

American Political Science Association
Task Force on Congressional Reform
Report from the Subcommittee on
Technology and Innovation

September 2019

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Over the past several decades, successful organizations, large and small, have taken advantage of the revolution in information technologies to communicate with stakeholders, share information internally, learn about their environment, and reap operational efficiencies. Congress's forays into the information revolution, in contrast, have been tentative. Congress¹ is struggling to keep pace with increasingly rapid technological advances. The institution lacks the expertise to identify policy solutions to regulate or promote responsible development and use of emerging technologies. Additionally, Congress has not adopted new tools and technologies that could better support its own operations or facilitate better communication with constituents. As a consequence, constituent voices are left unheard, internal communications among members and staff are inefficient, the informational gap with executive agencies has continued to grow, and the security of congressional information infrastructure is vulnerable.

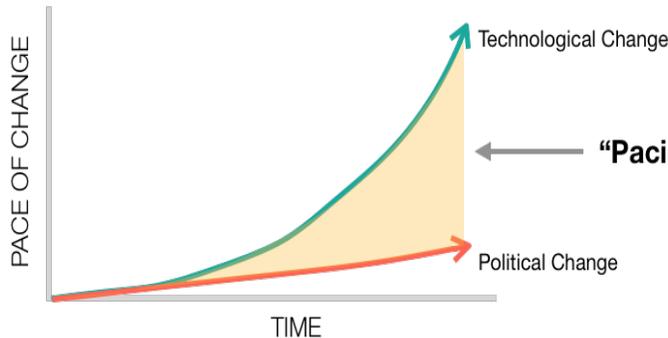
We propose a focused set of reforms that will move Congress into the twenty-first century and provide a platform for it to adapt to the rapidly changing informational technology environment. This report relies on a comprehensive view of congressional modernization, calling for a Congress that prioritizes information and continuous learning and uses technology to gather and process input from a wide array of sources to improve policy, oversight, constituent engagement, and its own operations. Modern organizations rely extensively on information to guide data-driven decision-making. They build continuous learning and refinement based on experimentation into their workflow and culture and, as a result, are able to adapt to rapidly changing circumstances. Modernizing Congress, then, is about more than upgrading technology — it is about instituting ongoing processes that facilitate information-gathering, experimentation, and evidence-based decision-making.

The Pacing Problems: Congress has fallen behind on technology in several key ways

Political institutions have failed to keep pace with the exponential rate of technological advances; this is not a problem unique to Congress. Arizona State University Professor Gary Marchant described it as a

¹ The lack of capacity for engaging technology is similar in both the House and the Senate. While we use Congress generically to describe the problems, our recommendations focus specifically on the House.

“pacing problem” — “the growing gap between the pace of science and technology and the lagging responsiveness of legal and ethical oversight society relies on to govern emerging technologies.”²



There are three related manifestations of this pacing problem for Congress: **external**, as the substance and scope of policymaking and oversight fail to keep pace with technological innovation; **inter-branch**, as

Congress falls behind the executive branch and fails to maintain capacity to operate as a co-equal branch; and **internal**, as Congress lags in incorporating new technology into its own processes and workflow.

The technology and innovation subcommittee offers recommendations to address the pacing problem in each of its manifestations, but provides the greatest depth on recommendations related to the *internal* pacing problem, for several reasons. First, technology to improve the internal functioning of Congress will free up resources and capacity that can be reallocated to higher priority tasks such as policy research and expert engagement. Second, making it easier for Congress to receive and process information will improve the institution’s ability to hear from diverse sources, increasing opportunities for broader understanding. Third, as society becomes more data-driven in the long run, addressing the external and inter-branch pacing problems will require more than just good advice; it will require the ability to monitor, analyze, and incorporate information on a constant basis. This rapidly approaching new world will require Congress to get its own technological and cybersecurity house in order.

Addressing the External Pacing Problem

The external pacing problem has received significant attention lately, as several high profile events have exacerbated the public’s sense that Congress is not up to the task of legislating or conducting oversight in areas of emerging technology. The infamous “Facebook Hearings,” of April 2018 are now universally referenced as an illustration of Congress’ inability to comprehend the business models and practices of companies and technologies it is tasked with regulating. At these hearings, “[o]n the whole, senators

² Marchant, Gary E., Allenby, Braden R., Herkert, Joseph R. (Eds.), “The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight,” (2011), Springer, <https://www.springer.com/gp/book/9789400713550>

didn't grapple with the cultural and political implications of Facebook so much as with the basic mechanics by which it operates."³ As one commenter put it, the hearings:

*proved conclusively what I had believed for many years ... the U.S. government leaders know so little about tech that they cannot even ask meaningful questions under a national spotlight, let alone develop comprehensive cyber-policies that will protect our citizens and promote our critical tech industries.*⁴

