

**EXISTING RESOURCES AND INNOVATIONS NEEDED
TO REPLACE LEGACY IT AND SAVE TAXPAYER
DOLLARS**

HEARING

BEFORE THE

SUBCOMMITTEE ON
EMERGING THREATS AND SPENDING
OVERSIGHT

OF THE

COMMITTEE ON
HOMELAND SECURITY AND
GOVERNMENTAL AFFAIRS
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TUESDAY, SEPTEMBER 28, 2021

U.S. SENATE,
SUBCOMMITTEE ON EMERGING THREATS AND
SPENDING OVERSIGHT,
OF THE COMMITTEE ON HOMELAND SECURITY
AND GOVERNMENTAL AFFAIRS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2:30 p.m., via Webex and in room 342, Dirksen Senate Office Building, Hon. Margaret Wood Hassan, Chairwoman of the Subcommittee, presiding. Present: Senators Hassan, Rosen, Ossoff, Scott, and Hawley.

OPENING STATEMENT OF SENATOR HASSAN¹

Senator HASSAN. This hearing will come to order. Good afternoon and welcome to our distinguished panel of witnesses. Thank you for appearing today to discuss the resources and services available to agencies seeking to modernize their outdated and obsolete legacy information technology (IT) systems.

There is a lot to discuss today: how Congress can supplement these resources in order to accelerate modernization, hold agencies accountable to their modernization plans, and reduce the Federal Government's reliance on aging technology.

Also critical here is, of course, ensuring that in all of these efforts we are staying focused on saving taxpayer dollars. This is critically important because we know that outdated technology fails to serve the American people and is insecure against sophisticated cyber attacks. It also wastes billions in taxpayer dollars every year due to poor procurement actions, improper payments, and expensive contractors needed to operate and maintain aging systems.

I also want to thank Ranking Member Paul, who is unable to join us today, and his staff for working with me on this hearing and, more broadly, on our ongoing efforts to curb wasteful spending. Just last week, we introduced the 2021 edition of Acting on the Annual Duplication Report Act, which would implement recommendations made to Congress by the Government Accountability Office (GAO) to eliminate wasteful duplication, fragmentation, and overlap across the Federal Government. I look forward to working with Ranking Member Paul and all of my colleagues to move that bill forward.

¹The prepared statement of Senator Hassan appears in the Appendix on page 25

Today's hearing builds on a hearing this Subcommittee held in April that focused on the issues that are holding agencies back from realizing significant cost savings, increased security, and greater service delivery by modernizing their systems. The question we are asking today is: How are these agencies using existing tools and resources to transform their aging technology, and what can Congress do to fill the gaps that may remain?

At our previous hearing, former Federal agency chief information officers (CIO) and a Government Accountability Office expert on Federal IT management discussed the costs and challenges that legacy IT systems present. We learned that detailed IT modernization plans are critical to an agency's long-term success in updating IT and budget for capital projects. We learned that funding mechanisms, such as the Technology Modernization Fund (TMF) and agency working capital funds, need to be improved to accommodate multi-year modernization efforts. Most importantly, we learned about the impact that the Federal Government's aging IT infrastructure has on the American people.

Despite some challenges, agencies have a tremendous opportunity to modernize these outdated systems and, in turn, make government more effective and efficient. Over the course of the pandemic, we saw chief information officers across the government quickly equip their agencies to work remotely. Congress and the Executive Branch have made more financial resources available to agencies to upgrade their IT systems than ever before, and there are programs and policies in place to assist agencies in taking their aspirations and turning them into achievements.

Lending their expertise and insights on what more we can do to address the challenges we face is our panel of very accomplished witnesses, consisting of the Federal Chief Information Officer, the Administrator of the U.S. Digital Service (USDS), and the Director of Technology Transformation Services (TTS). I look forward to hearing from all of you today about your work to assist agencies in reducing their reliance on costly, outdated, and obsolete technology.

Now, it is the practice of the Homeland Security and Governmental Affairs Committee (HSGAC) to swear in witnesses. If you will please stand, and even stand in your virtual environment, that would be great, and please raise your right hands. Do you swear that the testimony you give before this Subcommittee will be the truth, the whole truth, and nothing but the truth, so help you, God?

Ms. MARTORANA. I do.

Ms. HSIANG. I do.

Mr. ZVENYACH. I do.

Senator HASSAN. All three witnesses have answered in the affirmative. Thank you all. Please be seated.

I will now introduce our witnesses. Our first witness today is Clare Martorana. Ms. Martorana is the Federal Chief Information Officer and leads the Office of Electronic Government and Information Technology at the Office of Management and Budget (OMB). Before joining the Biden Administration in her current role, she served as Chief Information Officer for the Office of Personnel Management (OPM), where she led the Agency's efforts to improve

security and operations. Ms. Martorana joined the Federal Government in 2016 but has spent over 2 decades working to make information accessible to the public through digital innovation.

Welcome, Ms. Martorana. You are recognized for your opening statement.

TESTIMONY OF CLARE MARTORANA,¹ FEDERAL CHIEF INFORMATION OFFICER, OFFICE OF MANAGEMENT AND BUDGET

Ms. MARTORANA. Chair Hassan, Ranking Member Paul, Members of the Subcommittee, thank you for the invitation to testify today on information technology. It is my pleasure to be here with my colleagues, Mina Hsiang and Dave Zvenyach. On a daily basis, the three of us work together and collaborate, and frankly, that is what it is going to take to make the best use of taxpayer dollars to deliver a seamless and secure customer experience for the American people.

It is important to note that not all old systems are legacy and old does not always mean bad, antiquated, risky, or in need of retirement. The legacy technology I am most concerned with are systems that are out of support, cannot be patched, have availability issues, or cannot meet user needs or policy goals, systems whose security cannot keep pace with our adversaries. With a secure system, even when deemed legacy, we can still deliver modern customer experiences to the public. Teddy Roosevelt said, “Do what you can, with what you have, where you are.” I am happy to report that we can do a great deal across government with what we have, but what we need to do is work differently.

Securing and modernizing Federal IT is a team sport, and here is what we can do now. Agency investments should be aligned to an enterprise IT and cybersecurity modernization plan. Technology and data enable each agency to execute on its mission for the American people, and they must be secure. An enterprise operating model requires all agency and program leadership to work together to achieve successful investment, deployment, and sustainment of modern, secure technology. We must put our customers at the center of everything we do, simply put, designing with users, not for them. We are establishing a culture in government that is mindful of customer experience in delivering agency missions.

Using incremental software development, we can show our colleagues across government that service improvements are possible even within a legacy IT environment, and we must show and not tell. By delivering minimally viable products, we are able to get working software into the hands of users early and give design and development teams the opportunity to adjust based on user feedback about the services. By learning quickly what works and what does not, we reduce the risk of failure and can deliver higher quality, secure services to the public.

It will take an enterprise mindset to get there. When I became the CIO at the Office of Personnel Management, I was the seventh CIO in 7 years. The Agency was facing an uncertain future and had a number of critical IT challenges, including mainframe legacy technology that held crucial data for our Nation. We knew we

¹The prepared statement of Ms. Martorana appears in the Appendix on page 27.

would not be able to solve the multitude of problems we were facing alone.

I reached out to a colleague and now friend, the CIO of the General Services Administration (GSA), who immediately provided top technologists from his team to join mine, fill critical gaps, and help assess the situation. We realized we needed the specialized skills of another group of tech talent, the United States Digital Service, who have within their capability set the ability to rapidly assess critical infrastructure, identify insecure vulnerabilities, and recommend a path forward. From there, my colleagues at OMB provided historical context on previous investments and helped develop a financial strategy and path forward. Our team also engaged with GSA's Centers of Excellence (CoEs) in conducting an options analysis for the work ahead. This ultimately led to successful procurement of new supportable mainframe technology and its relocation to modern state-of-the-art data centers.

These successes would not have been possible if I stayed in my silo. It took the combination of internal and external forces, technical talent, budget management officials, legal, privacy, finance, human resources (HR), acquisition, agency leadership, and legislative affairs colleagues, and many others to create the momentum we needed to stabilize, secure, and modernize operations.

In conclusion, every single group I have met across government wants to be part of the solution, and I am planning on taking them up on their offer. I look forward to working with you and our key stakeholders so we can be successful on this IT modernization journey.

Thanks for the opportunity to be here today, and I look forward to your questions.

Senator HASSAN. Thank you so much for your testimony.

We are now going to turn to our witness who is appearing virtually, Mina Hsiang. Ms. Hsiang was recently named Administrator of the U.S. Digital Service within the Office of Management and Budget. She has worked as part of the U.S. Digital Service team on several previous important projects, such as rolling out "www.vaccines.gov" in response to the Coronavirus Disease 2019 (COVID-19) pandemic. She brings with her many years of experience in the private sector, working on digital innovation and customer service to her role as Administrator.

Welcome, Ms. Hsiang. You are now recognized for your opening statement.

TESTIMONY OF MINA HSIANG,¹ ADMINISTRATOR, UNITED STATES DIGITAL SERVICE, OFFICE OF MANAGEMENT AND BUDGET

Ms. HSIANG. Chair Hassan, Ranking Member Paul, and Members of the Subcommittee, thank you for the invitation to testify on legacy information technology in government on behalf of the United States Digital Service. I am honored to be here alongside my colleagues, Clare Martorana and Dave Zvenyach. I am grateful that technology lets me participate remotely while sick.

¹The prepared statement of Ms. Hsiang appears in the Appendix on page 31.

The mission of USDS is to ensure that government services are delivered well, using the best of technology and design. We do this in partnership with government agencies, by recruiting and hiring top technical talent into Federal service, to work on important projects across the government, side by side with agency civil servants. We also collaborate closely with our technical partners across the government, including agency CIOs, the Federal CIO, and GSA. We are proud to have a track record of convening teams that partner with agencies to define and deliver on programs, both urgent and ongoing.

