the summarized results of the evaluation criteria from the GAO guide for best practices over scheduling that resulted in reportable findings. The criteria serve as industry best practices or benchmarks against which performance is evaluated.

Exhibit 4: Summary of Findings Impacting Objective 3 Criteria
Evaluation Objective and GAO Guide followed by Criteria followed by NLS Results and then OCIO Results.

Objective 3 Schedule Assessment Guide.

Capturing All Activities. Findings 4 and 6. None.

Sequencing All Activities. Finding 7. Finding 7.

Assigning Resources to All Activities. Findings 6 and 7. Finding 7.

Establishing Durations for All Activities. Finding 7. Finding 7.

Verifying that the Schedule is Traceable Horizontally and Vertically. Finding 7. Finding 7.

Confirming that the Critical Path is Valid. Finding 7. Finding 7.

Conducting a Schedule Risk Analysis. Finding 2. None.

Updating the Schedule Using Logic and Process. Finding 5.

Objective 4: Determine whether NLS IT Modernization Initiative projects are being developed in accordance with best practices in the exposure draft of the GAO Agile Assessment Guide, where applicable.

Kearney noted that the GAO Agile Assessment Guide is currently in exposure draft form and GAO is seeking input and feedback on the draft until September 27, 2021. As a result, the criteria used as part of Objective 4 is inherently limited as it is subject to change based on subsequent revisions before the final guide is issued. Further, the current Library-wide policy on the use of Agile for project management is that Agile is the preferred approach and is not required. Thus, we did not present the results specific to Agile as findings in this report. See also Appendix A for scope and methodology of this evaluation.

Nevertheless, in accordance with our evaluation Objective 4, this section summarizes the state of the NLS IT Modernization Initiative projects as it pertains to Agile. The NLS IT Modernization Initiative projects did not meet the majority of the criteria within the exposure draft of the GAO Agile Assessment Guide.

Exhibit 5 lists the summarized results of the evaluation criteria from the GAO guide for best practices over Agile. The criteria serve as industry best practices or benchmarks against which performance is evaluated.

Exhibit 5: Summary of the Evaluation of Criteria

Evaluation Objective and GAO Guide followed by Criteria followed by NLS Results and then OCIO Results. All details for criteria follow in text that follows.

Objective 4 Exposure Draft of the GAO Agile Assessment Guide.
Team composition supports Agile methods.
Work is prioritized to maximize value for the customer.
Repeatable processes are in place.
Staff are appropriately trained in Agile methods.
Technical environment enables Agile development.
Program controls are compatible with Agile.
Organization activities support Agile methods.
Organization culture supports Agile methods.
Organization acquisition policies and procedures support Agile methods.

Exhibit 6: NLS Use of Agile Practices by Project.

Project follows if Agile was used.
Stop Gap Player. None.
Smart Phone. Hybrid (Waterfall and agile components).
Smart Speaker. Hybrid (Waterfall and agile components).
Braille eReader. Hybrid (Waterfall and agile components).
BARD. Hybrid (Waterfall and agile components).

The Smart Phone, Smart Speaker, and Braille eReader projects utilize a hybrid project framework consisting of both Waterfall [Footnote 7] and Agile components. Waterfall, by definition, is a different project framework than Agile. As such, its use on projects is not Agile. Moreover, the exposure draft of the GAO Agile Assessment Guide does not discuss best practices as it relates to Waterfall or hybrid project management frameworks. These three projects require the construction of hardware and software to run on the developed hardware. The development of hardware is run using a waterfall approach while the development of software is run using Agile. NLS contracts out all direct project work for these projects. During the procurement phase of projects, NLS will send its Agile methodology to contractors for review to ensure the contractor can meet the requirements of Agile as prescribed by NLS. However, as an organization, NLS does not perform Agile. Further, per inquiries, NLS is waiting on guidance from OCIO to establish policies and Standard Operating Procedures (SOP) related to the performance of Agile best practices.

Based on discussions with OCIO, Kearney noted that OCIO stated they perform Agile on the BARD project. However, OCIO did not provide documentation to support the Agile practices in place. Specific requests for Agile practices that were not supported include, but are not limited to:

- Agile teams use user stories to define work.
- System design supports iterative delivery.
- Organization culture supports Agile methods.
- Requirements are further refined as part of ongoing backlog refinement.
- A consistent process is in place to measure the value of work to ensure that user stories are developed based on relative value.
- The program uses Agile artifacts, such as a road map, to ascertain requirements traceability.

- Ensure that contract data requirements rely on Agile metrics.
- Metrics should be tailored based on a program s needs.
- Performance goals should be assessed frequently to match the Agile development cadence.

Therefore, Kearney determined the BARD project did not meet the requirements of the best practices outlined in the exposure draft of the GAO Agile Assessment Guide.

See the Schedule of Findings and Recommendations section of this report for additional detail on the findings identified.

SCHEDULE OF FINDINGS AND RECOMMENDATIONS

Finding 1 Lack of Policies and Consistent Processes for Tracking Actual Costs Through the Life of a Project for all NLS IT Modernization Initiative Projects

Background: Each individual NLS IT Modernization project (i.e., Braille eReader, BARD and DTBMs [Stop Gap Player, Smart Speaker and Smart Phone]) has a project charter that outlines project objectives and project budgets. Depending on the project, the NLS and OCIO project teams are responsible for monitoring project budgets, as detailed in the project charters, which can include labor hours incurred by NLS and OCIO employees, contracted labor, and other direct costs (e.g., materials).

In a prior audit performed by the Library OIG, [Footnote 8] the OIG evaluated the System Development Life Cycle (SDLC) methodology and recommended that the Library establish a budget methodology to track project development costs and measure variances against approved costs. Additionally, OIG made a similar recommendation to OCIO [Footnote 9] that suggested a formal checklist be developed to aid in developing, executing, and maintaining project costs.

Indirect costs are important to be included in total project costs to determine the entire life cycle cost of the project/product. Indirect costs are costs that are shared and allocated among several or all projects that benefit from the costs incurred. Examples of indirect costs could include the salary of a multi-project Project Manager (PM) or project team member where, based on the, assigned tasks, such as time spent for initiative-wide planning sessions or creating/updating an IMS for all initiatives. Indirect costs may also include salaries of service unit leadership to be allocated across many projects among other cost objectives, as well as any materials or equipment where direct cost allocations could not be determined with any level of accuracy.

Tracking total incurred costs enables an accurate account of the execution as well as creates a historical register for future/similar projects.

Condition: NLS and OCIO do not consistently and fully identify and monitor all project-related costs on any NLS IT Modernization Initiative project.

NLS does not have a process in place to capture internal costs, specifically Library employee labor hours and other Library indirect costs, for the Braille eReader and DTBM projects (Stop Gap Player, Smart Speaker, and Smart Phone). NLS project costs

are tracked only through the procurement process (i.e., costs that are invoiced to the projects for contracted labor services or goods procured) and maintained by the individual PM in any chosen method. Therefore, NLS PMs do not quantify or monitor direct and indirect costs for the administration and management of these projects to capture a holistic picture of actual project costs to date.

OCIO does not consistently capture all project costs for the BARD project. Currently, as part of a pilot program with the Financial Services Directorate (FSD), OCIO is developing a process to track actual direct Government labor costs utilizing the WebTA Labor Module, including capturing direct Library personnel labor hours manually and then recording the associated labor costs in the Library's financial management system (LBFMS), which then will feed the ServiceNow Project Portfolio Management (PPM) module. Per FSD response to Notification of Finding and Recommendations, the Library-wide implementation of the new process is estimated to be completed by the first quarter of Fiscal Year (FY) 2022. However, currently, this process does not include collection of project costs associated with the procurement process (i.e., costs that are invoiced to the projects for contracted labor services or goods procured), which are tracked manually outside of these systems, nor any direct or indirect costs incurred internal to the Library, but outside of OCIO (i.e., NLS employee labor or any other indirect Library costs). Therefore, OCIO PMs do not fully quantify or monitor direct and indirect costs for the administration and management of the BARD project to capture a holistic picture of actual project costs to date.

Criteria: GAO's Cost Estimating and Assessment Guide, Step 12: Update the Estimate Best Practice, states:

The cost estimate is regularly updated to ensure it reflects program changes and actual costs.

- The estimate is updated to reflect changes in technical or program assumptions, and how these changes affect the cost estimate is documented.
- The cost estimates are replaced with actual costs and the sources of the actual costs are documented.

Variances between planned and actual costs are documented, explained, and reviewed.

- The estimate documents variances and any lessons learned for elements whose actual costs or schedules differ from the estimate.

The GAO's Cost Estimating and Assessment Guide, Chapter 1, states: As part of this baseline, a full accounting of LCCEs, including all direct and indirect costs for planning, procurement, operations and maintenance, and disposal, is expected.

Causes: In anticipation of a future Library-wide process and aside from the OCIO pilot to capture Library personnel labor hours, NLS and OCIO have not undertaken interim steps to track and monitor all direct and indirect costs associated with a project in a holistic way. Additionally, neither NLS nor OCIO have office or project policies in place that require formal records for tracking actual costs. Lastly, there is no Library-wide cost accounting policy related to the allocation of

indirect costs.