As the complexity and scope of government has transformed over the years, policymaking has become largely reactionary, coming after an issue has been identified and, in most cases, left up to lawmakers who have only a superficial understanding of the topics under consideration. And Congress has become dependent on outside sources of expertise,⁵ in many cases through research or policy suggestions sponsored by interest groups or think tanks with a specific policy agenda.⁶ Congress must develop the internal capacity to understand analytic and technical arguments independently of the expert who is providing the advice, so as to be able to exercise independent judgment and avoid capture by narrow interest groups.⁷

To address this need, the subcommittee recommends three courses of action:

1. Improve processes and tools by which committees engage with experts to inform policy making

Lawmaking and oversight are core responsibilities of the legislative branch, and committees are the central actors in this work in Congress.⁸ Within committees, legislation and oversight priorities typically emerge from familiar paths, much as they have for decades. Committee leaders and staff tap existing

³ Pliott, Elena, The Senate Tries to Figure Out Facebook, *The Atlantic*, April 11, 2018, <https://www.theatlantic.com/politics/archive/2018/04/zuck/557717/>

⁴ Schafer, Mark, The Facebook Congressional Hearings were more disturbing than you realize, <https://businessgrow.com/2018/04/13/facebook-congressional-hearings/>

⁵ Richard L. Hall and Alan V. Deardorff, "Lobbying as Legislative Subsidy" *American Political Science Review*, 2006, Available: <http://dx.doi.org/10.1017/s0003055406062010>.

⁶ Kay Lehman Schlozman and John T. Tierney, *Organized interests and American democracy*, vols. (Harper & Row, 1986)., Arthur Lupia and Mathew D. McCubbins, *The Democratic Dilemma: Can Citizens Learn What They Need to Know?*, vols. (New York, N.Y.: Cambridge University Press, 1998).

⁷ For discussions, see <https://thehill.com/opinion/judiciary/454744-republicans-cognitive-dissonance-about-congress> , <https://www.rstreet.org/2018/01/24/bring-in-the-nerds-reviving-the-office-of-technology-assessment/> , https://www.belfercenter.org/sites/default/files/files/publication/FWG%20Spring%202019%20Session%201_OTA.pdf , and https://www.belfercenter.org/sites/default/files/2019-06/PAE/CFO%20Policy%20Brief_vF.pdf

⁸ Kevin M. Esterling, *The Political Economy of Expertise: Information and Efficiency in American National Politics*, vols. (Ann Arbor, Mich.: University of Michigan Press, 2004); Keith Krehbiel, *Information and Legislative Organization*, vols. (Ann Arbor, Mich.: University of Michigan Press, 1992).

networks of connected interests to identify areas in need of policy change or oversight attention: lobbyists or interest groups present an “ask,” a local official or industry representative with district ties brings an issue to the attention of their lawmaker, the media highlights an issue, an agency requests a change, or a lawmaker initiates action based on their own knowledge or experience on an issue.

Though “Congress has access to the raw materials for a modern system of effective data-driven representation,” committees are not currently tapping into “the experiences and perspectives of citizens... [or]... the data produced through government-funded research, transactions and programs” in their work.⁹

Technology presents opportunities to streamline committee processes, better inform and engage committee members and their staffers, and to incorporate what we call the “SIDE” elements (Stakeholders, Individuals, Data, and Experts) into the lawmaking and oversight process.

Engaging a broad range of *stakeholders* and *individuals* can expand the knowledge base of committees, bringing in new perspectives and important information about the on-the-ground impact of policy proposals and policies already in place. High-quality *data* can help members move beyond anecdotes and provide committees with objective measures of policy impacts and areas that need their attention. And *experts* inside and outside of Congress can offer their informed judgments of policy proposals and their projected effects as well as analysis of problem areas in current policy. Taken together, SIDE can help committees take actions grounded in evidence and informed by widespread consultation with interested and knowledgeable parties. This is particularly important as committees work to oversee and legislate on complex and emerging technologies.

Examples of technology to improve committees’ access to information include:

- Introducing a (non-commercial) platform for stakeholders and experts to sign up to engage on specific topics
- Providing a request for information (RFI) process in the early stages of bill formation
- Encouraging initiatives to make nonpartisan experts available to answer staffer and lawmaker questions
- Introducing opportunities for moderated “open drafting” for early bill drafts
- Experimenting with “agile” policymaking that authorizes demonstration projects to compare results across different policy interventions
- Allowing for asynchronous online “21st Century Hearings”

⁹ Lorelei Kelly, *Modernizing Congress*, Beeck Center for Social Impact + Innovation at Georgetown University, July 2019

Each of the technologies mentioned above is currently available in some format but most committees are not aware or able to make use of these offerings. In a later section, this report recommends the establishment of a *House Technology Working Group* with a dedicated task force specifically on Committee Technology; the above tools provide examples of technologies that could be reviewed and evaluated by this task force.