At USDS, we are focused on improving delivery in a few key ways. First, we aim to make services more straightforward, reliable, and sustainable through stronger technical foundations. This is about making services simpler and more consistent for the families, small businesses, veterans, and others that we serve. This means strategic technical planning for multi-year programs, designing technology for performance and reliability, using integrated or shared tools for services, and building for fast improvement, including frequent deployment of code. It also means making it easier for agencies to do these things simply and by default, which is far from the status quo.

Software is never done since needs, both technical and human, are always changing. We must make it easy and secure to iterate quickly.

Second, we center our objectives around the people that we service. We put our users first. For example, when we think about veterans who need to know their benefits eligibility or school nurses who must track and report COVID testing in their school, we design the process, implementation strategy, and technical build around what will create the best possible outcomes for them. This usually requires an explicitly iterative process that incorporates users in every turn, evaluating how we are doing on the outcomes that matter for them and revising based on what we find.

Finally, we find and empower great people. We strive to bring the best practices and skills from across the country, and we do this by recruiting team members with diverse and relevant backgrounds, including government, to bring their expertise to our critical mission. We have also created training and upskilling programs to ensure that our colleagues who already sit in critical positions throughout government can continue to be aware of and use current best practices. We are partnering with agencies and OPM to develop new capabilities across the government, to develop hiring practices for technical talent, to scale what we know works.

These strategies are based on our experience from many different companies, agencies, and other organizations. We know that they work to prevent and address legacy IT problems, but they need to be scaled more universally across government in order to address the overall challenge. Without the right people, process, and technical foundations for every program in service, they will default to a slow pace of updates and change, becoming static and risk becoming legacy.

We work to collaborate with programs early so that they do not encounter crises as a result of these problems, but when it does happen, we partner closely with our colleagues to fix it as in the

example of the OPM mission-critical system that Clare mentioned. USDS joined the OPM CIO's team to provide the technical expertise to identify and debug OPM's current challenges with the mainframe and also to offer the best practice technical framework and strategy for moving forward on the solution. We then partnered as well with GSA when they arrived as they brought their expertise and capacity to drive the operationalization of the solution.

The public, the families, small businesses, veterans, and others who are counting on these services do not care how many agencies exist, where the boundaries are, which legislation created which system or eligibility, or what the color of money is for maintaining a system. They want a simple and clear experience when they interact with their government programs. They want systems and programs that work together, address their needs, and deliver the outcomes they expect, minimizing their stress and the burden on their lives.

In collaboration with our agency partners, the three of us seated in front of you are already working hard to coordinate and collaborate on the appropriate capabilities necessary to enable such a world, focusing on the experience of those we serve, empowering talented public servants, and learning from users to drive iterative, agile development and procurement. We have outlined some of the challenges that make it more complex, and we look forward to working with you to design solutions.

Thank you for the opportunity to testify, and I look forward to your questions.

Senator HASSAN. Thank you very much, Ms. Hsiang.

Now we will turn to our third witness, who is Dave Zvenyach. Mr. Zvenyach is the Director of Technology Transformation Services and Deputy Commissioner of the Federal Acquisition Service within the General Services Administration. An attorney by training, Mr. Zvenyach's previous experiences working for the Washington D.C. Council exposed him to the technology challenges that governments face. From there, he joined the General Services Administration and later independently consulted on Federal acquisition policy, and he rejoined the Technology Transformation Services office earlier this year.

Welcome, Mr. Zvenyach. You are now recognized for your opening statement.

TESTIMONY OF V. DAVID ZVENYACH,¹ DIRECTOR, TECHNOLOGY TRANSFORMATION SERVICES, U.S. GENERAL SERVICES ADMINISTRATION

Mr. ZVENYACH. Thank you, Chairwoman Hassan, Ranking Member Paul, and Members of the Subcommittee. My name is Dave Zvenyach, and I am the Director of Technology Transformation Services at the General Services Administration.

It is an honor to be here today and a privilege to work alongside my colleagues, Clare Martorana and Mina Hsiang, as we work together to provide trusted, accessible, and respectful government experiences with and for all. They are accomplished technologists, dedicated public servants with a deep passion for service delivery.

¹The prepared statement of Mr. Zvenyach appears in the Appendix on page 36.

It is important that we are here together because delivering quality software at the scale of government requires a coordinated team effort.

As Mina said, our work requires a focus on the experience of those we serve, empowering talented public servants, and learning from users to drive iterative, agile development and procurement. I am fortunate to work every day with incredibly talented individuals and teams all across the country, who join the government for one reason, to make sure that the technology for the government of the people works for the people.

In government, we need to shift how we talk about and how we deliver software. We need to understand that software delivery is never really done. Technology is always evolving, and we need our systems to keep up with changes in the law, to improve performance and reliability, to meet new users' needs, and we need to focus and prioritize improving service delivery. We need to shift the government toward an expectation that every system in production should be continuously improved so that there is no such thing as a legacy system and no such thing as "done." By that measure, we have a long way to go.

But we also know that, as Clare said, we can do a great deal across government with what we have today. At GSA, we are proud of the role we play in working with our partners in modernizing government systems and improving procurement outcomes.

At the core of our mission at TTS, to design and deliver digital government with and for the public, is the modernization and security of government's infrastructure and applications. Much of our work at TTS, our superpower, if you will, is focused on reuse, whether it is our FedRAMP program which helps agencies adopt secure cloud technologies through a "do once, use many" security approach, or the U.S. Web Design System which is an example of a great collaboration with the U.S. Digital Service, which provides a consistent and accessible experience across agency websites, or "www.digital.gov," which enables practitioners to share best practices and learnings through communities of practice. These and other shared services, our TTS solutions, are a core part of what we do at TTS.

We also partner directly with agencies through our Presidential Innovation Fellows (PIF) programs, 18F, and the TTS Centers of Excellence.

The Office of Personnel Management journey described by my colleagues is a fantastic example of the sort of collaboration needed to fundamentally change the way services are delivered to employees, Federal agencies, and the public. A longtime partner of GSA, OPM looked at their health and benefits, retirement, and HR systems challenges and realized that expertise in understanding the entire landscape was needed. It would require technology and data asset inventory improvements, true, but it would also require the development of an acquisition strategy because of the impending loss of contract support. As Clare and Mina mentioned, the TTS Centers of Excellence played a critical role in developing and executing that acquisition strategy, helped facilitate the migration and modernization of OPM's mainframe, and assisted OPM in the sustained data governance and organization improvements along the

way. We are honored to continue to partner with OPM on their modernization journey to this day.

The next few years will bring increasingly complex challenges. With our ability to implement cross-government solutions, we are uniquely positioned to help agencies address them. By shifting how the government thinks about delivering technology, focusing on the impact on mission and users, looking to expertise and innovation in government, and collaborating with our industry partners outside of government, we can significantly improve Federal technology and ultimately how agencies serve the public.

As long as there is work to be done, software delivery will never be done. If we work on these challenges together, though, we can build the momentum we need to make sure that when Congress enacts a law, when a user has a new need, and a system needs to be available, our systems are ready for that change.

Thank you for the opportunity to be before you today. I look forward to answering any questions you may have.

Senator HASSAN. Thank you very much for your testimony.

Thank you to all three of you for such clear and good testimony, and I am going to begin with my round of questions. As I indicated earlier, this is a complicated afternoon in the Senate. Senators are going to be coming and going from votes and may be joining us remotely. The level of attendance is yet to be determined is what I am trying to say.

Let me start with a question to Ms. Hsiang and Ms. Martorana. The U.S. Digital Service is known for quickly responding to crises when they arise. For example, in the early days of the COVID-19 pandemic, the U.S. Digital Service assisted agencies with increasing their digital capacity to serve the American people.

But even in the absence of a crisis, the U.S. Digital Service is also capable of taking a proactive approach to IT modernization and digital transformation that can yield really impressive results. For example, the U.S. Digital Service was able to collaborate with the Centers for Medicare and Medicaid Services (CMS) on its payment processing system. The system was more than 50 years old and relied on outdated code, which made it difficult to use, costly to maintain, and vulnerable to improper payments. But with the help of the U.S. Digital Service, CMS modernized its system and migrated it to the cloud before it encountered a major system failure or similar crisis.

Ms. Hsiang, how can the U.S. Digital Service jumpstart agency IT modernization and movement away from legacy IT as it did with the Centers for Medicare and Medicaid Services?

Ms. HSIANG. Senator Hassan, thank you so much for that question. It is a great one. It boils down to leadership. A crisis creates a situation where doing something differently from how you have done things in the past suddenly becomes absolutely necessary and everyone can agree on that. It creates an opportunity for, as Clare noted, show, do not tell, the opportunity to do things differently and to see how that evolves.

That said, the same circumstances can be created without a crisis through responsible leadership and the executive within an agency. If executives truly understand the implications of their IT systems through their cooperations, if the executives are deeply

committed and leaders are deeply committed to ensuring that technology systems and technical systems continue to support the mission, they, too, can create the circumstances where it does not feel risky to do something different but instead feels like the appropriate thing to do.

Senator HASSAN. Thank you.

Ms. Martorana, on the topic of improper payments, how are other agencies that manage Federal benefits taking advantage of IT modernization, such as cloud computing, to prevent waste, fraud, and abuse of taxpayer dollars?

Ms. MARTORANA. Thank you for that question. There are significant efforts underway across multiple agencies that are delivering benefits to, and services to, the public that are focused on assuring that the benefits make their way to the recipients. There are activities that are going on in partnership with Federal agencies and reaching out to States where those payments are ultimately delivered in some cases.