Effects: Without proper identification and monitoring of all actual project costs, NLS and OCIO cannot comply with the GAO best practices to update cost estimates based on actual costs and understand variances between cost estimates and actuals. Additionally, NLS and OCIO are unable to accurately identify the total costs incurred for the NLS IT Modernization Initiative at any given time. Thus, any communication of total project costs, total project cost estimates, or budget-to-actual comparisons to Library leadership or external stakeholders may be inaccurate. Further, an inability to determine actual costs may lead to unplanned incremental funding requests, delays in project completion, incomplete projects, costly resource realignments, and an inability to accurately estimate future needs based on historical actuals.

Recommendations: Kearney recommends that:

1. FSD, in consultation with OCIO PMO, continue efforts to align actual cost tracking practices with the GAO Cost Estimating and Assessment Guide, as previously recommended by the OIG. [Footnote 10] Until such time that FSD can implement actual cost tracking practices that are aligned GAO Cost Estimating and Assessment Guide Library- wide, we recommend that FSD implement cost accounting procedures to close the gap while the ideal solution is being designed. For example, FSD can issue policies and procedures on cost identification and collection/recording, as well as using manual solutions and templates, in the interim, after conducting a cost/benefit analysis and risk assessment. Kearney would like to reiterate that considerations should include:
 - a. Direct costs associated with Library employee labor, contracted labor, and other direct costs (e.g., materials).
 - b. A reasonable allocation of Library indirect costs related to the administration and management of project.
 - c. Costs by type of expenditure.
 - d. Process considerations by project type and size, such as the level of detail required and the use of the PPM module, where available.
2. NLS require the NLS IT Modernization Initiative PMs to leverage existing actual cost tracking practices, with consultation and review by OCIO PMO and FSD, to identify and track all actual project costs and update cost trackers on all applicable NLS IT Modernization Initiative projects on a minimum standard frequency, in line with FSD s evolving requirements.
3. NLS/OCIO designate an individual to perform scheduled internal/self-assessments and compliance reviews over the actual cost trackers for each project. Furthermore, we recommend that these reviews be approved by NLS and OCIO management for transparency of both the actual costs by project, as well as the process to track it, with evidence of the management review and approval being documented and retained.

Management s Views on Conclusions and Findings: Management concurs with Kearney s recommendation and has provided a target completion date to implement changes. See Appendix B Management s Views on Conclusions and Findings for full response.

Kearney s Evaluation of Management s Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for

full response.

Finding 2 Lack of Consistent Risk Monitoring by NLS for the Braille eReader and DTBM Projects

Background: In response to a 2015 GAO recommendation [Footnote 11] to establish a risk management policy and process for FY 2016, the Library developed Library of Congress Directive (LCD) 5- 310.1, Project Management Life Cycle (PMLC), effective August 2017 and applicable to all Library IT projects. The PMLC directive states that each project should have a risk management team that is responsible for periodically evaluating, monitoring, and mitigating risks for each project. The PMLC directive also states that a risk register is necessary for small, medium, and large projects, and that the register should provide a record of risks, along with the assessment of their impacts, mitigation strategy, and resolution for the risks for each project. The Project Charters for the Braille eReader and DTBM Projects (i.e., Stop Gap Player, Smart Speaker, and Smart Phone) do not classify the projects as being small, medium, or large in accordance with LCD 5-310.1 and Project Classification Worksheets were not provided for these individual projects. According to LCD 5-310.1, all Library IT projects must follow the PMLC and PMs are expected to use the PMLC as a guide in managing their projects.

Condition: NLS PMs for the Braille eReader and DTBMs (i.e., Stop Gap Player, Smart Speaker, and Smart Phone) projects did not maintain proper risk registers, including the tracking and updating of identified risks by project, as required by LCD 5-310.1. NLS created an IT Roadmap early in the NLS IT Modernization Effort planning process in an attempt to have a guideline of the overall project timeline. The NLS IT Roadmap included a risk register related to all NLS IT modernization projects that generally met PMLC requirements given it contains columns for the assessment of impact and probability, mitigation strategy, contingency plan, and resolution or interim remarks; however, the majority of the risks have no resolution or interim remarks populated. Further, the NLS IT Roadmap Risk Register has not been updated since December 2019 and may omit pertinent risks. For example, there is only one risk identified that impacts the cost area, while it is evident from other issues noted within this report and numerous FY 2020 New and Expanded Program Requests (NEPR) that numerous risks existed for cost increases. Further, the risk register did not meet the fundamental GAO best practices, such as identifying high-priority risks and conducting periodic reevaluations of the risk register. Thus, there are no current risk registers that provide a record of risks with an assessment of impact and probability, mitigation strategy, contingency plan, and resolution for each risk.

Criteria: LCD 5-310.1, Project Management Life Cycle (PMLC), PMLC Required Deliverables, states:

Table 1 below shows deliverables that must be produced during the life cycle of a project.

Table 1: PMLC Deliverables and Roles

Phase followed by Deliverable(s) followed by Purpose and When Required. RACI - PM/PM Team followed by PCCB followed by OCIO Tower Owners, Project Team and

Stakeholders

Execution and Control

Status Report. Provides a project update format to be submitted to the Library's IT Project Management Office. Large, Medium and Small projects. R, C, I, C, I.

Risk Register. Provides a record of risks, with assessment of impact and probability, mitigation strategy, contingency plan, and resolution for each risk. Large, Medium, and Small projects. R, I, null, C, null.

RACI standard for the following roles = R: The role which produces the deliverable; Accountable (also approver or final approving authority): The role which is accountable for the correctness and completeness of the deliverable, and who must sign off (approve) the deliverable that Responsible provides; Consulted: Those whose input is sought, typically subject matter experts to produce the deliverable and are generally informed when the final deliverable is produced; Informed: Those who are notified generally only on completion of deliverable.

GAO's Schedule Assessment Guide, Best Practice 8, states:

A schedule risk analysis starts with a good critical path method schedule. Data about program schedule risks are incorporated into a statistical simulation to predict the level of confidence in meeting a program's completion date; to determine the contingency, or reserve of time, needed for a level of confidence; and to identify high-priority risks.

Programs should include the results of the schedule risk analysis in constructing an executable baseline schedule.

Prudent organizations recognize that uncertainties and risks can become better defined as the program advances and conduct periodic reevaluations of the risk register.

GAO's Cost Estimating and Assessment Guide, Step 9 Best Practice, states: A risk and uncertainty analysis is conducted that quantifies the imperfectly understood risks and identifies the effects of changing key cost driver assumptions and factors.

Causes: Despite the Library-wide PMLC guidance that has been developed in response to the GAO recommendation, NLS has not developed or implemented procedures or requirements for maintaining formal risk registers. The current practice is for NLS PMs to manage risks for each project through team meetings and report issues to leadership, such as Project Owners and Project Sponsors, as needed, with undefined roles and coordination between NLS and the OCIO PMO.

Effects: Without risk registers, NLS is unable to adequately assess, mitigate, and remediate known risks, and be assured that appropriate stakeholders are informed. Moreover, unmitigated risks may lead to unforeseen project delays, inefficient and ineffective resource allocation, and unplanned funding requests.

Recommendations: Kearney recommends that NLS (in coordination with the OCIO PMO):

1. Require NLS PMs to develop and maintain formal risk registers for each NLS IT Modernization Initiative project in accordance with LCD 5-310.1, Project Management

Life Cycle (PMLC), to track identified risks with a minimum standard frequency for periodically updating identified risks and resolutions. These risk registers should be maintained by the risk management team and reviewed by the risk manager, as detailed in the PMLC directive.

2. Monitor compliance with LCD 5-310.1, as described in Recommendation #1 above, and perform scheduled internal/self-assessments and compliance reviews over the procedures.

Management's Views on Conclusions and Findings: Management concurs with Kearney's recommendation and has provided a target completion date to implement changes. See Appendix B Management's Views on Conclusions and Findings for full response.

Kearney's Evaluation of Management's Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for full response.

Finding #3 Lack of LCCEs by NLS for the Braille eReader and DTBM Projects

Background: As detailed in GAO's Cost Estimating and Assessment Guide, an LCCE provides a structured accounting of all labor, material, and other efforts required to develop, produce, operate, and maintain, and dispose of a program. The program LCCE encompasses all past (sunk), present, and future costs for every aspect of the program regardless of funding source. The GAO Cost Estimating and Assessment Guide has 12 steps for developing and maintaining an accurate and complete cost estimate through the life of any project.

LCD 5-310.1, Project Management Life Cycle (PMLC) states that large projects should complete Cost Estimating Spreadsheets and Cost Estimating Documents during the Initiation Phase of the project. The PMLC directive defines that the spreadsheets should determine specific project costs categorized by types of IT expenditures and that the cost estimating documents should describe the processes and assumptions associated with the project. NLS did not provide Project Classification Worksheets for the Braille eReader and DTBM Projects to determine the required deliverables associated with cost estimation; however, according to LCD 5-310.1, all Library IT projects must follow the PMLC and PMs are expected to use the PMLC as a guide in managing their projects. LCD 5-310.1 further states that Project Cost Estimation Leads (which may be the PMs, where appropriate) are responsible to create an initial project cost baseline/high-level estimation, without any caveats regarding project size. Regardless of the size of a project, full cost estimations are critical.

