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**Before the Select Committee on the Modernization of Congress**

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Chair Kilmer, Vice Chair Timmons, and Members of the Committee:

I am pleased to appear today to testify about ways to improve the digital capacity of the House of Representatives. I will be speaking to structural issues that raise the costs of implementing digital initiatives to serve Members, staff, civil society groups, and, last but certainly not least, your constituents.

I have served at the Committee on House Administration for 13 years and the U.S. Government Publishing Office (GPO) for eight years in a variety of leadership roles supporting the modernization of the legislative process as well as the full range of institutional capabilities. Examples include creating the Legislative Branch XML working group, implementing docs.house.gov, modernizing committee audio and video capabilities to include uniform webcasting, forming the Legislative Branch Cyber Security working group, participating in the Bulk Data Task Force, and increasing the resiliency of the legislative process.

In doing this work, I have collaborated with stakeholders across the House of Representatives and the legislative branch, and built working relationships with executive branch agencies, members of civil society, academics, and businesses.

I have been asked to speak today to two issues: first, structural and governance issues that impede effective digital cooperation across the legislative branch and, second, the effect of ethics rules on modernization.

Three key issues to consider are:

1. How should technology be governed and funded in the House and across the legislative branch?
2. What technology products or improved processes should be mandated to improve the digital experience of all stakeholders?
3. How should the tension between creativity and stability be managed? The use of open source software can be a proxy for this discussion—where and how should it be used?

## **Institutional and Organizational Issues: Governing and Funding**

Many of the impediments to addressing the technology needs of stakeholders are being worked around in Congress today. Few are showstoppers in and of themselves. Rather, these impediments risk resulting in the death by a thousand cuts: many small and medium-sized problems that cumulatively increase costs and slow progress. This results in stakeholders implementing creative workarounds, which do not necessarily scale. The same type of problem is solved multiple times, resulting in non-interoperable systems and greater maintenance costs, sapping funding for innovation.

The following sections enumerate the problems that arise and my recommendations for reform.

### **Prioritize Projects**

A key reason congressional projects take longer than equivalent projects in the private sector is that there is no overall prioritization mechanism in the House or the larger legislative branch. In short, there are too many concurrent projects. Each stakeholder tasks House Officers, especially the House Chief Administrative Officer (CAO), with projects, and no entity has taken on the role of program management to prioritize and integrate the schedules and needs of competing or dependent projects. This is not a competency issue within the officer organizations; it is a higher-level problem regarding how the institution as a whole prioritizes and manages technical projects.

This means that internal technologists are balancing too many separate projects concurrently, and thus many projects are part time and involve the inefficiency of stopping and starting work. This also applies to contracted resources, which need to fully employ their people. If the funding does not allow for full-time work, vendors will add other projects so that their people can multitask. The inefficiency of working on multiple projects grows as the number of concurrent projects rises. It is not surprising that this arises, as there is also no single entity with a wide range of scope that is responsible *sua sponte* for identifying technology projects, responding to user needs, and pushing forward innovation.

If needed functionality is not provided centrally in a timely manner, then various stakeholders will implement their own ad hoc solutions. (See “Technology Use in Committees” below.)

The House should establish a transparent process for prioritizing projects and resources that provides Officer organizations clear direction. Its charter should include not just listening to internal stakeholders, but also non-legislative branch stakeholders who have a track record of pushing for innovation inside Congress.

Another promising way to address these challenges would be empowering, expanding, and leveraging the House Digital Service. The House Digital Services team<sup>1</sup> is part of the Chief Administrative Officer's organization within House Information Resources. The team's current scope restricts what kinds of problems it can address without negotiation with other stakeholders. As recommended by this Committee, increasing the scope by chartering a House-wide Digital Service would allow for greater utilization of their capabilities.

### **Address Funding Models**

The pacing of all projects is limited by funding. The Appropriations Committee has more requests than funding for the legislative branch allocation. Consider the following scenario: If a technology project is scoped for five years, it is not unreasonable to allocate 20% per year. However, this precludes accelerating progress if conditions permit. It may also mean that projects are not finished as promised, because in the best case it finishes on time; finishing ahead of schedule becomes impossible.

It should be noted that not all projects need to be accelerated. If a working legacy solution is expected to reach the end of its useful life in four years, a three-year replacement project does not need accelerating. Projects solving an unmet need that affects the effectiveness of Congress should be candidates for a more aggressive funding strategy, which should be tied to that project meeting and exceeding the project plan. This could be accomplished with greater use of multi-year or no-year funding to provide additional flexibility.