IT modernization: we are doing several different things across the Federal enterprise to focus on this. One is a concerted effort to do user research, making sure that we understand what the problem is that we are trying to solve and understanding both the technical, cultural, and business process challenges that are often the complex mix that causes challenges in operations. We are learning across the Federal enterprise.

One of the unique groups that I have the great fortune to work with is the CIO Council, and through that vehicle we share these best practices and lessons learned. Recently, a CIO came and in the open of a meeting talked about the fragility of a system and was seeking the advice of other CIOs to remediate the issue. I think we will continue to see both on the digital side the collaboration that we all benefit from but also in the planning and execution of these large policy efforts that are impacting service delivery to the public.

Senator HASSAN. Thank you. I have a question for Mr. Zvenyach. While GSA's Technology Transformation Services provide a number of innovative tech products and services to agencies, I want to specifically discuss the 10x and Presidential Innovation Fellows programs. Both of these programs are designed to bring in new ideas to enhance government IT performance and promote better service delivery. Can you explain how the 10x and Presidential Innovation Fellows programs work, and what specific innovations have come out of these programs that are making government IT work better for the American people?

Mr. ZVENYACH. Thank you for the question. I will start with 10x. 10x is a program that is modeled after best practices around private investment, so venture investment, and it uses a phased approach to invest in ideas that might scale in government technology. One of the lessons that we have learned is that not every idea is of equal merit and, frankly, the most expensive ideas in government are the ones that think that they are great ideas but actually do not bear out.

Senator HASSAN. Right.

Mr. ZVENYACH. The benefit of 10x is that we have evaluated over 1,000 ideas, been able to graduate the ones that have the most

merit into production. Programs like the U.S. Web Design System that I mentioned in my testimony serves almost 250 million sessions per month. That was originally a proposal that came through the 10x process, and it allows for almost, I think, 80-something agency partners to use that consistent experience across the Federal Government. That is the sort of thing that comes out of 10x. We are very proud of the work that we do largely because it does use the best practices, that phased investment approach that you see in private industry, and takes that into government.

In that same vein, the Presidential Innovation Fellows program pairs private sector entrepreneurs and innovators with public sector leaders. The thesis behind the PIF program, as we call it, is to pair PIFs with deputy secretaries, CIOs, CXOs across the government and make sure that they are bringing that innovation into the government. The interesting plot twist is that these PIFs often end up staying in government, and it has been a really extraordinary opportunity to bring that innovation into the public sector, get them attached to the mission that we all know is important, and have them stay and really contribute that service to the American people.

Senator HASSAN. Great. One of the projects funded by 10x focused on assisting agencies with IT management, budgeting, and planning by producing a field guide to what is known as agile acquisition, a term of art that I wanted to make sure I understood. Agile acquisition allows agencies to test new products and work with program developers to incorporate user feedback into product design to ensure that the products work and meet the agency's needs before the agency makes that kind of major investment. I think that is really what you were just getting at.

Talk a little bit more about how agile acquisition saves taxpayer dollars and how we can ensure that agencies pursue agile acquisition processes as much as possible.

Mr. ZVENYACH. It is such a great question. I think one of the things that we often see in procurement is that two things are true. One is that there is the tendency to think about procurement sort of in silos. In software, we talked about how software is a team sport. You want to make sure that everybody is on the same team in focus and service delivery on behalf of the user. The same needs to be true in procurement. You cannot have a contracting officer sitting on the other side of the CIO sitting on the other side of the finance sitting on the other side of legal.

Senator HASSAN. Yes.

Mr. ZVENYACH. Everyone needs to be on the same team, focused on procurement outcomes.

Agile acquisition is really trying to bring teams together so that we are focusing on how do we actually do iterative development, how do we actually make sure that we are focused on outcomes, not just outputs.

Senator HASSAN. Right.

Mr. ZVENYACH. Outcomes on behalf of the program. Programs like 10x create opportunities to both show how it works and then also to teach so that we have ability to do once and reuse. We are really proud of the work that comes out the guides, the derisking guide and the like, and I thank you for that question.

Senator HASSAN. It is really important, and again, it gets at this whole-of-government approach, sharing information, breaking down silos.

A question for you, Ms. Martorana. The many policies, programs, services, and financial resources available to agencies seeking to modernize their IT systems can only be useful if the agencies are taking advantage of them. Is there currently a way to track agency use of the various tools, services, and resources that we have been discussing today and measure whether they are helping agencies effectively modernize?

Ms. MARTORANA. Thank you for that question. There are numerous planning tools that are in place related to IT tracking, cost, scheduling, performance, and IT system modernization projects in total: the IT dashboard, the Capital Planning and Investment Control (CPIC) process, through FISMA. There are many mechanisms that we are using.

One of the things that is a focus of my office is with so many data inputs we want to make sure that we are making the best informed decisions with the data. Just gathering data for compliance reasons alone and not being able to tie the data to a very specific outcome, making sure that we are having the greatest impact with the investment dollars that we are given—and they are taxpayer dollars—we all take that very seriously. We want to make sure through those tools that we are looking at fraud, waste, and abuse as kind of the cornerstones of good business. That is what any good business person does.

But I do think that there are opportunities for us to get better at this. I think that transparency and accountability for some of these projects—we have over 700 high-value assets in the Federal Government. That is a large data set. I think in total we have over 8,000 large IT projects that are active in the Federal Government. We are trying to think of ways where we can use data and data visualization to drive some informed decisionmaking and also help us identify risk earlier in the process.

Senator HASSAN. Are there any other things you think you need to implement? Essentially, you talked a little bit about data collection and possibly tracking how agencies are using. But to really implement kind of the assessment function, do you feel like you have the tools and it is just a matter of directing them correctly, or there are other things you could develop or use?

Ms. MARTORANA. I think the complexity of this is really challenged by some of our funding mechanisms.

Senator HASSAN. OK.

Ms. MARTORANA. Single-year funding for projects that are complex—

Senator HASSAN. Yes.

Ms. MARTORANA [continuing]. Adds quite a bit of burden to the process and sometimes forces people to make decisions in advance of having a fully validated plan.

Senator HASSAN. Got it.

Ms. MARTORANA. I think we also have opportunities and need for business process improvement, making sure that to our team sport theme today that both program officials, agency officials, CIO

teams, our procurement colleagues are all focused on accomplishing the same end result.

I think, again, I would kind of go back to funding.

Senator HASSAN. Yes.

Ms. MARTORANA. Making sure that we have flexible funding vehicles, like TMF—

Senator HASSAN. Yes.

Ms. MARTORANA [continuing]. Which is allowing us to move out on multi-year modernization projects, but surrounded by a team of people that are incented by our collaborative nature to hopefully drive a better improvement of the service delivery that we are trying to accomplish. I think those things in combination are keys, and I think it requires partnership also with the Hill for us to be successful.

Senator HASSAN. OK. Thank you.

I think we are expecting another Senator shortly, but I am going to continue along with my questions until she gets here. This is a question to all three of you. As part of the American Rescue Plan (ARP), the Technology Modernization Fund, administered by the Office of Management and Budget and the General Services Administration, received \$1 billion to increase the fund's capacity to assist agencies in achieving their IT modernization goals. We touched on this a little bit, but in addition the American Rescue Plan also provided funds to the IT modernization services and programs at the U.S. Digital Service and GSA.

To date, what projects have these funds supported, what benefits are the American people receiving or will receive as a result of these projects? Why don't we start with you, Ms. Hsiang, and then we will go to Mr. Zvenyach and Ms. Martorana.

Ms. HSIANG. Thanks for the great question. I would love for Clare to speak to the details of the TMF money since she is responsible there, but I would add that our funding to Information Technology Oversight and Reform fund (ITOR) or to USDS-specific programming has enabled a number of programs to be staffed and for us to work toward program outcomes.

In particular, this has enabled our work on "www.vaccines.gov" and the assistance hotline and textline associated with that. It has allowed us to do work toward the child tax credit in collaboration with Treasury and the Internal Revenue Service (IRS). It has enabled work on unemployment insurance and modernizing those systems and programs. It has enabled our work on unemployment insurance and modernizing those systems and programs. It has enabled our work on the emergency broadband benefit program at the Federal Communications Commission (FCC), work in the social safety net benefits programs that are administered by U.S. Department of Agriculture (USDA) and FMS, emergency rental assistance at Treasury, and then us to support programs at Small Business Administration (SBA) around Shuttered Venue Operators Grants and Restaurant Revitalization Fund.

I would note that in addition to helping us directly support those specific programs and ensuring that service delivery against those programs achieves the intended goals of the programs, it also allows us to work in all of those agencies on a mission-critical program that is of high priority, which allows us show that agency and

work closely with that agency on implementing new, more modern capabilities, to help that agency have an example of what more modern capabilities look like.

As Clare noted before and I also mentioned, a lot of times what it takes to sort of—to your first question, what motivates change, the mandate to do something new in addition to visibility and how to do it differently often creates an opportunity for more widespread change within an organization. In addition to the direct benefits to these programs, it also has allowed us to work closely with and help modernize some of the practices at each of those agencies.

Senator HASSAN. Thank you.

Mr. Zvenyach.

Mr. ZVENYACH. Thank you. I, too, will defer to Clare on the TMF, but for our purposes the American Rescue Plan has enabled a number of different investments. We also have supported a number of specific agency initiatives under the American Rescue Plan.

But because of TTS's unique role to focus on cross-agency initiatives and to think about how we might be able to provide sort of the reusable aspects, a number of our investments have been sort of building on the theme of 10x. We talked about the idea of those investments in trying to find what in the venture world you would call multiples. Things like the U.S. Digital Corps is an investment that we made, and the U.S. Digital Corps is an investment in trying to bring in the next generation of technology leaders and trying to find early career technologists in government. That is the sort of thing that we think can have not just immediate effect but transformational effect on government.