Additionally, OIG's recent recommendation [Footnote 12] to the OCIO included developing a formal checklist that contains the GAO Cost Estimating Assessment Guide's best practices for Project Managers to follow when developing, executing and maintaining project costs.

Currently, as part of a pilot program with the FSD, the OCIO is developing a process to track actual costs utilizing the WebTA Labor Module, including capturing Library personnel labor hours manually and then recording the associated labor costs into the ServiceNow PPM module. Per FSD response to Notifications of Findings and Recommendations (NFR), the Library-wide implementation of the new process is

estimated to be completed by the first quarter of FY 2022.

Condition: NLS does not develop LCCEs nor does it have a formalized process for LCCE development regarding the Braille eReader and the DTBM projects (Stop Gap Player, Smart Speaker, and Smart Phone). These projects do not have proper cost estimation and assessment procedures in place. Specifically, NLS lacks documentation and processes for determining cost influence, estimation techniques involving historical costs, cost sensitivity analyses, cost estimate revision, and proper management approval over cost estimates. NLS has attempted to informally develop LCCE through the inclusion of Operations and Maintenance (O&M) costs in project charters; however, this practice does not meet the requirements for an adequate LCCE and is not an adequate baseline, as it does not consider all past, present, and future labor, material, and other efforts associated with the project regardless of funding. Further, the project charter cost estimates do not:

- Provide documentation showing the source data used, the reliability of the data, and the estimating methodology used to derive each element s cost, as suggested in GAO best practices.
- Describe how the estimate was developed so that a cost analyst unfamiliar with the program could understand what was done and replicate it, as suggested in GAO best practices.
- Determine specific project costs by types of IT expenditures, as required by LCD 5-310.1 for large projects.
- Describe the process and assumptions used, as required by LCD 5-310.1 for large projects.

Criteria: GAO s Cost Estimating and Assessment Guide, Step 1 Best Practice, states: The cost estimate includes all life cycle costs.

GAO s Cost Estimating and Assessment Guide, Step 5: Identify Ground Rules and Assumptions, Best Practice, states: The estimate documents all cost-influencing ground rules and assumptions.

GAO s Cost Estimating and Assessment Guide, Step 6: Obtain the Data, Best Practice, states:

The estimate is based on a historical record of cost estimating and actual experiences from other comparable programs.

GAO s Cost Estimating and Assessment Guide, Step 8: Conduct a Sensitivity Analysis, Best Practice, states: The cost estimate includes a sensitivity analysis that identifies a range of possible costs based on varying major assumptions and parameters.

GAO s Cost Estimating and Assessment Guide, Step 10 Best Practice, states: The documentation shows the source data used, the reliability of the data, and the estimating methodology used to derive each element s cost The documentation describes how the estimate was developed so that a cost analyst unfamiliar with the program could understand what was done and replicate it.

GAO s Cost Estimating and Assessment Guide, Step 11: Present the Estimate to

Management, Best Practice, states: The documentation provides evidence that the cost estimate was reviewed and accepted by management.

LCD 5-310.1, Project Management Life Cycle (PMLC), PMLC Required Deliverables, states:

Table 1 below shows deliverables that must be produced during the life cycle of a project

Table 1: PMLC Deliverables and Roles

Phase followed by Deliverable(s) followed by Purpose and When Required. RACI - PM/PM Team followed by PCCB followed by OCIO Tower Owners, Project Team and Stakeholders

Initiation. Cost Estimating Spreadsheet. Determine specific project costs categorized by types of IT expenditures. Large projects. R. I. C. Null. Null. Cost Estimating Document. Describes the process and assumptions. Large projects. R. I. C. Null. Null.

RACI standard for the following roles = R: The role which produces the deliverable; Accountable (also approver or final approving authority): The role which is accountable for the correctness and completeness of the deliverable, and who must sign off (approve) the deliverable that Responsible provides; Consulted: Those whose input is sought, typically subject matter experts to produce the deliverable and are generally informed when the final deliverable is produced; Informed: Those who are notified generally only on completion of deliverable.

Section 1.10 of the Cost Estimating Document requires the Cost Estimation Team to document any changes to the baseline cost estimate throughout the life cycle of the project.

Causes: The existing PMLC directive does not require full LCCEs during the Initiation Phase of all projects. Current cost estimation requirements do not cover all necessary aspects of the GAO guidance. NLS stated it is waiting for guidance from FSD as it pertains to the OCIO/FSD pilot to be finalized before implementing a process for cost estimates and LCCEs. In anticipation of a future Library-wide process, NLS has not undertaken interim steps to develop cost estimates and LCCEs and has not fully implemented the PMLC directive for cost estimating.

Effects: NLS is unable to accurately identify the projected costs for the NLS IT Modernization Initiative at any given time. Thus, any communication of expected project costs or budget-to-actual comparisons to Library leadership or external stakeholders may be inaccurate. Further, an inability to determine accurate cost estimates may lead to unplanned incremental funding requests, inappropriate classification of costs to be expensed or capitalized, delays in project completion, incomplete projects, or costly resource realignments. Without a proper cost estimation baseline or periodic revisions thereto, NLS is not in compliance with the PMLC and is not following GAO best practices.

Recommendation: Kearney recommends that the NLS IT Modernization Initiative PMs (in coordination with the OCIO PMO) implement OCIO PMO's formal cost estimating and assessment checklist that contains the GAO Cost Estimating and Assessment Guide's best practices for PMs to follow when developing, executing, and maintaining project

costs, once it is completed in response to OIG's recent recommendation [Footnote 13] to the OCIO.

Management's Views on Conclusions and Findings: Management concurs with Kearney's recommendation and has provided a target completion date to implement changes. See Appendix B Management's Views on Conclusions and Findings for full response.

Kearney's Evaluation of Management's Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for full response.

Finding #4 Lack of Consistent WBS and EVM Procedures

Background: According to GAO's Schedule Assessment Guide and GAO's Cost Estimating and Assessment Guide, a WBS is the cornerstone of every program because it defines in detail the work necessary to accomplish a program's objectives. The GAO's Cost Estimating and Assessment Guide additionally states that EVM measures the value of work accomplished in a given period and compares it with the planned value of work scheduled for that period and the actual cost of work accomplished. The exposure draft of the GAO Agile Assessment Guide describes EVM as having the capability to alert program managers to potential problems sooner than they might be discovered if only tracking expenditures. The EVM is a significant product within the WBS. WBSs are key to developing, executing, and maintaining project costs as PMs must be able to identify what costs and resources need to be allocated to the tasks and the order in which tasks must be completed. Further, EVM allows PMs to identify deficiencies and risks associated with costs and schedule of the project to determine the best plan of action to complete the project on time and on budget. The exposure draft of the GAO Agile Assessment Guide also states:

The WBS is the framework used by federal agencies to organize the work into manageable, smaller components. It is an essential input to three principle program controls used by federal agencies: cost estimating, scheduling, and EVM. Using the work breakdown structure, a program's cost estimate and schedule are developed and, if warranted, they can be combined into one baseline used to measure program performance.

In a prior audit performed by the Library OIG, [Footnote 14] the OIG evaluated the SDLC methodology and recommended that the Library establish a budget methodology to track project development costs and measure variances against approved costs. Currently, as part of a pilot program with the FSD, OCIO is developing a process to track actual direct Government labor costs utilizing the WebTA Labor Module, including capturing Library personnel labor hours manually and then recording the associated labor costs into the ServiceNow PPM module. Per FSD response to NFRs, the estimated completion date of the new process is the first quarter of FY 2022. In addition, OCIO stated it is working with experts in Agile EVM to determine the best approach to implement EVM at the Library. Per inquiry with the OCIO, the EVM guidance is expected to be completed by FY 2022.

Moreover, GAO [Footnote 15] recommended to the Library the following, Establish and implement an organization-wide policy for developing cost estimates that includes key practices as discussed in this report. WBSs are significant to developing costs estimates, as PMs need an understanding of the tasks requiring completion to adequately estimate the cost of the task. Moreover, EVM allows PMs to estimate the total costs required to complete the project at a given time and the total costs once the project is completed. As a result, PMs must identify deficiencies and risks

associated with costs and schedule of the project to determine the best plan of action to complete the project on time and on budget.

Based on inquiries to the NLS Deputy Director, NLS's expectation is that Project Charters have cost estimate components, persons developing charters have developed reasonable estimates, and PMs manage the costs throughout the project with PMs communicating issues to leadership.

Condition: NLS IT Modernization projects do not have a valid WBS and EVM framework.

Specifically:

- There is no WBS for the NLS Braille eReader project and there are no current plans to create one
- NLS projects for the Stop Gap Player and Smart Speaker currently have a WBS under development but it is not yet finalized
- NLS provided a WBS for the Smart Phone project, but it is not maintained or updated consistently, as the version provided in December 2020 was last updated August 2019
- The OCIO provided a WBS for the BARD Cloud, but it was not updated as the project end date showed November 20, 2020 and the project was not complete at the time of submission of the WBS on December 2, 2020.