The Modernization Fund, which this Committee has advocated for, is a good step forward. I recommend using it to fund projects of no more than four to six months' duration in order to deliver timely results, which in turn would increase support for the strategy as people see tangible benefits. In addition, efficiencies gained from these modernizations, and resulting cost savings, should be rolled in part back towards further technology modernization efforts.

### **Centralize Technology Functions**

No other national parliament splits technology development in the lower chamber between two entities—the Clerk and the CAO—according to the Congressional Research Service (CRS) and my interactions with parliamentary delegations. Given the unique nature of the House's organizational structure, improvements should be made. There are a range of options that could be adopted, from most wide-ranging to most specific:

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<sup>1</sup> MODCON Recommendation 95: Establish a Congressional Digital Services Task Force to examine the need for and role of a specialized group of technologists, designers, and others to support the House's internal and public-facing operations.

1. *Create one central IT organization* like other national legislatures and the U.S. Senate. For example, the House could charter a House Chief Information Officer as the CIO of the entire House and transition technology organizations to that CIO. Product Managers who best understand the business model and customer needs should remain in the other organizations to serve as experts and advocates.
2. *Establish two central IT organizations with clearly defined roles.* The Clerk would become responsible for all legislative related development, including HOLC and within Committees. The CAO would be responsible for all other centralized IT in the House.
3. *Identify smaller IT organizations that would demonstrate progress,* if options 1 and 2 are not possible in the next Congress. For example, Consolidate the Sergeant of Arms CIO organization to the CAO and the IT functions of the House Office of Legislative Counsel to the Clerk.

*Additionally, if option 1 is not implemented, assign responsibility to the CAO for all digital infrastructure and devices connected within House buildings, including the House side of the Capitol. The scope of that responsibility should be negotiated with stakeholders but should include all network devices. The CAO should ensure that the resilience of this infrastructure matches the continuity and data preservation requirements of House leadership for affected organizations.*

## **Digital Services Roadmap**

Each legislative branch agency invests in technology. The Government Accountability Office (GAO) should select a maturity model to help guide agency progress. GAO should be tasked with creating an agency self-assessment on digital service capabilities and maturity for each agency using the maturity model.

A number of entities publish roadmaps and maturity guides for digital service organizations. It would be helpful to have one definition in the legislative branch to enable apples-to-apples comparisons for funding and coordination of development projects amongst the agencies.

Consider as well a co-creation process or coordinating function among the legislative branch agencies. For example, are there ways that the services of the GAO, GPO, or CRS should coordinate with one another and use shared services, tools, or data? Instead of focusing these agencies around the legislation that established them, perhaps they should be designing their products from the point of view of the congressional end user. Building synergies across agencies that address common issues could be more fruitful than having them thinking inside the proverbial box.

## **Acquisition Flexibility**

The executive branch through the General Services Administration (GSA) supports challenges and contests as one method of acquiring solutions. There is specific statutory authority,<sup>2</sup> which excludes the legislative branch. These methods can broaden the number of participants attempting to solve the given problem and help nurture a community through the interactions of a contest. Contests can choose to require that all submissions be open source to aid all developers in maturing solutions to that problem set. Of course, this is not appropriate in all circumstances.

One concern in the House has been how to match the level of effort with the compensation to avoid the ethics issues previously discussed.

The Library of Congress has hosted<sup>3</sup> legislative data competitions to improve access and visualization tools with cash prizes for the winners. The challenge was restricted to legislative research due to the scope of their appropriations.

I recommend establishing legislative authority for the House to conduct contests and challenges with monetary compensation.

I discuss elsewhere how co-creation, such as the use of open source software, can be another way for the House to improve its technological capabilities.

## **Improve Data Sources for Oversight**

Congress uses external information from the executive branch and outside entities as part of the committee oversight process to assess program effectiveness. An entity such as the Government Publishing Office (GPO), the Library of Congress (LOC), or the Bulk Data Task Force should be responsible for curating that information into standard formats and access methods on behalf of the legislative branch. Publishing standards for data elements so that unique and common identifiers are used increases the ability to combine disparate data sources effectively.

Depending on the stability of how the external data is stored and curated, it may be necessary to import information so that it is under the control of the legislative branch and not subject to “correction.” In addition, there may be value in pointing to information held externally, although

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<sup>2</sup> Public Law 111-358, section 105.