Also, investments in the FedRAMP automation. FedRAMP is one of the things that we think enabled us to respond to the pandemic, frankly, is the ability to use virtual technologies and cloud service technologies. Investments in automation in FedRAMP and sort of improving the through-put in FedRAMP is important.

We have also made investments in more speculative things. There is a project that I like called Pie Spots, and the idea with Pie Spots is to say how might we use raspberry pies, which are these like tiny little devices to maybe bridge the digital divide. There is a number of investments that we are looking at that some of which might work, some of which might not. But the idea with some of these investments is that we want them to have again these returns on investment, really, I think, focusing on value, and using these funds in a way that has both transparency and accountability but also has real multiples in value to the public.

Senator HASSAN. Thank you.

Ms. Martorana.

Ms. MARTORANA. Yes, I really appreciate the congressional commitment to IT modernization through the resources made available through the American Rescue Plan. The funding provided to USDS, GSA, and through the TMF are an investment in both our information security and the quality of government services. We have received applications for TMF funding from 48 different agencies or components of agencies, totaling about \$2.3 billion. We have sent up to Congress for review the first seven proposals that are going to be awarded through TMF, and two-thirds of them represent cy-

bersecurity. The appropriation was for solar winds, mitigating the impact of solar winds and the cybersecurity challenges that we are facing, as well as challenges that came to light during COVID-19.

What you will see in the multitude of those project proposals is a new way of us looking at how to disburse money. We really are trying to be strategic investors, working with our agency partners, making sure that we are evaluating these programs, obviously, for the greatest risk that they potentially have to the Federal enterprise. But also, we are looking at the highest probability of success, the highest value to the public for some of these, and the highest impact to security outcomes.

The focus that we have been able to use, a tool that was in the original appropriation but was not utilized previously, but we felt the emergency need of solar winds and the COVID-19 pandemic really warranted us focusing on payment flexibility. We issued guidance on payment flexibility and have had a significant number of proposals come in requesting that due to the urgent need of those agencies asking for that.

The investment portfolio guidance that we gave out focused on high-value assets—

Senator HASSAN. Right.

Ms. MARTORANA [continuing]. Again, really in the swim lane of IT modernization. Public-facing digital services, shared services, and cybersecurity. As I said, about 75 percent of the project proposals that have come in have had a primary or secondary cybersecurity focus.

Senator HASSAN. Thank you. I appreciate that very much.

I am now going to turn to my colleague, Senator Rosen, for her round of questions.

OPENING STATEMENT OF SENATOR ROSEN

Senator ROSEN. Thank you, Chair Hassan, and thank you for holding your second hearing on the important issue of the Federal Government's IT modernization.

This may not seem like the most exciting topic to some people, but as a former computer programmer, I know how important it is to get this right. This is not just about IT. It is about making sure that when not just Nevadans but all Americans, when they interact with their government because they are waiting on a tax refund, a Social Security payment, trying to renew a passport, applying for a grant, they know it is the technology that makes it possible for them to access and get what they need from the Federal Government.

It is the responsiveness of the government, the security that hopefully we can provide. Glad to hear about those cybersecurity projects. It really allows us, if we modernize, to deliver those services that people really need.

As Chair Hassan has pointed out, modernizing IT across the Federal Government also has the potential to save millions of dollars in taxpayers' funds. It is really the responsible thing to do. I want to thank the Chair again. I want to thank all the witnesses for your time today and, of course, for what you are doing every single day.

I want to talk a little bit about IT Centers of Excellence. Mr. Zvenyach, I am interested in the IT modernization Centers of Excellence that GSA established in 2017, that Senators Portman and Hassan worked to codify in 2020. The goal of the centers is to connect private industry with government agencies to achieve their IT modernization goals. Can you give us an update on the progress that GSA is making with these Centers of Excellence, and what resources do you think you need to make them more effective or tweak them? How do we build on the success?

Mr. ZVENYACH. Great. Thank you. Thank you for that question. We are very proud of the work that we have done with the Centers of Excellence. We heard one example earlier with the OPM.

Another example that I think is just a wonderful example is with the work that we have done with the U.S. Department of Agriculture. We had just an extraordinary partnership there. We were able to increase approvals by almost 3.5 percent, save tens of millions of dollars in annual cost avoidance by eliminating 31 out of 37 data centers, by providing better experience in terms of things like AskUSDA, really working to improve both the data, the governance, and just the overall user experience with the Department of Agriculture. Our partnerships really with a number of agencies with the Centers of Excellence have been something that we are really proud of and something that we continue to invest in.

I think where we see opportunity for the Centers of Excellence—and I think this is true across the board—is two things. One, we know that we need partners on the other side, who understand that these are complex challenges. As Mina said earlier, it really does require leadership to create those conditions for change. Obviously, in an emergency, everyone is ready to jump to the fray and to make those conditions, but unless there is another partner on the other side who is willing to make the changes that they need to make it does not really stick. The Centers of Excellence have done extraordinary work with our partners, but we need to always make sure that we have partners on the other side that have really clear understanding of their challenges.

Maybe they do not have answers. In fact, usually it is better if they do not have answers because sometimes they have preconceived notions about what might work. But if we have a clear understanding this is the problem that you are trying to solve, then we can come to the table and help bring our expertise and pair with their expertise to get it done.

The other thing that I will note is that one of the perpetual challenges with this is that we bring in extraordinary technologists. The last thing that we need to be doing is to be worrying about how we are going to deal with this interagency agreement and that interagency agreement and funding things. As we said, nobody really cares about the color of money. We just want to get to work and help people get these problems solved.

I think that is the thing that we really need to figure out is how do we make it easier for technologists to focus on the challenges, to work across our agency boundaries because the public does not care about these boundaries and neither do the technologists. They just want to work together to solve these important problems.

I think that is incumbent on leadership. It is incumbent on our partnership with Congress. It is obviously important for our relationship with OMB and beyond.

Senator ROSEN. I could not agree more. You set me up perfectly for my next question because I was going to talk about the success of the Department of Agriculture that you have really had there. How can other agencies use this USDA model for IT modernization? Because what you have been talking about is just phenomenal.

Mr. ZVENYACH. It is a great example. What I should say is that for every USDA there is another one. Right?

One of the great things about USDA is we had extraordinary partnership and leadership over at the U.S. Department of Agriculture. Gary Washington, the CIO there, was an extraordinary leader. We had folks sort of all the way up and down the chain who were excited about the mission and who understood that this was not going to be easy. It was going to require a commitment to users. It was going to require some iterative development. Closing down 31 data centers does not happen overnight.

Senator ROSEN. Right.

Mr. ZVENYACH. It takes sustained investment, and it requires sustained attention and focus. I think that as we look to other agency partners, what we need them to understand is that when they show up we also expect this to be a long-term partnership and something that they and we are not coming to the table for a quick fix. This is not this thing that you say, "OK, I have solved it. We have moved on." This is a long-term investment because the work is not done until software works for the public.

Senator ROSEN. Thank you. I would like to briefly touch on cybersecurity. You said two-thirds of the requests so far, proposals out there, were for cybersecurity projects because we absolutely need to make sure that cybersecurity is part of it. There are multiple, always multiple, points of, I suppose, interception from hackers that are out there. Maybe that is the best way to put that. As we modernize these legacy IT systems, we have to really be sure that we are protecting the taxpayers who rely on government services.

Ms. Martorana, can you tell me what services your agencies provide related to cybersecurity, and how do you ensure that agency modernization plans pay sufficient attention to sustaining cybersecurity? The sustainment. It is one thing to go in first, but it is, as you said, iterative development. You have to continue to do it over and over again.

Ms. MARTORANA. Yes, cybersecurity. There was a wonderful hearing here last week with three Federal leaders: Mr. Inglis, Ms. Easterly, and Mr. DeRusha. I do not think we could have a better team of people focused on cybersecurity for the Federal enterprise.

We focus in IT modernization through the cybersecurity executive order that came out. We assigned 23 tasks to Federal agencies related to cybersecurity.

One of the really collaborative ways that we are trying to focus on this is through the guidance that we just issued on zero trust. What we have recently undertaken is a public comment, a period of public comment, on the zero trust strategy that we put out, and

we found we received over 100 comments in the 2 weeks that this was available for the public, from industry, from private citizens, and from Federal employees. We got a great, diverse set of comments that are actually going to make our strategy more actionable for Federal agencies. I think that type of collaborative and open perspective on cybersecurity is what is needed for us to keep our projects safe and secure.

In the Technology Modernization Fund, as I mentioned, the 75 percent, we are doing something that is a best practice in the Federal Government and in the private sector, which is we are picking projects that not only have the greatest chance of success but that we can also build playbooks off of, so that we can repeat—every agency is trying to get to a basic level of zero trust, which basically means not trusting any traffic inside your network, constantly validating to make sure that you are not just securing the perimeter, but you are making sure that you are watching every transaction that happens within the network.

By trying to get us to that base level of zero trust, we are applying that to every IT modernization project that we undertake. Things have to be secure by design. Security is not an afterthought.

Senator ROSEN. Right.

Ms. MARTORANA. Security cannot be something you bolt on or it is someone else's responsibility. It is a core part of the way that we do software development, that we build projects, and that we will approve plans that come before the TMF board.

Senator ROSEN. Thank you for that. I agree. I am very happy to hear about the public comment because if you do not ask people on the ground what they need—the goal of writing good software is to give people what they actually need, not what someone thinks they need. I think that is a great way to go.

Madam Chair.

Senator HASSAN. Thank you very much, Senator Rosen.

I am going to turn now to Senator Ossoff, who is joining us virtually.

