

# OVERSIGHT OF THE LIBRARY OF CONGRESS' INFORMATION TECHNOLOGY MANAGEMENT

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## HEARING BEFORE THE COMMITTEE ON HOUSE ADMINISTRATION HOUSE OF REPRESENTATIVES ONE HUNDRED FIFTEENTH CONGRESS FIRST SESSION

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JUNE 8, 2017  
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## OVERSIGHT OF THE LIBRARY OF CONGRESS' INFORMATION TECHNOLOGY MANAGEMENT

THURSDAY, JUNE 8, 2017

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON HOUSE ADMINISTRATION,  
*Washington, DC.*

The Committee met, pursuant to call, at 10:02 a.m., in Room 1310, Longworth House Office Building, Hon. Gregg Harper [Chairman of the Committee] presiding.

Present: Representatives Harper, Davis, Comstock, Smith, Loudermilk, Lofgren, and Raskin.

Staff Present: Sean Moran, Staff Director; Kim Betz, Deputy Staff Director/Policy and Oversight; Cole Felder, Deputy General Counsel; Eric McCracken, Communications Director; C. Maggie Moore, Legislative Clerk; Rob Taggart, Deputy Legislative Clerk/Oversight; Jamie Fleet, Minority Staff Director; Khalil Abboud, Minority Deputy Staff Director; Eddie Flaherty, Minority Chief Clerk; and Meredith Connor, Minority Staff Assistant.

The CHAIRMAN. I now call to order the Committee on House Administration for the purposes of today's hearing, "Examining the Library of Congress" Information Technology Management."

The hearing record will remain open for 5 legislative days so Members may submit any materials they wish to be included.

A quorum is present, so we may proceed.

I would like to thank our witnesses for taking time out of their schedules to be with us today.

Dr. Hayden, thank you for returning. I know you testified before this Committee earlier in the year on the Library of Congress' priorities for 2017 and beyond.

And I thank Mr. Barton and Mr. Hyde for their appearances before our Committee to discuss this important issue with us.

While IT management was briefly discussed at our hearing in February, today's hearing will allow the Committee to receive more detailed information on what the Library is doing to improve their management of the Library's IT systems.

The Library of Congress serves many different constituencies in many different capacities. The 11-month audit resulted in 6 broad findings and 31 corresponding recommendations to strengthen the Library's IT management.

According to GAO, the weaknesses included lack of strategic planning, lack of processes related to investment management, lack of processes related to acquisition management, weak processes related to information security, and lack of service to the Library's

service units, such as CRS and the Copyright Office, and a lack of leadership, including a chief information officer.

Since GAO released its report, the Library has worked to address these recommendations. To date, five recommendations have been fully implemented to GAO's satisfaction.

For example, in 2015, the Library appointed Mr. Barton as the new Chief Information Officer. Later, in 2016, Dr. Hayden issued a memorandum directing all Library technology activities be centrally coordinated through the Office of the Chief Information Officer and be approved by the Library's Chief Information Officer.

And most recently, the Library completed its IT strategic plan. Finally, the Library has developed and implemented a number of policies and processes to review IT investments as well as inventory IT systems.

According to GAO, the Library has committed to closing another 22 recommendations by the end of this year, a very ambitious goal.

I look forward to hearing from all of our witnesses today on these efforts, including understanding what support will be available.

For example, there are many things that we will look at today with the witnesses. And as we look at how things have gone, I also want to point out a couple of other things before we hear from Ms. Lofgren.

The Library of Congress serves as the largest Library in the world, maintaining much more than 164 million items in its collections. It houses a Copyright Office, which registered more than 414,000 copyright claims in fiscal year 2016.

The Library is also home to the National Library Service for the Blind and Physically Handicapped, which according to the Library, in fiscal year 2016 provided 22 million copies of braille and recorded books and magazines to more than 800,000 individuals.

These are just a few of the Library's roles and the constituencies that they serve. As technology has advanced, the Library's constituencies have changed the way that they consume information. As a result, it has had to modernize its systems, evolving its IT systems and processes to meet the needs of its constituencies in a digital world.

However, these changes have not come without management challenges. As far back as 1996, the Library had issues managing its IT systems, and these are a part of our history. And you look at what has happened in the past as we have gone through these things, and we want to come to a point where we address these challenges and these recommendations that have been made.

So I would now like to recognize my colleague, Zoe Lofgren, the gentlelady from California, for the purpose of providing an opening statement.

Ms. LOFGREN. Thank you, Mr. Chairman.

Mr. Brady was unable to be here this morning, so I am happy to give the statement, his statement. We are thankful that this hearing is being held and that we can hear from these wonderful witnesses, and it is good to see them all.

Under the leadership of Dr. Hayden and now CIO Bud Barton, we think the Library has made great strides in the IT area, and that is really important.

We think about the Library in terms of its wonderful collection, the beautiful building, the Copyright Office, services for the blind, but none of that really functions well if we don't have an adequate IT system. And as we know, we have had deficiencies there for a long time.

The appointment of Mr. Barton has been a huge important step forward. We are appreciative of that. The clearly defined roles and responsibilities are just essential if we are going to move forward successfully in the IT area.

It is my understanding that of the 31 recommendations made by the GAO, all are either on schedule or ahead of schedule or have been completed, which is really fabulous.

The Library, I think, has submitted their budget request for fiscal year 2018, and in it they have requested increases to their funding to support the continued IT modernization, and I think we all need to support this request. It is an investment in our future. The Library can't be expected to keep pace with rapid technological changes if they are not resourced to do so.

As I say, the Library is a world-class cultural institution. It is something we are proud of. It is one of the premier visitor attractions in this beautiful city. But the behind-the-scene work of the IT people is essential.

So thank you, witnesses. Thank you, Dr. Hayden, for your terrific leadership in this part of the Library and every other. It is a pleasure to see you again.

And with that, Mr. Chairman, I know that there are no other hearings commanding attention on the Hill today, so I will yield back.

The CHAIRMAN. Well, as evidenced by the incredible number of media representatives who are here to cover this hearing. That is a great observation, Ms. Lofgren.

The gentlelady yields back.

Anyone else? Any other member care to make any opening statements?

Mr. RASKIN. Mr. Chair, I just wanted to welcome back to the Committee Dr. Hayden. As the only representative of the Free State here, I want to just commend Dr. Hayden on her leadership and just reemphasize how proud everybody is in Maryland of what you are doing in the Library of Congress. And, of course, we had your leadership at the Enoch Pratt Library in Baltimore. So I want to associate myself with the remarks of Ms. Lofgren and welcome you back.

The CHAIRMAN. The gentleman yields back.

I would now like to introduce our witnesses. Dr. Carla Hayden was sworn in as the 14th Librarian of Congress on September 14, 2016. Her appointment to this position also marked the first time in our Nation's Library that we have had a woman and an African American.

Dr. Hayden is a librarian's librarian, dedicating her entire career to pursuing the accessibility of libraries in communities. In her short time leading the Library, Dr. Hayden has already demonstrated her commitment to continuing the tradition of collecting, preserving, and making available a vast collection of educational resources and protecting those collections for future generations.

The Committee welcomes you back, Dr. Hayden.

Mr. Bernard “Bud” Barton was named the Library’s Chief Information Officer on September the 8th, 2015. In his capacity as CIO, Mr. Barton serves as the primary adviser to the Librarian on all information technology matters, as well as a voting member of the Library’s Executive Committee. Prior to his service at the Library, Mr. Barton was the Deputy Administrator and Chief Information Officer of the Defense Technical Information Center.

Welcome to you, Mr. Barton.

Our final witness is Mr. Kurt Hyde. Mr. Hyde is the current Inspector General for the Library of Congress. As the IG, Mr. Hyde is responsible for assessing the Library’s operations. Prior to serving as the Library’s IG, Mr. Hyde served as the Deputy Inspector General for audit and evaluations at the Special Inspector General for Troubled Asset Relief Program. Sounds a lot like TARP.

Welcome, Mr. Hyde.

Again, we thank each of you for joining us today. We look forward to hearing your testimony. And the Chair will now recognize for 5 minutes Dr. Carla Hayden for the purposes of an opening statement.

Dr. Hayden.

**STATEMENTS OF THE HONORABLE DR. CARLA D. HAYDEN, LIBRARIAN OF CONGRESS; MR. BERNARD A. BARTON, JR., CHIEF INFORMATION OFFICER, LIBRARY OF CONGRESS; AND MR. KURT W. HYDE, INSPECTOR GENERAL, LIBRARY OF CONGRESS**

**STATEMENT OF CARLA D. HAYDEN**

Ms. HAYDEN. Thank you. And good morning, Chairman Harper and Members of the Committee. And thank you for allowing me to provide testimony on information technology at the Library of Congress. I want to express my gratitude for the support this Committee and, in fact, the entire Congress gives to the Library.

The Library’s vision is to provide excellent service to Members of Congress while providing free and equal access to the public. When I envision the future of this great institution, I see it growing in stature. And as its resources are readily available for more people online, users will not have to be in Washington, D.C., to access the Library’s vast resources and collections. Our hope is that everyone everywhere will have a sense of ownership and pride in this national treasure.

And now, nearly 9 months into my tenure, I continually believe and am inspired by the depth and breadth of the Library’s collections and the expertise and commitment to public service by its staff.

The Library continues to focus, with my direction, in earnest on its information technology management challenges. The Government Accountability Office, GAO, delivered reports to the Library in 2015 that cited the need to improve the institution’s overall IT planning, management, and operations. The Library Inspector General also delivered reports on IT investment management and systems development.

Together, these reports offered dozens of specific helpful policy and operational recommendations to the Library, and we welcome these examinations and especially the constructive guidance they provide. That knowledge and guidance has proven critical to developing the dynamic state-of-the-industry IT infrastructure and management the Library so sorely needs.

In the months since I took office, to better support these priorities, we have taken important steps to strengthen management and oversight within existing resources.

In November, I addressed the need to maximize value from the Library's investment in technology by directing that all technology activities be centrally coordinated through the Office of the Chief Information Officer and approved by Mr. Bud Barton, who now reports directly to me.

I have weekly meetings with Mr. Barton, who shares regular updates on the progress being made in not only centralization, but on the entire progress of IT modernization. IT centralization is well underway and IT investment planning is now monitored and coordinated Librarywide.

The enhancements in the IT infrastructure also allow us to increase visibility and accessibility of the Library and its programming to all of your constituents around the country and to support modern applications for programs such as the Veterans History Project mobile application. More and more events are being livestreamed to schools and public libraries across the Nation, and schoolchildren and teens from various States are able to watch, listen, and even ask questions to high-profile writers and authors.

Chairman Harper and Members of the Committee, the Library is both America's first Federal cultural institution and part of the innovative infrastructure of America. I thank you, again, for supporting the Library.

And I would like to now introduce and have Mr. Bud Barton and Inspector General Kurt Hyde give you more details about the progress we have made.

[The statement of Ms. Hayden follows:]

**Statement of Carla Hayden  
The Librarian of Congress  
Before  
The Committee on House Administration  
U.S. House of Representatives  
On  
Oversight of the Library of Congress' Information Technology Management  
June 8, 2017**

Good morning Chairman Harper, Ranking Member Brady, and Members of the Committee. Thank you for inviting me to provide testimony on information technology at the Library of Congress. I would like to express my gratitude for the support this Committee, and indeed the entire Congress, gives to the Library.

The Library's mission is to provide excellent service to Members of Congress and the American public. Nearly nine months into my tenure, I continue to be inspired by the breadth and depth of the Library's collections. The staff exhibits great expertise and commitment to public service, of which I am most proud.

When I envision the future of this great institution, I see it growing in stature. As its resources are readily available for more people online, users will not have to be in Washington, D.C. to access the Library's vast collections. Rather, everyone will have a sense of ownership and pride in this national treasure. While maintaining our collections of physical items, such as books and manuscript papers, is essential to our work, it is also true that the modern user requires an increasingly digital Library. I am committed to bringing forth a robust, agile, and responsive IT service to ensure the Library is properly positioned to do the work of the future.

The Library is both America's first federal cultural institution and part of the innovative infrastructure of America. Modernizing the Library's basic technology infrastructure is a top priority. As a result, the Library will increase its capacity to serve the mission-specific business needs of each service unit, including the Congressional Research Service and the U.S. Copyright Office. I look forward to remaining engaged with Congress as the Library makes progress on modernization.

This work has already started by initiating action under the Library's 2016-2020 Strategic Plan to "harmonize systems across the Library that provide technical support for everyday operations." I am also prioritizing "appropriate governance structures that ensure accountability, efficiency and coordination in the Library's IT investments," as defined by the Strategic Plan. The Library has hired a permanent CIO, who is in charge of all technology programs across the Library. We have also implemented an agency-wide IT investment policy to ensure strategic oversight of technology spending.

Addressing IT management continues to be a primary focus. The Government Accountability Office (GAO) delivered reports to the Library in 2015 that cited the need to improve the institution's overall IT planning, management and operations. The Library Inspector



General (IG) also delivered reports on IT investment management and system development life cycle management. Together, these reports offered specific policy and operational recommendations to the Library. The Library is working diligently to implement GAO and IG recommendations. Their knowledge and guidance have proven critical to developing the dynamic, state-of-the-industry IT infrastructure and management the Library needs.

In the months since I took office, we have taken important steps to strengthen management and oversight within existing resources. In March, the Library issued an updated IT Strategic Plan to better align IT with the Library's overall strategic direction. The IT plan outlines four goals to be accomplished over the next five years: 1) Provide Strategic Direction and Leadership; 2) Improve IT Investment Management; 3) Deliver Business-Driven Capabilities; and 4) Strengthen Protection for Systems and Information. We have added performance measures to strengthen the plan and to help ensure we stay on track in meeting its goals.

The Library's ultimate IT vision is to ensure that technology is managed as a strategic resource across the Library, supporting our ability to deliver continuous uninterrupted digital services to our various patron communities.

Last November, I addressed the need to tighten IT governance and maximize value from the Library's investment in technology by directing that all technology activities be centrally coordinated through the Office of the Chief Information Officer (OCIO) and approved by the Chief Information Officer, Mr. Bernard "Bud" Barton, who reports directly to me. Mr. Barton and I have weekly meetings to discuss the progress being made in centralization and modernization.

