

Statement of Bernard A. Barton, Jr.
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Before
The Committee on House Administration
U.S. House of Representatives
On
Oversight of the Library of Congress' Information Technology Management

Chairman Harper, Ranking Member Brady, members of the committee, it is an honor to appear here representing the Library of Congress as Chief Information Officer (CIO). I would like to start by thanking each of you for your support of the Library.

During the 18 months I have been here, I have had the opportunity to meet with your staff numerous times to discuss the opportunities and challenges we face in improving information technology (IT) at the Library of Congress. Throughout my career, I have worked in a variety of organizations but in my short time here, I have become an admirer of the Library and am devoted to improving it. My optimism is due in no small part to the dedicated staff whose first goal is to provide superior customer service to Congress and the American people.

As you are aware, the Library is working to implement recommendations from the Government Accountability Office (GAO) and the Library's Office of the Inspector General (OIG) regarding information technology. I take these recommendations very seriously. I am confident that we will be successful in addressing these concerns, resulting in a highly-capable, agile, and customer-oriented IT service for the Library of Congress. We are making steady progress implementing changes to IT leadership, investment planning, cybersecurity, and the overall IT future for the agency.

Leadership and Governance

Since my appointment as CIO in September 2015, the Library has made important changes at the leadership level. The Office of the Chief Information Officer (OCIO) has both the authority and responsibility to implement change.

The Library has promulgated a regulation establishing the Office of the CIO and describing the role and responsibilities of the CIO. The position now reports directly to the Librarian with a clearly defined role in executive decision-making and has final authority over all technology matters.

Additional Library regulations strengthen IT processes and establish new policies regarding IT governance mechanisms that are integral to effective and efficient IT management. These regulations encompass such topics as the Library's policy on IT resource management; policies and responsibilities regarding the recordation, review, and approval of IT activities for the agency; the establishment of an IT Steering Committee to review IT decisions with input from representatives from each Library service unit; and the establishment of an Enterprise Architecture Program Office to guide the Library in developing the enterprise IT future state and roadmap, among others.

With centralized IT responsibility, OCIO is operating with transparency, fairness, and open communication. My immediate priority is to strengthen Library-wide working relationships and to understand the mission-specific IT capabilities needed by the different Library service units. OCIO is focused on delivering standardized and consistent capabilities across the Library in a manner that is reliable, on time, and within budget.

IT Modernization

The Library is currently in the midst of an agency-wide IT modernization effort that will result in more reliable and responsive IT service delivery.

Thanks to Congress' multiyear commitment to the Library's data center migration, we are aggressively moving forward with transitioning from our current Tier 1 facility to more advanced Tier 3 equivalent hosting environments. Moving production systems out of our current data center will provide significant improvements in reliability and enable greater focus on modernizing business application across Library service units, including the United States Copyright Office.

The Copyright Office and OCIO have begun a project to update the Copyright Office's February 2016 Provisional IT Modernization Plan and Cost Analysis, per instructions from the House and Senate Appropriations Committees. Representatives from both offices are working together closely, along with a contractor to conduct further interviews and analysis. This effort will respond to the Committees' request and to ensure that the Library has an actionable plan that documents a roadmap for ensuring that copyright patrons are able to access information as seamlessly as possible, and the Copyright Office is able to rely upon a stable IT infrastructure to meet their business needs.

The Librarian's directive to centralize IT, as well as recommendations from the Library's Inspector General, will continue to aid the successful modernization in each of these areas, which will ultimately benefit all Library service units and patrons.

Strategic Direction and Planning

In the same month I arrived at the Library, OCIO issued a Library-wide IT Strategic Plan. This plan was updated in May 2017 to incorporate feedback from the GAO and the Library's IT Steering and Executive Committees. This update specifically includes an appendix listing performance measures that support the goals and objectives identified in the plan.

It is my priority to ensure that OCIO staff see the direct connections from the Library's strategic plan, to the IT strategic plan through the governance structure we are implementing, to the day-to-day work accomplished in OCIO.