2. Support efforts to allow individuals with technical expertise to undertake short tours of duty within Congress

At any time on Capitol Hill, approximately 230 “fellows” augment committee and personal office staff. Some, like the Wounded Warrior fellowships, are funded by Congress itself. Others, like the American Academy for the Advancement of Science (AAAS) Fellows are selected and supported by an outside organization. In 2015, Travis Moore, a former Congressional staffer who had experienced the lack of tech expertise on the Hill, began a crowdfunding campaign¹⁰ to support a “TechCongress” fellowship, drawing inspiration from the successful Presidential Innovation Fellowship¹¹ and other similar programs¹² that follow a “tour of duty” approach for executive branch technology offices. Since 2016, TechCongress has supported 23 fellows¹³ that have served in the House and Senate, supporting member and committee offices by providing extensive technical assistance on a range of substantive technology issues such as cybersecurity, privacy, and the Evidence-Based Policy and Open Data Act. Each year, TechCongress reports a growing number of qualified applicants (over 500 this year), demonstrating the considerable interest from people with tech experience in applying their skills and knowledge to further the work of Congress. The House should support these efforts and examine ways to facilitate the placement of more people with technical skills within House offices.

3. Establish a new support agency to advise Congress on emerging technologies

From 1974 to 1995, Congress funded a support agency known as the Office of Technology Assessment (OTA) that was designed to equip Congress “with new and effective means for securing competent,

¹⁰ Overly, Steven, “Ex-Hill staffer aims to boost tech pipeline to Capitol Hill,” *Washington Post*, July 9, 2019, <https://www.washingtonpost.com/news/powerpost/wp/2015/07/09/ex-hill-staffer-aims-to-boost-tech-pipeline-to-capitol-hill/>

¹¹ <https://presidentialinnovationfellows.gov/>

¹² 18F in the General Services Administration (<https://18f.gsa.gov/>) and the U.S. Digital Services (<https://www.usds.gov/>)

¹³ <https://www.techcongress.io/fellows>

unbiased information concerning the physical, biological, economic, social, and political effects” of emerging technology.¹⁴

During its operation, OTA completed 750 full-length reports on a wide array of topics related to defense, energy, healthcare, the environment and education. Each report took on the order of 18 months to two years to complete. In 1995, its last year of operations, OTA had budget of \$22M (1995 dollars) and a staff of 189, mostly full-time researchers, along with a large number of outside consultants and contractors drawn from the executive branch, industry and academia.¹⁵

OTA worked hard to maintain its well-earned reputation as a politically-neutral advisor for Congress.¹⁶ It had three core features that were designed to ensure Congress received competent, unbiased, and scientifically-based advice on emerging technology.¹⁷ First, the OTA was governed by an independent board, the Technology Assessment Board (TAB). The TAB included members of Congress appointed by the House Speaker and Senate President Pro Tempore, based on recommendations from the majority and minority leaders in both chambers, and both parties and both chambers were equally represented. TAB played a clear agenda-setting role for the agency, approving the topics OTA could investigate. Second, in their research, the OTA staff worked extensively with global networks of experts and with diverse stakeholders to gain perspectives from all sides of an issue.¹⁸ Third, OTA’s reports provided a summary of the technical background on the problems to be solved, along with a set of policy options that potentially could address the problems. OTA’s role was to define or frame the problem and identify possible solutions, and it did not make recommendations among the options or advocate to Congress in favor of any particular option.¹⁹

Over the past year, several significant steps have been taken towards establishing new resources for technology analysis in Congress. In January 2019, the Government Accountability Office (GAO) launched a new Science, Technology Assessment, and Analytics (STAA) team to (1) provide technology

¹⁴ <https://bipartisanpolicy.org/report/congress-needs-the-office-of-technology-assessment-to-keep-up-with-science-and-technology/>

¹⁵ Bruce Allen Bimber, *The Politics of Expertise in Congress: The Rise and Fall of the Office of Technology Assessment* (SUNY Press, 1996) 32–35.

¹⁶ Bimber, *The Politics of Expertise in Congress: The Rise and Fall of the Office of Technology Assessment*.

¹⁷

https://www.belfercenter.org/sites/default/files/files/publication/FWG%20Spring%202019%20Session%201_OTA.pdf

¹⁸ <https://www.cato-unbound.org/2019/06/10/kevin-kosar/congress-tech-policy-knowledge-gap> and <https://www.rstreet.org/2018/01/24/bring-in-the-nerds-reviving-the-office-of-technology-assessment/>

¹⁹ *Ibid.*, 39.

assessments and technical services for the Congress, (2) audit federal science and technology programs, (3) compile and utilize best practices in the engineering sciences, and (4) establish an audit innovation lab to explore, pilot, and deploy new advanced analytic capabilities.²⁰ In April 2019, the House Appropriations Committee approved \$6 million in funding “to re-establish the Office of Technology Assessment (OTA), using the agency’s existing authorization.”^{21 22} Most recently, the Select Committee on the Modernization of Congress recommended “reestablish[ing] an improved Office of Technology Assessment (OTA) to study and recommend emerging technologies, provide nonpartisan information and policy analysis to Member offices, support legislative branch agencies in their examination of new technologies, focus on general oversight and policy, and facilitate peer reviews of potential new technologies.”²³