IT centralization is well underway. I am also pleased to report that the Library has taken several other major steps to improve IT management. These include:

- Continuous tracking of IT spending across all appropriations;
- Aligning internal IT governance models and improving the IT investment management process to capture the breadth and depth of IT resources. This includes empowering the IT Steering Committee to review IT decisions with input from each Library service unit;
- Creating an agency-wide project management office within the Office of the Chief Information Officer;
- Creating full inventories of IT systems and IT hardware assets, as well as identifying duplicative hardware, software and infrastructure; and
- Successfully executing the Library's largest ever disaster recovery exercise, which will help ensure the security and availability of our systems.

Cybersecurity plays a prominent role in our strategic direction, recognizing that new cybersecurity threats emerge every day. To meet these threats, we are being proactive. The Library has protective controls deployed throughout its network to ensure our collections and data are secure. We are also actively engaging with Congress and other support agencies as part

of the Legislative Branch Cyber Security Working Group to share best practices and improve the all-around IT security posture.

These enhancements in IT infrastructure allow us to make more Library programming available to your constituents around the country. More and more events are being live streamed to schools and public libraries across the nation. School children and teens from various states are able to watch, listen and even ask questions to high-profile creators and authors like Cokie Roberts, Congressman John Lewis and graphic artist Gene Luen Yang. I look forward to the new and exciting ways technology will allow us to connect.

Thank you for inviting me to provide testimony on this important topic for the Library, and for your ongoing support, as we make the changes necessary to realize our vision for technology at the Library of Congress.

The CHAIRMAN. Thank you, Dr. Hayden.

And we appreciate your testimony and look forward to hearing more from you.

At this time, the Chair will recognize Mr. Bud Barton for 5 minutes for the purposes of an opening statement.

**STATEMENT OF BERNARD A. BARTON, JR.**

Mr. BARTON. Good morning, Chairman Harper and Members of the Committee. I am honored and humbled to appear before this Committee this morning representing the Library of Congress as its Chief Information Officer. I would like to start by thanking each of you for your support to the Library and of our IT modernization efforts.

In my short time at the Library, I have become an admirer of our mission and work, and I am devoted to improving it. My optimism is due in no small part to the dedicated and committed staff at the Library, whose first priority is to provide superior customer service for the Congress and for the American people. I will focus today on steps we are taking to ensure that priority is achieved.

As you know, the Library is working to implement recommendations from the Government Accountability Office and the Library's Inspector General regarding IT. I take their recommendations very seriously and am confident that we will be successful in addressing these concerns, resulting in highly capable, agile, and customer-oriented IT services for the Library of Congress and its customers.

So far, we have closed 51 of 74 nonpublic GAO recommendations and 5 of the 31 public recommendations, and we are making steady progress as noted earlier on the others.

Since my appointment in September of 2015, the Library has made important changes at the leadership level to ensure that I have the authority to implement positive change. The Librarian recently directed all Library technology activities to be centrally coordinated through the Office of the CIO.

In implementing this directive, the Library has promulgated internal regulations, established roles and responsibilities and other policies to ensure effective and efficient IT management. Our plan for centralization follows current industry best practices for streamlining IT governance, investments, and resources. We recently updated the Librarywide IT strategic plan to incorporate feedback from the Government Accountability Office and the Library's IT Steering and Executive Committees.

In addition, I am taking the lead on the Library's digital strategy effort with full support and participation from my colleagues. The digital strategy will address the Library's vision for using technology to fulfill our mission.

We continue to improve the Library's IT investment processes. For fiscal year 2018 we are incorporating technology business management principles into our investment cycle. The objective is to improve transparency, accountability, and IT value delivery to meet business and mission goals.

Thanks to Congress' multiyear commitment to the Library's data center migration, we are aggressively modernizing through state-of-the-art offsite hosting environments that will provide significant

improvements in reliability, allow for scalability, and enable greater focus on business applications across the Library.

As confidential consultants to the Congress, administrator of the national copyright system, and stewards of the Nation's cultural history, the Library is well aware of the need to ensure security of the digital content in our care.

Securing IT systems require proactive monitoring, testing, incident management, as well as anticipation of future cyber-based threats. We have created a dedicated information security office staffed with true cybersecurity professionals to ensure that the Library IT systems are secure. We received funding during our fiscal year 2017 request to support this effort and to implement multi-factor authentication to further protect the Library's network.

We are also active participants in the Legislative Branch Cybersecurity Working Group, through which we are able to share threat information knowledge about new technologies to improve the legislative branch security posture.

While working to improve enterprise infrastructure and processes, we continue to work with the Library's service units on their specific systems and applications. These efforts will help ensure that service units are able to rely upon a stable IT infrastructure to meet their business needs and that the Library has an actionable roadmap to enable patrons to access services and information as seamlessly as possible.

Congress.gov, the official website for U.S. Federal legislative information, has recently experienced record usage, serving millions of unique visitors each month. LOC.gov pages have recently been redesigned to emphasize the Library's unparalleled collections and to highlight the Library's events, exhibits, and staff expertise. This is the first step in realizing the Librarian's goal for expanding discovery and use of the fantastic resources available to all through the Library.

In closing, the progress we have made over the last 18 months, along with my commitment to continuous improvement moving forward, has set a foundation for outstanding IT service to the Congress and the American people.

I appreciate this Committee's support and am happy to answer your questions.

[The statement of Mr. Barton follows:]

**Statement of Bernard A. Barton, Jr.  
Chief Information Officer  
Library of Congress  
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.

The CHAIRMAN. Thank you, Mr. Barton.

The Chair now recognizes Mr. Hyde for 5 minutes for your testimony.

#### **STATEMENT OF KURT W. HYDE**

Mr. HYDE. Chairman Harper and Members of the Committee, thank you for the opportunity to testify on the progress the Library of Congress has made in addressing its IT deficiencies, challenges, and the work of the OIG in this area.

Since 2011, our semiannual reports to Congress have consistently identified IT infrastructure as the top management challenge for the Library. I have been the IG at the Library since the summer of 2014. Our work over this time has emphasized that a robust strategic plan is essential to the Library's ability to efficiently and effectively fulfill its mission and be nimble to meet changing customer demands.

We all recognize that an agency of the magnitude and importance of the Library, whose very essence involves collecting and conveying information, cannot succeed in the information age without a highly functioning and leading-edge digital infrastructure. Changes at the senior-most levels of both Library leadership and IT management have resulted in momentum toward developing the foundation for a stable infrastructure.

In our 2009 report on IT strategic planning, we found significant issues with the Library's strategic plan and process, customer service problems, IT investments not linked to the strategic plan, and an organizational structure that did not foster good IT governance.

In 2015, both GAO and my office found similar IT management issues as identified in 2009. For example, as a consequence of not having a strong strategic plan, the Library's eDeposit Program, which is the Library's program to collect electronic works, was not effectively implemented. In our 2015 report, we identified strategic planning, leadership, and governance issues as causes for this.

Since 2015, three significant changes have occurred. First, the previous Librarian disbanded the old structure and organization and created an Office of the Chief Information Officer. Secondly, management hired a qualified CIO to lead the Library's IT reforms, and Mr. Barton has the experience and technical qualifications required for this position. And third, Dr. Hayden as a new Librarian shifted the lines of reporting so that the CIO now reports directly to her.

In taking these actions, the Library complied with longstanding government requirements and opened the door for the CIO to, first, become more strategically prepared and, secondly, to dramatically change how IT provides services. The first will take time, and the second requires a laser focus on day-to-day operations, and the CIO is making good headway in this area.

As we have advised the Librarian and the CIO, a concurrent task will be to staff the CIO's office with the knowledge, skills, and capabilities critical to achieving these goals, as well as to contract out for services to temporarily fill the critical gaps.

For sure, it will be a challenge to do this and steady the ship at the same time. Fortunately, the CIO has a very effective deputy and has brought on board some other critical technical executives.

The CIO and his staff have over 100 audit recommendations that will take time to adequately address. Our focus at this point is to look at implementation and not create additional recommendations at the macro level.

I want to get back to strategic planning for a moment, because it is the crux of what will make or break the Library's success in the digital age.

As we have said in our reports, the Library does not have a strong track record in implementing its enterprisewide strategic plan. The imperative for the Librarian and other Library executives is to put together a strategic plan and implement it in a deliberate and timely manner.

This is no easy task. Once executed, it will require top-most executives to constantly monitor the various units' implementation and will require changes in the Library's governance and reporting. The Library has taken the steps of hiring a strategic planning officer to help implement this.

The plan's key components must include a comprehensive digital services strategy and an understanding of its customer. Presently, the Library has neither.

The Library and its CIO need a coherent, overarching strategy that interconnectivity and customers' needs. Such a strategy must have a good grounding of what that needs to look and feel like from a customer's perspective, be it a Member of Congress receiving a CRS report, e-commerce solutions for copyright, or pushing research out and making it available to the research community.

Great challenges lie ahead for the Library. Senior management's commitment to change and the positive movement we have seen in recent years makes us hopeful that the Library is on the right course.

Thank you for the opportunity to address this Committee, and I would be happy to answer any questions.

[The statement of Mr. Hyde follows:]

**Prepared Statement and  
Testimony for the Record**

**Of**

**Kurt W. Hyde  
Inspector General  
Library of Congress**

**Hearing on**

**Oversight of the Library of Congress' Information Technology Management**

**Before the**

**United States House of Representatives  
Committee on House Administration**

**June 8, 2017**





**Testimony of Kurt W. Hyde  
Inspector General, Library of Congress  
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**Introduction**

Chairman Harper, Ranking Member Brady, and members of the committee, thank you for the opportunity to testify today on information technology (IT) challenges at the Library of Congress and on the Library's progress in addressing them.

The Office of the Inspector General (OIG) first identified the IT area as a "Top Management Challenge" in our 2011 Semiannual Report to Congress and has consistently reported on IT challenges since that time.

I have been the Inspector General since the summer of 2014 and, under my direction, the OIG has emphasized that robust strategic planning is essential for the Library to efficiently and effectively manage IT and fulfill its mission.

We all recognize that an agency of the magnitude and importance of the Library, whose very essence involves collecting and conveying information, cannot succeed in the information age without a highly functioning, efficient, and leading edge digital infrastructure. This necessarily includes a knowledgeable and adept IT management group seamlessly interacting and advising Library senior management in developing and maintaining efficient systems that deliver desired services to all customers. Recent changes made at the senior-most levels in both the Library's IT management and executive leadership have facilitated more productive interactions between these groups and have helped to set the foundation for a stable and efficient IT infrastructure.

**Backdrop: 2009 findings**

To understand the basis for my assessment, it is important to understand the background on which it is based. On April 29, 2009, my predecessor testified before this committee about a then-recently completed OIG performance audit<sup>1</sup> on the Library's management of IT infrastructure investments. The audit examined (1) whether the Library's IT strategic plan aligned with its overall strategic plan; (2) the validity and integrity of the IT strategic plan; and (3) the appropriateness and effectiveness of the Library's IT organizational structure and placement.

The OIG's 2009 audit report had findings in the following areas:

1. Strategic Planning Process: The planning process was not inclusive of all internal stakeholders, and the policy assigning responsibility for strategic planning was not clear. The Library's IT strategic plan also did not align well with its overall strategic plan, was not a unifying force at the

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<sup>1</sup> *Information Technology Strategic Planning: A Well Developed Framework is Essential to Support the Library's Current and Future IT Needs*, 2008-PA-105, March 2009.

Library, and was not incorporated into the organization's culture. One significant result was that the Library's digitization efforts were unfocused.

2. IT Investment Process: The Library did not evaluate spending decisions as a whole, as part of a capital asset planning and investment process and as part of a strategic planning process that considered spending decisions in relation to accomplishing the Library's mission. Management also did not conduct a cost/benefit analysis of alternatives on a consistent basis, evaluate the return on IT investments, or properly track IT costs, the effect of which resulted in the lack of transparency on IT costs that resulted in efforts and purchases of IT hardware and services that were uncoordinated and duplicative. Although there were some success stories, in the absence of an effective investment process, success was often difficult to repeat, and the Library was years behind other federal agencies in its IT capital investment processes and IT project management disciplines.
3. Organizational Structure: The organizational structure of the IT function did not foster strategic planning and good IT governance. For example, the Chief Information Officer (CIO) was not given the authority to make Library-wide decisions on IT governance, capital planning, and asset management.
4. Enterprise Architecture: The Library did not have an enterprise architecture program for planning future technology. There was no proper mapping of the Library's IT infrastructure, nor was there an informed process for projecting a "to be" state to help prevent duplication of efforts. There were also costly iterations of systems to support business applications and incompatible vendor hardware. As a result, the Library's ability to identify system interfaces was diminished along with experiencing limitations for economies of scale.
5. Customer Service: There were significant customer service problems, many of which were not addressed by IT management because the Library did not employ quality assurance mechanisms, such as service-level agreements and performance metrics.

The Inspector General opined in his testimony that these findings resulted in large part from Library management not understanding how IT strategic planning would help achieve the Library's mission and from Library employees not knowing their IT-related roles and responsibilities, as well as from IT planning being disconnected from evaluations of actual IT performance. Library employees needed to understand how IT planning impacted the Library's ability to accomplish customer goals and objectives. In all, the report presented 26 recommendations spanning all five topic areas.

#### **Change between 2009 and 2015 was slow**

Using good IT management practices as criteria, the 2009 report demonstrated that Library leadership at the time was well behind in understanding, implementing, and maintaining efficient and effective IT operations in the information age. In the subsequent five years, the Library made only incremental progress in the key areas identified in the report. Just as important, the Library's IT function was not

effectively aligned within the organization, and there was little progress on the critical issue of developing a Library-wide digital collections strategy.

In December 2014, the Government Accountability Office (GAO) initiated a statutorily-mandated audit of the Library's IT operations<sup>2</sup> along with an in-depth review of the Copyright Office's IT operations.<sup>3</sup> Like the OIG, GAO identified weaknesses at all levels.<sup>4</sup> In March 2015, the OIG delivered the first<sup>5</sup> of seven reports<sup>6</sup> over the next two years focused on the Library's IT management policies and practices, strategic approach, and digital collections efforts. Each of the reports reiterated and expanded upon the findings and recommendations made by the OIG's 2009 audit.