One key activity that will help the Library, and OCIO specifically, to provide strategic direction and leadership, is the Library-wide IT skills assessment. OPM is providing support to the Library in this endeavor, which will ensure that human capital planning addresses the specific skills critical to meeting future IT needs.

Finally, with new regulations we have strengthened the roles and responsibilities of the IT Steering and the Executive committees in IT planning and decision-making. We have clarified the impact these two management bodies have on Library IT resource use, not only to ensure that resources are allocated to the highest priority mission needs, but also to ensure that technical solutions implemented cast a wide beneficial net.

Organizational Structure/Centralization

On November 28, 2016, the Librarian directed all Library technology activities to be centrally coordinated through OCIO. Centralization will unite currently distributed IT workforces, governance, operations, and resources from within all Library service units. It adopts current industry best practices, streamlining IT processes and resources. It also moves us in the direction that auditors and appropriators have recommended for the past several years. Benefits of centralization include:

- Having one authoritative source for all of the Library's IT information;
- Increasing IT spending transparency;
- Reducing duplication and cost of software, hardware, and IT overhead;
- Allowing business units to focus on their unique missions;
- Increasing the overall IT security posture; and
- Enabling more efficient application of personnel, contract labor, and other resources.

OCIO has taken several steps to improve our organizational structure to better support the Library. In February 2017, we successfully implemented Phase 1 of restructuring OCIO. Reforms took into consideration several GAO and OIG recommendations that will bolster IT service delivery and governance. Phase 1 formally established a Library-wide Project Management Office (PMO) to communicate and enforce the Library's Project Management Lifecycle/System Development Lifecycle methodology, which ensures the Library's major IT projects are effectively managed in a consistent manner across all service units.

Project managers within the OCIO were reassigned to support the newly created PMO. In addition, software development activities were consolidated within the OCIO under one directorate. Reporting relationships under the office of the Deputy CIO were streamlined to provide more efficient and consistent IT service delivery.

In March 2017, OCIO engaged the services of an IT organizational consultant to assist in the design, communication strategy, and implementation of a new organizational structure. When implemented, OCIO will operate as a centralized, strategic business providing superior customer service to each service unit, supporting both enterprise and mission-specific technology needs.

IT Investment Management and Acquisitions

OCIO has begun to implement comprehensive revisions to its IT Investment Management (ITIM) processes to provide a framework for effective investment management and to ensure the Library has the most accurate and up-to-date information to support its decisions.

OCIO has improved agency-wide investment processes and workflows during the FY 2017 budget cycle, improving transparency around the overall IT technology spending.

During FY 2016, OCIO and the Office of the Chief Financial Officer (OCFO) piloted and established IT expenditure coding structures to capture agency-wide IT spending in its central financial system. We continue to analyze agency-wide IT expenditure data recorded and captured during the procurement process to focus on accurate, complete, key data fields that inform IT investment management decisions. This includes providing detailed guidance to service units on IT expenditure classifications, definitions, and Budget Object Class categories relevant to IT investments. To improve the tracking of IT assets, OCIO and Integrated Support Services (ISS) Logistics have selected the Asset Management Tracking System (AMTS) as the agency-wide tool to maintain a comprehensive inventory of all agency IT assets. The system will track both capitalized and non-capitalized accountable IT assets.

OCIO's longer term goal beyond FY 2017 is to implement significant improvements to the management decision making data available to support overall IT investment management. For FY 2018, we are incorporating Technology Business Management (TBM) principles into our investment planning cycle. The overall objective is to improve transparency, accountability, and IT value delivery to meet business and mission goals. To begin to fully integrate IT Investment Management with budgetary resource planning and execution, OCIO adopted the TBM IT Towers framework to its investment portfolio structure for FY 2018 to capture the entire IT spend for the agency at the summary level.