While reauthorization of the OTA would be relatively easy as the enabling statute has never been repealed, Congress should consider adopting a new kind of Congressional support entity that is a better fit with today’s fast-paced technology landscape and with changing congressional politics.²⁴ First, the OTA should develop alternative products than the dense and thick reports that took two years to complete-- this lengthy time frame to develop reports does not fit well with the quick pace of today’s technology changes.²⁵ Second, instead of a bipartisan TAB that exercises control over the agency’s direction, the OTA should be structured more like the other support agencies with an independent and accountable director that serves the Congress as a whole rather than a limited set of legislators.²⁶ Third, instead of developing extensive in-house research staff, the new agency should employ technical staff who can work in

²⁰ Our New Science, Technology Assessment, and Analytics Team, January 29, 2019, <https://blog.gao.gov/2019/01/29/our-new-science-technology-assessment-and-analytics-team/> although the GAO is primarily tasked with auditing rather than problem- and options definition, see https://www.belfercenter.org/sites/default/files/2019-06/PAE/CFO%20Policy%20Brief_vF.pdf

²¹ Legislative Branch: FY2020 Appropriations, CRS Report #R45755, <https://fas.org/sgp/crs/misc/R45755.pdf>

²² <https://federalnewsnetwork.com/technology-main/2019/05/office-of-tech-assessment-gets-6m-in-startup-funding-under-draft-spending-bill/>. As one commentator notes, \$6 million is not enough to provide OTA the capacity to produce assessments, but it is enough money for a new OTA staff to engage in planning and developing new procedures. See <https://federalnewsnetwork.com/federal-drive/2019/05/need-for-otas-return-to-congress-more-evident-observers-say/>

²³ Second Round Of Recommendations - Staffing, Technology And Accessibility In Congress, July 25, 2019, <https://modernizecongress.house.gov/committee-activity/bills/second-round-recommendations-staffing-technology-and-accessibility-congress>

²⁴ <https://www.belfercenter.org/publication/congressional-futures-office>

²⁵ Tudor, Grant and Justin Warner. *The Congressional Futures Office: A Modern Model for Science & Technology Expertise in Congress*. Policy Analysis Paper, Harvard Kennedy School, Belfer Center for Science and International Affairs. May 2019. Pgs. 105-108. <https://www.belfercenter.org/sites/default/files/2019-06/PAE/CongressionalFuturesOffice.pdf>

²⁶ *Ibid*, pgs. 112-114.

interdisciplinary teams and specialize in networking globally to tap into the knowledge of outside experts on emerging issues.²⁷ Such a redesigned agency would be more agile and more responsive to the information needs of committees and of individual members.

Addressing the Inter-Branch Pacing Problem

Even more severe than the negative public perceptions about Congress' capacity to deal with emerging tech issues was the executive branch's struggles to manage the failed launch of HealthCare.gov on October 1, 2013. That singular event marked an inflection point in the executive branch's approach to technology, igniting a modernization effort that has endured and accelerated.

The Obama administration famously "brought in the nerds" to fix the health care site and, in the process, revolutionized how technology gets done in government.²⁸ Since 2013, the executive branch has made a concerted effort to recruit tech experts into government service for "tours of duty"²⁹ through programs like the Presidential Innovation Fellows,³⁰ the government's internal digital contractor 18F,³¹ and the U.S. Digital Service³² which embeds tech experts within Executive branch agencies. Six years later, the Trump administration has produced the impressive President's Management Agenda (PMA) that articulates a "long-term vision for modernizing the Federal Government in key areas that will improve the ability of agencies to deliver mission outcomes, provide excellent service, and effectively steward taxpayer dollars on behalf of the American people."³³ The PMA emphasizes modern information technology and "fully leveraging the value of federal data"³⁴ as key elements for executive branch reform and provides a framework to track progress by identifying cross-agency priority goals³⁵ and key performance indicators.³⁶

²⁷ Ibid, pgs. 115-123.

²⁸ <https://www.theatlantic.com/technology/archive/2015/07/the-secret-startup-saved-healthcare-gov-the-worst-website-in-america/397784/>

²⁹ Chase Gunter, White House pitches tech giants on civic service, *Federal Computer Week*, Oct 22, 2018

<https://fcw.com/articles/2018/10/22/white-house-tech-service-summit.aspx>

³⁰ <https://presidentialinnovationfellows.gov/>

³¹ Colter, Angela, "Happy 5th birthday, 18F," March 19, 2019, <https://18f.gsa.gov/2019/03/19/18F-5-Anniversary-achieve/>

³² <https://www.usds.gov/mission>

³³ <https://www.performance.gov/PMA/PMA.html>

³⁴ <https://strategy.data.gov/>

³⁵ Cross-Agency Priority (CAP) Goal Overview https://www.performance.gov/CAP/CAP_goals.html

³⁶ Key Performance Indicators, https://www.performance.gov/CAP/key_performance_indicators.html

In many cases, technology advances in the executive branch are undertaken at the direction of Congress. Several new laws³⁷ in the past decade have mandated or facilitated data standardization and sharing, information technology upgrades, and improvements to public-facing services by federal agencies. While the executive branch has moved ahead, Congress has notably failed to launch a parallel effort to define its goals and upgrade its own technological capacity. This failure contributes to a growing technical and expertise imbalance with the executive branch that threatens Congress' ability to act as a coequal branch of government.