Further, none of the WBSs provided show the EVM component. Therefore, NLS and the OCIO are unable to adequately assess project completion as a function of both time and cost by individual and overall tasks. Moreover, NLS and the OCIO would not be able to remediate issues in scheduling and costs estimates identified. Further, NLS and the OCIO do not have the processes or efforts in place to adequately communicate the extent and significance of risks identified to Product Owners and Project Sponsors or to Library leadership and other stakeholders.

Criteria: GAO's Schedule Assessment Guide, Best Practice 1, states: The schedule should reflect all activities as defined in the program's work breakdown structure (WBS), which defines in detail the work necessary to accomplish a program's objectives, including activities both the owner and contractors are to perform.

GAO's Cost Estimating and Assessment Guide, Step 4 Best Practice, states: The cost estimate WBS is product-oriented, traceable to the statement of work, and at an appropriate level of detail to ensure that cost elements are neither omitted nor double-counted.

GAO's Cost Estimating and Assessment Guide, Step 7 Best Practice, states: The cost model is developed by estimating each WBS element using the best methodology from the data collected.

GAO's Cost Estimating and Assessment Guide, Step 12 Best Practice, states: Variances between planned and actual costs are documented, explained, and reviewed.

GAO's Exposure Draft Agile Assessment Guide, Chapter 7 EVM Best Practices, states: The program has a certified EVM system.

GAO's Cost Estimating and Assessment Guide, Chapter 18 EVM Process, states:

The EVM process can be broken down into thirteen fundamental activities, outlined and described in this section:

1. define the scope of effort with a WBS
2. identify who in the organization will perform the work;
3. schedule the work to a timeline;
4. estimate resources and authorize budgets;
5. determine objective measures of earned value;

6. develop the performance measurement baseline;
7. execute the work plan and record all costs;
8. analyze EVM performance data and record variances from the performance measurement baseline (PMB) plan;
9. forecast estimates-at-completion (EACs) using EVM;
10. conduct an integrated cost-schedule risk analysis;
11. compare EACs from EVM (9) with EAC from risk analysis (10);
12. take management action to respond to risks; and
13. update the performance measurement baseline as changes occur.

Causes: NLS does not have a formal documented process in place for developing WBS and is not required to develop a WBS based on LCD 5-310.1, Project Management Life Cycle (PMLC).

NLS does not require EVM determinations to be made and the Library has not yet formally implemented EVM.

Effects: There is an increased risk that unmitigated deficiencies in the project schedule and budget will lead to projects falling behind schedule, projects not being completed, cost overruns, and unplanned funding requests. Without a WBS and EVM to aid in proper planning of the projects, NLS and the OCIO are not following GAO best practices.

Recommendation: Kearney recommends that:

1. The OCIO PMO, in consultation with FSD, continue efforts to implement EVM in accordance with GAO best practices and with consideration for project size requirements.

Until such time that OCIO PMO can implement EVM in accordance with GAO best practices, we recommend that the OCIO implement policies and procedures to close the gap while the ideal solution is being designed. For example, the OCIO can issue policies

and procedures on how to develop WBSs and take steps toward calculating EVM within a timely manner at the beginning of the project, based on project size requirements, with reassessment on a regular and recurring basis.

2. NLS require the NLS IT Modernization Initiative PMs to leverage existing WBS/EVM procedures, with consultation and review by the OCIO PMO and FSD, to create a WBS with the OCIO's evolving requirements.

3. NLS/the OCIO designate an individual to perform scheduled internal/self-assessments and compliance reviews over the WBS/EVM for each applicable project. Furthermore, we recommend that these reviews be approved by NLS and OCIO management for transparency of both the WBS/EVM by project, as well as the process to track it, with evidence of the management review and approval being documented and retained.

Management's Views on Conclusions and Findings: Management concurs with Kearney's recommendation and has provided a target completion date to implement changes. See Appendix B Management's Views on Conclusions and Findings for full response.

Kearney's Evaluation of Management's Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for full response.

Finding 5 Lack of Consistent Project Status Reporting

Background: NLS owns two main IT Modernization projects, the Braille eReader and DTBMs (Stop Gap Player, Smart Phone, and Smart Speaker). These projects have weekly status meetings where the project status, risks, and timelines are discussed. These meetings are attended by the Project Sponsor, Product Owners, PMs, Project

Coordinator, Senior Advisor, Engineering Manager, and any necessary contracting personnel, if applicable. Depending on the focus of the meeting (e.g., ATO [Authority to Operate] and Security meetings), the NLS liaison within the OCIO attends.

LCD 5-310.1, Project Management Life Cycle (PMLC) notes that during the Execution and Control Phase, the Project Team should provide status reports to Product Owners, stakeholders, and the Library's PMO. A status report is expected from any size project within the Library. Status reports are valuable to highlight a project's recent progress and any problems or corrective action with cost, schedule, and performance. In the spirit of the GAO best practices, programs should be monitored continually for their effectiveness by comparing planned and actual performance against the approved program baseline.

Condition: NLS PMs do not consistently document status reports to include updates on the status of the project during the status reports' covered timeframe. Often, the status updates are contained in brief meeting minutes. Currently, status reports/meeting minutes provided by NLS give limited and unclear updates on where each project stands and are not consistent across projects. For example, meeting minutes for the Smart Speaker focus on specific technical achievements and action items, with responsible parties identified, but do not track general status of cost, schedule, or project health. Weekly status reports for the Braille eReader provide a stoplight project health score, bulleted accomplishments and upcoming activities, and high-level issue identification, often without specific responsibilities identified or the impact of issues. The status reports/meeting minutes do not include reporting of new project risks, mitigation, or resolution of previously identified risks. NLS did not provide evidence that status reports or meeting minutes were submitted to the Library's IT PMO.

Criteria: LCD 5-310.1, Project Management Life Cycle (PMLC), PMLC Required Deliverables states:

Table 1 below shows the deliverables that must be produced during the life cycle of a project

Phase followed by Deliverable(s) followed by Purpose and When Required. RACI - PM/PM Team followed by PCCB followed by OCIO Tower Owners, Project Team and Stakeholders.

Execution and Control. Status Report. Provides a project update format to be submitted to the Library's IT Project Management Office.

Large, Medium and Small projects. R, C, I, C, I.

RACI standard for the following roles = R: The role which produces the deliverable; Accountable (also approver or final approving authority): The role which is accountable for the correctness and completeness of the deliverable, and who must sign off (approve) the deliverable that Responsible provides; Consulted: Those whose input is sought, typically subject matter experts to produce the deliverable and are generally informed when the final deliverable is produced; Informed: Those who are notified generally only on completion of deliverable.

GAO's Schedule Assessment Guide, Best Practice 9: Updating the Schedule Using Actual Progress and Logic, states:

Progress updates and logic provide a realistic forecast of start and completion dates for program activities. Maintaining the integrity of the schedule logic is

necessary to reflect the true status of the program. To ensure that the schedule is properly updated, people responsible for the updating should be trained in critical path method scheduling.

GAO's Cost Estimating and Assessment Guide, Chapter 12: Update the Estimate, states:

Programs should be monitored continually for their cost effectiveness by comparing planned and actual performance against the approved program baseline. In addition, the cost estimate should be updated with actual costs so that it is always relevant and current.

The continual updating of the cost estimate as the program matures not only results in a more accurate estimate, but also gives opportunities to incorporate lessons learned.

Future estimates can benefit from the new knowledge.

Causes: The PMLC directive does not include a requirement for information that must be included in project status reports or a timeframe for how often status reports should be completed. The PMLC directive refers to a sample template, which includes instruction for the appropriate information to be included; however, NLS PMs are not using the sample template.

Weekly status meeting discussions for projects led by NLS PMs are not consistently documented via meeting minutes or written status reports that can be distributed to stakeholders not attending the meeting or retained for historical information.

Effects: Without proper tracking of a project's progress, NLS is unable to determine if a project is on, behind, or ahead of schedule, and this can lead to projects focusing on non-value-adding activities and projects missing the critical path.

Unreliable project status information could also mislead users who rely on the reporting to help make resource allocation decisions. NLS is not in compliance with LCD 5-310.1 and is not following GAO best practices for appropriately monitoring project status in a manner that allows for informed updates to project schedules and cost estimates.

Recommendation: Kearney recommends that NLS (in coordination with the OCIO PMO):

1. Require NLS PMs to follow LCD 5-310.1, Project Management Life Cycle (PMLC) and leverage OCIO PMO project status report templates for each NLS IT Modernization Initiative project in order to document the possible impacts to the project schedule, cost estimates, and performance due to items discussed during weekly status meetings/reports, as well as require PMs to update the project schedule and cost estimates based on the impacts identified in the status report.
2. Monitor compliance with LCD 5-310.1, as described in Recommendation #1 above, and perform scheduled internal/self-assessments and compliance reviews over the procedures.

Management's Views on Conclusions and Findings: Management concurs with Kearney's recommendation and has provided a target completion date to implement changes. See Appendix B Management's Views on Conclusions and Findings for full response.