<sup>3</sup> The Library of Congress offered top prizes of up to \$10,000, which created significant interest from civic technologists. See Tina Gheen, “Library of Congress Announces First Legislative Data Challenge,” Library of Congress, July 16, 2013, <https://blogs.loc.gov/law/2013/07/library-of-congress-announces-first-legislative-data-challenge>; “Library of Congress Announces Second Legislative Data Challenge,” Library of Congress, September 10, 2013, <https://www.loc.gov/item/prn-13-161>; and “Library of Congress Launches Congressional Data Challenge,” Library of Congress, October 19, 2017, <https://www.loc.gov/item/prn-17-132>.

it may make sense to utilize internet archival sources to verify what was posted at a given point in time.

Standard access methods through uniform Application Programming Interfaces (API) simplify integration into established information systems, such as congress.gov. and govinfo.gov. In addition, a mature digital infrastructure allows users—Members, staff, and the public—to create ad hoc reports, queries, and visualizations. Congress should consider how these needs could be more effectively met through business intelligence products to reduce the effort of staff to create custom information products.

The House should continue to work with the Senate on providing for common needs of Members. The Senate shared and is maintaining the Quill application with the House, which is an excellent precedent. Extending scarce resources by dividing up developing constituent support workflows, such as an Military Service Academy nomination process, would improve efficiency and service.

### **Technology Use in Committees**

Support for technology use within Committees is no one's specific responsibility; the Clerk, CAO, Legislative Counsel, and the committees all own portions. One of the challenges is how to spread process improvements enabled by technology laterally across the committees. For example, one House committee funded and is maintaining an application for managing the Questions for the Record (QFR) process, which includes a history of QFR questions and responses by roles such as Assistant Secretary for Management over time.

Individual point solution tools in committees are costly to develop and maintain and violate the “develop once, use many” principle. Furthermore, best practices do not easily spread among committees, especially when new staff are onboarded, because of separate ad hoc tools and processes. It would be wise to conduct an in-depth survey of committees for these unique tools and practices and to consider whether and how such tools could be offered on a chamber-wide basis.

Furthermore, lawmakers should consider the resilience of committee operations during a continuity event. The nature of the event will determine which committees need to meet after an event which may have caused the unavailability of key staff from those committees. Replacement staff, perhaps clerks from other committees, need to understand the differences in committee rules and practices from their own committee, but they should not have to learn different tools in order to conduct a hearing or markup in the aftermath of an emergency.

The Office of the Clerk should extend the functionality of the Legislative Information Management System (LIMS) to support required committee functions. Where differences in process cannot be resolved, LIMS should adjust the workflow for each committee.

## **Automatically Create Committee Reports**

A pilot project was developed by the Committee and House Administration, working with the Office of the Clerk to use the information in docs.house.gov to automate and standardize the creation of committee hearings. With this Committee's recommendation for electronic submittal,<sup>4</sup> this project should be rechartered. Government Publishing Office funding<sup>5</sup> of at least \$4,000,000 in 2017–18 was used to create and publish these reports; this funding could be freed up through automation. This was intended to save staff significant time creating these reports, improve the quality of the documents by making sure the information is in appropriate data formats, and improve the timeliness by which reports are reported out to the chamber and made available online.

Staff met with each committee's legislative staff in 2013–14 to establish a standard house format with adjustments for the unique needs of each committee. Docs.house.gov would have been expanded to include additional information, such as transcripts. A vendor developed prototype software to demonstrate the feasibility of a modern report format; the project was turned over to GPO, which decided not to proceed in 2017. The cost of the prototype was \$50,000.<sup>6</sup>

## **Stability Versus Innovation**

Different domains have different requirements for stability, consistency and innovation. The core legislative process has very high requirements for stability, accuracy, and repeatability. By contrast, there are many tasks undertaken by stakeholders in the House that are repeated and time-consuming, but automation is not supported by the chamber. In those instances, there may be greater risk-tolerance and innovation, allowing an increased workflow to improve productivity.

The House should define a strategy regarding where and how to use open source and acquisition flexibilities to best effect.

Core functionality, such as how committees operate, should be incorporated into centralized tools but could be acquired via internal development, open source strategies, co-creation with outside stakeholders, and/or challenges or competitions as appropriate.

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<sup>4</sup> MODCON Recommendation 53: The House should make permanent the option to electronically submit committee reports.