Congress has found itself in this position before, when previous imbalances led to the creation of the original OTA in 1972³⁸ and the Congressional Budget Office in 1974.³⁹ In fact, nearly fifty years later, Congress finds itself in the position that Senator Kennedy described during the OTA authorization: "the role of Congress in national science policy would become more and more perfunctory and more and more dependent on administration facts and figures, with little opportunity for independent congressional evaluation."⁴⁰

Addressing this deficiency will require Congress to initiate its own goal and metrics-driven process — perhaps drawing inspiration from the approach undertaken with the President's Management Agenda to develop a "long-term vision" while "fully leveraging the value of federal data" and tracking progress through priority goals and key performance indicators. The following recommendations provide ways for the House to take first steps towards this approach:

1. Require committees to clearly state committee mission in rules and establish key metrics in committee oversight plans

³⁷ Recent laws enacted to support executive branch modernization

- **The Digital Accountability and Transparency Act (DATA Act)**, "modeled on spending transparency measures implemented with president Obama's 2009 stimulus bill" and "g[a]ve federal contractors and grantees a single portal to report how they're spending taxpayer money"
- **Modernizing Government Technology Act** - "creates working capital funds for IT projects at CFO Act agencies that don't already have them, as well as a central modernization fund housed by the General Services Administration."
- **Foundations for Evidence-Based Policy Act** - "stem[med] from more than 20 recommendations the bipartisan Commission on Evidence-Based Policymaking and aims to improve the ability of researchers, evaluators, and statisticians both inside and outside government to securely use the data that government already collects to better inform important policy decisions. The act included the **OPEN Government Data Act**, "which requires all non-sensitive government data to be made available in open and machine-readable formats by default"

³⁸ Blair, P., Congress's Own Think Tank: Learning from the Legacy of the Office of Technology Assessment (2013), p. 27

³⁹ Andrew Prokop, The Congressional Budget Office, explained, Vox, Jun 26, 2017, <https://www.vox.com/policy-and-politics/2017/3/13/14860856/congressional-budget-office-cbo-explained>

⁴⁰ Blair, P., Congress's Own Think Tank: Learning from the Legacy of the Office of Technology Assessment (2013), p. 27

A key element of an effective data or technology strategy is to begin with a clear statement of problems to be addressed—clarity that can be difficult to achieve in the political sphere. At the beginning of each Congress, committees establish subcommittees and adopt rules⁴¹ and submit oversight plans.⁴² The House should consider amending its rules to require the inclusion of a clear, brief mission statement in committee rules that describes priorities for the committee’s work, as well as a list of key metrics that the committee will monitor in carrying out its oversight duties.

This combination of developing a clear mission statement for each committee and designating key metrics provides an early opportunity committee members to establish priorities and an approach for the session ahead. It also alerts agencies, industry, and the public to the committees’ area of proposed focus, and which metrics will be relevant for assessing progress. Most importantly, reflecting on these elements at the start of a new session sets out the parameters of the committees’ data strategy for its work in the coming session, allowing committees to proactively organize to collect relevant data. The practice of establishing a mission statement and metrics is a strategic step for introducing lawmakers to the clarity of language that is required around laws and regulations for emerging technologies. When processes are automated, the most important requirement is a clear statement of the goals to be achieved and how success will be measured. Incorporating a similar exercise into the committee rules process will help members practice and hone this 21st Century skill that will support their work.

2. Require a statement of purpose and identification of key metrics at bill introduction

In 2011, the House of Representatives adopted a rule requiring members to state the constitutional basis for Congress’s power to enact the proposed legislation when introducing a bill or joint resolution.⁴³ The Constitutional Authority Statement (CAS) has “limited legal import,”⁴⁴ but serves as a reminder at bill drafting that Congress acts pursuant to the powers granted in the Constitution.

The House should consider amending its rules to require that new legislation also include a clear statement of purpose and list of key metrics at the time of introduction. As with the CAS, the statement

⁴¹ Rule XI, Clause 2(a)

⁴² Rule X 2(d)(1)

⁴³ House Rule XII, clause 7(c) – Constitutional Authority Statements and the Powers of Congress: An Overview, Congressional Research Service Report #R44729, March 11, 2019, <https://fas.org/sgp/crs/misc/R44729.pdf>

⁴⁴ Constitutional Authority Statements and the Powers of Congress: An Overview, Congressional Research Service Report #R44729, March 11, 2019, <https://fas.org/sgp/crs/misc/R44729.pdf>, p 19.

of purpose and key metrics would provide guidance for executive branch implementation of the legislation and set basic expectations of the metrics for which the law is intended to optimize. Importantly, the key metrics in particular would also clearly identify data relevant for future congressional oversight of the policy.