#### **Significant changes since 2015**

In 2015, to address OIG and GAO recommendations, the Library made three fundamental changes that overhauled the organization, management, and operation of the Library's IT function. This paved the way for the Library to dramatically improve the effectiveness of IT services and become more strategically prepared for the 21<sup>st</sup> century.

First, in May 2015, the previous Librarian of Congress announced the disbandment of the old organizational structure, created a stand-alone Office of the Chief Information Officer (OCIO), and inserted a temporary CIO to immediately begin addressing operational weaknesses and audit recommendations. The CIO position was established as the agency-wide officer in charge of all IT planning, capital investments, policies, and enterprise architecture decisions.

Second, in September 2015, following a nationwide search, Library management hired Mr. Barton to serve as the Library's first professional CIO and lead the Library's IT reformation. Hiring the Library's first-ever, technically qualified, experienced CIO was an important, positive step.

And third, in November 2016, Dr. Carla Hayden, as the new Librarian, shifted the lines of reporting so that the CIO now reports directly to her instead of to the Chief Operating Officer. This not only puts the CIO position in line with statutory requirements for the executive branch, it also makes the position one of the most senior in the Library. Elevating the position is significant because it gives the CIO recognition as a Library-wide strategic and operational partner, having both roles is critical for him to be effective.

<sup>2</sup> GAO, *Library of Congress Needs to Implement Recommendations to Address Management Weaknesses*, GAO-16-197T.

<sup>3</sup> GAO, *Copyright Office Needs to Develop Plans that Address Technical and Organizational Challenges*, GAO-15-338.

<sup>4</sup> GAO found that the Library did not have an IT strategic plan that is aligned with the overall agency strategic plan and establishes goals, measures, and strategies; the Library was not effectively managing its investments; the Library did not have a complete process for tracking its IT spending or an accurate inventory of its assets; the service units were often not satisfied with the IT service they were receiving, which contributed to their independently pursuing their own IT activities; and the Library did not have the leadership needed to address these IT management weaknesses.

<sup>5</sup> *Report on the Design of Library-wide Internal Controls for Tracking Information Technology Investments*, 2014-IT-101, March 2015.

<sup>6</sup> *The Library Needs to Determine an eDeposit and eCollections Strategy*, 2014-PA-101, April 2015; *Benchmarking the Library of Congress Information Technology Fiscal Year 2014 Budgetary Obligations and Human Capital*, 2015-IT-101, March 2016; *FY 15 Review of Server Configurations of Tier 1 Systems: Summary Report*, 2015-IT-103, August 2016; *July 2016 Disaster Recovery Exercise Review*, 2016-IT-101, February 2017; *FY 2016 Review of Systems Development Life Cycle*, 2016-IT-102, February 2017; *Analysis of Library of Congress IT Storage Infrastructure*, 2015-IT-104, March 2017.

The importance of these developments cannot be overstated. Before their implementation, the Library's IT group was struggling.

Upon his arrival, Mr. Barton assumed the daunting task of addressing basic gaps that many executive branch agencies tackled ten or more years ago and implementing over a hundred recommendations made by OIG and GAO to bring the Library in line with standards. He is appropriately approaching the situation with deliberate speed, which I applaud, and, under his direction, the Library is making notable progress in the IT area for the first time. Mr. Barton inherited 145 OIG recommendations of which he has cleared 33. Going forward, our focus will be to monitor implementation-related issues and not create additional recommendations at the macro-level.

#### **The CIO's imperatives**

The CIO has operational and strategic imperatives to address, but to make fundamental changes and improvements over the short-term (3-year) he needs to build a team with the right mix of qualified full-time equivalents and contract support. The CIO has taken significant, positive steps in this regard. His Deputy CIO is a distinguished, qualified, and effective IT executive with over twenty years of Library of Congress experience. He has also begun to hire highly qualified and technologically experienced managers within the system engineering, contingency planning and disaster recovery, and data center operations areas. Additionally, as we have advised the Librarian and the CIO, he will need contract support to backstop for critical gaps.

To adequately and consistently deliver IT services, the Library has acted to address multiple challenges in IT governance and performance issues that have been highlighted by the OIG, including:

- Initiating a step-by-step analysis of all Library IT governance programs. The goal is an integrated IT governance program that incorporates the 1996 Clinger-Cohen Act, as appropriate, in which all IT proposals are evaluated for consistency with strategic direction, reviewed by the appropriate governance structures, and tracked through to completion.
- Implementing an IT capital plan covering both developmental projects and infrastructure. The capital plan will become a multi-year planning tool that incorporates Office of Management and Budget's (OMB) requirements for executive branch agencies as appropriate. It will also be integrated with the Library's strategic, tactical, and budget planning processes. The governance structure will ensure integration with these and other governance components.
- Linking strategic planning, budgeting, and financial accounting to ensure that the Library's IT Steering Committee can effectively support the IT investment management, enterprise architecture, and information resource management processes. This includes incorporating variance tracking as a Library-wide governance mechanism as well as pursuing other cost accounting and historical IT cost analyses.
- Collaborating with service units on meeting their respective mandates and seeking integration at key governance points, and assuring sufficient senior management oversight.
- Centralizing and enhancing cybersecurity, including two-factor identification.

- Conducting the first contingency planning failover testing to the Alternative Computing Facility (ACF) for multiple Library critical systems.
- Drafting a comprehensive overhaul of Library IT policies to properly institute IT investment management/capital planning investment control (ITIM/CPIC) compliance.
- Establishing service-level agreements, maintaining software and hardware patches, and other standard operating functions.

#### **Challenges remain for the Library: Primary Computing Facility and Strategic Planning**

Recognizing that significant progress has been made, challenges remain that will complicate efforts to accomplish a well-functioning IT environment. One such challenge is moving to an adequate Primary Computing Facility (PCF), and another is improving the Library's enterprise-wide strategic plan.

The OIG reported in March 2017 that the PCF has had significant issues over the last several years and has not adequately kept up with demand.<sup>7</sup> We learned that power utilization is at or near maximum capacity in its current state, requiring significant work-arounds that increase risk. High rates of IT storage growth will increase the burden on OCIO technical staff and on physical PCF and ACF components, such as power, cooling, and floor space. Congress has acted by providing initial funding for the new facility, which enables positive changes, but the build-out will take time and considerable effort.

Hiccups may occur while the Library is still operating at the current PCF. While planning the new PCF, the CIO will also have to address various hardware and related infrastructure needs, including those related to maintaining current business operations and growing capacity in the short-term, and intensify the OCIO's contingency planning.

Further, work remains to increase the ACF's capacity to avoid having a significant contingency event that creates a prolonged disruption in the delivery of services to stakeholders and customers. Adequate testing of disaster recovery capabilities had not been enforced at the Library until recently, making it unclear how the ACF would perform. Without a formalized testing model for disaster recovery that is directed from a strategic level and managed consistently across systems, the Library has lacked the foundation to fully validate recovery capabilities and demonstrate readiness. The CIO is making progress in this area and has started testing more comprehensively. A full test needs to be done, however. This testing also needs to happen on a regular basis, as outlined in the Library's Security Directive. The CIO and agency heads should report on the results of the testing to the Librarian, ensuring compliance with the directive's requirement and satisfying the responsibility of both the CIO and the Librarian.

To effectively identify the PCF's needs, the CIO also needs to define the Library's "to be" enterprise architecture and infrastructure; additional funding from a variety of sources may be required to support this initiative and its timing. The direct benefit is a greater return on the Library's existing enterprise storage investment, enhanced cybersecurity protection of data, and increased data availability. This all

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<sup>7</sup> *Analysis of Library of Congress IT Storage Infrastructure*, 2015-IT-104, March 2017.

results in improved key stakeholder satisfaction and accurate management decisions aligned with the business financial/budgetary needs and technology performance/functional requirements.

**More robust strategic planning is needed**

I want to get back to the other imperative for the CIO, IT strategic planning, because it is the crux of what has the potential to make or break the Library's success in the digital age. But we can't talk about IT strategic planning without first addressing strategic planning for the Library as a whole, so I will address the Library's strategic planning initiative first.

As we have said in our reports, it is critical and time-sensitive for the Librarian and all Library executives to create a strong enterprise-wide strategic plan and implement it in a deliberate and timely manner. Historically, many of the Library's management challenges have flowed from a lack of proper strategic planning and performance management.

The Library should develop a more robust strategic planning framework that establishes strategic goals with specific and aggressive outcomes in which it measures its performance with valid and verifiable performance metrics. This involves ensuring that strategic plans—from the Library's enterprise-wide strategic plan to all of its supporting subordinate strategic plans—seamlessly align to maximize coordination and reduce redundant requests for resources.

The Library's current enterprise-wide strategic plan for FYs 2016-2020 was created to be a "living" plan, intended to guide the Library during a time of leadership transition and be revised once a new Librarian arrived. Along these lines, Dr. Hayden has expanded the Library's planning and performance improvement activities and, with the recent launch of a Library-wide envisioning initiative,<sup>8</sup> is moving towards developing a Library-wide strategic plan supported by aligned service unit plans. The key will be to have a full set of priorities for the Library by the end of the fiscal year and aggressively start to implement them in 2018.

First and foremost, the Library should prioritize identifying and addressing the needs of customers as part of strengthening its strategic planning and performance management since it has no comprehensive data on customers' needs, feedback, and experience and currently has no effort to collect such data on an on-going basis. The Library must develop a better understanding of its customers by obtaining comprehensive and reliable customer satisfaction data, defining its intended customer experience, and then addressing the customer experience in its strategic plan. The Library needs to know how its services look and feel from its customers' perspectives, whether they are members of Congress receiving Congressional Research Service reports, customers of the Copyright Office, or academic researchers delving into the Library's collection materials. Having done this, the Library must then employ its strategic planning and performance management framework to measure performance and identify adjustments needed to improve customer services and related service unit performance.

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<sup>8</sup> The Library's initiative, Envisioning 2025, launched in May 2017. According to the Library, it is "designed to inform the Library's direction and vision for the future and set clear priorities to guide how the institution moves forward to that future." The Library of Congress Gazette, June 2, 2017.

Until these issues are addressed, the Library's IT strategic planning will lack the necessary direction and focus. For example, initiating a digital collections strategy is critical to the Library's success in collecting digital materials and to the Library achieving its desired position as a leader in the digital collections arena. However, in the absence of the enterprise-wide strategic plan spelling out digital services and collections objectives, responsibilities, etc., several units within the Library are creating digital collections strategies and requesting resources for implementation. This situation has made the Library vulnerable to the risks of duplication of efforts and acquisitions, as highlighted in our 2009 report on IT Strategic Planning.

Further, the Library's eDeposit program, a digital collections initiative implemented in 2010, serves as a warning of what can go wrong in the absence of proper planning and implementation. As outlined in our April 2015 eDeposit audit report, the OIG could not determine whether progress made after five years of effort had met management's expectations because Library leadership had not established quantifiable expectations related to cost, performance, and project completion; the Library described its progress as "incremental." The audit also highlighted other issues, such as the Library's inability to monitor significant IT investments across its planning, budgeting, program/project management, and financial accounting systems. Further, without better project management practices, the OIG concluded that digital collections initiatives will be at an increased risk of failure. The OIG also identified the need to take into account the unique requirements and business needs of the Copyright Office. For example, the Library needs to ensure that electronic works transferred by the Copyright Office from copyright registration or mandatory deposit for the Library's collections are protected from unauthorized copying and sharing.

As noted previously, the CIO has hired capable IT professionals, however we believe the Library does not have the specialized knowledge, skills, and abilities to create a fully comprehensive digital services strategy and implementation plan. Such a strategy must incorporate an overview of what the Library currently has in its digital collections, what it ingests, how it is processed and stored, and how it interacts with the consumer. It is our belief that the Library must engage a highly experienced firm to develop and help implement an overarching digital services strategy and successful collection effort. Because of the lack of progress, getting such a plan in place should be a top priority. Expert guidance will ensure that the strategy appropriately coordinates the collection policy requirements of the Library and Copyright along with the technological framework required to manage and sustain digital collections data.

Overlaying all of this, senior-most leadership must institute an oversight process that incorporates planning, performance management, and reporting processes into significant decision-making; continually monitors and holds service units accountable for performance variances; and analyzes and corrects performance shortfalls on a real-time basis. Implementing such an ongoing oversight process will motivate service units to deliver strategic results. Without such a methodical approach led by senior management, strategic planning and performance management will not obtain the desired results. Recognizing this organizational weakness, the Deputy Librarian prior to Dr. Hayden's arrival, established the new position of Senior Advisor for Organizational Performance filling it with an executive having extensive corporate and organizational experience in strategic planning and performance management.

At this time that position reports directly to Dr. Hayden, providing strategic planning and the required organizational positioning and tone necessary to signify its importance to everyone at the Library. The Library also recently began a design and launch of an integrated enterprise-wide risk management framework, in keeping with OMB Circular A-123. It will be important for the Library to follow-through in FY 2018 to ensure that this work quickly informs the revision of existing strategic plans.

#### **IT Strategic Planning has improved**

The Library's and the OCIO's imperatives are intertwined; to adequately develop the IT plan, the CIO needs a fully formed enterprise-wide strategic plan that identifies and addresses customer needs and an associated digital services strategy. As of March 31, 2017 OCIO issued an updated version (1.2) of *The Library of Congress IT Strategic Plan for FYs 2016-2020*. Its four strategic goals include (1) Provide strategic direction and leadership; (2) Improve IT Investment Management; (3) Deliver business-driven capabilities; and (4) Strengthen protections for systems and information. Our seven IT audits over the last two years<sup>9</sup> identified a number of significant deficiencies prohibiting the OCIO from accomplishing these strategic goals. Importantly, under the direction of the CIO, the Library must improve its IT governance framework and internal controls. The IT Steering Committee, Architecture Review Board, Executive Committee, Strategic Planning and Performance Management Office, and the Budget Office must understand, exercise, and improve their participation in directing, coordinating, and achieving strategic IT results. For too long, these governance mechanisms have been weak and the members were not fully exercising their roles in delivering IT strategic results. Those governance bodies and the incumbent executives need to provide more muscular leadership in an effort to quickly move toward closing the Library's gaps in systems, best practices, and effective IT management.