Kearney's Evaluation of Management's Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for full response.

Finding #6 Lack of IMS and Inconsistent Processes for Updating Individual Project Schedules

Background: GAO's Schedule Assessment Guide states, In general, schedules can refer to programs and projects. In this guide, a program encompasses an entire program

from beginning to end, including all government and contractor effort. An IMS may be made up of several or several hundred individual schedules that represent portions of effort within a program. When projects are conducted simultaneously with overlapping resources and dependencies, an IMS can be useful to coordinate multiple project schedules to better ensure that the critical paths, resources, and project milestones are communicated and tracked. This is useful for both IT and non-IT projects.

NLS's Braille eReader, Smartphone, and Smart Speaker projects are dependent on the software that is being developed by OCIO's BARD project. Thus, at a minimum, an IMS should be developed for Braille eReader, BARD, Smartphone, and Smart Speaker projects.

Per LCD 5-310.1, Project Management Life Cycle (PMLC), which NLS and the OCIO are required to follow, all Library IT projects require a project schedule to be created during the Planning Phase of the project. Further, LCD 5-310.1 sets an expectation that initial project plans are updated throughout the project life cycle. However, the PMLC does not discuss or require an IMS.

Additionally, OIG made a recommendation to OCIO16 in that the PMO should analyze and collectively manage the IT modernization projects with an IMS consisting of all IT modernization project efforts.

Condition: There is no NLS IT Modernization Initiative IMS. Further, NLS does not consistently update the individual project schedules to reflect new developments during the life of the project. Specifically, as provided in December 2020, the latest revised project plan with a schedule for the NLS Smartphone was updated as of October 2019 and the latest revised project plan with a schedule for the NLS Stop Gap Player was as of March 2019. Moreover, NLS did not provide a project schedule for the NLS Smart Speaker project.

Criteria: LCD 5-310.1, Project Management Life Cycle (PMLC), 3.1.2, Planning, states: The Planning Phase is complete when initial planning deliverables have been completed by the Project Manager; however, initial project plans are expected to be updated throughout the project life cycle.

The GAO Schedule Assessment Guide, Best Practice 1, states:

The schedule should reflect all activities as defined in the program's work breakdown structure (WBS), which defines in detail the work necessary to accomplish a program's objectives, including activities both the owner and contractors are to perform. An IMS should be based on critical path method scheduling that contains all the work represented in logically linked activities representing the execution plan. At its summary level, the IMS gives a strategic view of activities and milestones necessary to start and complete a program.

The GAO Schedule Assessment Guide, Best Practice 3, states:

Progress updates and logic provide a realistic forecast of start and completion dates for program activities. Maintaining the integrity of the schedule logic is necessary to reflect the true status of the program. To ensure that the schedule is properly updated, people responsible for the updating should be trained in critical path method scheduling.

Causes: NLS and the OCIO are not required by LCD 5-310.1 to have an IMS.

Furthermore, there is no minimum frequency on which individual project schedules are required to be reviewed and updated.

Effects: NLS and the OCIO are unable to adequately communicate interdependencies between projects, allocate resources and costs, and meet overall IT Modernization goals in an effective, efficient, and timely manner. Moreover, NLS and the OCIO are

unable to adequately determine if projects are on schedule and are unable to adequately communicate and accurately quantify project delays to Library management. Lack of communication of project schedule interdependencies may lead to project delays, project overruns, or incomplete projects. Further, miscommunication and lack of dependency relationships may lead to further misallocation of costs, as critical projects may not receive resources needed for completion. This could further impact all dependent projects and risks compromising the completion of the NLS IT Modernization Initiative as a whole. Further, without maintaining proper integrated schedules, NLS and OCIO are not following GAO best practices.

Recommendation: Kearney recommends that:

1. The OCIO, in consultation with NLS, identify project dependencies within the NLS IT Modernization Initiative projects (Braille eReader, BARD, Stop Gap Player, Smart Speaker, and Smart Phone) and among any other Library-wide IT modernization efforts. If Library-wide IT modernization dependencies exist, we recommend the OCIO create a Library-wide IT modernization IMS. If no other dependencies exist outside of the NLS IT Modernization Initiative projects, we recommend NLS, with consultation with the OCIO, create an NLS IT Modernization Initiative IMS.
2. NLS require NLS PMs to follow LCD 5-310.1, Project Management Life Cycle (PMLC), to update individual project schedules on a regular and recurring basis for each NLS IT Modernization Initiative project and communicate individual project schedule changes to the owner of the applicable IMS to be created in Recommendation #1 above.
3. NLS monitor compliance with LCD 5-310.1, as described in Recommendation #2 above, and perform scheduled internal/self-assessments and compliance reviews over the procedures.

Management's Views on Conclusions and Findings: Management concurs with Kearney's recommendation and has provided a target completion date to implement changes. See Appendix B Management's Views on Conclusions and Findings for full response.

Kearney's Evaluation of Management's Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for full response.

Finding #7 Lack of Consideration for All Pertinent Elements of Scheduling

Background: According to LCD 5-310.1, Project Management Life Cycle (PMLC), NLS and the OCIO are required within the Planning Phase of any size IT project to complete a project schedule. The project schedule should serve as a primary planning calendar and schedule baseline for the project and include both project management and technical tasks and subtasks needed to complete the project.

Further, according to GAO's Schedule Assessment Guide, there are 10 best practices to ensure a well-formulated schedule is created. The Schedule Assessment Guide states that a project schedule should be used as an integrated and reliable schedule of time to show when major events are expected, as well as the completion dates for all activities. This scheduling helps to determine if the program parameters are realistic and achievable. In summary:

The schedule is an essential basis for managing tradeoffs between cost, schedule, and scope. Among other things, scheduling allows program management to decide between possible sequences of activities, determine the flexibility of the schedule according to available resources, predict the consequences of managerial action or inaction in events, and allocate contingency plans to mitigate risk.

Additionally, Obsidian Global LLC made the following recommendation to the OCIO:

[Footnote 17]

OCIO should undertake a dedicated effort to develop tactical project schedule management processes that align with the best practices for project schedule management as outlined in the PMBOK Knowledge Area Project Time Management, and the GAO Schedule Assessment Guide to determine if the IT modernization project schedules provided sufficient detail to accurately track and manage performance. Condition: NLS and the OCIO do not have detailed project scheduling processes in place to account for resource allocation, task levels and dependencies, establishing realistic activity durations, and documenting total float. Further, NLS does not properly account for project activity sequencing or traceability when creating project schedules.

Criteria: GAO's Schedule Assessment Guide, Best Practice 2: Sequencing All Activities, states:

The schedule should be planned so that critical program dates can be met. To do this, activities must be logically sequenced and linked that is, listed in the order in which they are to be carried out and joined with logic. In particular, a predecessor activity must start or finish before its successor. Date constraints and lags should be minimized and justified. This helps ensure that the interdependence of activities that collectively lead to the completion of activities or milestones can be established and used to guide work and measure progress.

GAO's Schedule Assessment Guide, Best Practice 3: Assigning Resources to All Activities, states:

The schedule should reflect the resources (labor, materials, travel, facilities, equipment, and the like) needed to do the work, whether they will be available when needed, and any funding or time constraints.

GAO's Schedule Assessment Guide, Best Practice 4: Establishing the Duration of All Activities, states:

The schedule should realistically reflect how long each activity will take. When the duration of each activity is determined, the same rationale, historical data, and assumptions used for cost estimating should be used. Durations should be reasonably short and meaningful and should allow for discrete progress measurement. Schedules that contain planning and summary planning packages as activities will normally reflect longer durations until broken into work packages or specific activities

The schedule should identify reasonable total float (or slack) the amount of time a predecessor activity can slip before the delay affects the program's estimated finish date so that the schedule's flexibility can be determined. The length of delay that can be accommodated without the finish date's slipping depends on the number of date constraints within the schedule and the degree of uncertainty in the duration estimates, among other factors, but the activity's total float provides a reasonable estimate of this value. As a general rule, activities along the critical path have the least float.

Unreasonably high total float on an activity or path indicates that schedule logic might be missing or invalid.

GAO's Schedule Assessment Guide, Best Practice 5: Verifying that the Schedule can be Traced Horizontally and Vertically, states:

The schedule should be horizontally traceable, meaning that it should link products and outcomes associated with other sequenced activities. Such links are commonly referred to as hand-offs and serve to verify that activities are arranged in the

right order for achieving aggregated products or outcomes. The schedule should also be vertically traceable that is, varying levels of activities and supporting sub-activities can be traced.

Such mapping or alignment of levels enables different groups to work to the same master schedule.

GAO's Schedule Assessment Guide, Best Practice 6: Confirming That the Critical Path is Valid, states:

The schedule should identify the program's critical path the path of longest duration through the sequence of activities. Establishing a valid critical path is necessary for examining the effects of any activity's slipping along this path. The program's critical path determines the program's earliest completion date and focuses the team's energy and management's attention on the activities that will lead to the project's success.

Causes: LCD 5-310.1, Project Management Life Cycle (PMLC), states that project schedules include both project management and technical tasks and subtasks needed to complete the project, but the directive does not require that project schedules include details such as resource assignments, task duration, task dependencies, or total float. Additionally, the PMLC directive does not require PMs to track the sequencing or traceability of its projects within project schedules.