OPENING STATEMENT OF SENATOR OSSOFF

Senator OSSOFF. Thank you, Madam Chair. Thank you to our panel.

Reflecting on the performance of the rental assistance program that Congress passed in the American Rescue Plan Act, to help families stay in their homes during the pandemic, and how that rental assistance then was meant to be distributed via a patchwork of counties, municipalities, and State governments, the complexity of execution left many local governments unable to rapidly scale the technical infrastructure necessary to solicit and receive applications, to process them, and to deploy funds. It defies reason, in my opinion, that we would ask thousands of jurisdictions around the country to replicate the production of new technical infrastructure where, clearly, they do not have the capacity, and the need was urgent.

My question for you to begin with, Ms. Martorana, is: Could you reflect on how we might be able to centralize much of that activity so that we can scale an effort like that swiftly and improve ease of use for the customer, in this case, a tenant or a landlord seeking

to access rental assistance and to make it easier for local government partners to stand up new programs like this in emergencies?

Ms. MARTORANA. Thank you very much for that question. In my opening testimony, I focused on designing with users, not for users. One of the most critical parts of designing software products and services is making sure you understand the problem you are trying to solve. It is absolutely critical that we do this most foundational step in every single leg of service delivery, whether it is starting at the Federal level and then being dispensed to States and then local—municipal and local governments. That is a key focus of all of ours related to service delivery.

Senator OSSOFF. Thank you, Ms. Martorana, and that is an admirable principle, and I am sure that one, when applied, results in better outcomes. But let us think a bit more here. What is your reaction to the idea that when we, Congress creates such a program and seeks to rapidly deploy, for example, rental assistance resources across the country, we would make an API or a piece of software or a ready-to-use commercial solution available to those States or counties. Or, move in the opposite direction, from downstream to upstream, by allowing those counties to plug into a Federal system.

Designing with users, that is a great principle, but can you please comment on this specific case and how the Congress could have better designed this program and how we can work with executive agencies to make it easier to rapidly deploy resources, to integrate with State and local governments, on a project such as the rental assistance program.

Ms. MARTORANA. Yes. I do not have as much detailed information on the rental assistance program specifically, but I think I can really touch on the point that you are trying to make about us using modern technology solutions to deliver better services to the public. Application programming interfaces, APIs are something that can be developed from legacy systems. You do not need to have a totally modern tech stack in order to use some of these more modern, best practice, development capabilities. They would deliver better services downstream to State and local governments.

But I think that you are onto something that is a very important part of how we are thinking across the Federal Government, and possibly my colleagues might be able to jump in on this as well because that is a method that is tried and true. We used APIs off of legacy systems at the Department of Veterans Affairs (VA) in order to give veterans, caregivers, and their families the services that they deserved. This is a process that is possible. It is utilized every single day across government and in the private sector. I just cannot speak specifically to the rental assistance use case.

Senator OSSOFF. Thank you, Ms. Martorana. I would welcome and invite your colleagues to weigh in, maybe sequentially down the table, on this point. What I am asking you to do is to help the Committee envision the design of systems, technology, and implementation for a case such as the one that I raised and that we are discussing.

Senator HASSAN. Why don't we start with Mr. Zvenyach and then go to Ms. Hsiang.

Mr. ZVENYACH. Great. Thank you. I think a couple of things to note. The first is that sort of, as Mina said in her testimony and it is similar to what Clare is describing, I think one of the challenges that we confront with something like the program you are describing is that the public does not care about our organizational boundaries. They do not care that I am part of GSA and Clare is part of OMB and that the Department of Housing and Urban Development (HUD) is HUD. They just do not care. They do not care that a county is part of a State or that the State is unrelated to the Federal Government. They just want the program to work.

But our technology systems are built around the funding flows that go from agency to agency, or agency to county, or agency to State. What we need to do is we need to find a way to connect the technologists to each other without having it be totally dependent on saying, OK, I am optimizing for my agency, I am optimizing for my thing, and instead, start to have better conversations about how we can collaborate across those boundaries.

That is, frankly, the shift that we need to make as a government is that we have to stop centering around our org chart, stop centering around how we organize ourselves, and start organizing around how we can best deliver for the public because the public does not care about our org chart. They care about their service delivery. What we have to be doing is to reorganize our work and reorienting our efforts in order to best service, to deliver.

To specifically answer the question, the thing that we would need to do is to be able to work with Congress when you are enacting legislation to understand the program design and make sure that we are aligning the money flows and also aligning the technologists that are going to be working on this at the same time that you are putting the policy in place because the policy and technology cannot be sequential. It cannot be that you pass a law and then the technology comes in far afterward because if the technology cannot implement the policy then it will not work. When Congress passes a law, if the technology does not implement it, it is not a successful program. We have to be able to work with Congress in order to make sure that the systems do what Congress wants it to do.

Senator HASSAN. Thank you.

Senator OSSOFF. Thank you.

Ms. Hsiang.

Ms. HSIANG. Thank you, Senator Ossoff. I agree with the statements of my colleagues here and would just add that developing technology to support a specific outcome or to support a specific program is an inherently iterative process. We need to identify what the specific outcomes we are targeting are and then run sort of an iterative process to identify the right approaches that take into account the systems that are currently in place, that take into account the capabilities of players at various levels, and that take into account the realities of State and local government, intermediaries, grantees, and the public who is looking to interact with those systems and how they plan and want to engage and their capacity for doing so.

To sort of agree with what Clare said, I think it is very important to focus on what the outcomes are for our specific users. In

this case, there are two different sets of users, State and local grantees, and also the public.

Then I think as Dave notes, it is important for us to be part of that iterative process. By “us,” I do not necessarily mean us USDS, but I mean technologists.

If you are looking to design—if you, the Hill, if you, Congress, are looking to develop legislation with a specific outcome objective that can be enabled by technology, the best way to ensure that you achieve the outcomes that you are looking for is to engage technologists in an iterative process and along the way, as you are developing that legislation, to ensure that the program design is possible to be executed with technology at the various levels.

Senator OSSOFF. Great insight. Thank you.

Thank you, Madam Chair. I yield back.

Senator HASSAN. Thank you.

Senator Hawley.

OPENING STATEMENT OF SENATOR HAWLEY

Senator HAWLEY. Thank you, Madam Chair. Thanks to the witnesses for being there.

Ms. Martorana, can I start with you. You write in your testimony that no two agencies are the same and the different agencies are in different points when it comes to IT modernization. I would be curious that what in your view are the specific agencies that right now have the greatest modernization needs?

Ms. MARTORANA. Sorry about that.

Senator HAWLEY. That is OK. It is hard to see the red light.

Ms. MARTORANA. Thank you for the question. I do not know that I could answer that specifically. I work with CIOs every single day, and we work on numerous projects related to their portfolios. Some have some cybersecurity challenges that they are focused on, but I do not think wholesale that it would be easy for me to point out a specific agency.

Senator HAWLEY. Let me flag one for you. In a previous hearing on this same topic, we learned that the Treasury Department’s age—the system that the Treasury uses to hold taxpayer information, is 51 years old, if I have my facts right. In addition to that, we have asked a lot of this system over the past year to distribute pandemic aid in an unprecedented manner. Let me ask you, to what extent is Treasury’s IT modernization a priority for the administration?

Ms. MARTORANA. It is a large priority. I was actually on the phone with the CIO several days ago, working on this very matter. One of the things that I said in my opening testimony is while it is easy for us to think about technology, legacy technology, from an age perspective, we try to focus on it from a risk perspective. Can something meet the policy needs that are being written, and can we actually deliver for users? Can we patch the system should there be a security issue?

Not all legacy systems are—all of them, if we had a magic wand, I would want us to have the most modern technology across government wholesale, full stop. But we have to prioritize with the dollars that are allocated to each agency, to prioritize the systems

that are at greatest risk, might not be able to be patched, have availability issues where they might go down.

In working with the CIO of Treasury, those are the conversations that we are trying to have to make sure their high-value assets are prioritized the right way for the right investment and to accelerate their IT modernization journey.

Senator HAWLEY. Very good. Just on this same point, do you have a sense of what reasons Treasury and the IRS have given for why modernization activities have been delayed in the past, in other words, why we are where we are?

Ms. MARTORANA. I think some of the complexity is some of the policy initiatives that we undertake as a Federal Government that requires us to reprogram some of our systems. Some of those foundational items at Treasury went through reprogramming for the Affordable Care Act (ACA). Then they went through, just recently, reprogramming for PPP or for COVID—other COVID relief, ARP relief. Some of those systems we are prioritizing operational need versus long-term modernization opportunities.

A lot of these are not only intricately designed within the agency itself. Some of them deliver services to other agencies. Making sure that you can sequence your modernization projects, do them in bite-size chunks, so that you are not trying to boil the ocean at one time, are all part of the complexities that CIOs deal with on a daily basis and on an annual planning basis.

Senator HAWLEY. Very good. That is helpful. That is really helpful.

Let me ask you about a GAO report issued in June 2019 to 8 different Federal agencies with legacy systems. The report had recommendations that identified and documented modernization plans for their systems, but as of earlier this year, if I am not mistaken, seven of those eight had not yet implemented the GAO's recommendations going on over 2 years now. I just want to ask if the implementation of these findings is a priority for you and the administration and what you are doing to ensure that those recommendations get implemented.

Ms. MARTORANA. Yes, IT modernization plans are our priority. I have been working with GAO closely to understand the baselining of their reporting and what we need to do to partner together to support those agencies on their journey.

Senator HAWLEY. Very good. Thanks so much for being here.

Thank you, Madam Chair.

Senator HASSAN. Thank you very much, Senator Hawley.

I appreciate the testimony of the witnesses so much. I appreciate your work and your service.