To effectively plan and manage the Library's acquisition of IT systems and increase the likelihood of delivering system capabilities on time and within budget, OCIO also began piloting an IT risk management program in FY 2017 under the guidance of the Library's Strategic Planning and Performance Management Office (SPPM). This entailed developing an IT risk framework for the OCIO which can be modified and expanded for all Library offices. Additionally, OCIO's Project Management Office now has the authority to set Library-wide policy and best practices on agile application development, project requirements development, cost estimation, and scheduling.

IT Security and Privacy Programs and Policies

As stewards of the nation's cultural history and increasingly the library of last resort, the Library is well aware of the need to maintain the security of the content in our care.

Securing IT systems requires continuous proactive monitoring, testing, and incident management, as well as looking ahead to the evolving array of cyber-based threats. Addressing cybersecurity risks will continue to require resources and technologies to match the challenges from constantly changing threats. We have deployed a Governance, Risk and Compliance system to strengthen our continuous monitoring activities and assess IT security risk. A set of common controls have been developed and used to test all Library IT systems as part of our security procedures. In addition, the offsite Alternate Computing Facility has the necessary IT security tools to ensure systems can operate at that location if required.

To protect the Library from denial of service attacks, we have contracted with a cloud-based denial of service mitigation service. In response to the denial of service last year, this mitigation service has been successfully used recently when legitimate traffic to Congress.gov swelled to record high numbers after high profile legislation was released. This contract also allows us to

use a content delivery service to make content available to our patrons no matter where they reside.

We now also provide Plan of Action and Milestones (POAMs) reports and statuses to Library service units and executive management. The POAMs are being addressed according to the schedule documented in the latest version of the security directive. In an effort to improve agency-wide IT security, we recently implemented Information Security Continuous Monitoring (ISCM) to ensure the agency has an ongoing awareness of information security, vulnerabilities, and threats to support organizational risk management decisions.

To further improve our IT security posture, we requested and received funding in the FY 2017 omnibus to support a centralized, dedicated Information Systems Security Office (ISSO) role and to implement multifactor authentication to protect the Library's network. The ISSO centralization effort will allow true IT security professionals to guide Library System Owners in operating secure systems and to ensure that IT security is part of the development and implementation processes for every new system. ISSO will also perform the critical task of maintaining security at the same rigor across the Library and not allowing one system to become a weak link in the chain. Multifactor authentication will significantly decrease the risk of unauthorized access to Library systems. We are working with the other Legislative Branch agencies to make sure we have a way to federate identities across the Legislative Branch.

The Library has improved its privacy policies and direction to allow for better identification of sensitive data and privacy systems. To ensure the protection of Library systems and information, we have developed and completed an inventory of the Library's information systems and updated the policy for IT security documentation, such as the System Security Plans (SSPs).

Lastly, we are active participants in the Legislative Branch Cyber Security Working Group and the Legislative Branch CISO Council. Through these groups, we are able to share threat information and knowledge about new technologies that each agency is implementing to improve its security posture. The Working Group also presents an important venue for Legislative Branch entities to collaborate on solving issues of shared concern.

Customer Service/IT Services Supporting the Business Needs of the Library

To improve transparency with service units, OCIO has created individualized Memorandum of Understanding (MOUs) to provide IT services above baseline requirements. These MOUs were completed in June 2016. In addition, we have completed and executed a Service Level Agreement as of September 30 2015, which identifies commonly-available base services for all our service units. We will work with service units to ensure these services continue to be up to date and cost effective.

For mission-specific needs, we have begun to work with each service unit to identify and address requirements that are targeted to their business operations. Both common and mission-specific services are being incorporated into a service catalog, using industry-standard service management principles and practices.

As recommended in the 2015 GAO report, the Library has taken a number of steps to consolidate or decrease duplication of IT activities, including shifting responsibility and oversight of all IT Specialists to the OCIO. We have also taken ownership of the Office of Security and Emergency Preparedness' (OSEP) hosting environment. Now, all public-facing web pages are coordinated through OCIO's Web Services division. We also publish a baseline IT service catalog, which describes the IT services OCIO provides to Library organizations and staff.