The updated IT strategic plan is an improvement, but the plan should emphasize the following areas:

- Fill the knowledge and capabilities gaps by developing a human capital plan to obtain the right knowledge, skills, and abilities for all IT positions;
- Implement a performance planning apparatus that deliberately and methodically drives strategic planning monitoring and accomplishments similar to our recommendation above for Library-wide strategic planning oversight;
- Enhance the Library's fiscal framework for managing IT investments including the internal controls as well as the linkages between the agency's stakeholders, agency strategic plans, and budget planning for capital investments; and
- Improve the fiscal framework for the capital planning and investment process to ensure it identifies the complete costs of projects and ensures that the Library adequately plans, selects,

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<sup>9</sup> *Report on the Design of Library-wide Internal Controls for Tracking Information Technology Investments*, 2014-IT-101, March 2015; *The Library Needs to Determine an eDeposit and eCollections Strategy*, 2014-PA-101, April 2015; *Benchmarking the Library of Congress Information Technology Fiscal Year 2014 Budgetary Obligations and Human Capital*, 2015-IT-101, March 2016; *FY 15 Review of Server Configurations of Tier 1 Systems: Summary Report*, 2015-IT-103; August 2016; *July 2016 Disaster Recovery Exercise Review*, 2016-IT-101, February 2017; *FY 2016 Review of Systems Development Life Cycle*, 2016-IT-102, February 2017; *Analysis of Library of Congress IT Storage Infrastructure*, 2015-IT-104, March 2017.



manages, and evaluates its IT investments to maximize its return on investment and minimize risk.

For the IT strategic plan to be fully responsive to the Library's needs, the input of the Library's envisioning initiative also needs to be incorporated into the enterprise-wide strategic plan and then taken into account for the IT strategic plan. The Library's IT strategic plan must facilitate a coordinated and integrated approach to addressing the Library's needs, such as managing business operations and collections data. For efficiency, the CIO needs this guidance to construct a digital infrastructure that accommodates the Library's diverse needs.

For example, our *IT Storage Infrastructure* report<sup>10</sup> found that a significant amount of groundwork needs to be done in order to achieve a better strategic, cost-effective, long-term storage objective, to not only improve resource allocation but also to provide better insight for total infrastructure utilization and future planning. Without a coordinated and organization-wide plan to manage its storage requirements, the Library will face enormous and wasteful storage costs complicated with multiple vendors, unsupported technologies, and multiple unnecessary platforms. Recognizing the unique needs of the Library related to its significant and ever growing digital collections, it must develop storage strategies that make use of the various available storage alternatives including owned infrastructure, public clouds, internal clouds, and third party repositories. In the face of limited budgetary resources it is fundamentally important that the Library obtain economies of scale from an effective IT strategic approach that focuses on shared services for all of its digital needs.

In conjunction with the aforementioned activities, the Library needs to implement greater cost controls. At the time of GAO's audit<sup>11</sup> of the Library's IT operations, it had difficulty determining the Library's annual IT expenditures. OIG's Audit Report No. 2016-IT-102, *FY 2016 Review of Systems Development Life Cycle*, found significant issues in accounting for the Library's IT capital investments. We have stated in various reports that improvement opportunities exist for capturing and reporting full-time employee costs related to specific development projects. Internal software development costs can often consume significant human capital resources, and the inability to accurately capture and track such costs will make it difficult to identify project development cost overruns. This inability also makes it more likely that Library resources will be wasted. System development success should be evaluated continuously based on whether projects are being delivered as designed, on time, and at or below budgeted costs.

The Library also needs to improve its tracking of IT costs to adequately validate IT efficiencies, practice effective project management, and demonstrate a project's return on IT investment. Just as importantly, it needs reliable historical IT financial accounting data to effectively demonstrate sound custody of its IT budgetary resources or make convincing requests for IT budgetary initiatives.

Currently, OCIO has taken the initiative to develop a methodology to collect historical IT financial data, establish a framework for the Library's IT Capital Planning and Investment Control process, and formulate its basis for cost management. However, given the responsibilities related to managing

<sup>10</sup> *Analysis of Library of Congress IT Storage Infrastructure*, 2015-IT-104, March 2017.

<sup>11</sup> GAO, *Library of Congress Needs to Implement Recommendations to Address Management Weaknesses*, GAO-16-197T

financial data, the Chief Operating Officer and Chief Financial Officer should take leading roles in establishing the CPIC process and developing the capability to collect and report reliable IT financial data.

Great challenges lie ahead for the Library. The CIO must develop best IT practices, implement effective strategic planning, and institute sufficient planning, budgeting, and accounting practices. Despite these challenges, in less than two years, the CIO and his deputy have established the proper tone and demonstrated initial progress in overcoming them. The new Librarian's challenge will be to zero in on strategic planning and timely implementation. When they address these issues, we believe the Library will make tremendous progress.

**Acronyms Used**

ACF	Alternative Computing Facility
CIO	Chief Information Officer
CPIC	capital planning investment control
GAO	Government Accountability Office
IT	information technology
ITIM	IT investment management
OCIO	Office of the Chief Information Officer
OIG	Office of the Inspector General
OMB	Office of Management and Budget
PCF	Primary Computing Facility

The CHAIRMAN. Thank you, Mr. Hyde.

We appreciate each of you giving us your testimony, and we will look forward to questions now.

And, obviously, we all know how the timing device works, so I am going to recognize myself now for 5 minutes of questions.

The first question that I have, really, Mr. Hyde, you just mentioned that the Library of Congress had hired someone to do the strategic planning. Who is that person?

Mr. HYDE. That is Diane Haughton.

The CHAIRMAN. Okay.

Mr. HYDE. And she has extensive experience in that area. She has started up the risk management process as well as assisting and helping the Librarian implement the envisioning process.

The CHAIRMAN. And as the IG, are you satisfied, then, with her qualifications and with the effort she thus far is making?

Mr. HYDE. I am. She is very qualified.

I think one of the things that you had mentioned in your opening statement was is there necessary support available. And I think that the Library, and we have talked about this with both the Librarian and the CIO, is that they need to hire contract support for this. They need to bring in a qualified firm to help them with the digital services strategy as well as an enterprisewide strategy.

The CHAIRMAN. Okay. Now, I think it is pretty ambitious, obviously, and that is good, trying to close these recommendations. What are the challenges or barriers or opportunities, perhaps, that your office anticipates for the Library to close each of the remaining 26 recommendations?

Mr. HYDE. I think it is time. When the CIO first came on board as well as before the new Librarian came on board, I met with the then Chief of Staff, Robert Newlen, who is now the Deputy Librarian, and I said, these are not quick fixes, these are 3 to 5 years it will take to implement many of these recommendations, and just do it at deliberate speed and grouping them in a very logical way.

The CHAIRMAN. Okay. So the report was that there would be an attempt to close out 22 of those 26 remaining before the end of this year. Is that likely, or are these ones that can be done in that period of time?

Mr. HYDE. Well, I think the GAO recommendations, I think they have been working with GAO on a regular basis, weekly meeting with GAO to close those. And some of these can be closed relatively quickly, and that is like putting in the right structure.

The CHAIRMAN. Sure. And so if that happens, and if my math doesn't fail me, there are 26 left; we do 22 of them by the end of the year, that leaves 4 of the recommendations to be completed. And are those ones that you are saying would take years to do?

Mr. HYDE. For ours, I think that you have the strategic planning element, the cost controls that are needed, the identification of the right infrastructure, the server infrastructure that is needed, cloud decisions, for example, that would take longer. But the others can be relatively quickly.

The CHAIRMAN. Mr. Barton, if I could ask you, as we look at this, would you talk about your plans to address those remaining GAO recommendations? Your testimony highlights changes the Library

is making. But talk about the steps the Library is making to fulfill those recommendations. Just give us some specifics there.

Mr. BARTON. Yes, sir. The Deputy CIO and GAO counterpart meet on a weekly basis to discuss the outstanding GAO recommendations. We are very confident that the target dates we have set we will meet.

Although, I would like to say that the primary goal from my perspective is not just to close the recommendations. The recommendations are great, and they are a good roadmap. My intention is that we take those recommendations and view them as an opportunity to get ahead of future issues, right?

So this is not a check the box, get the recommendations closed issue that I am trying to address. It really is setting the Library up for success in the future, not just to get to the recommended goals.

The CHAIRMAN. So not necessarily to check the box and say it is done, but to make sure you have done that but you continue for the future to make sure that we don't get into another situation with many recommendations that need to be done?

Mr. BARTON. Yes, sir.

The CHAIRMAN. Okay. That is great.

And I realize my time is almost up. So at this point, I will now recognize the gentlelady from California, Ms. Lofgren, for 5 minutes for questions.

Ms. LOFGREN. Thank you very much.

Mr. Barton, after you were hired and Mr. Mao became the acting Librarian, you both started working together and redefining the Office of the CIO and consolidating IT. Were there particular units or personalities that were opposed to some of your proposed modernization and centralization plans?

Mr. BARTON. Thank you for the question, ma'am.

Opposed may be a stronger word than I would use. Many of the service units have some concerns. They, and rightfully so, are very mission focused, and the Library's track record on supporting those missions is mixed.

I have committed to each of the service units that they will not experience a degradation in IT services as we implement this centralization and that we will allow them to spend more of their time on their mission-oriented IT needs and less time on the general day-to-day IT requirements that any organization has, in email and word processing—

Ms. LOFGREN. So is it your view at this point that, basically, everybody is on board with the plan?

Mr. BARTON. Yes, ma'am, it is my view. And I have regular meetings with each of the service unit heads, and each one of them has expressed the desire to make this be successful. There are still remaining concerns that we are addressing on a weekly basis.

Ms. LOFGREN. That is great news.

In your testimony, you indicated that you are working with the Copyright Office to rework their IT modernization plan. That is really important to my district. We have large software and small software companies that rely on the Copyright Office and are desperate that the modernization has not yet been accomplished.

The first version of the plan failed to consider the work being done in the Library, as I understand it. Was that a mistake?

Mr. BARTON. I think it missed an opportunity to take advantage of existing IT infrastructure and the ability for focusing specifically on mission requirements as opposed to infrastructure requirements.

Ms. LOFGREN. So at this point it is my understanding that the Copyright Office's modernization plan will leverage and coordinate with the Library's organizationwide strategic plan. Will that save money compared to the other plan?

Mr. BARTON. I anticipate that it will. I would like to say that we are having weekly meetings with the Copyright Office now to discuss how we are going to modernize their actual modernization plan. That is being very productive.

Ms. LOFGREN. Good.

Mr. BARTON. We are making good progress.

Ms. LOFGREN. Is it going to save time, you think?

Mr. BARTON. I would be very surprised if it did not save time.

Ms. LOFGREN. Good.

What kind of impact, if any, does not having a permanent Register have on the progress that you are making?

Mr. BARTON. It would be hard for me to judge that.

Ms. LOFGREN. Okay.

Mr. BARTON. But I would say that the current Register and I meet twice a month.

Ms. LOFGREN. The Acting Register.

Mr. BARTON. And we are having very detailed discussion about her needs and how we can use IT at the Library to meet those needs. I feel that as long as she feels empowered to make decisions, that we will be successful going forward. That would be a question she——

Ms. LOFGREN. Okay. Maybe I should ask Dr. Hayden.

It was my understanding that your plan was to post the Register of Copyright's opening on the USAJOBS site last April with a plan to hire in 60 days, but I don't think the opening was ever posted.

What caused the delay in hiring the Register? And what kind of impact does not having an appointed Register have, do you think, on the Copyright Office's ability to modernize? It is very important that that proceeds.

Ms. HAYDEN. The Library has worked directly with Congress on the Register position, and at this point the search and the process for having a permanent Register has been suspended. And in the interim——

Ms. LOFGREN. Because of the bill that passed the House?

Ms. HAYDEN. It is a congressional decision. And in the interim, we have worked—and I want to say and echo what Mr. Barton said about working with the Acting Register on making sure that we continue the momentum on modernizing the office and the processes. That is critical, and that needs to happen regardless.

And so we have taken the lead, basically, on making sure that that continues while we wait for Congress to make a decision on the——

Ms. LOFGREN. My time is up, but I am glad to hear that we are just proceeding and making the decisions in the absence. I think

the bill was a mistake, as I said publicly, but the fact that it passed the House doesn't mean anything. I mean, most of the bills we send to the Senate die there. So I am hoping that we don't mess up the modernization effort in that key element of the Library, and I am very, very reassured by your comments, Dr. Hayden.

Ms. HAYDEN. Thank you.

Ms. LOFGREN. And I yield back.

Mr. DAVIS [presiding]. Thank you. I completely agree with my colleague. Many things we pass just do die in the Senate.

But I do want to say thank you to Dr. Hayden. And I appreciated your responses to Ms. Lofgren's questions, especially about respecting what may or may not happen in this institution. Your willingness to work with us here in this Committee on issues that are related to infrastructure inventory, IT today, and also your willingness to work with us on issues that may have jurisdiction in other Committees that members may serve on has been a breath of fresh air for me.

Personally, it has been great to get to know you. I look forward to continuing to work with you to address some issues that are in my district that you are very familiar with because of your time spent in my district too.

So thank you very much for your responses.

Ms. HAYDEN. Thank you.

Mr. DAVIS. I am going to actually not ask you any questions. I am going to go to Mr. Hyde instead.

Ms. HAYDEN. Okay.

Mr. DAVIS. But thank you, Dr. Hayden.

Mr. Hyde, I think you are probably more appropriate to answer the question that I have. It is really about inventory. Before you can set a strategic plan to continue to buy and upgrade new products, I guess we have to make sure that we have an inventory of the products that were already purchased and used and may or may not still exist within the Library to make sure we got it right. That is something that I think many Member offices forget to really truly manage, and there comes a time when they have to get their inventory straight too.

You have much more and a much larger inventory than each of us do as Members of Congress, but that is why we in the House and this Committee, in particular, have really tried to strive to put together a Leg. branchwide purchasing operation, so that institutions like yours that have a larger facility, larger needs, can also take advantage of better systems.

So I want to ask you, Mr. Hyde, how would you assess the state of inventory management and capacity planning at the Library right now?

Mr. HYDE. I think there are two components to that. One is from an IT perspective, and that, I think, that the CIO's office is getting their arms around. That was one of the issues that GAO brought up and that we brought up a while ago.

Mr. DAVIS. So GAO, if you don't mind me interrupting, had identified 18,000 computers, and you really only had physically about 6,500?