Effects: The lack of various scheduling details does not allow for the project schedules to be used as proper management tools to help effectively perform the work for IT projects. Poor scheduling may result in incorrect budgeting, project slowdowns, and wasted labor and resources. Additionally, this may result in communication issues between personnel for which tasks have been prioritized and linked and to determine which tasks need to be completed before others can begin, resulting in slowdowns or temporary halts in the project. Without traceability and sequencing, NLS is unable to accurately prioritize, sequence, and link activities to appropriately schedule projects. Without establishing these elements within the project schedules, NLS and OCIO are not following GAO best practices.

Recommendation: Specific to the OCIO, Kearney notes that open recommendation 4.1 within 2019-IT-104, IT Modernization Evaluation Report regarding a tactical project schedule management process suffices to remediate this finding for OCIO-managed projects; therefore, we offer no further recommendation.

Kearney recommends that NLS (in coordination with the OCIO PMO) implement the same recommendation, specifically that NLS implement the project schedule management processes that OCIO PMO will develop to align with PMBOK Knowledge Area Project Time Management and the GAO Schedule Assessment Guide, and that NLS perform scheduled internal/self-assessments and compliance reviews over the procedures.

Management's Views on Conclusions and Findings: Management concurs with Kearney's recommendation and has provided a target completion date to implement changes. See Appendix B Management's Views on Conclusions and Findings for full response.

Kearney's Evaluation of Management's Comments: Kearney noted that Management agrees with our recommendation; therefore, we have no further comments. See Appendix C for full response.

APPENDIX A SCOPE AND METHODOLOGY OF THE EVALUATION

Scope and Limitations

For an evaluation, scope is defined as the boundary of the evaluation and is directly tied to the evaluation objectives. The scope defines the subject matter that the auditors will assess and report on, such as a particular program or aspect

of a program, the necessary documents or records, the period of time reviewed, and the locations that will be included. The scope of this evaluation:

- Is limited to the planning efforts of the National Library Service for the Blind and Print Disabled (NLS) and Office of the Chief Information Officer (OCIO) for their modernization initiatives over five projects, specifically the Braille and Audio Reading Download (BARD) cloud, Braille eReader, Smart Phone, Smart Speaker, and Stop Gap Player

- Is limited to the current state of the NLS and OCIO projects, specifically from September

2020 through April 2021, which was our fieldwork period

- Included the necessary documents or records requested from NLS and OCIO to complete testing and perform walkthroughs for key controls/processes as they relate to the project management activities performed by NLS and the OCIO.

To obtain background information for this evaluation, Kearney & Company, P.C.

(Kearney) researched the Government Accountability Office (GAO) guides, previous evaluations and reviews performed, and Office of Inspector General (OIG) reports. We also met with NLS and OCIO personnel to obtain additional details regarding its processes related to the modernization initiatives.

We structured our evaluation of the NLS Information Technology (IT) Modernization Initiative using criteria from three different GAO guides as the evaluation criteria. The criteria provide a suitable benchmark in which to assess the modernization initiative against the evaluation objectives.

Methodology and Work Performed

Kearney conducted this evaluation from September 2020 to June 2021 in Washington, D.C. in the following three phases:

1. Planning Assessing the design of NLS's and OCIO's policies and best practices relating to the criteria, specifically to scheduling, cost estimating, and agile implementation, and understanding status of projects
2. Internal Controls and Testing Testing the implementation of best practices established for processes related to scheduling, cost estimates, and agile implementation performed by NLS and the OCIO by inspecting supporting documentation, such as project charters, schedules, estimates, and status reports
3. Wrap-Up and Reporting Concluding on the project status and the best practices of scheduling, cost estimates, and agile implementation of the projects as a result of evaluation procedures performed.

Kearney designed our methodology to obtain reasonable assurance that the evidence is sufficient and appropriate to support our conclusion in relation to the evaluation objectives and to reduce evaluation risk to an acceptable level. Our methodology included the following procedures for gathering and analyzing evidence to address the evaluation objectives:

- Requesting overview information from NLS and OCIO on the five projects that comprise the NLS IT Modernization Initiative

- Reviewing the applicable policies, procedures, and processes implemented by NLS and OCIO by leveraging knowledge of prior audits, the GAO Cost Estimating and Assessment Guide, Scheduling Assessment Guide, and exposure draft of the Agile Assessment Guide, as well as process-related controls obtained during the evaluation, including, but not limited to, those covering:

 - Project Charters

 - Project Management Plans

 - Project Schedules

Library of Congress Directive (LCD) 5-310 Project Management Life Cycle (PMLC)
LCD 5-310 System Development Life Cycle (SDLC)
LCR 5-310 IT PMO

IT Modernization Initiative Contracts Awarded

Project Status reports

Organizational Plans

IT Modernization Roadmap

Product Requirements

Invoice Tracking (when available)

Agile Methodology

Sprint Plans

Sprint Artifacts

Patron Surveys

- Conducting interviews to discuss the procedures in place to prevent/detect fraudulent activities
- Inquiring and observing processes performed by NLS and OCIO personnel related to practices required by the GAO guides, as applicable, to determine whether they are designed effectively
- Inquiring of NLS and OCIO personnel on changes that have occurred since the previous evaluation/review/audits were performed
- Identifying the manual and automated controls implemented by NLS and OCIO to address the criteria
- Identifying areas where the manual and automated controls are designed ineffectively, or missing altogether, through observation, inquiry, and/or re-performance, as well as determining the underlying cause(s)
- Assessing the known and potential impacts that result from the control deficiencies noted
- Completing risk assessments to evaluate the Risk of Failed Benchmark and noting gaps

Evaluating added risks, as necessary, to achieve the evaluation objectives

- Assessing identified criteria to see if NLS and OCIO policies and procedures are aligned with the GAO best practices
- Conducting an Exit Conference upon the conclusion of testing
- Completing Quality Control (QC) and wrap-up procedures to verify compliance of the engagement with Council of the Inspectors General on Integrity and Efficiency (CIGIE) standards
- Evaluating gaps and deficiencies noted during the evaluation to conclude on the NLS IT Modernization Initiative projects performed by NLS and the OCIO
- Drafting NFR and sending them to NLS, the OCIO, Financial Services Directorate (FSD), and OIG for review
- Drafting an evaluation report with conclusions for internal Kearney review
- Issuing the draft report to NLS and the OCIO for review and comment on Kearney's conclusions
- Evaluating and incorporating NLS and OCIO's feedback, as necessary, and issuing a final report to the OIG.

Work Related to Internal Controls

Kearney performed steps to assess the adequacy of internal controls related to the evaluation objectives. We assessed the design of controls related to the business processes and systems relevant to the NLS IT Modernization Initiative. Results of

the work performed on internal controls during the evaluation are detailed in the Evaluation Results section of the report.

APPENDIX B MANAGEMENT S VIEWS ON CONCLUSIONS AND FINDINGS

DATE August 17, 2021

TO Kurt Hyde, Inspector General

FROM J. Mark Sweeney, Principal Deputy Librarian of Congress

SUBJECT Management Response to OIG report 2020-IT-105, Evaluation of the Library of Congress National Library Service for the Blind and Print Disabled's Information Technology Modernization Initiative

Thank you for providing the draft evaluation report the National Library Service for the Blind and Print Disabled's (NLS) information technology (IT) modernization initiatives.

During the evaluation process, NLS and the Office of the Chief Information Officer (OCIO) have been coordinating to address some of the concerns raised in your report. For example, NLS has already begun developing risk registers and otherwise implementing the OCIO PMLC processes and documentation for the NLS IT Modernization initiatives.

We appreciate the evaluators' acknowledgement of the Library's current efforts in drafting an OCIO Implementation Plan, IMS, and Project Management Office (PMO) Execution Roadmap for core IT projects. As the library develops these documents and refines the PMO guidelines, the Library will leverage such information and practices across the agency to help build the expertise of service units in the management of their modernization projects and further collaboration across the Library.

With respect to the recommendations relating to costing, we note that the Financial Services Directorate (FSD), in conjunction with OCIO, is working to develop a new indirect cost methodology. Currently, the PMO captures cost and schedule estimates in project charters and tracks certain actual project cost data via a spreadsheet that informs overall project management. The PMO continues to mature processes for data collection, including the initiation of a pilot for the new WebTA labor management module. Once the Web TA pilot has been concluded and results evaluated, in conjunction with the FSD methodologies that are developed, NLS PMs will be able to implement all of the adopted procedures to ensure more fulsome costing and tracking of NLS IT modernization initiatives.

The attached spreadsheet provides additional responses and target dates for addressing each of the recommendations. We appreciate the opportunity to work together to improve the NLS' IT modernization activities.

cc: Bernard A. Barton, Chief Information Officer

Judith Conklin, Deputy CIO

Jason Yasner, Acting Director of NLS

Edward Jablonski, Chief Operating Officer

Mary Klutts, Chief Financial Officer

Elizabeth Scheffler, Acting Comptroller

Elizabeth Pugh, General Counsel

Management Comments on Draft OIG Report 2020-IT-105

Evaluation of the Library of Congress National Library Service for the Blind and Print Disabled's Information Technology Modernization Initiative

Recommendation followed by Responsible Office followed by Comments and target completion date.