Infrastructure/Improve Library Hosting Environments

To improve service to the Library and its customers, OCIO has enhanced our IT infrastructure and hosting environments. We have updated our Alternate Computing Facility (ACF) by implementing new IT security tools and backup appliances to augment network visibility, conduct traffic analysis, implement dynamic malware protection, streamline audit log collection and reporting, and automate system account administration.

In 2016, we spearheaded a new IT Business Continuity and Disaster Recovery (BCDR) program with the goal of improving business continuity planning, contingency operations, and disaster recovery exercises for IT services. The program has successfully coordinated numerous planned power outages and disaster recovery exercises. In July 2016, the Library completed the largest disaster recovery exercise for failover capabilities ever conducted at the Library. The unprecedented and successful testing at this scale was enabled by the Library's ACF enhancements as well as coordination from the new IT BCDR program.

As an "Uptime Institute Tier 1 facility", the Library's current power and cooling systems supporting the PCF are not sufficient to support the Library's mission. In FY 2017, the Library requested and was approved for a three-year investment to migrate the Library's Primary Computing Facility (PCF) to Tier 3 facilities. The funding requested will support the Library's most fundamental information technology requirements and mitigate location vulnerabilities. The new data center infrastructure will also be scalable to meet the changing and expanding needs of the entire Library and its service units, laying a foundation for IT modernization going forward.

Application Development

The Library's Application Development program is responsible for a collection of public web properties, digital library applications, and business systems that provide unique resources to Congress, researchers, students, teachers, Library staff, and the general public. OCIO is collaborating with teams across the Library to improve and expand these resources, while also working to develop new tools, formats, and processes to ensure the Library is properly positioned to collect, preserve, and serve information in all formats.

The consolidation and realignment of IT staff in recent months has increased collaboration and transparency, with teams sharing resources and best practices across program and service unit boundaries. Recent efforts have focused on improvements to the Library's Project Management and Software Development Lifecycles, with adoption of Agile Software Development practices serving as a driving force in increased collaboration between Library teams and divisions.

Congress.gov (<https://www.congress.gov>) is the official website for U.S. federal legislative information. The site provides access to authentic, accurate, timely, and complete legislative information for Members of Congress, legislative agencies, and the public. It is developed and administered by the Library, using data from the Office of the Clerk of the U.S. House of Representatives, the Office of the Secretary of the Senate, the Government Publishing Office, Congressional Budget Office, and the Library's Congressional Research Service.

In 2016, the development team achieved a major milestone with the retirement of the legacy THOMAS system, following the completion of equivalent functionality and content on Congress.gov. In addition to providing users with a more modern and full-featured experience through Congress.gov, the Library reduced vulnerabilities and improved security by retiring the outdated software and hardware required by THOMAS.

OCIO collaborates with CRS, the Law Library, and congressional staff and stakeholders to bring enhancements to Congress.gov on a frequent basis, working iteratively and making extensive use of user feedback in every release. Since September 2015, the OCIO team has completed over a dozen major releases of the site, with each release including functional, content, and performance enhancements. Recent Congress.gov releases have included new search capabilities that allow more precise queries across a growing body of content. The Library worked side by side with congressional users to ensure these new search features are tuned to their day-to-day needs in support of Members and congressional business.

Congress.gov has recently experienced record usage, serving millions of unique visitors each month. The Congress.gov team's work to make the site mobile friendly has led to dramatically increased use of the site by mobile users, and has been essential in accommodating the huge traffic generated by user sharing of site content on social media.

LOC.gov (<https://www.loc.gov>) is the Library's flagship web property, delivering content and services to patrons of all types, across the world. A hub for dozens of programs, LOC.gov provides access to the Library's unique subject matter expertise and millions of digitized items including photos, videos, audio, books, newspapers, maps, and more. Our web team has recently implemented a new visual design across much of LOC.gov, most prominently is the new LOC.gov home page design. LOC.gov pages have been redesigned to emphasize the Library's unparalleled collections materials, and to highlight the Library's events, exhibits, and staff expertise. New designs have also graced our online exhibitions and catalog, providing improved accessibility and a mobile-optimized experience across tens of millions of web pages.