Mr. HYDE. Right. And Mr. Barton can answer the specifics on this, but I think that that is correct. There is a challenge between

the recordkeeping and the actual inventory and what things have been that are old and not used and not needed anymore. And I think that that is what was the challenge at the Library.

Mr. DAVIS. Does your disposed inventory go to the GSA?

Mr. HYDE. No, I think there is a—I don't know that answer. I can get that to you. But I think there is flexibility on what they can do with the inventory.

Mr. DAVIS. Okay. What steps has the Library taken to more accurately account for the IT resources?

Mr. HYDE. Right. Well, he has a team. As a matter of fact, they have been recently just talking to me about different ways to efficiently record that inventory. And so they are taking action and they are trying to get their arms around it. And also determining the smaller pieces, do we really spend our time on the smaller pieces versus the larger elements, and they are working towards it.

Mr. DAVIS. Mr. Barton, do the current regulations and processes for acquisition management allow your office to acquire the needed IT services effectively and easily?

Mr. BARTON. Easily would be a matter of—

Mr. DAVIS. Well, nothing is ever easy in acquisition, unfortunately.

Mr. BARTON. Exactly. So we have not had any circumstances where we have not been able to get the items or services, equipment, that we need. There is always room for improvement in those types of processes. But I am satisfied with the current acquisition process with the Library.

Mr. DAVIS. To what extent will the GAO recommendations improve or hinder that effectiveness?

Mr. BARTON. There have been several suggestions and implemented suggestions from the GAO primarily regarding contract phrasing, required clauses within contracts, dealing with security, dealing with the ownership of data or property of the government whenever we enter into contracts. So that was a very practical help from the audits.

Mr. DAVIS. All right. My time is running out, so I have a couple of quick questions to ask you, Mr. Barton.

How soon do you anticipate closing recommendations related to this area in the GAO study?

Mr. BARTON. I will have to take that for the record, sir, but we do expect that we will be closing the vast majority by the end of this calendar year.

Mr. Davis. Okay. How are you using the Legislative branchwide acquisition process?

Mr. BARTON. That is a very good question. We are using Leg. branchwide acquisition capabilities whenever it is possible and makes sense for us. In fact, most of the contracts that we are writing ourselves these days are open for the rest of the Legislative branch to use.

Mr. Davis. Well, thank you. My time has expired. And I have to go to another hearing, so Mr. Loudermilk is going to take over and ask his questions from here.

Thank you very much.

Mr. BARTON. Thank you.



Mr. LOUDERMILK [presiding]. I apologize for the delay with the change there. It was unexpected. But I now recognize myself for 5 minutes for questions.

Mr. Barton, I want to talk and continue the conversation we were having about the GAO report, which was, I guess, published in March of 2015. Is that correct?

Mr. BARTON. Yes, sir.

Mr. LOUDERMILK. Specifically on the 10 items or recommendations made regarding information security—or management, the information security management— to date, from what it appears, is only 1 of the 10 recommendations has been completed. Is that correct?

Mr. BARTON. Of the public recommendations, yes, sir.

Mr. LOUDERMILK. Okay. And 5 of those, number 20, 21, 23, 26, and 28, were actually scheduled to be completed in December of 2016. What is the delay on those and what is the status? What is the new estimated date of completion of those items?

Mr. BARTON. So I will take for the record the actual new estimated completion dates. I do not have that information right at my fingertips.

[The information follows:]



Office of the Chief Information Officer

June 13, 2017

The Honorable Gregg Harper  
 Chairman  
 Committee on House Administration  
 U.S. House of Representatives  
 1309 Longworth House Office Building  
 Washington, DC 20515

The Honorable Robert A. Brady  
 Ranking Member  
 Committee on House Administration  
 U.S. House of Representatives  
 1307 Longworth House Office Building  
 Washington, DC 20515

Dear Chairman Harper and Ranking Member Brady,

Thank you for your interest in the Library's Information Technology program and for the opportunity to respond to your questions during the June 8 Committee on House Administration hearing. The purpose of this memorandum is to more fully answer Mr. Loudermilk's questions from the hearing concerning information security recommendations in the public GAO report "Strong Leadership Needed to Address Serious Information Technology Management Weaknesses" (GAO-15-315).

Upon receipt of this report in March 2015, as well as the non-public report "Actions Needed to Resolve Information Security Weaknesses" (GAO-15-575SU), work commenced immediately on all recommendations. Information security is an utmost concern and we have given special attention to the ten public and 74 non-public recommendations. To date, one of ten public and 51 of 74 non-public recommendations related to information security and privacy have been successfully closed.

In answer to Mr. Loudermilk's question during the hearing on the reason for the delay in completing the information security and privacy recommendations, I assure you we have been continuously working on each of these. Much progress has been made and we are very close to resolving most of them. The work we have performed to reach these final stages of closure has significantly improved the security of our IT systems. As per the recommendations, we first developed the necessary policies and procedures. We then began implementing the new policies and procedures for our large number of IT systems. We continue to work with GAO to close these recommendations. As it relates to recommendations pertaining to Continuous Monitoring (recommendations #22 and #24), we reached an agreement with GAO to monitor IT systems in the newly established Continuous Monitoring program for one annual cycle. Therefore, we extended the dates to ensure our new program is in accordance with GAO's analysis of our progress. In addition, we recently received congressional funding to establish an Information Systems Security Office that will centralize IT security professionals within our IT Security Group. These professionals will significantly improve our IT security program and ensure required documentation for each IT system is completed.

To ensure we are progressing aggressively on our open recommendations, we meet with GAO weekly and have quarterly site visits with their entire audit team to show evidence on our open IT security recommendations. Additionally, we have recently provided GAO secure access to our

governance, risk and compliance system to enable complete transparency on our IT security program. Access to this system of record will not only provide our current state of IT systems but will also provide authoritative evidence to facilitate recommendations closure.

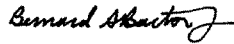
An update on estimated completion dates for the ten GAO public recommendations pertaining to information security and privacy is below:

#	Recommendation	Est. Date
19	Inventory of Library-Wide Information Systems	CLOSED
20	System Security Plans (SSPs)	Q4 FY 17
21	Documentation of Key Controls in SSPs	Q4 FY 17
22	Completion of Security Testing	Q3 FY 18
23	Remedial Action (POAMs)	Q4 FY 17
24	Guidance on Continuous Monitoring (Authority to Operate)	Q3 FY 18
25	Contingency Planning	Q1 FY 18
26	Security Awareness and Privacy Training Policies	Q4 FY 17
27	Contracts addressing Security and Privacy Requirements	Q3 FY 17
28	Privacy Risks in Privacy Impact Assessments (Chief Privacy Officer)	Q4 FY 17

While the closure of one out of ten GAO public recommendations related to information security and privacy may seem slow, please be assured that significant progress has been made on the remaining nine, as well as the remaining non-public recommendations. Although we have not closed them, we continue to work on each. In fact, GAO has acknowledged, as evident on their website, that substantial progress has been made on the majority of the information security and privacy recommendations.

Please let me know if you have any additional questions; I am available to provide a briefing at your convenience.

Sincerely,



Bernard A. Barton, Jr.  
Chief Information Officer  
Library of Congress

cc: The Honorable Barry Loudermilk  
U.S. House of Representatives  
329 Cannon House Office Building  
Washington, DC 20515

Mr. BARTON. In general, the reason that we have delays from originally scheduled dates, twofold. Either we get into the fixing of those recommendations and determine that it was much more difficult or complex than what we anticipated or the Government Accountability Office has determined that they need to have more details than what we have provided on the initial submission.

It is very much an interactive process with the GAO and the Library. What may not be known is that their actual audit was the broadest audit that they had ever done for any organization across the Federal Government. And so there are many details that have to be worked out, and we have very ongoing conversation on correcting those issues.

Mr. LOUDERMILK. Okay. Of course, our concern has been there has been quite a good amount of time that has transpired since March of 2015 even till the completion date that was estimated of December 2016. Now we are in June of 2017. And some of those are pretty critical items, such as ensuring that everyone that has access to the IT system has their required training and documented. So some of those seem pretty important to get done as quickly as possible.

Let me transition over to another incident that happened at the Madison Data Center, when there was an issue. You experienced some system outages. But a decision was made not to fall over to the backup facility. Why did you decide not to go to the backup facility in that incident?

Mr. BARTON. That was actually the week I started at the Library.

Mr. LOUDERMILK. Okay.

Mr. BARTON. So that was a good welcoming package. And as Mr. Hyde noted, I have a very capable deputy, who is sitting behind me today, and she was on top of this issue to begin with.

Without going into too much detail, there were security-related concerns, which prevented us from being able to switch over to our alternate computing facility.

Mr. LOUDERMILK. Okay. Have those security concerns been addressed and resolved?

Mr. BARTON. Yes. And as a matter of fact, we conducted the largest fail-over exercise this past year, and we took all of the critical systems for the Library and failed them over to the alternate computing facility with the security requirements in place, and we were functioning as we should be.

Mr. LOUDERMILK. And so the fail-over was successful?

Mr. BARTON. Yes.

Mr. LOUDERMILK. Was there any significant delay in the fail-over? So if we were to have another incident today, we would be able to fail-over to the alternate facility without any disruption of service?

Mr. BARTON. Yes, sir.

Mr. LOUDERMILK. Okay.

Back in July of last year, coming up on a year, the Library had a denial-of-service attack, which, of course, disrupted the services and the websites. What has been taken to protect against these denial-of-service attacks and other related service interruptions?

Mr. BARTON. As you are aware, the cyber threat is constantly evolving. We have procured services that allow us to mitigate significant volume of denial-of-service attack. Without going, again, into too many details on the security side of things, we are confident that for any significant anticipated type of volume of attack, we have put in place the procedures and services that allow us to mitigate those concerns.

Mr. LOUDERMILK. Okay. My time is expiring, and if you could get back with the Committee on the new dates on the information security management, of the 10, of what those anticipated dates are, it would be appreciated.

Mr. BARTON. Yes, sir.

The CHAIRMAN [presiding]. I want to thank each of you for your testimony.

I have a follow-up question, Mr. Barton, if I could ask.

How are you establishing actual business requirements and the appropriate level of service needed to meet those requirements? For example, key systems, like Congress.gov and copyright customer facing systems, should have very high expectations while others might need less.

Mr. BARTON. Thank you, sir. As you may or may not be aware, there are standards established by the NIST, National Institute for Standards and Technology, that we follow. And we are really involved with the organization that requires the services.

For example, the Copyright Office has their eCO system that it uses for registration, and Copyright would be the determining organization as to what is the level of service that is required for their capability. The same with the CRS. So we understand that whenever Congress is in session, CRS has to be functioning.

So we look at each application on a case-by-case basis, and we have, essentially, a checklist that we go down. And we ask the system owners, do you need this type of capability and response time?

So it is a very integrated approach, collaborative with the organization that is providing the capability, and I think it is working out fairly well at this point. We still are dealing with a lot of legacy concerns that we are addressing as quickly as we can.

The CHAIRMAN. How do you measure that performance, not only on meeting not only the service end user expectations, how do you measure that?

Mr. BARTON. That is an ongoing development effort for us. We do have a service desk where people call, and they will open up tickets, and we ask them to evaluate how they are satisfied with the service that they receive. That has always been, at least in my tenure, a fairly positive experience. The vast majority, over 95 percent of the responses we receive, are very positive. So that is one way we measure them.

Another way that we are looking at, and we have a service management process that we are implementing for the Library that deals with across the board spectrum of all IT services, and that will establish service level agreements within our service catalogue, which will be automated, how we monitor those based on server up times, response time to request for Web services, those types of things. So both a combination of asking the recipient of the service and monitoring the automated systems so that we can establish

what is our baseline and then improve the performance from the baseline.

The CHAIRMAN. Thank you.

And in light of that, Ms. Lofgren, do you have any follow-up questions?

Ms. LOFGREN. No.

The CHAIRMAN. I had one last quick question for you, Dr. Hayden, before we stop. How do you recognize employees who go above and beyond? Is there some way that you do that?

Ms. HAYDEN. The first person that, I must say, I would recognize immediately would be Mr. Barton and commend him for the work he has done. During my confirmation hearing, I mentioned Mr. Barton assuring me that technology would not be a problem, and that has been borne out.

And so recognition comes, of course, for the entire staff in many ways, sometimes actual additional compensation in various forms, but definitely recognition and holding them up. And there are award programs that I have participated in where people are recognized.

The CHAIRMAN. I now recognize Ms. Lofgren.

Ms. LOFGREN. Not a question, just an observation.

Obviously, the Library is a very big operation. There are hundreds of employees. You know, morale in the past has been a problem. But I have just had random Library employees come up to me and really express great pride and satisfaction in the work they are doing, and I think it is a real credit to your leadership, Dr. Hayden. I wanted to share that with you. And I think the fact that so many employees are happy and full of pride in their work and come up and tell a Member of Congress, that actually speaks to a lot about what you are doing. So thank you for it.

And I will yield back.

The CHAIRMAN. The gentlelady yields back.

In light of what I think is some good progress and what we are trying to accomplish, I would anticipate we will revisit this issue maybe early next year, since we have a lot of these recommendations that we are working on, and kind of measure where we are at that point.

Without objection, all members will have 5 legislative days to submit to the chair additional written questions for the witnesses, which we will forward and ask the witnesses to respond as promptly as they can so that their answers may be made a part of the record.

Without objection, the hearing is adjourned.

Ms. HAYDEN. Thank you.

[Whereupon, at 10:53 a.m., the Committee was adjourned.]



THE LIBRARIAN OF CONGRESS

July 24, 2017

The Honorable Gregg Harper  
Chairman  
Committee on House Administration  
U.S. House of Representatives  
1309 Longworth House Office Building  
Washington, DC 20515

The Honorable Robert A. Brady  
Ranking Member  
Committee on House Administration  
U.S. House of Representatives  
1307 Longworth House Office Building  
Washington, DC 20515

Dear Chairman Harper and Mr. Brady:

Thank you for the opportunity to respond to additional questions from the Committee on House Administration related to the June 8, 2017 hearing, "Oversight of the Library of Congress' Information Technology Management." My responses to the Committee's questions supplement information provided during the hearing and address additional topics of interest to the Committee regarding Library Information Technology (IT).

I look forward to working with you as we make progress in IT management. I will be pleased to provide any additional information related to the enclosed responses.