3. Develop dashboards that display updated data on committee metrics

Dashboards collect and aggregate accurate and precise information, support real-time data updates, and present information clearly in a dynamic view that enables users to understand both the bigger picture takeaways as well as more detailed information.⁴⁵ Clear presentation of data through dashboards can make complex information more accessible and easier to understand. This visual presentation of data over time “can support the complete policy-making cycle including policy formulation, implementation, and evaluation” and facilitate “monitoring and analysis for faster and more accurate decision-making, resulting in increased efficiency and effectiveness of operations.”⁴⁶ Indeed, for committees who identify their mission and key metrics at the start of each new session, those stated objectives can serve as a framework for the development of dashboards; customized dashboards could be created to present key information that committees identify as essential metrics to support their legislative and oversight functions.

Addressing the Internal Pacing Problem

The remainder of the subcommittee report focuses on improving technology and processes for the internal operations of Congress, which we view as the most important area of focus. Indeed, Congress’ ability to overcome the external and inter-branch pacing problems largely depends on their investment in addressing the internal pacing problem and improving their own internal technology. As other successful organizations have taken advantage of the revolution in information technologies to improve communication and internal process and reap operational efficiencies, Congress’s forays into the information revolution have been tentative at best. As a consequence, the informational gap with executive agencies has continued to grow, the security of congressional information infrastructure is vulnerable, and important perspectives from constituents and stakeholders remain unheard. In this

⁴⁵ Ricardo Matheus, Marijn Janssen, and Devender Maheshwari, “Data science empowering the public: Data-driven dashboards for transparent and accountable decision-making in smart cities” *Government information quarterly*. (2018), Available: <http://www.sciencedirect.com/science/article/pii/S0740624X18300303>.

⁴⁶ Ibid.

section, we propose a focused set of reforms that will provide a platform for the House to adapt to the rapidly changing informational technology environment.

Technology will play a central role in connecting Congress to diverse streams of information, broadening access to constructively incorporate a wider array of *stakeholders* and *individuals*, improving access to *data*, and enabling more effective engagement with *experts* inside and outside of Congress. However, as a chamber with 441 individual member offices, 20 committees, and several administrative and research support agencies, decisions about technology use in the House are made independently by these different offices with minimal coordination, information sharing, or evaluation of best practices to influence technology adoption choices.

The decentralized nature of Congress offers the potential to leverage individual offices and committees as laboratories, identifying what works best in different circumstances and allowing offices to learn from each other. Effective decision-making around technology in Congress requires a balance between centralization and decentralization. Some degree of central coordination enables information sharing and collaboration to resolve shared technology problems and evaluate innovative solutions, but the distributed and disconnected architecture around congressional technology currently in place does not offer opportunities for this kind of collaborative effort or learning about successes and failures. Better coordination will require an approach that respects the autonomy of the different offices within Congress and taps into their expertise to support effective technology modernization efforts.

1. Establish a House Technology Working Group

The Subcommittee on Technology and Innovation recommends the creation of the *House Technology Working Group* as a venue for disparate offices to coordinate and share information about how to effectively modernize congressional technology. This working group made up of members and staffers with interest and expertise in congressional technology should collaborate across existing silos to identify and evaluate technology that can support lawmaking, oversight, constituent engagement and overall operations for the institution. By bringing together members and staff from across the institution, the working group provides a new--and needed--forum for identifying shared technology challenges and assessing new tools.

The working group should serve as a nimble organizational structure to help the House navigate the rapidly evolving world of information technology. To be effective, the working group needs to (1) empower staff members who are on the front lines of the use of technologies and are the most knowledgeable about their capabilities and limitations, and (2) have precise and relevant tasks to tackle.

The working group should make clear and actionable recommendations that would advance congressional technology.

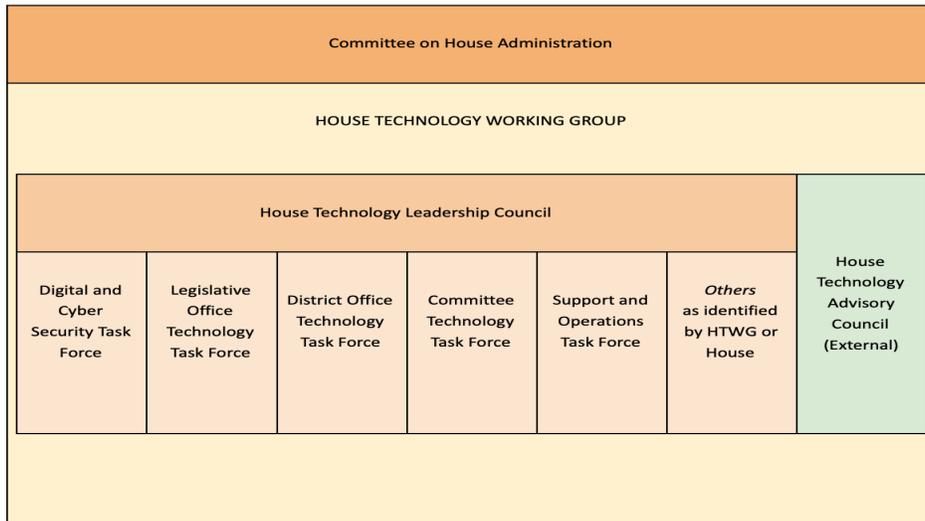
There are numerous technologies that could improve members' interactions with constituents and their access to relevant legislative information and could enhance the security and support available at the institutional level. This Technology and Innovation Subcommittee report has offered an assessment of potential innovations in these areas, and these ideas reflect a range of technologies that the House Technology Working Group should study. Indeed, there is a significant need for the working group to assess these tools suggested by the Technology and Innovation Subcommittee to determine their viability in the unique congressional context--only a working group that taps into the knowledge of relevant staffers can effectively evaluate how well these technologies will function in today's Congress.