<sup>5</sup> In 2017–2018, the Legislative Branch Subcommittee funded \$4,419,000 for details to Congress and \$2,360,000 for creating and publishing Committee Reports. Current year report language no longer includes this information. Details are used mainly for the creation of committee reports but also support other requirements.

<sup>6</sup> This was prior to Mr. Halpern becoming the GPO Director.

However, this raises the question of where technology should be differentiated. A framework for committee oversight, as discussed above, could be matched with a range of query and visualization tools so that each side or Member in a committee could use their own strategy to inform the oversight process.

### **Effects of Ethics Concerns on Modernization**

When the Committee on House Administration established the Congressional App Challenge in 2015,<sup>7</sup> I worked closely with Ethics Committee staff to establish the rules of the competition. At that time, the Congressional Art Competition<sup>8</sup> was a logical starting point for the discussion. Technology companies often have issues before Congress that they wish to influence. It was not a concern that the makers of art supplies would use the Art Competition as a means for undue influence. This explains the different rules for different competitions; it would be simpler for House staff to have one set of rules for all competitions involving students.

### **Open Source**

Open source technology development involves developers publishing their code in a public-facing code repository, allowing for others to use the code, and enabling others to submit suggestions on how to improve or expand the code's functionality. (By comparison, closed source means that the code is not published online and individuals are not allowed to modify the code.) This open source technology ecosystem underpins much of the technology we use today.

Typically, developers find pre-written code in open repositories, such as GITHUB, to speed up the technology development process. Many of these pre-written pieces of code solve problems of general interest, such as comparing the text between documents. However, if the code focuses specifically on technology needs of Congress, then in some instances the Ethics Committee may view it as an attempt to encourage favoritism for the creators. This creates anomalous results, as the operations of Congress are of general public interest and it is not unusual for public stakeholders to be interested in similar questions as congressional staff. Nonetheless, there may be an apparent (if not actual) conflict that apparently arises from the potentially improper giving of a gift or conduct of work that may only be done by a paid employee.

There are several use cases to consider from an ethics perspective.

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<sup>7</sup> See "About," Congressional App Challenge, <https://www.congressionalappchallenge.us/about>.

<sup>8</sup> The Congressional Art Competition was established in 1982 as the Artistic Discovery Competition and evolved over time into the Congressional Art Competition. High School students in participating districts may submit two-dimensional art. The winning piece from each district is displayed in the United States Capitol. The winners of the Congressional App Challenge create a video discussing their work, which is played on a display in the United States Capitol. See "Congressional Art Competition," U.S. House of Representatives, <https://www.house.gov/educators-and-students/congressional-art-competition>.



1. Incorporating free software components into product development.

The House has been using open source or free software for at least 20 years. These have been for general functionality and not House-specific requirements, which avoid one ethics concern.

2. Participating in the development of open source software.

Open-source development involves a give and take to discuss use cases, requirements, software defects, etc. It can be unclear when House staff provides input. At one end of the spectrum, providing input on software defects, etc., is a public-spirited effort to make technology better for everyone. At the other end, the Congress could be inappropriately tasking outside groups to do work for the House.

In the worst-case scenario, a major technology company spends hundreds of thousands of dollars developing and openly posting code that only the House will use for the purpose of influencing the House. On the other hand, non-profits and individuals in the civic or legislative tech space want to help make improvements in the legislative process or public access to information without raising ethics concerns.

3. Publishing House software for the open source community

Participating in open source forums by contributing internally developed source code is a welcome public-minded participation by congressional actors. The converse, using open source software in congressional operations, should be preceded by a plan to address security and incorporation of external code into House operated software.

4. Member offices jointly developing open source software.

This will run into limitations on the use of MRA funds, including staff time, which generally prohibit supporting non-House activities.

Clearer guidelines regarding participation in open-source communities, source of contributions, and breadth of reuse would help internal developers utilize open source without creating ethics concerns.

## **Summary**

The House Select Committee on the Modernization of Congress is providing valuable leadership to modernize Congress's technology systems. To achieve these significant reforms, the Committee and the House of Representatives should address:

- The organizational placement of House technology organizations and their respective roles;
- Added acquisition flexibility to increase innovation;
- Defining a strategy for the use of open source that strikes an appropriate balance between stability and innovation;
- Legislative branch wide strategy and governance for information sharing, especially APIs and bulk data repositories, including access to appropriate executive branch information sources; and
- Reducing costs through appropriate use of technology.

The result of these constructive reforms would be a more effective and accountable Congress that uses technology to work better for Members, staff, and the American people.