Sincerely,

A handwritten signature in cursive script, appearing to read "Carla Hayden".

Carla Hayden  
Librarian of Congress

Enclosure

**Dr. Carla Hayden, Librarian of Congress  
Responses to Questions for the Record**

**Committee on House Administration  
June 8, 2017 Hearing  
“Oversight of the Library of Congress’  
Information Technology Management”**

**Questions from the Majority:**

- 1. In its March 2015 report on the Copyright Office’s IT environment, GAO recommended that the Register of Copyrights develop an IT strategic plan that includes the office’s prioritized IT goals, measures, and timelines, and is aligned with the Library’s ongoing strategic planning efforts. According to GAO, in May 2016 the Copyright Office released a provisional IT strategic plan that partially addressed GAO’s recommendation. What is the status of the Library’s efforts to fully implement this recommendation?**

The Library accepted GAO’s recommendation that the Register of Copyrights develop an IT strategic plan that includes the office’s prioritized IT goals. In an effort to ensure that the many activities and initiatives regarding Copyright modernization are cohesively communicated, the Library intends to address the GAO recommendation by including goals, measures, and timelines for Copyright modernization in the update to the Copyright IT Modernization Plan. This update was a requirement from the Appropriations Committees, to be submitted in early August 2017. We are confident that the updated plan will also address GAO’s recommendation.

- 2. In its March 2015 report on the Copyright Office’s IT systems, GAO stated that, once the Copyright Office has developed IT investment proposals for modernizing the office, it can develop business requirements that can be used by Library and Copyright Office staff or external vendors with the appropriate expertise to identify technical solutions that will address the Copyright Office’s challenges. What progress has the Library made to develop (1) IT investment proposals for modernizing the Copyright Office and (2) business requirements to address the office’s challenges?**

IT investment planning for fiscal year 2018 is well underway, which is reliant on business cases prepared by the business units and a collaborative process between service units and OCIO to develop actionable cost estimates. This planning process is comprehensive of all of the Library’s service units—including the Copyright Office. Based on the work that Copyright and OCIO staff are currently performing to deliver an actionable IT Modernization Plan to the Appropriations Committees, a roadmap for building future IT investment plans will be available.

OCIO and the dedicated IT staff of the Copyright Office are working to make sure that we have a common and in-depth understanding of Copyright’s business and technical needs. It is



essential that the modernization effort address Copyright's mission to serve the creative community. We will work together to align modernization efforts with specific, needed improvements in core services like Registration and Recordation. IT staff around the Library are collaborating to share best practices in technical areas and to ensure the improvements we have made since the GAO audit and our realignment of IT staff are shared across all areas, including Copyright. Copyright will be able to take full advantage of the experience that OCIO has in application development, digital content management services, investment planning and management, and other areas.

3. **While rail improvement projects were underway in Springfield, IL, foundations of homes and artifacts were found from the 1908 Springfield, IL riots. As a result, local groups were able to secure the area as a historical preservation site. The LOC was contacted about the artifacts, and Dr. Hayden, in particular, expressed interest for the LOC to acquire these items. Where is the LOC in the process to acquire these items for display in the LOC?**

The Library provided the office of Rep. Rodney Davis with a list of list Illinois state level organizations with whom to consult to obtain advice about the care of the artifacts, and institutions within the state that may have an interest in the artifacts. Librarian of Congress Dr. Carla Hayden has also expressed interest in adding them to the Library's collections. Dr. Hayden will be visiting Springfield on September 9, 2017 to meet the people who are excavating and inventorying the artifacts, and local stakeholders.

4. **How is the Library improving its IT investment processes?**

The Library has significantly expanded its IT investment management process and requirements. We have implemented a rigorous process that stipulates all planned and ongoing Library IT activities be subjected to review, approval, and ongoing monitoring. The IT Steering Committee monitors the status of all IT approved investments through a quarterly reporting process. Problematic reports are flagged and subjected to additional scrutiny and action, including a recommendation to the EC and Librarian that the IT investment be terminated or addressed through another cost-effective corrective action.

As part of the FY2018 IT investment planning process, the OCIO has implemented a framework for rationalization and organization of the Library IT investment portfolio for FY18 based on elements of the Technology Business Management (TBM) model. Specifically, to reduce some of the current complexities associated with managing the IT investment portfolio (for example, a large number of individual IT investments of varying scope and associated resources, and varying cost estimation practices), the FY18 IT investment portfolio will be structured around logical groupings of IT resources (TBM IT Towers) and be developed using a structured cost estimation process that is based on GAO guidance and industry best practice.

5. **What is the Library doing to modernize its IT?**

The Library plans to use its agency-wide and multi-year IT modernization effort to improve key areas including IT Governance, IT Investment Management, IT Infrastructure, IT Applications, and IT Security. Key initiatives include:

- Mature its Enterprise Architecture (EA) with an updated Technology Reference Model (TRM) to guide current and future-state technology decisions
- Implement ITIL best practices while refining an IT Service Catalog and implementing an IT Lifecycle Management Platform tool
- Establish an agency-wide IT Project Management Office (PMO)
- Implement the Technology Business Management (TBM) model in coordination with multiple Library Service Units to improve IT investment management
- Transition the Library's legacy Primary Computing Facility (PCF) to a hybrid hosting model to improve availability of IT systems and services
- Refresh technical infrastructure and desktop services with updated hardware
- Mature a software development operations (DEVOPS) capability
- Implement multi-factor authentication for end-user devices to adopt federal IT best practices
- Modernize IT applications and systems to provide flexible, user friendly customer experiences.

**6. How does centralization of IT staff support that effort?**

The centralization of IT staff, in conjunction with the Library's IT modernization initiative will yield the following benefits:

- Consistent application of IT best-practices and processes across the Library to ensure compliance with GAO and OIG audit recommendations
- Faster delivery of projects and more efficient operational maintenance of IT infrastructure and applications by standardizing IT practices, using common tools and enabling re-use of IT services
- Ability to deliver more projects by efficient allocation of IT staff resources across multiple projects
- Improving the Library's IT staff cross-training capabilities and reaping economies of scale in regard to training and staff development
- Reducing contractor resource costs for IT service delivery

**7. Are the Library's networks and IT systems secure?**

Without hesitation, I can assure the Committee that the Library's networks are secure. We have put in place processes, procedures, equipment and technologies to protect our systems across the spectrum of known threats. We have also deployed protective controls throughout the network to ensure that data is properly secured and controlled.

We are centralizing the role of Information Systems Security Officer (ISSO) with the approval of additional funds in our FY2017 budget request. Centralized ISSOs 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. ISSOs 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.

It is the nature of cybersecurity that challenges continue to evolve. Our protections include active monitoring for new and emerging threats. We participate in the Legislative Branch Cyber Security Working Group which has helped us improve protections and provide lessons learned to the other agencies on successes we have had with new technologies. The group has helped increase information sharing about threats, which helps improve everyone's security posture.

We are also always evaluating policies and procedures for opportunities to improve. As an example, we will be implementing multi-factor authentication for end-user devices to adopt federal IT best practices that will add an additional layer to prevent unauthorized access and increase the protections

**8. What improvements have been made to avoid a repeat of the 2015 service interruptions?**

Each year the Architect of the Capitol (AOC) performs essential testing and electrical maintenance within the Library's Madison Building. In support, the Library shuts down the primary data center. This is a significant and high-risk operation. The 2015 planned power outage and subsequent recovery was the cause of a nine-day service disruption.

The Library has made great strides in being able to prevent operational interruptions. Improvements since 2015 include:

- Enhanced the Alternate Computing Facility (ACF) by procuring and installing security tools and backup appliances at the ACF to comply with Federal IT best practices. As a result, the Library can continue to run business critical IT systems during incidents by moving them to a secure alternate hosting environment.
- Implemented a cloud content delivery network (CDN) service to improve availability of web content.
- Established a Business Continuity and Disaster Recovery program to improve continuity planning.
- 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.

We appreciate Congress providing funding in the fiscal 2017 omnibus to supports the Library's long-term transition from its current Uptime Institute Tier I facility to a hybrid hosting model, allowing more than one hosting solution to improve IT service availability. This will an important part of the Library's IT modernization effort.

**Questions from the Minority:**

1. **It is our understanding that your plan was to post the Register of Copyrights opening on USA Jobs last April with a plan to hire the Register in 60 days. To our knowledge the opening was never posted. What has caused this delay in hiring a new Register?**

Because I take particular care to work closely with Congress on areas of mutual interest, I paused the search for a new Register of Copyrights following the passage of H.R. 1695 by the House of Representatives. This legislation would change the process of selecting a Register, and similar legislation was later introduced in the Senate. I therefore felt it was appropriate to pause the process to give Congress time to consider this legislation. I made this decision in consultation with Members of Congress and will continue to work closely with them to ensure that the Copyright Office is well-equipped to serve its constituencies.

2. **What kind of impact does not having an appointed Register of Copyrights have on the Copyright Office's ability to not only plan its own modernization efforts but also leverage the work being done by the Library overall?**

The Copyright Office is currently under the capable leadership of Acting Register Karen Temple Claggett. The Librarian of Congress meets regularly with her to hear relevant updates and ensure that the Library of Congress is providing proper support for the Copyright Office.

Like other service units within the Library, the Copyright Office has crafted its own modernization plans. The Copyright Office benefits, as do all service units, from Library IT centralization as we work together to modernize our systems and operations. Our Chief Information Officer leads the technical and information technology elements of the Library's modernization plan and works closely with the Copyright Office on its unique IT needs.

3. **How can this Committee assist the Library in appointing a new Register of Copyrights as soon as possible?**

Decisions about leadership of the Copyright Office will continue to be made in consultation with Congress. We will continue to work closely with Congress to determine how and when to address a permanent solution.



## LIBRARY OF CONGRESS

Office of Inspector General

July 25, 2017

The Honorable Gregg Harper  
Chairman  
Committee on House Administration  
U.S. House of Representatives  
Washington, DC 20515

Dear Chairman Harper:

Thank you for the opportunity to testify before the Committee on June 8, 2017, on the Library of Congress's information technology management. This letter responds to your June 29, 2017, letter containing questions for the hearing record. My answers are as follows:

**Questions from the Majority:**

- 1. How would you assess the IT strategic plan in terms of quality, completeness, and alignment with the Library's needs? Are you monitoring the Library's current effort to identify priorities and realign assets around those priorities? In your opinion, does either the current IT strategic plan or new initiative give adequate benchmarks to measure progress? Would you recommend any changes? Is the IT strategic plan realistic? Will the development of priorities be more effective?**

The IT strategic plan is a positive first step in being more responsive to the Library's IT needs, in particular its operational needs. However, the IT strategic plan will not be complete or aligned with the Library's needs until the Library itself has an appropriate and more robust strategic plan that includes a focus on digital services and e-commerce solutions for Copyright, as well as other directional efforts that comport to the Librarian's vision over the next ten years. In this regard, the Library has recently initiated a strategic planning effort, and the Office of the Inspector General (OIG) will be monitoring and reporting on the Library's progress. In our September 2016 Semiannual Report to Congress, Top Management Challenges, we stated that an organization-wide strategic plan is an essential building block to achieve the desired state-of-the-art technology infrastructure and best practices.

Through periodic meetings with the Chief Information Officer (CIO) and his staff, our office is monitoring the progress of the Office of the Chief Information Officer's (OCIO) efforts to improve the foundation of client services, correct IT investment and inventory processes, and provide a stable primary computing facility. The IT strategic plan includes some measureable performance targets for the current fiscal year (2017). As funding for major service unit initiatives is approved for FY18, we will be monitoring the annual IT performance targets for support for specific Library strategic goals, including Copyright IT modernization.

In my written testimony to the Committee, I noted that the IT strategic plan was an improvement from prior versions but that the plan needed to emphasize 1) filling the knowledge and capabilities gaps by developing a human capital plan for all IT positions; 2) implementing a performance planning apparatus that deliberately and methodically drives strategic planning monitoring and accomplishments; 3) enhancing the Library's fiscal framework for managing IT investments including the internal controls and linkages to stakeholders, agency strategic plans, and budget planning for capital assets; and 4) improving the fiscal framework for the capital planning and investment process to maximize return on investment and minimize risk.

In addition, although we believe the Library's IT plan is realistic, we feel that the CIO has areas of opportunity to improve. The Library has lagged in its ability to track both IT capital investment costs and periodic IT operating costs. The Library must implement an effective cost accounting process to support its IT planning, governance, and management oversight functions. Evaluating the effectiveness of its centralized OCIO function will also depend on the Library's ability to accurately track its IT activity costs for each accounting period. The achievement of two of the IT strategic plan's goals is dependent on sound cost accounting methodology. Although the CIO is in the process of planning for its version of a cost accounting methodology, the CIO alone cannot lead this effort; we believe the Library should share in driving these goals in the short term. Additionally, recognizing the cross-cutting nature of that objective, the Library's Chief Operating Officer should become a partner in its success to ensure that its development becomes a near-term accomplishment.

Finally, OCIO needs to take some critical steps that will provide greater transparency on its priorities. For each strategic goal's objective, OCIO should provide an associated project plan that defines the critical path, work breakdown structures, and milestones required to accomplish the objectives during the strategic plan's applicable five-year period. This will allow Congress and senior management to measure OCIO's progress towards accomplishing its goals, make the necessary adjustments, and retain alignment with both the Library's strategic plan and subordinate service unit strategic plans. As part of our three-year audit plan, OIG will monitor and report on the Library's IT strategic planning efforts along with its efforts to identify IT priorities.

To achieve the purposes of strategic planning by federal agencies, the Library must improve its transparency. Currently, Congress, agency staff, and the public's insight into the Library's progress towards its strategic goals at all levels is limited. The Government Performance and Results Act (GPRA) and its successor, the GPRA Modernization Act of 2010, were intended to allow sunlight on federal program results. The Library must make progress in opening up its strategic goals, performance measures, and results to all stakeholders and provide the intended transparency.

As the Library manages through the mechanism of its IT strategic plan, not only will its development of priorities become more effective, we believe the accomplishment of those priorities will become more apparent and successful through better planning, execution, and evaluation activities associated with strategic planning.