By creating a working group to facilitate ongoing attention to congressional technology, the House can increase its own capacity and be in a stronger position to function as a modern institution, develop policy and conduct oversight that responds to and even anticipates emerging innovations, and engage with constituents in new and innovative ways. An effective House Technology Working Group would receive institutional support, through authorization in statute or House rules under the Committee on House Administration and assignment of dedicated staff, and would work to build lawmaker trust and buy-in by disseminating clear information about its work, providing regular updates on progress, and maintaining open communication.

The working group should organize itself around technology priorities for the chamber, with authorizing language that establishes task forces to specialize around each priority.⁴⁷ To coordinate the efforts of these task forces, the working group should also include a Technology Leadership Council with representatives from each of the task force teams as well as key institutional decision makers from both parties. The council would focus on the bigger picture of the working group's modernization efforts, setting priorities, coordinating the work happening across the different task forces, and making recommendations about which technologies or initiatives being developed by task forces should be funded. Finally, the House could consider authorizing an outside advisory group, modeled after the Defense Innovation Board,⁴⁸ that could integrate outside experts into the working group's efforts. This external advisory group would bring in new ideas and perspectives and support the working group's progress.

⁴⁷ The task forces will build on the model of two existing congressional task forces that have successfully advanced changes in Congress' technology infrastructure: the Bulk Data Task Force (BDTF) and the Communicating with Congress (CWC) project.

⁴⁸ <https://innovation.defense.gov/>



We recommend that legislative language authorizing HTWG include the following elements:

- **Identify priority areas for House technology and establish task forces to focus on each.** Recommended initial task forces include: (1) Digital and Cyber Security task force; (2) Legislative Office Technology task force; (3) District Office Technology task force; (4) Committee Technology task force; and (5) Congressional Support and Operations task force. The House Technology Working Group should be authorized to establish additional task forces around emerging technology needs in the chamber. Task forces will operate in effect as subcommittees of the working group, and each task force should have at least one lawmaker from both the majority and minority as well as representatives from support agencies and other relevant offices.
- **Establish a House Technology Leadership Council to oversee and coordinate the task forces.** The House Technology Leadership Council will include representatives from each of the task force teams, one representative from each legislative support office or agency (i.e. CAO, Clerk, Parliamentarian, etc.), and the chair and ranking member of the Committee on House Administration.
- **Authorize an external advisory group.** These outside advisors should include technologists with expertise in new and emerging tools. As there are constitutional, legal, ethical, and rules considerations that govern technology in the House, the advisory board should also include institutionalists who understand the legal and policy realities of the congressional context.
- **Authorize support staff.** The House Technology Working Group should have a dedicated coordinator and project managers for each task force.

The HTWG and its task forces should approach their modernization efforts by consulting widely to identify needs, evaluating different technologies, and making clear and actionable recommendations that would improve congressional technology. Operationally, the HTWG should gather input from relevant stakeholders, individuals, data and experts to guide their decisions and coordinate systematic efforts to examine different available or emerging technologies that could be used in Congress. To support this work, the HTWG should follow this modernization process:

- **Step 1: Identify areas that would benefit from new technology or process upgrades.**

The working group and task forces should coordinate efforts to identify issues within congressional operations where new applications of technology may be appropriate, engaging with stakeholders and individuals within Congress as well as data and experts to diagnose problem areas and technology priorities.

- **Step 2. Evaluate potential solutions to identified problems.** As pain points or opportunities for improvement are identified, relevant task forces should identify possible solutions by evaluating existing technologies and defining the characteristics of tools that could be built to better address congressional needs. In this stage, task forces should invite input from staffers as well as technologists and experts who use or develop related solutions for the private sector, asking for their judgments on the viability of different technological tools.
- **Step 3. Support pilots of new technology in individual offices.** To identify technology that will work best in Congress, task forces should support committees and individual offices in implementation and evaluation of small-scale pilot projects, ideally deployed simultaneously in similar settings (i.e. offices A, B, and C test one promising technology while offices D, E, and F test another potential innovation). These pilots allow for the assessment of technologies *within the specific contexts where they would be deployed*. This approach uses the decentralized nature of Congress as an asset to evaluate and compare new ideas and solutions.
- **Step 4. Develop best practices for use of technology in Congress.** Drawing on the evidence gathered throughout steps 1, 2, and 3, and on the information sharing facilitated by the working group, task forces should develop recommended best practices for use of technology in Congress. These recommendations should be clear, accessible, and readily available to staff and lawmakers.
- **Step 5. Refine through a continuous iterative process.** New tools and technologies should be revisited often, continually identifying further areas for improvement and testing variations to enhance existing and emerging technologies in use across the House.