We are in the middle of a vote. I do have a couple of more questions, and I will ask you to be relatively brief in your responses, and then we will wrap up the hearing so I can go vote.

Ms. Martorana, I wanted to follow up with you. We talked about how making sure there is flexibility for repayment for the Technology Modernization Fund is important, but in addition to expanding access to the TMF it is important that Congress authorize agencies to transfer money into working capital funds. The Modernizing Government Technology Act, which was passed in 2017, authorized agencies to establish IT working capital funds to pro-

vide a flexible source of funding for long-term IT projects from within the agency.

However, the Modernizing Government Technology Act did not include authority for agencies to move money into these accounts, which leaves these critical funding mechanisms unavailable to most agencies. In fact, only the Small Business Administration has received authority to transfer money to its IT working capital fund in order to pay for ongoing IT modernization projects.

How is the Office of Management and Budget working with agencies that are seeking the transfer authority to ensure that congressional authorizers and appropriators will support these requests?

Ms. MARTORANA. Thank you for that question. We are supportive of legislative fixes that would help agencies use these innovative funding models, including working capital funds. It is really essential. As we noted earlier, 1-year money or having real restrictions on the funding that is being provided to agencies, to move out on these multi-year projects, is really challenging.

Senator HASSAN. Yes.

Ms. MARTORANA. We are working closely with our CIO colleagues and across OMB on utilizing it. But there might be the need for some legislative fixes, and I really look forward to working with you and the Committee on those.

Senator HASSAN. We would really look forward to all of you, as you identify this type of issue, really letting us know about them as soon as possible so we can work to make sure that the agencies have the kind of authorities that they need.

Because we are running up on a vote, I am going to ask one wrap-up question. I am going to ask each of you to respond to it, and I am going to be a little unfair here and ask each of you to try to keep your response to about a minute.

At our April hearing, I concluded by asking each witness what in their opinion is the greatest challenge presented by the use of legacy IT systems. Today, our conversation is focused on solutions for modernizing legacy IT. As we conclude, I would like each of you to describe what in your view is the most important thing agencies should be doing to modernize their outdated and obsolete IT systems. We will start with Mr. Zvenyach. Then we will go to Ms. Martorana, and then we will go to Ms. Hsiang.

Mr. ZVENYACH. I think the first thing that agencies should do is not try to go it alone. If agencies try to do this by themselves, if they try to focus on their particular solutions in their own way, they are going to find themselves in a much harder place.

If we work as a team, if we work across our agency boundaries, we reuse the things that are available, we use the playbooks that are created, we use the shared services that we have and invest in those shared services, we focus on our users, we work in iterative ways, we do not let the things that have historically left us in a position of saying "This is how we have always done it" and instead say "This is what is actually important for the public," then we are going to be in a better position to actually modernize these systems.

Senator HASSAN. Thank you.

Ms. Martorana.

Ms. MARTORANA. Yes, I would say continuing to move out on the planning journey. I think, to Dave's really good point, not going it alone. While our agency missions are completely unique, we are dealing with many of the same problems at every single agency.

What we try and do through the CIO Council is work on collaboration, sharing information very openly, making sure that we understand what problem someone is trying to solve. We share everything from wholesale planning and financial data to playbooks, as Dave mentioned, and configuration settings for software, to be able to move out faster. We are working on a project through the CIO Council of connecting agencies, calendaring functionality so we can schedule meetings more easily. While they seem like simple things, spinning up those kinds of collaborative activities I think is going to be absolutely key to us continuing this modernization journey.

Senator HASSAN. Thank you so much.

Ms. Hsiang.

Ms. HSIANG. Thank you. I would say that for agencies to make the most progress on their modernization journey there are a few key components. First, to recognize that it is a journey and the best approach is to take it in chunks. Everything is lower risk. This is what we have seen work across industry. Doing it piece by piece is critical, and not trying to do any big bang or blanket modernization, but instead to think about it as a stepwise process and journey that you are embarking on.

Second would be to think about the personnel and engage in some new approaches for hiring to ensure that you have the right personnel for the expertise that is required at every step of this journey. There are many different competencies that are required. Director Easterly said it well; we need to help agencies move to competency-based hiring. I think that that will help support modernization—they on their modernization journeys as well. There are some key things that they can do that we are happy to share.

Finally, I would encourage them to focus in thinking about the right approaches for procurements to support that modernization. The right approaches are some of the things that Dave has spoken about, that Clare has spoken about. They need the types of flexible and iterative procurements that support the modernization that they are looking to accomplish and to support that stepwise and iterative approach they are looking to take.

Senator HASSAN. Thank you so much. I want to thank all three of you for your time, for your testimony this afternoon. Thank you for really valuable insights on this topic and your contributions to improving Federal IT systems in a fiscally responsible way.

I want to thank you for your service to our country. It is really important, and you have really shone an important light this afternoon on the progress we have made and the progress we can continue to make.

I look forward to continuing to work with this administration on encouraging use of existing IT modernization tools and resources to secure IT systems and deliver government services more effectively, as well as to coordinate on ways that Congress can fill the gaps to achieve the ultimate goal of saving taxpayer dollars and improving service to our taxpayers, too.

The hearing record will remain open for 15 days, until 5 p.m. on October 13th, for submissions of statements and questions for the record.

This hearing is now adjourned.

[Whereupon, at 3:46 p.m., the Subcommittee was adjourned.]

A P P E N D I X

**Opening Statement as Prepared for Delivery by Chair Maggie Hassan
Emerging Threats and Spending Oversight Subcommittee Hearing:
Existing Resources and Innovations Needed to Replace Legacy IT and Save Taxpayer
Dollars
September 28, 2021**

Good afternoon, and welcome to our distinguished panel of witnesses – thank you for appearing today to discuss the resources and services available to agencies seeking to modernize their outdated and obsolete legacy IT systems.

There's lots to discuss today - how Congress can supplement these resources in order to accelerate modernization, hold agencies accountable to their modernization plans, and reduce the federal government's reliance on aging technology. Also critical here is, of course, ensuring that in all these efforts we are staying focused on saving taxpayer dollars.

This is critically important because we know that outdated technology fails to serve the American people and is insecure against sophisticated cyberattacks. It also wastes billions in taxpayer dollars every year due to poor procurement actions, improper payments, and expensive contractors needed to operate and maintain aging systems.

I would also like to thank Ranking Member Paul and his staff for working with me on this hearing and more broadly on our ongoing efforts to curb wasteful spending. Just last week, we introduced the 2021 edition of Acting on the Annual Duplication Report Act, which would implement recommendations made to Congress by the Government Accountability Office to eliminate wasteful duplication, fragmentation, and overlap across the federal government. I look forward to working with Ranking Member Paul and all of my colleagues to move that bill forward.

Today's hearing builds on a hearing this subcommittee held in April that focused on the issues holding agencies back from realizing significant cost savings, increased security, and greater service delivery by modernizing their systems. Today, we are asking, "How are agencies using existing tools and resources to transform their aging technology, and what can Congress do to fill the gaps that remain?"

At our previous hearing, former federal agency chief information officers and a Government Accountability Office expert on federal IT management discussed the costs and challenges that legacy IT systems present. We learned how detailed IT modernization plans are critical to an agency's long-term success in updating IT and budgeting for capital projects. We learned that funding mechanisms, such as the Technology Modernization Fund and agency working capital funds, need to be improved to accommodate multi-year modernization efforts. And most importantly, we learned about the impact that the federal government's aging IT infrastructure has on the American people.

Despite some challenges, agencies have a tremendous opportunity to modernize these outdated systems and, in turn, make government more effective and efficient. Over the course of the pandemic, we saw chief information officers across the government quickly equip their agencies

to work remotely. Congress and the Executive Branch have made more financial resources available to agencies to upgrade their IT systems than ever before. And there are programs and policies in place to assist agencies in taking their aspirations and turning them into achievements.

Lending their expertise and insights on what more we can do to address the challenges we face is our panel of accomplished witnesses, consisting of the Federal Chief Information Officer, the Administrator of the U.S. Digital Service, and the Director of Technology Transformation Services.

I look forward to hearing from all of you today about your work to assist agencies in reducing their reliance on costly, outdated, and obsolete technology.

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Testimony of Federal Chief Information Officer Clare Martorana

Senate Committee on Homeland Security and Governmental Affairs
Subcommittee on Emerging Threats and Spending Oversight

Hearing: *Existing Resources and Innovations Needed to Replace Legacy IT and Save Taxpayer Dollars*

Introduction

Chairwoman Hassan, Ranking Member Paul, and Members of the Subcommittee, thank you for the invitation to testify on legacy information technology in government. It's my pleasure to be here with my colleagues Mina Hsiang and Dave Zvenyach. We are collaborators and frankly, that's what it's going to take to modernize IT across government.

I've found that when you bring people, process, and technology together, you can create momentum in addressing even the most challenging IT issues in government. It is my hope that our discussion today will highlight a new way of working with you and our colleagues across government to address this longstanding challenge.

What is Legacy IT?

It's important to note that not all old systems are legacy, and old doesn't always mean bad, antiquated, risky, or in need of retirement. The legacy technology I am most concerned with are systems that are no longer supported and whose security cannot keep pace with our adversaries. First and foremost, a government system must have a secure foundation. From there, it must be able to deliver for your constituents, the American people. For instance, when I was with the U.S. Digital Service at the VA, we connected to legacy systems by using application programming interfaces, or APIs, to deliver a modern customer experience for our Veterans. The underlying technology to support this effort was what some might call old, but it was secure, stable, and able to accept a new front-end interface for customers.

Teddy Roosevelt said, "Do what you can, with what you have, where you are." I'm happy to report that we can do a great deal across government with what we have. What we need is to work differently, and recruit and reskill people with the right experience, mindset, and executive level support to make it happen.