**2. Your written testimony highlighted a number of concerns – primarily with the PCF and the ACF. Please elaborate on those concerns.**

The major concern with the Primary Computing Facility (PCF) on Capitol Hill, and the Alternate Computing Facility (ACF) is the potential impact to the survivability and recoverability of data

within the Library. Congress created the ACF in 2002 to provide backup and business continuation for important systems and applications in the event of an interruption to Library operations at its PCF.

In 2009 and again in 2014, we reported that it was unclear whether the Library's operations at the ACF could successfully provide service to its customers in the event of a catastrophic failure of the main data center.<sup>1</sup> Our 2015 review highlighted continued concerns over the ACF's ability to recover critical applications.<sup>2</sup>

We noted that the PCF and ACF "capabilities are misaligned, inhibiting the Library's preparedness for various site failure scenarios." This report further concluded, "The PCF requires significant infrastructure investments that may be better spent on a new facility. The PCF is in disarray and disrepair; for example, hardware appears to be installed ad hoc, wherever space was available. Data center cooling is insufficient and supplemented by floor fans and power distribution does not appear to be balanced to provide the necessary redundancy. Given the extent of deficiencies observed at the PCF, it may not be cost beneficial to invest in the improvements." We further stated, "electrical capacity at the Library cannot be expanded and...the lack of adequate backup or additional power for operations (including cooling) exposes the Library to an indirect single point of failure."<sup>3</sup> Finally, expanding on this topic, we reported in 2015, "The ACF serves as a failover site for the PCF but houses only about one-third of the total disk storage infrastructure...That means the ACF cannot support a long-term catastrophic failure of the PCF. Simply put, the ACF does not have the resources to support the business systems operating from the PCF."<sup>4</sup>

The PCF will continue to be at risk for planned and unplanned outages of the Architect of the Capitol (AOC) operated power plant in the Library's James Madison building. Testing of the Library's failover capabilities is critical to managing these risks. The OCIO has started to more effectively test this capability, but unlike other agencies in the executive branch, it has not fully tested its failover capabilities on an annual basis. For example, in the current year (2017), annual IT failover testing is being delayed until early calendar year 2018 due to the AOC's delay of the annual planned power outage.<sup>5</sup>

#### **Questions from the Minority:**

- 1. In your testimony you state that the IG "believes the Library does not have the specialized knowledge, skills, and abilities to create a fully comprehensive digital services strategy and implementation plan." Could you elaborate on how the Library should be tackling this issue?**

In the past, the Library has had stalled digital initiatives and incomplete deliverables. In contrast, the Library's current leadership must take a more ambitious approach in order for the Library to regain its role as a recognized leader in the digital arena. The Library cannot succeed with a

<sup>1</sup> OIG Report No. 2009-IT-101, *Improvements are Needed to Bolster the Readiness of the Alternate Computing Facility*; OIG Report No. 2013-IT-103, *ACF Data Backup and Recovery Procedures*

<sup>2</sup> OIG Report No. 2015-IT-103, *FY 15 Review of Server Configurations of Tier 1 Systems: Summary Report*

<sup>3</sup> Ibid.

<sup>4</sup> OIG Report No. 2015-IT-104, *Analysis of Library of Congress IT Storage Infrastructure*

<sup>5</sup> Email, OCIO to OIG – June 7, 2017

strategic approach that invokes undefined outcomes, inadequate performance measurements, and passive accountability for performance shortfalls. In our Top Management Challenges, we have urged Library senior management to establish a comprehensive digital strategy that has aggressive outcomes that seamlessly interface with other strategic plans (Library, IT, and service units).

The Library must exert a sense of urgency in creating a fully comprehensive digital strategy and implementation plan by taking a two-prong approach. In the short-term, the Library cannot wait to develop internally the specialized knowledge, skills, and abilities (KSAs) needed to guide its development of that strategy. Under the leadership of the Director of Strategic Planning & Performance Management (DSP&PM), the Library should conduct a search to engage a contractor with strategic planning experience in the realm of information technology and digital collections. Specialists with such a background may be found in academia and consulting along with executives with experience in the business and technology sectors. Leading the development and implementation of the strategy will be a full-time position.

The Contractor should provide the Library with a roadmap to the desired, future state that defines the critical path towards the “to be” state, the required multiple components of development (work breakdown structures), and related human capital, processes, technology, and budgetary funds to finance arrival at the desired state. The roadmap should also provide the tools to measure progress and evaluate deviations and corrective measures.

In the long term, the Library can learn from this contracting effort, drive the implementation of the strategy with the help of the Contractor, and more deliberately develop the KSAs of its staff through a comprehensive human capital strategy. Part of the human capital strategy and learning from the Contractor will be for staff and the CIO to gain a greater knowledge of the digital area and how to deliver valid and verifiable performance metrics. They will need to complement these metrics with a management apparatus that continually reviews performance activity, identifies performance variances, and continuously oversees corrective activities. A less intense approach poses risks to achieving goals and serves to undermine efforts to assess and remedy performance shortfalls.

The development of a fully comprehensive digital services strategy requires that the plan thoroughly align with the Library’s strategic plan, the IT strategic plan, and the collecting divisions’ plans. Only that approach will reduce exposure to waste on redundancies and assure the Library leverages its enterprise architecture and digital investments in a manner that supports all of its customers. Our Audit Report No. 2014-PA-101, *The Library Needs to Determine an eDeposit and eCollections Strategy* provides specific guidance for developing a fully comprehensive digital collections services strategy and seven recommendations that are vital for the strategy’s success.

**2. You state that one of the areas that should be emphasized is filling the knowledge and capabilities gaps by developing a human capital plan to obtain the right knowledge, skills, and abilities for all IT positions. How?**

Much of the IT knowledge and capabilities gap will be more clearly identified after the Library has created a more robust strategic plan and implementation path. The OCIO will be a core component of any such strategic plan. To define its IT human capital “to be” state, the CIO must first determine



the OCIO's human capital "as is" state. In doing so it must conduct an assessment of the current workforce's KSAs, define what KSAs its "to be" workforce requires based on the Library's strategic plan, and conduct a gap analysis. After identifying the existing workforce KSA gaps, the CIO can embark on developing a plan to fill those gaps. The CIO has started to evaluate its "as is" state—it has contracted with OPM to conduct a comprehensive assessment of the current skills and competencies of existing Information Technology Specialist staff across the Library. Nonetheless, certain staff limitations are known without the need of an over-arching strategic plan, and those gaps can be filled as budget resources are identified.

Further, developing a performance culture should be the consistent theme driving the Library's human capital planning efforts. Library management should align its human capital plan with its strategic plan, with the human capital plan becoming its formula for continuous improvement. Similar to strategic planning, the Library must develop a monitoring apparatus that continually reviews the Library's progress towards its human capital planning goals and enables it to timely initiate corrective measures to accomplish its strategic goals. During this ongoing process, the Library must develop and implement strategies to recruit, retain, and backup critical talent essential to the Library's ongoing success.

**3. You testified that 33 of the OIG's 145 recommendations that Mr. Barton inherited have been cleared. What is the status of the remaining 112? How many are close to being completed, and are the recommendations being addressed at a sufficient pace?**

In several of our reports, and in discussions with management, we have stated that the Library may not be able to sufficiently address recommendations in the near term because of the need to resolve other, basic elements first. After a senior management change in 2015, the Library appointed an interim CIO who began the daunting task of addressing basic gaps that many executive branch agencies tackled ten or more years ago. By implementing recommendations made by OIG and the U.S. Government Accountability Office (GAO), these efforts are bringing the Library in line with federal technology standards and best practices. The CIO and his team are continuing to address these recommendations. They are approaching the situation with deliberate speed, and, under their direction, the Library is making notable progress in the IT area for the first time. We are also pleased that the CIO has proactively included specific FY 2017 targets in the IT strategic plan to close recommendations from OIG and GAO. Further, improved management and execution of the IT mission should substantially address many of the recommendations and reduce the amount and the associated risk of the new recommendations resulting from current and planned reviews.

Finally, I'd like to take this opportunity to address a question posed by Congressman Rodney Davis at the hearing. He asked me whether the Library's disposed inventory goes to GSA. While I did not have that information on hand at the hearing, I committed to getting back to Vice Chairman Davis with a complete answer, as follows:

The Library of Congress has not disposed of IT equipment to GSA's Computers for Learning Program since 2014. Under a Memorandum of Understanding, the Library currently donates its IT equipment to the Federal Prison Industries, Inc. (DBA UNICOR), which is within the Bureau of Prisons, a component of the Department of Justice.

We last reviewed the disposal of the Library's IT equipment in 2012, Audit Report No. 2012-PA-101, *Improvements Needed to Prevent Wasteful Procurement and Inefficient Disposal of IT Workstations*. All recommendations from this report are closed.

Thank you for the opportunity to respond to these questions. I would be happy to meet with you to discuss any of this information or any of the other work we do at the Library of Congress OIG.

Sincerely,

A handwritten signature in black ink, appearing to read "Kurt W. Hyde". The signature is stylized with a large, looped "H" and a trailing "3" at the end.

Kurt W. Hyde  
Inspector General

cc: The Honorable Robert Brady  
Ranking Member  
Committee on House Administration



Office of the Chief Information Officer

July 21, 2017

The Honorable Gregg Harper  
Chairman  
Committee on House Administration  
U.S. House of Representatives  
1309 Longworth House Office Building  
Washington, DC 20515

The Honorable Robert A. Brady  
Ranking Member  
Committee on House Administration  
U.S. House of Representatives  
1307 Longworth House Office Building  
Washington, DC 20515

Dear Chairman Harper and Mr. Brady:

Thank you for the opportunity to respond to additional questions from the Committee on House Administration related to the June 8, 2017 hearing, "Oversight of the Library of Congress' Information Technology Management." Our responses clarify and provide additional information regarding a number of topics including the IT Strategic Plan, the Office of Personnel Management (OPM) agency-wide IT Human Capital Needs Assessment, security, organizational restructuring, business requirements, asset inventory tracking, acquisition and asset management policies and procedures, the status of the Multifactor Authentication (MFA) in the Legislative Branch study, identification of duplicative IT services, increased service unit collaboration and customer satisfaction, and modernization, to name a few.

I look forward to future opportunities to communicate the progress that has already been made, and to outline clear benchmarks for progress moving forward.

Sincerely,

A handwritten signature in cursive script, reading "Bernard A. Barton, Jr.".

Bernard A. Barton, Jr.  
Chief Information Officer  
Library of Congress

Enclosure

**Mr. Bernard A. Barton, Chief Information Officer  
Library of Congress  
Responses to Questions for the Record  
  
Committee on House Administration  
June 8, 2017 Hearing  
“Oversight of the Library of Congress’  
Information Technology Management”**

**Questions from the Majority**

- 1. The IT strategic plan describes how the CIO intends to use IT to implement the Library's strategic plan. Please describe what processes and service unit involvement were used to create this plan. How will the IT strategic plan inform the new strategic planning effort currently underway? How will you and your offices ensure the goals of the strategic plan are met?**

The Library issued the 2016-2020 IT Strategic Plan in September of 2015. Library's service units, as well as the Executive Committee and the IT Steering Committee, were asked to comment and provide input. Since then, the plan has been updated twice, most recently in March of 2017. The update issued in March 2017 includes an appendix that contains fiscal year 2017 annual performance measures that support the goals and outcomes identified in the strategic plan. Currently, OCIO is identifying the fiscal 2018 performance measures that will continue to move us towards accomplishing the goals identified in the Plan. These will be issued also as an appendix to an update of the 2016-2020 IT Strategic Plan.

- 2. In your written testimony, and in briefings with the Committee, a number of ongoing skill assessments in the CIO's office have been discussed. Describe what those assessments have identified. Did the OPM assessment inform the need for the additional FTE included in the FY18 budget request?**

The Library has partnered with Office of Personnel Management (OPM) to conduct an agency-wide IT Human Capital Needs Assessment with the goal of identifying gaps between current skills and future needs of IT staff. In June 2017, OPM began administering the surveys as planned, with a proposed closing date of July 21, 2017. Once the surveys close and the data analyzed, the Library will better understand the IT Skills gap that may exist and will develop an action plan to close the gap. The FY18 budget request for additional FTE was not informed from the OPM assessment work still in process, but instead derived from known enterprise infrastructure and mission IT support staff limitations.

- 3. Please describe your office's efforts to balance investments in infrastructure with line of business investments for service units such as copyright specific systems or systems necessary for CRS.**

**a. Moving forward, what will your office's role be with respect to needed investments related to "line of business" and what will the role of service units be in these decisions?**

IT investments go through a rigorous vetting process with participation of each service unit at three different level of the organization culminating in a Library IT investment plan reviewed by and recommended to the Librarian by the Executive Committee. We are working with the Copyright Office and CRS, as well as all the Library service units to ensure their IT mission-specific needs are addressed. The Library's 2016-2020 IT Strategic Plan identifies goals that apply to all services units within the Library of Congress. These goals are: provide strategic direction and leadership; improve IT investment management; deliver business-driven capabilities; and strengthen protection for systems and information. Additionally, over the past 18 months, we have been maturing our governance processes and will continue to do so. Over the past few months, we have finalized nine new Library regulations to strengthen IT processes and establish new policies regarding IT governance mechanisms that are integral to effective and efficient IT management. As we move forward to a centralized IT model, OCIO will be operating with transparency, fairness, and open communication. It is our priority to strengthen Library-wide working relationships and to understand the mission-specific IT capabilities needed by the different Library service units. Moving forward, the OCIO will provide central planning, coordination, and execution oversight for all Library IT investments to increase value to service unit missions, business products and services. These centralized services will increase the efficiency and effectiveness of IT staff and contractor resources and invested IT capital assets across the institution and improve the delivery of IT services. Mechanisms include: oversight of IT investment planning and IT resources through an agency-wide IT Steering Committee; adoption of an enterprise-wide architecture (EA) framework; promulgation of Project Management Office (PMO) best practices and standards, following a more modern agile modular system development approach; and maturing Library's IT service catalog, (a set of IT service management practices that focuses on aligning IT services with the needs of business).

**b. Relatedly, how will your office establish requirements for line of business systems, such as the Copyright Office and CRS, so that they fit into the Library IT environment? How will you determine the skill sets needed of your employees so that you also meet technical requirements such as disaster recovery, computer security, and maintainability?**

Service units will define business requirements for future systems. OCIO is responsible for taking these business requirements, turning them into technical requirements and then managing the process of converting technical requirements into finished IT capabilities. The OCIO is responsible for ensuring IT capabilities meet business needs as approved by the Librarian.