This proposed modernization process for the HTWG emphasizes information from a diverse set of sources; supports evidence-based decision-making about organizational changes; and embraces

experimentation to evaluate solutions to specific institutional needs of Congress. Importantly, *this process institutionalizes an ongoing approach to modernization and improvement through an inclusive working group.*

This way of organizing tech deployment within the institution in many ways runs counter to the prevailing culture of the Hill. The HTWG addresses many of the challenges that are unique to Congress that have stymied technology improvement in the institution:

- **Lack of central hub of expertise and technical advice.** The HTWG would provide systematic evaluation of new technologies, a centralized resource hub for information about best practices, and a forum for House-wide communication and coordination.
- **Lower-level and short-term staffers most familiar with technology and its challenges lack decision-making power.** The HTWG process emphasizes direct engagement with front-line staff, tapping into their expertise to identify pain points in congressional technology and to evaluate potential solutions and inform areas of focus for the working group.
- **Congressional functions not amenable to outsourcing.** The recommended process deploys pilot projects to test the viability of new technologies within the context where they will be used in Congress. Through pilot projects, new technologies are essentially vetted to ensure that they support the specific work of the institution.
- **Difficult to reach consensus on problems to be solved.** The HTWG should solicit input from a range of sources to identify technology priorities for the institution. While consensus may not emerge, the careful effort to engage interested parties in problem definition can build confidence that the working group will focus on widely-shared challenges.
- **Difficult to change culture.** Uncertainty about the effects of new technology often leads members to default to the status quo. The proposed process focuses on gathering evidence, allowing institutional actors to feel confident in adopting new tools and technologies, and ongoing efforts to improve the institution based on that evidence.

The HTWG solves many of organizational problems that have constrained technology modernization in the past. The working group and modernization process has the potential to instill a culture of technological innovation necessary for the chamber's efficient operations and to ensure the legislature is not left behind as technology moves forward.

2. Establish a Congressional Digital Services

The executive branch notably established 18F and the US Digital Services to help agencies in building front-facing websites and technological tools to create a more seamless experience for citizens and to standardize design and architectural elements. The House would benefit tremendously from establishing a similar team of technologists, designers, user experience researchers, and developers. As previously proposed by the OpenGov foundation, a Congressional Digital Services within the Library of Congress would “identify key challenges and process pain points in Congress and district offices, and help build tools or clear procurement barriers to ensure the legislative branch has world class tools to listen to and engage with constituents, collaborate on legislation, and perform core functions”.⁴⁹

3. Establish a Technology Subcommittee within the Committee on House

Administration

While the House Technology Working Group will provide a venue for coordinating technological planning, implementation, and evaluation throughout the House, an even more substantial step would be the creation of a House Technology Subcommittee within the Committee on House Administration. This House Technology Subcommittee would serve as a permanent organizing entity to coordinate efforts to modernize congressional technology and would assume responsibility for the core tasks outlined for the working group. The subcommittee would continuously review areas in need of improved technology and identify and evaluate new and emerging tools. Importantly, the subcommittee would have the authority to consider legislative proposals and require reporting about House technology. This subcommittee would also have jurisdiction over the offices across the House responsible for different applications of technology, facilitating more effective coordination across distinct offices.

The creation of a new subcommittee within the House Administration Committee would reflect a sustained commitment to expanding Congress’ technological capacity. The House Technology Subcommittee would become a clear, central point of contact for those in the institution interested in improving technology within their own offices. With a more permanent organization to lead technology modernization for the chamber, offices across the House would be in a better position to integrate new and emerging tools that would improve their internal operations and support their legislative, oversight and constituent engagement work.

Modernization is an Ambitious Ongoing Project for Congress

⁴⁹ <https://mymadison.io/documents/cds-bill>

Members of Congress, individually and collectively, work hard to represent their constituents, legislate, and oversee the executive branch. However, the institution has not equipped members and their staff with the technical capacity to do the job they would like to do as well as they would like to do it.

This report outlines an ambitious project for Congress. Updating technology to what is currently available, and layering that technology on existing organizational routines, represents only a short-sighted and ultimately inadequate modernization effort. Congress instead must modernize itself to meet the challenge of regulating and overseeing fast-paced technological change and staying up-to-date with continually evolving technology for their own operations. Establishing a House Technology Working Group and supporting its coordination of an ongoing modernization effort can position Congress to continuously update its systems and practice evidence-driven decision-making about its use of new technologies. Using these new tools and technologies, Congress can broaden its access to constructively incorporate a wider array of *stakeholders* and *individuals*, improve its use of *data*, and pursue more effective engagement with *experts* inside and outside of Congress. This modernized Congress, then, will make information and continuous learning central not only to the institution's substantive policymaking and oversight work, but also to its more fundamental internal organization and processes.