Why Modernizing Government IT is Challenging

In private sector technology, I made decisions in a relatively linear way and directed funding to the areas in greatest need and with the greatest return on investment. As an agency CIO, however, I had to operate within a legacy funding model, with seven different and discrete streams of funding within an uncertain budgetary cycle that did not provide a great deal of flexibility. In addition to an uncertain budget, I had to

meet and balance a myriad of executive, legislative, and oversight requirements. This way of operating presented a level of complexity that is truly staggering and does not make sense – or deliver value to the American people -- in a modern operating environment.

Coming into my role as Federal CIO, this first-hand experience has helped me understand these unique challenges and given me an opportunity to deliver solutions. First, it's important to note that government technologists did not create the problems they are facing – in many cases, they have inherited them. The path to modernizing government IT requires CIOs, Chief Information Security Officers, Chief Financial Officers, Chief Acquisition Officers, Chief Human Capital Officers, Chief Privacy Officers, and other agency senior leaders to be aligned and working together to build an operational model for investment, deployment, and sustainment of technology. Technology and data power each agency to execute on its mission for the American people. This C-Suite operational model is essential for agencies to deliver modern, secure services for the public.

21st Century Government IT: What's Possible

Government technology can deliver greater value to the American people and empower the federal workforce when government technologists work across the enterprise to operate more efficiently and effectively in service to our nation. As we retire and modernize technology across government, we will stand up a technology infrastructure that is integrated across federal agencies and is secure by design, so the public can have a seamless experience. When your constituents interact with our government, they expect – and deserve -- government services that are as easy to use as the consumer products and services they use in their daily lives.

As Federal CIO, I envision an enterprise technology framework that enables our government to: make quick and efficient decisions informed by data; seamlessly communicate within the federal government and between federal, state, local, and tribal governments; proactively and securely meet the needs of the public; and maintain flexibility to adjust to emerging circumstances, like COVID-19, Hurricane Ida, or persistent cyber campaigns by our adversaries.

This committee's decisive action earlier this year to support the allocation of \$1 billion in emergency funding to the Technology Modernization Fund has provided a great start to develop this framework. To date, we have received more than one hundred project proposals from agencies, requesting more than \$2 billion. Seventy-five percent of those proposals are focused on cybersecurity improvements. As the Board prepares to release the first round of project approvals, there is a strong focus on learning what works well for one agency, and translating those experiences and lessons learned into successful outcomes for many agencies.

What it Will Take to Get There

Enterprise Collaboration

When I became CIO of the Office of Personnel Management, I arrived as the seventh CIO in 7 years. The agency was facing an uncertain future as an organization and a number of critical IT challenges, including aging legacy mainframe technology that held crucial data for our nation. In short, I knew I would not be able to solve the multitude of problems I was facing alone. So, I phoned a friend – the CIO of GSA -- who immediately provided top technologists from his team to join mine, fill critical gaps, and help assess the situation.

This partnership enabled us to realize that we needed the specialized skills of another tech talent group, the U.S. Digital Service (USDS), who have within their capability set the ability to rapidly assess critical infrastructure, identify and secure vulnerabilities, and deliver a recommended path forward. From there, my colleagues at OMB provided historical context on previous investment strategies and helped develop a financial strategy for the path forward. Working with my team, we were then able to engage GSA's Centers of Excellence in conducting an options analysis and criteria for the long tail of the work ahead. This ultimately led to the successful procurement of new, supportable mainframe technology and its relocation to modern, state-of-the-art data centers using the limited IT modernization funding that was still available.

These successes would not have been possible by remaining in my silo. It took a combination of internal and external forces -- technical talent, budget and management officials, legal, privacy, finance, acquisition and legislative affairs colleagues, and many others to create the momentum we needed to stabilize, secure, and modernize operations.

Showing, Not Telling

No two federal agencies are the same. Every IT organization across government is at a different point in their modernization journey. Through the appropriations process, we are entrusted with taxpayer dollars to deliver impactful and accessible technology and services for our citizens. As Federal CIO, I have the responsibility and the ability to set an enterprise vision and serve as a convening force, identifying where agencies are on their modernization journey and ensuring they have the people, specialized teams, and executive air cover they need to be successful.

Our work starts by understanding what our citizens need and keeping them at the center of everything we do. Working with colleagues from USDS and GSA's Technology Transformation Services (TTS), the federal CIO and CISO communities, and technologists across government, we can make best use of the appropriated dollars we receive to deliver secure, modern technology for the American people. When we are aligned as technologists and committed to a shared vision across government, we can deliver digital experiences for our citizens in just weeks.

We will get there by establishing a culture across government that is mindful of customer experience (CX), and providing structure and consistency around how agencies should approach CX in delivering on their mission. We will use an incremental, fast-paced style of software development to learn quickly what works and what doesn't, and reduce the risk of failure -- and show our colleagues across government what's possible even within a legacy IT environment. By delivering minimum viable products, or MVPs, we are able to get working software into users' hands early and give design and development teams the opportunity to adjust based on user feedback about the service. With each new digital product launched, our workforce will be able to do less manual work and focus on the reason they came to government: to deliver higher quality service to the American public.

Conclusion

I joined the Biden Administration and stayed in government because I've witnessed firsthand how modern technology delivery can fundamentally transform the way we can deliver for the American people. Every single group I have met across government wants to be part of the solution and I'm going to take them up on their offer. By working across the enterprise, we can identify and retire the technology that needs to be retired, and deliver secure, best-in-class products for our federal workforce so they can deliver an exceptional customer experience for the American people.

I look forward to working with you and our key stakeholders, keeping you apprised of our progress, and identifying where we need your help so we can all be successful on this government-wide IT modernization journey.

Thank you for the opportunity to be here today. I look forward to your questions.

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Testimony of the United States Digital Service Administrator, Mina Hsiang
Homeland Security & Governmental Affairs Committee
Hearing on Legacy IT Systems Modernization

Introduction

Chairwoman Hassan, Ranking Member Paul, and Members of the Subcommittee: thank you for the invitation to testify on legacy information technology in government on behalf of the United States Digital Service (USDS). I am honored to be here, alongside my colleagues Clare Martorana and Dave Zvenyach.

While I am newly appointed as the Administrator of USDS, I am also a returning public servant. My government career began at the FDA, where I was an intern evaluating the safety and efficacy of medical devices. Later, I went to OMB, where I worked on programs supporting energy innovation and our challenged automotive sector. After joining the HealthCare.gov rescue team, I helped stand up USDS, and led our work there in healthcare for the first three years. I am excited to be back at OMB and to return to USDS as its Administrator. We have a unique opportunity to address the challenging problems affecting the delivery of government services to the American public.

United States Digital Service

The mission of USDS is to ensure that government services are delivered well, using the best of technology and design. We leverage capabilities, tools, and best practices from across sectors and industries to strengthen essential government programs. We do this in partnership with government agencies by recruiting and hiring top technical talent to staff projects across the government and work side-by-side with agency civil servants. We also collaborate closely with our technical partners across the government, including agency CIOs, the Federal CIO, and GSA. We're proud to have a track record of convening teams that partner with agencies to define and deliver on urgent and ongoing programs.

At USDS, we are focused on improving delivery in a few ways:

We aim to make services more straightforward and sustainable, making it easier for the public, including families, small businesses, and Veterans, to get the services they need. We also aim to increase accessibility to these more straightforward and sustainable models by making it simpler for agencies to launch new services with more efficient business processes, and simpler for IT organizations to build and maintain necessary tools. We publish "playbooks" to share best practices, and we provide service blueprints for others working toward change in this space.

Additionally, we approach programs by centering objectives around the people we serve. We orient implementation towards providing good outcomes for people who need and use government services. For example, when we think about new mothers applying for WIC, or school nurses who must track and report COVID testing in their school, we design the process, implementation strategy, and technical build around what will create the best possible outcomes for them. This

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often requires an explicitly iterative process that incorporates user research, strategic technical road mapping, agile development, and continuous improvement.

Another critical component of our approach includes finding and empowering great people – both career civil servants and new public servants. We strive to bring the best practices and skills from across the country, and we do this by recruiting team members with diverse and relevant backgrounds to bring their expertise to our critical mission, as well as scaling best practices. This model has successfully helped us deliver excellent services and has resulted in help filling other roles in public service, including some USDS alumni who wish to make a more long-term commitment. We recruit for our organization, but we have learned that the long-term success of programs requires hiring capabilities across the government. That is why we have been working with agencies and the Office of Personnel Management (OPM) to develop new techniques and capabilities across the government to evolve hiring processes.

USDS has successfully partnered with many agencies, our work on OPM's mainframe is a good example. OPM required specific expertise and response skills coupled with the experience to help with both remediation and a strategic plan forward – capabilities where USDS excels. Our model enables us to support agencies quickly in these critical moments. Given the engagement scope and timeline, we also partnered closely with agency staff and other teams like the Technology Transformation Service to work towards building capacity for the long term.

We work on longer term, broader projects as well. When implementing The Medicare Access and CHIP Reauthorization Act of 2015, the Centers for Medicare & Medicaid Services partnered with us early on to ensure that the program systems and data platforms were well designed to meet the program objectives, and to support a successful launch. They engaged us early which led to an iterative and user-driven policy process hand-in-hand with strategic technology development, utilizing new more iterative contracting vehicles, leading to stronger and more durable decision making and systems.

IT Management: Building towards better outcomes

Technology exists as a means to an end, not as an end in itself.

I started my career as a medical device engineer; the primary objective of my work was to help people live longer, healthier lives – it was not to build a widget for the sake of building a widget. Additionally, we had to think about the safety and efficacy of the medical devices, which is deeply dependent on how straightforward the device is to use - for example, how easily it fits into someone's life and frame of reference.