The Library has partnered with Office of Personnel Management (OPM) to conduct an agency-wide IT Human Capital Needs Assessment with the goal of identifying gaps between current skills and future needs of IT staff. In June 2017, OPM began

administering the surveys as planned, with a proposed closing date of July 21, 2017. Once the surveys close and the data tallied, the Library will better understand the IT Skills gap that may exist and will develop a plan to close them.

- 4. In your written testimony, you briefly touched on the Asset Management Tracking System (AMTS) as the agency-wide tool to maintain a comprehensive inventory of all agency IT assets. How are you tracking the effectiveness of this system? Please share performance metrics if available. What are some examples of how this system has successfully tracked both capitalized and non-capitalized accountable IT assets?**

For many years the Asset Management Tracking System (AMTS) has been used by the Library as the official tracking system for all fixed capitalized assets. The FY 2016 financial audit confirmed AMTS capitalized asset listing was accurate and recommended improvements in procedures and timely completion. A consolidated solution to tracking accountable personal property (non-capitalized), fixed assets below the capitalized level, has been addressed. Earlier this year, the Library expanded AMTS to incorporate all capitalized and accountable personal property. OCIO is currently conducting a full physical inventory of all accountable personal property. Concurrently, an inventory of all fixed capitalized assets is underway. Both are scheduled for completion in conjunction with the FY 2016 fiscal close.

- 5. GAO recommended broad deployment of so-called Multi-factor authentication to better protect Library systems. What is the status of this effort? In early May, Congress directed the Library to conduct a study prior to executing the multi-factor authentication request. Is the study complete?**

- a. You also mentioned that the Library is working with other Legislative Branch agencies to make sure you have a way to federate identities across the Legislative Branch. What is the status of that effort?**

The Library contracted with RAND, a Federally Funded Research and Development Center (FFRDC), to conduct a study on Multifactor Authentication (MFA) in the Legislative Branch. RAND has completed the final report which will be delivered to the committees by the end of the month. RAND has also completed a draft SOW for the Library to use to implement MFA. The SOW will be released after the Legislative Branch study has been delivered to the committees. RAND will also be working with the Library to review vendor responses and compare them to the requirements in the report and SOW. The recommendations in the study identify common characteristics of MFA technologies and contemplates interoperability of these technologies should Legislative Branch agencies desire to federate portions of their capabilities.

- 6. In your written testimony, you mentioned the Library has contracted with a cloud-based denial of services mitigation service. Has this service been effective in allowing the Library to use a content delivery service to make content available to Congress and the public no matter where they reside?**

The Library has implemented a content delivery network (CDN) service that allows for increased protection from denial of service attacks. This technology also enhances content delivery to Congress and the public by caching digital content in the cloud, allowing for faster response times for end users. The average performance time for the Congress.gov home page is currently 1.51seconds, and average availability is 99.5%. This is a 6% improvement in performance and a 1% improvement in availability prior to the CDN implementation. Similarly, LOC.gov has gained a 26% improvement in performance and 1% improvement in availability since the CDN implementation. Moving cached content through a third party content distribution service allows for these faster response times as it pushes the content closer to the end user, resulting in Congress and the public receiving the same level of performance regardless of their location.

- 7. In your testimony to the Committee, you touched on the LOC's progress on Acquisition and Asset Management policies and procedures. In March 2015, GAO reported Library service units purchased unnecessary hardware and software, maintained separate e-mail environments, and managed overlapping and duplicative IT activities. To help ensure an efficient and effective allocation of Library IT resources, GAO recommended the Library conduct a review to identify duplicative or overlapping activities and investments and assess the costs and benefits of consolidating identified IT activities and investments. What progress has the Library made to address this recommendation? Is this one of the recommendations the Library anticipates closing this year? What is your timeline for closing all recommendations related to Acquisition and Asset Management?**

The Library is conducting a review of the IT services currently being offered by Library service units, and assets used to provide the services. The results of this review will be an inventory of Library services and assets, as well as identification of duplicative IT services, activities, and investments. The review will be used to develop a process to reduce and/or eliminate existing duplication, and to prevent duplication of services, activities and investments in the future. This process will be integrated into the Library's ITIM framework. Since the publication of the GAO report, the Library has taken a number of specific steps to consolidate or decrease duplication of IT activities. These include:

- shifting responsibility and oversight of all IT Specialists (job series 2210) to OCIO;
- removal of several helpdesks outside of the OCIO;
- moved the printing functions from Integrated Support Services to OCIO;
- shifting oversight of the Office of Security and Emergency Preparedness' (OSEP's) physical security network to OCIO;
- coordinating all public-facing web pages through OCIO's Web Services division;
- publishing a baseline IT service catalog, which describes the IT services that OCIO provides to all Library organizations and staff;

In addition, the Library has implemented a more robust ITIM process, in which all service units participate. This process is not only intended to identify all of the Library's IT resource requirements, but also affords the opportunity for senior management to see the full universe of IT resources and consolidate where appropriate.

OCIO anticipates providing evidence of implementation to GAO regarding IT Acquisitions recommendations (4) by the end of Q1/FY2018 and the recommendation associated with duplicative or overlapping IT activities or investments by Q2/FY2018.

- 8. In March 2015, GAO found the Library's central IT provider was not delivering IT service that satisfied the needs of the other Library units, which contributed to other units pursuing their own IT activities. In November 2016, the Library initiated efforts to centralize IT management by detailing all top-level IT staff in the various service units to the Office of the Chief Information Officer (CIO). In light of GAO's finding and the Library's efforts to centralize IT, it is important that the Library's Office of the CIO collect data on satisfaction with the IT services it provides. What steps has the Library taken to collect data on satisfaction with the IT services provided by the Office of the CIO? What progress has the Library made to improve satisfaction with these services?**

The Library drafted a customer satisfaction improvement plan based on the Software Engineering Institute's (SEI) Initiating, Diagnosing, Establishing, and Acting & Learning (IDEAL) model as recommended by General Accountability Office (GAO). An IT investment is being submitted for implementing the plan to the Information Technology Steering Committee in FY2018.

- 9. How are you working with the service units to define service expectations?**

The Library continues to engage service units through the use the service catalog and memorandum of understandings. As the Library centralizes IT resources, a formal process will be established to provide liaison services. This is currently being addressed in Phase 2 of the OCIO re-organization. The OCIO convenes regular meetings with service units at several levels and publishes metric data including customer satisfaction surveys and Service Desk ticket data. In addition, OCIO has completed and executed Service Level Agreements (SLAs) for implementation of standard services and commodity IT across all Library service units. These SLAs identify a set of clearly-stated commonly-available base services. We are working with the service units to ensure these services continue to be based on up-to-date cost-effective technologies. For mission-specific needs, we have begun to work with each service unit to identify and address requirements that are targeted to business operations. Both common and mission-specific services are being incorporated into a service catalog, using industry-standard service management principles and practices.

- 10. In your written testimony, you mentioned the completion and execution of a Service Level Agreement as of September 30, 2015, which identifies commonly-available base services for all Library service units. What steps are you taking to ensure that these services continue to be up to date and cost effective?**

As a baseline, we have completed and executed Service Level Agreements (SLAs) for implementation of standard services and commodity IT across all Library service units. These SLAs identify a set of clearly-stated commonly-available base services. We are working with the service units to ensure these services continue to be based on up-to-date



cost-effective technologies. For mission-specific needs, we have begun to work with each service unit to identify and address requirements that are targeted to business operations. Both common and mission-specific services are being incorporated into a service catalog, using industry-standard service management principles and practices. OCIO published the service catalog on September 29, 2016. It consists primarily of base services (commodity) that were identified in the service level agreements. In addition to the service catalog, the OCIO established Memorandum of Understandings (MOU) with each service unit to agree on service requirements of those services that are not yet reflected in the service catalog. OCIO is also implementing the Technology Business Management (TBM) framework to capture costs of IT resources. Additionally, it aligns resources, services, projects, and business capabilities cohesively into a value chain to enable transparency of IT costs, consumption, and business performance.

- 11. In your written testimony, you briefly covered the LOC's data migration with the movement of production systems out of the current Tier 1 facility to more advanced Tier 3 equivalent hosting environments. Please provide examples of significant improvements in reliability that have enabled a greater focus on modernizing business applications across Library service units as a result of this migration.**

Thanks to Congress' multiyear commitment to the Library's data center migration, we are aggressively implementing our transition from the current Primary Computing Facility (PCF), rated as "Uptime Institute Tier 1", to a hybrid infrastructure model that includes Tier 3-equivalent hosting environments. Moving production systems out of the PCF will provide significant reliability improvements and enable greater focus on modernizing business application across Library Service Units.

An "Uptime Institute Tier 3 rating" implies redundant power and cooling components and corresponding redundant delivery paths, to ensure every power and cooling component needed to support the IT environment can be shut down and maintained without impact on the overall IT operation. Redundancy of these critical components will allow facility maintenance, repair, and testing events to occur without shutting down data center services. The current PCF requires an annual shutdown during maintenance and testing by the Architect of the Capitol (AOC). Hardware failure is experienced during each planned power shutdown. During the August 2014 shutdown, \$60,000 worth of equipment failed and had to be replaced. The August 2015 shutdown and subsequent recovery was the cause of the costly nine-day outage. Operating in a Tier-3 facility will eliminate planned power outages and significantly reduce risk for Library IT systems.

- 12. In your written testimony, you mentioned there are several steps the Office of the CIO has taken to improve its organizational structure to better support the Library. Phase 1 of the restructuring formally established a Library-wide Project Management Office (PMO) to communicate and enforce the Library's Project Management Lifecycle/System Development Lifecycle methodology. Can you give us a specific example of how this has ensured the Library's major IT projects are effectively managed in a consistent manner across all service units?**

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 to improve 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. As part of Phase 1, 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. Per the recently developed PMO regulation, the OCIO PMO has been vested with responsibility for tracking, monitoring, and assessing Library wide IT projects. This oversight responsibility will help ensure that all Library IT projects are effectively managed and in a consistent manner across all service units. This oversight responsibility has already begun to help ensure that all Library IT projects are effectively managed in a consistent manner across all service units. For example, PMO weekly reports which show the progress and health status of IT projects now include both OCIO-managed and Service Unit-managed projects. Also, the monthly Project Portfolio Review meeting includes all IT projects across the Library with a focus on at risk projects. These changes have brought increased visibility to IT projects and enabled the PMO to provide feedback and guidance to IT project teams Library-wide.

**Questions from the Minority:**

- 1. Since the Acting Register of Copyrights took office, how has the coordination between the Library and Copyright Office's IT management improved?**

On May 16, 2017, the Copyright Office and OCIO kicked off a project to update 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. By early August 2017, the Library will issue a joint response 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 that the Copyright Office is able to rely upon a stable Library IT infrastructure. While work on this Copyright IT Modernization Plan update continues, OCIO and Copyright Office staff together identified mission focused initiatives that can be accelerated, revised, or deleted as the Library begins to adopt an integrated enterprise-wide investment approach, where Copyright remains integrated with the Library's IT Investment framework. The Library adopted the basic cost optimization principle where OCIO would fundamentally be responsible for commodity IT Infrastructure. This includes most of the infrastructure services, back office services, desktop services.

- 2. You testified that you are working with the Copyright Office to rework their IT Modernization Plan. The first version of that plan failed to consider the work being done by the Library, isn't that correct? Was this a mistake?**

The original Copyright Office Provisional IT Modernization Plan and Cost Analysis did not consider any work being done by the Library. That strategy failed to consider advantages of in-place and planned upgrades to infrastructure and services provided by the Library to all of its service units. On May 16, 2017, the Copyright Office and OCIO kicked off a project to update provisional Copyright Office plan, per instructions from the House and Senate Appropriations Committees. Representatives from both offices are working together closely to deliver an actionable plan that will document a roadmap for ensuring that copyright patrons are able to access information as seamlessly as possible, and that the Copyright Office is able to rely upon a stable Library IT infrastructure. While work on the Copyright IT Modernization Plan update continues, OCIO and Copyright Office staff together identified mission focused initiatives that can be accelerated, revised, or deleted as the Library begins to adopt an integrated enterprise-wide investment approach, where Copyright remains integrated with the Library's IT Investment framework. The Library adopted the basic cost optimization principle where OCIO will be responsible for the commodity IT Infrastructure. This includes most of the infrastructure services, back office services, desktop services and even some mission services in the areas where splitting from the Library was originally contemplated.

3. **It is our understanding that should the Copyright Office's modernization plan leverage and coordinate with the Library's organization-wide strategic plan, that significant time and money could be saved on the Copyright Office's current plan. Is that correct? And if so, how much?**

Together, the Copyright Office and OCIO reviewed the provisional IT Modernization Plan and identified mission focused initiatives that can be accelerated, revised, or deleted as the Library begins to adopt an integrated enterprise-wide investment approach, where Copyright remains integrated with the Library's IT Investment framework. The Library adopted the basic cost optimization principle where OCIO would be responsible for the commodity IT Infrastructure. This would include most of the infrastructure services, back office services, desktop services and even some mission services in the areas where splitting from the Library was originally contemplated. In the Library's fiscal 2018 Congressional Budget Justification, OCIO requested \$9.69 million for enterprise investment in IT modernization, and \$3.63 million for support for Copyright mission-focused initiatives. The estimates associated with the fiscal 2018 budget requests remain the same. The two requests in the FY2018 Congressional Budget Justification are less monetarily than the initial Copyright request in their IT provisional IT Modernization Plan, resulting in a cost reduction.

4. **What kind of impact does not having an appointed Register of Copyrights have on the Copyright Office's ability to not only plan its own modernization efforts but also leverage the work being done by the Library overall?**

The Copyright Office is currently under the capable leadership of Acting Register Karen Temple Claggett. The Librarian of Congress meets regularly with her to hear relevant updates and ensure that the Library of Congress is providing proper support for the Copyright Office.

Like other service units within the Library, the Copyright Office has crafted its own modernization plans. The Copyright Office benefits, as do all service units, from Library IT centralization as we work together to modernize our systems and operations. Our Chief Information Officer leads the technical and information technology elements of the Library's modernization plan and works closely with the Copyright Office on its unique IT needs.