1.1. FSD, in consultation with OCIO PMO, continue efforts to align actual cost tracking practices with the GAO Cost Estimating and Assessment Guide, as previously recommended by the OIG. [Footnote 10] Until such time that FSD can implement actual cost tracking practices that are aligned GAO Cost Estimating and Assessment Guide Library- wide, we recommend that FSD implement cost accounting procedures to close the gap while the ideal solution is being designed. For example, FSD can issue policies and procedures on cost identification and collection/recording, as well as using manual solutions and templates, in the interim, after conducting a cost/benefit analysis and risk assessment. Kearney would like to reiterate that considerations should include:

- a. Direct costs associated with Library employee labor, contracted labor, and other direct costs (e.g., materials).
- b. A reasonable allocation of Library indirect costs related to the administration and management of project.
- c. Costs by type of expenditure.
- d. Process considerations by project type and size, such as the level of detail required and the use of the PPM module, where available.

FSD, NLS, OCIO

Direct contract costs associated with major IT investments are currently captured and tracked. The Library has initiated a WcbTA pilot that is scheduled to end September 2021 with an evaluation to follow the pilot. The only NLS Modernization initiative included in the pilot is the smart devices project. However, if the pilot is successful, then the Library's expectation is to expand across the Library to capture and track labor costs for IT projects. FSD, working with OCIO, is developing an indirect cost methodology and analysis that will meet GAO requirements.

FY 22 Q3 FSD methodology anticipated FY21 Q4, in conjunction with the FY21 financial audit with policies to follow; and anticipated broader use of WebTA in FY22 Q3.

1.2. NLS require the NLS IT Modernization Initiative PMs to leverage existing actual cost tracking practices, with consultation and review by OCIO PMO and FSD, to identify and track all actual project costs and update cost trackers on all applicable NLS IT Modernization Initiative projects on a minimum standard frequency, in line with FSD's evolving requirements.

NLS, FSD, OCIO

As FSD and OCIO mature the Librat1's cost estimation process, the practices will be extended to NLS's IT Modernization portfolio. The finalized methodology will be applied to all chartered NLS projects to validate current cost and projected future costs.

FY 22 Q3

1.3. NLS/OCIO designate an individual to perform scheduled internal/self-assessments and compliance reviews over the actual cost trackers for each project. Furthermore, we recommend that these reviews be approved by NLS and OCIO management for

transparency of both the actual costs by project, as well as the process to track it, with evidence of the management review and approval being documented and retained.

NLS, FSD, OCIO

Compliance reviews will be incorporated into the actual cost methodologies to be developed under 1.1. NLS and OCIO will each designate individuals to perform scheduled internal/self-assessments and compliance reviews over the actual cost trackers for each project. The results of the reviews will be provided to and reviewed by NLS and OCIO management for transparency of both the actual costs by project, as well as the process to track it, with evidence of the management review and approval being documented and retained.

FY 22 Q3

2.1. Require NLS PMs to develop and maintain formal risk registers for each NLS IT Modernization Initiative project in accordance with LCD 5-310.1, Project Management Life Cycle (PMLC), to track identified risks with a minimum standard frequency for periodically updating identified risks and resolutions. These risk registers should be maintained by the risk management team and reviewed by the risk manager, as detailed in the PMLC directive.

NLS

NLS PMs will utilize the OCIO PMO risk register guidance to track identified risks for maintaining risk registers.

FY 22 Q2

NLS has begun to use guidance, but validation to occur through FY 22 Q2.

2.2. Monitor compliance with LCD 5-310.1, as described in Recommendation #1 above, and perform scheduled internal/self-assessments and compliance reviews over the procedures.

NLS, OCIO

The Library will review evidence of use of risk registers (after initial two quarters of use) to ensure compliance in documentation, updating, and implementation.

FY 22 Q2

NLS has begun to use guidance, but validation to occur through FY 22 Q2.

3. the NLS IT Modernization Initiative PMs (in coordination with the OCIO PMO) implement OCIO PMO's formal cost estimating and assessment checklist that contains the GAO Cost Estimating and Assessment Guide's best practices for PMs to follow when developing, executing, and maintaining project costs, once it is completed in response to OIG's recent recommendation to the OCIO.

NLS, OCIO

When completed, the NLS IT Modernization Initiative PMs will utilize OCIO PMO's formal cost estimating and assessment checklist that contains the GAO Cost Estimating and Assessment Guide's best practices.

FY 22 Q1. Per 2019-IT-104, rec 3 the Library to formalize checklist in FY 21 Q4.

4.1. The OCIO PMO, in consultation with FSD, continue efforts to implement EVM in accordance with GAO best practices and with consideration for project size requirements. Until such time that OCIO PMO can implement EVM in accordance with GAO best practices, we recommend that the OCIO implement policies and procedures to

close the gap while the ideal solution is being designed. For example, the OCIO can issue policies and procedures on how to develop WBSs and take steps toward calculating EVM within a timely manner at the beginning of the project, based on project size requirements, with reassessment on a regular and recurring basis.

OCIO, FSD

At present the Library documents project schedule and cost estimates through the project charter. OCIO will continue working on guidance for development of WBSs. Resolution of this recommendation is dependent on development of the cost methodology under 1.1. Thereafter, the Library will continue to evaluate necessary policies and thresholds for tracking project costs and schedule and validation of compliance with such policies. This includes assessing costs and benefits before implementing EVM, as current research suggests federal government thresholds for adopting EVM far exceed most Library IT projects, and likely are not appropriate for NLS IT modernization initiatives.

FY 22 Q4

4.2. NLS require the NLS IT Modernization Initiative PMs to leverage existing WBS/EVM procedures, with consultation and review by the OCIO PMO and FSD, to create a WBS with the OCIO's evolving requirements.

NLS, OCIO, FSD

See above 4. 1.

FY 22 Q4

4.3. NLS/the OCIO designate an individual to perform scheduled internal/self-assessments and compliance reviews over the WBS/EVM for each applicable project. Furthermore, we recommend that these reviews be approved by NLS and OCIO management for transparency of both the WBS/EVM by project, as well as the process to track it, with evidence of the management review and approval being documented and retained.

NLS, OCIO, FSD

See above 4. 1.

FY 22 Q4

5.1. Require NLS PMs to follow LCD 5-310.1, Project Management Life Cycle (PMLC) and leverage OCIO PMO project status report templates for each NLS IT Modernization Initiative project in order to document the possible impacts to the project schedule, cost estimates, and performance due to items discussed during weekly status meetings/reports, as well as require PMs to update the project schedule and cost estimates based on the impacts identified in the status report.

NLS

The NLS PMs are following the OCIO PMLC and using existing documents and tools to develop and track schedule, cost, and Performance. As such tools and practice evolve, the NLS PMs will adapt their processes accordingly.

FY 22 Q2

NLS has begun to use guidance, but validation to occur through FY 22 Q2.

5.2. Monitor compliance with LCD 5-310.1, as described in Recommendation #1 above, and perform scheduled internal/self-assessments and compliance reviews over the

procedures.

NLS, OCIO

FY 22 Q2

NLS has begun to use guidance, but validation to occur through FY 22 Q2.

6.1. The OCIO, in consultation with NLS, identify project dependencies within the NLS IT Modernization Initiative projects (Braille eReader, BARD, Stop Gap Player, Smart Speaker, and Smart Phone) and among any other Library-wide IT modernization efforts. If Library-wide IT modernization dependencies exist, we recommend the OCIO create a Library-wide IT modernization IMS. If no other dependencies exist outside of the NLS IT Modernization Initiative projects, we recommend NLS, with consultation with the OCIO, create an NLS IT Modernization Initiative IMS.

OCIO, NLS

NLS is developing an IMS for NLS IT Modernization initiatives, following OCIO guidance. However, full resolution may depend on successful completion of resolution

1.2.

FY 22 Q3

6.2. NLS require NLS PMs to follow LCD 5-310.1, Project Management Life Cycle (PMLC), to update individual project schedules on a regular and recurring basis for each NLS IT Modernization Initiative project and communicate individual project schedule changes to the owner of the applicable IMS to be created in Recommendation #1 above.

NLS, OCIO

As noted in response to 5. 1, the NLS PMs are following the OCIO PMLC and using existing documents and tools to develop and track schedule, cost, and performance. The NLS PMLC Modernization will follow the OCIO PMLC and such policies evolve, the NLS PMs will adapt the schedule documentation accordingly.

FY 22 Q3

6.3. NLS monitor compliance with LCD 5-310.1, as described in Recommendation #2 above, and perform scheduled internal/self-assessments and compliance reviews over the procedures.

NLS, OCIO

The Library anticipates a 6 month evaluation period following NLS activities described in 6.1 and 6.2.

FY 23 Q1

7. Specific to the OCIO, Kearney notes that open recommendation 4.1 within 2019-IT-104, IT Modernization Evaluation Report regarding a tactical project schedule management process suffices to remediate this finding for OCIO-managed projects; therefore, we offer no further recommendation.