NLS is currently engaged in a multiyear effort to upgrade the computer systems involved in book and magazine production. Completion is expected in FY 2019. NLS will also be releasing a modernized NLS website by August 2017. They continue to see NLS patrons adopt the BARD mobile app - this year there are now more BARD mobile app users than users of the BARD website. NLS is also engaged in the early stages of developing the IT infrastructure to support the fourth generation playback machine for talking and braille books. This infrastructure will be focused on using the internet as the primary means to deliver materials to NLS patrons. With Congress' recent approval of braille display technology, NLS has begun planning for implementation.

Critical to both LOC.gov and the Library's internal systems is the work of our Digital Library team, which supports the full lifecycle of digital content, from acquisition to access. The Digital Library team develops and maintains systems critical to digitization of analog materials, acquisition of digital materials, data preservation, quality review, and user access. The Digital Library is being developed to support exponential growth in the Library's digital collections, which double every 32 months. The Digital Library applications currently manage over 5 petabytes of data, including digitized materials of every type, and in support of programs such as the Civil Rights History Project, Veterans History Project, and the National Digital Newspaper Program. Newly developed tools are improving reporting and inventory processes, electronic Copyright deposits, and on-site researcher access to rights-restricted materials.

OCIO has been working with Copyright IT staff to bring Copyright into the mainstream of OCIO processes, including IT planning, project management, agile software development, and systems architecture. Recent enhancements to the Copyright DMCA application and OCIO's Content Transfer Services application have been created in direct collaboration with Copyright, ensuring that OCIO services meet Copyright business needs.

Copyright was able to access the expertise of the OCIO team responsible for LOC.gov and congress.gov to make significant improvements to the Copyright web site (<https://www.copyright.gov>). The new copyright.gov site features an improved visual design and information architecture, making the site easier to use for users of all types, from professionals to Copyright novices. The newly upgraded site also offers a mobile-optimized responsive design that provides users on all devices with a friendly interface.

The collaboration between OCIO and Copyright will continue as the combined team plans and develops the replacement of the legacy systems that support Copyright Recordation, Registration, and Licensing functions with high-performance, scalable systems that provide the enhancements and usability required to support a truly modern Copyright system.

LOC Digital Strategy

To support agency-wide digital strategy, in December 2016 the Library's Executive Committee inaugurated two related strategic initiatives: a strategic envisioning effort and a digital strategy effort. As CIO, I am taking the lead on the digital strategy effort, with support and full participation from my colleagues in the business units. As we develop a digital strategy for the Library, we will be defining how we use technology to implement and advance the business strategy.

Our goal for fiscal 2017 is to identify the framework upon which we will build the digital strategy. The framework, along with the results of the envisioning effort, will inform the full digital strategy document planned to be finished in FY 2018. The digital strategy document will include the Library's vision for using technology to fulfill our mission and will reflect the highest priority digital activities within the context of an updated strategic plan.

In support to this digital strategy, the Library has formed a new eCollections Steering Group. Led by OCIO and Library Services, this Library-wide committee is charged with working with Library stakeholders to coordinate across the Library in supporting the consistent implementation of the Library's approved digital collecting strategies and plans. The group also

supports an institutional goal to increase and sustain the acquisition of digital works, consistent with the Library's strategic plans and collecting strategies.

In closing, modernizing IT is critical to positioning the Library for the future. With your support our service to Congress and the American people promises to be the best it has ever been as we reach millions of new users in the years to come.

Chairman Harper, Ranking Member Brady, members of the committee, the Library of Congress is both America's first federal cultural institution and part of the innovative infrastructure of America. I thank you again for supporting the Library of Congress and our IT modernization efforts.