NLS will implement upon resolution of 2019-IT-104 recommendation 4.1 and the Library will conduct compliance reviews 2 quarters following implementation.

FY 22 Q3 Per 2019-IT-I04, rec. 4.1, the Library anticipates completion of tactical project schedule management processes and the PMO roadmap by FY 21 Q4.

Kearney recommends that NLS (in coordination with the OCIO PMO) implement the same recommendation, specifically that NLS implement the project schedule management processes that OCIO PMO will develop to align with PMBOK Knowledge Area Project

Time Management and the GAO Schedule Assessment Guide, and that NLS perform scheduled internal/self-assessments and compliance reviews over the procedures.
NLS

APPENDIX C KEARNEY S EVALUATION OF MANAGEMENT S COMMENTS

The following is Kearney & Company, P.C. s (Kearney) response to the comments that the Library of Congress (Library) provided in regard to our Evaluation of the National Library Service for the Blind and Print Disabled s Information Technology Modernization Initiative presented in Appendix B Management s Views on Conclusions and Findings.

Kearney s Response:

Kearney noted that Management agreed with the recommendations proposed in our report; therefore, we have no further response.

APPENDIX D ACRONYM LISTING

Acronym Definition

ATO - Authority to Operate

BARD - Braille and Audio Reading Download

BPH - Blind and Print-Handicapped

CGD - Contracts and Grants Directorate

CIGIE - Council of the Inspectors General on Integrity and Efficiency

DA1 - Digital Advanced Player

DS1 - Digital Standard Player

DTBM - Digital Talking Book Machine

EOL - Digital Talking Book Machine

EVA - Economic Value-Added

EVM - Earned Value Management

FSD - Financial Services Directorate

FY - Fiscal Year

GAO - Government Accountability Office

IMS - Integrated Master Schedule

IT - Information Technology

Kearney - Kearney & Company, P.C.

LBFMS - Library s Financial Management System

LCCE - Life Cycle Cost Estimate

LCD - Library of Congress Directive

Library - Library of Congress

MVP - Minimal Viable Product

NEPR - New and Expanded Program Request

NFR - Notification of Findings and Recommendations

NLS - National Library Service for the Blind and Print Disabled

O&M - Operations and Maintenance

OCIO - Office of the Chief Information Officer

OIG - Office of the Inspector General

OMB - Office of Management and Budget

PM - Project Manager

PMI - Project Management Institute

PMLC - Project Management Life Cycle

PMO - Project Management Office

PPM - Project Portfolio Management
QC - Quality Control
RFI - Request for Information
RFP - Request for Proposal
RMI - Recordation Modernization Initiative
SDLC - System Development Life Cycle
SOP - Standard Operating Procedure
TSB - Technology Strategy Board
UI - User Interface
WBS - Work Breakdown Structure

APPENDIX E NLS IT MODERNIZATION INITIATIVE PROJECT SUMMARY

Project Purpose followed by Expected Programmatic Outputs/Outcomes

Stop Gap Player (Lead Office: NLS)

Research the possibility of using a commercial DTBM player or restarting production of the NLS DTBM to fill the gap between a possible depletion of NLS DTBM inventory and the availability of the next-generation NLS audio player.

Determine whether the restarting production of the first generation DTBM or purchasing commercially available DTBMs is more cost effective, while considering the following:

- A contingency plan to purchase either additional quantities of Digital Advanced Player (DA1)/Digital Standard Player (DS1) DTBMs or modified Talking Book Players from commercial vendors.
- Estimated costs for restarting DTBM production
 - Tooling
 - Re-engineering to replace End-of-Life (EOL) components
 - Re-engineering of software needed to support any changed hardware
- Estimated costs for modified commercial players.

Smart Phone (Lead Office: NLS)

Evaluate the use of the commercial products (modified if necessary) for usability, discoverability and repeatability for playback, navigation of audio books and the catalog both on-line and standalone.

The need for accessories to enhance functionality usability will be assessed. There are known to be several existing User Interface [UI] enhancements to smartphones for use by the visually impaired (e.g., Project Ray or RealsAM).

Provide NLS patrons with a next generation DTBM using commercially available modified smart phones, focusing on:

- Preparing a requirements document for commercial supply of a small quantity of smartphones and necessary support infrastructure to evaluate usability and UIs of such a device with Blind and Print-Handicapped (BPH) patrons. Issuing a Request for Information (RFI) to help alert and identify potential offerors
- Issuing and evaluating responses to a Request for Proposal (RFP)
- Managing contract and acquisition of devices
- Determining requirements for what needs to be evaluated and tested through focus groups.

Smart Speaker (Lead Office: NLS)

Create a prototype of a voice UI (voice UI) on a smart speaker to understand patron acceptance of voice UI navigation and NLS technical requirements. Determine how

complex the book navigation needs to be to satisfy patron needs.

Provide NLS patrons with a next generation DTBM using a voice UI (voice UI) on existing smart speakers, with the goals to:

- Prepare use cases for voice UI playback and navigation
- Demonstrate a V1.0 smart speaker application using Google Home Mini that controls the searching, navigation, and playback of NLS DTBs
- Plan, develop, and test (15-20 staff and others) to provide iterative feedback to V1.0
- Plan, develop and deploy a three- to six-month evaluation (200+ patrons) to fully explore and validate understanding of patron acceptance of voice UI for navigation of the NLS collection
- Determine book navigation controls require to meet Minimal Viable Product (MVP) patron needs using Google
- Determine book navigation and controls required to meet MVP patron needs using Alexa.

Braille eReader (Lead Office: NLS)

Test the expansion of the NLS product offering to include a device that enables reading of electronic braille (a Braille eReader).

Enabling wider access to electronic braille to move toward greater distribution of content in electronic, rather than physical formats, which could significantly reduce paper braille production, inventory management and physical distribution costs. Objectives include:

- Selecting contractor to manufacture, maintain and support the production of eReaders; regional libraries will oversee the distribution of eReaders to selected patrons
- Producing training documentation, a communication plan and inventory control processes and procedures to support the distribution of eReaders from regional libraries to patrons
- Making required updates to affected systems impacted by the introduction of eReaders, WebREADS, PIMMS, DOD, and KLAS
- Gathering user experience data and feedback from patrons during and post the six-month pilot via focus groups and/or survey questionnaires
- Gathering lessons learned documenting issues among regional libraries that interfered with inventorying and distributing machines to patrons during the pilot
- Determining cost associated with funding additional production of eReaders at per unit cost and prepare TO before 2023
- Measuring pilot outcomes against critical success factors.

BARD (Lead Office: OCIO)

Address aging infrastructure risks by migrating to the cloud and re-engineer to leverage modern cloud technologies as the current BARD production servers have been decommissioned.

Provide access to thousands of special-format books, magazines, and music materials. The way books are delivered to patrons will be re-engineered to take advantage of cloud technologies, including:

- A modern system running in the cloud will extend the life span of the system significantly as it can be scaled as the patron base continues to increase and is expanded to include those with to people with various reading disabilities as well
- A system that has a smaller footprint by leveraging federated Library cloud

computing services

- A system that is more stable and has close to 100% availability
- Patrons will experience faster searches and downloads because the cloud infrastructure will be able to scale up to handle the increased demands during peak hours.

Footnotes:

1. GAO-20-195G, Cost Estimating and Assessment Guide, March 2020.
2. GAO-16-89G, Schedule Assessment Guide, December 2015.
3. GAO-20-590G, Agile Assessment Guide, September 2020, Exposure Draft.
4. <https://www.loc.gov/nls/about/overview/>
5. <https://www.loc.gov/careers/working-at-the-library/how-we-are-organized/>
6. GAO-20-195G, Cost Estimating and Assessment Guide, March 2020.
7. Per Fair, J. (2012). Agile versus Waterfall: approach is right for my ERP project? Paper presented at PMI Global Congress 2012 EMEA, Marseilles, France. Newtown Square, PA: Project Management Institute, Waterfall project management is characterized by, among other things, long-term project plans with a single timeline, rigid project management and team roles, linear-phased approaches that are completed consecutively, and deliverables that are delivered at the end of the project timeline.
8. 2013-IT-105, Report on the Maturity of the Library's System Development Life Cycle Processes and Procedures, February 2015.
9. 2019-IT-104, IT Modernization Evaluation Report, February 2021.
10. 2019-IT-104, IT Modernization Evaluation Report, February 2021.
11. GAO-15-315, Strong Leadership Needed to Address Serious Information Technology Management Weaknesses, March 2015.
12. 2019-IT 104, IT Modernization Evaluation Report, February 2021.
13. 2019-IT 104, IT Modernization Evaluation Report, February 2021.
14. 2013-IT-105, Report on the Maturity of the Library's System Development Life Cycle Processes and Procedures, February 2015.
15. GAO-15-315, Strong Leadership Needed to Address Serious Information Technology Management Weaknesses, March 2015.
16. 2019-IT-104, IT Modernization Evaluation Report, February 2021.
17. 2019-IT-104, IT Modernization Evaluation Report, February 2021.