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I look at IT similarly. It exists to make our work faster, more scalable, more accessible, and more efficient. Yet, our focus should remain on creating optimal outcomes for users – harnessing technology at every step to make the work easier – and to avoid becoming captive to the technology. This requires constant, iterative work.

IT systems are continually changing for many reasons. Sometimes, the capabilities needed change and evolve, or the other IT systems that an application must exchange data with change or increase, or an operating system need updating, hardware needs replacing, and preventative updates need to be applied to thwart malicious attacks. If we fail to do these things – if we don't invest over time, or if we don't make changes because we are afraid of the possible impacts – then we will amass technical and maintenance debt. This is how a system can become a legacy system.

Mission-critical systems are essential to evolve and improve; the riskiest option is usually leaving something alone for too long without updates or improvements. Software is never done.

To continually work on the technology, the right people must be in place. We know that private-sector companies are competing for technical talent – because strong technical talent is a necessity for operational success in today's tech-enabled world.

Additionally, we require the ability to budget and plan appropriately to serve mission needs. Budgeting and strategic planning for this work and continual adjustment and execution are critical and challenging in any organization. Organizations make difficult and explicit decisions about which systems to evolve and which systems to deprecate, often based on the needs of their users.

Lastly, it is critical to have the appropriate incentives and mechanisms for teams to do the right thing every step of the way. Determining an organization's mission and ensuring the technology is constantly pushed to align with that mission is essential for long-term success. That includes considering how the technical teams and their products are evaluated, how security is managed, and how reviews and oversight drive focus.

Legacy IT in Government: Building adaptable tools and organizations

Consistent with the definition in the Modernizing Government Technology Act, a “legacy” system is one that is “outdated or obsolete.” It can be easy to call all old technology systems “legacy,” – but that's an overly broad application of the term. Truly obsolete systems pose risks which must be mitigated through better planning, but for the majority of systems focusing on legacy versus non-legacy is not accurate and does not address the true concern, which is whether systems are keeping pace with the mission they serve.

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Many older systems operate well enough to accomplish their mission. With a bit of tuning and maintenance, they would be in a good place and shifting them to new platforms would be expensive and risky.

Yet, since the typical technology industry best practice of ongoing development is atypical in government systems, other systems can become underperforming systems long before they are technically “legacy,” meaning outdated or obsolete. Every year, these systems accumulate technical debt – as they are not being iterated on – and they inch closer to becoming “legacy.” When they do truly become legacy it is not usually a sudden event. We can see this coming, but our processes frequently make planning ahead and implementing preventative measures challenging. If we invested in an ongoing evolution that allowed for regular updates to keep them well-aligned with agency missions, they would serve us well for longer periods.

All of this occurs because the success factors outlined above are not prioritized.

Modernizing a legacy IT system is not an all-or-nothing proposition. It is a long process, with an overall strategic vision, goal, tactical and technical development, and decision-making along the way. It requires an iterative plan to manage and mitigate risks and long-term commitment with consistent support.

If we want that process to be successful, we need to invest in technical expertise and leadership. We must have people to do the work; with the right skills, expertise, the proper strategic engagement, and the proper authority to make these things happen. Decision-making is a constant exercise for a technology portfolio, not something you can do once and then set aside.

Federal procurement also offers challenges, USDS has invested significantly in developing best practices that work in government and in training procurement experts across agencies to improve performance, but we need to do more centrally to keep up with future progress. The policymaking and implementation process is also biased toward “new” – new eligibility rules, new program requirements, and new systems for each program, for each agency. This proliferation leads to many parallel and duplicate systems, increasing the burden and complexity of evolution and maintenance and the probability that they will not be maintained or harmonized for users. Without a robust process for working with and evolving what we already have to encompass new programs, we are destined to continue making interactions more confusing and duplicative for users. Improving upon this will require a more collaborative technical assistance process, which includes coordinated perspectives to help clarify what already exists and what the tradeoffs are for building something new versus evolving what we have or decommissioning what is outdated.

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Lastly, the oversight and incentives for teams often lag best practices, pushing teams toward reporting over functionality, outdated requirements, and disincentivizing change.

The Opportunity Ahead: Building simpler, more secure, cheaper systems by thinking about the person on the other end

The public – and most importantly, people who rely on government services – do not care how many agencies exist, where the boundaries are, which legislation created which system or eligibility, or what the color of money is for maintaining a system. They want a straightforward experience when they interact with government programs. They want systems and programs that work together, meet their needs, and deliver the outcomes they expect clearly, minimizing their stress and the burden on their lives.

It is not easy to design programs that fit together thoughtfully and intuitively for users. And it is not easy to build processes that can continually evolve to meet their changing needs. But it is the right thing to do for the public, and if we do that, we will be dramatically more likely to build systems to support it that are more robust, better maintained, and better evolved than the status quo.

In collaboration with our agency partners, the three of us seated in front of you are already working hard to coordinate and collaborate on the appropriate shared capabilities necessary in such a world by empowering that talent, focusing the experience of those we serve, and implementing agile development and procurement.

We have outlined some of the challenges that make it more complex, and we look forward to working with you to design solutions. Thank you for the opportunity to testify, and I look forward to your questions.

**Existing Resources and Innovations Needed to Replace Legacy IT and Save
Taxpayer Dollars**

**Statement of Dave Zvenyach
Director, Technology Transformation Services
Deputy Commissioner, Federal Acquisition Service**

U.S. General Services Administration

**Before the Senate Committee on Homeland Security and Governmental Affairs
Subcommittee on Emerging Threats and Spending Oversight**

September 28, 2021

Chairwoman Hassan, Ranking Member Paul, and members of the subcommittee, my name is Dave Zvenyach and I am the Director of Technology Transformation Services (TTS) and Deputy Commissioner of the Federal Acquisition Service (FAS) at the U.S. General Services Administration (GSA). I am pleased to be here today to discuss the important role that GSA plays in the replacement of the federal government's legacy technology systems.

As you know, digital technologies have fundamentally transformed the way that individuals interact in every sector, with corresponding changes in social norms and expectations. The public sector, too, has made strides over the years to take advantage of innovative solutions and emerging technologies to improve digital services.

The federal government is expected to spend nearly \$100 billion on information technology projects in fiscal year 2022. And yet, a significant portion of those funds are spent each year on maintaining legacy systems that are outdated, vulnerable to

attack, or fail to meet mission needs -all with an ever increasing price tag for service.

GSA, along with our colleagues at the Office of Management and Budget, is proud to play a critical role in delivering on all aspects of technology modernization and an improved, easy, and efficient procurement environment for federal agencies. At TTS, we stand ready to partner directly with agencies on their modernization journey.

Understanding Why Legacy Systems Exist and What to Do About Them

Perhaps the biggest challenge we have in the government technology space is recognizing that we need to shift how we talk about--and how we deliver software. In today's environment, we need to understand that software delivery is never "done." There's a belief that modern systems are those recently created and that they eventually age to become legacy systems that have to be replaced. But technology that is properly developed, maintained and continuously focused on meeting user needs etc may never become "legacy"; *all systems*, regardless of vintage, should be focused on meeting our users' needs and we should be prioritizing our work to maximize services delivery for the public. We need to shift the government toward an expectation that every system in production should be continuously improved, so that there is no such thing as a legacy system and no such thing as "done."

A commitment to user-centered design, agile principles, security, accessibility, and a clear product vision are essential to excellence in software delivery. This must be true for every system in government.

Unfortunately, when we talk about government legacy systems, we are almost always referring to the ones where the stakes are the highest, and where the perceived risk of failure is least acceptable. Under these conditions, organizations

tend to adopt an inherently risk-averse culture, where innovation is implicitly or explicitly discouraged.

Organizations with risk-averse cultures often build technology systems that are resistant to the continuous improvement approach. This should be pretty self-evident; if your culture is hostile to innovation, it would be pretty remarkable for your technology to be innovative. Too often, bureaucracies create systems that comply with all of the various rules, policies and regulations, but fail to meet users' needs or provide the optimal user experience. In such environments, technology and service delivery, is disconnected from mission delivery, and no one is encouraged or incentivized to pursue innovation or change.

Innovation is, of course, not just valuable for its own sake. Any software engineer in TTS will tell you that the "technology is never the hard part." Instead, because software is never done, and because systems must change over time, the government needs to embrace resilience, adaptation, and evolution in our systems. In most cases, this requires both long-term cultural change within organizations and intentionality around future system design.

Making the decision not to maintain legacy systems can also require humility and courage. When they were first created, many legacy systems met real users' needs. Over time, though, other systems --or components of those systems--came along that more effectively served the needs of those users. That is part of the natural evolution of technology.

As the government looks to ensure that we are best serving the needs of the public, we must prioritize those efforts that are core to our missions, and find ways to decommission or consolidate those legacy systems that no longer need to be maintained separately.

Technology Transformation Services

At the core of TTS' mission to design and deliver a digital government with and for the public is the modernization and security of the government's technology infrastructure and making it more efficient, and effective with modern applications, best practices, platforms, methodologies, expertise, and shared software solutions, all with the goal of improving the public's experience with the government.

Additionally, one of TTS' "superpowers" is that we have a range of programs and services that agencies can reuse for their digital services efforts, allowing the government to quickly scale modern technology practices, reduce duplication of effort, and save money. For example, FedRAMP helps agencies adopt secure cloud technologies, through a "do once, use many" security approach. Similarly, the U.S. Web Design System provides a more consistent and accessible experience across agencies and across sites. Data.gov provides a unified public view of the government's open data assets, and assists agencies with maintaining government open data standards. We even provide opportunities for practitioners to share best practices and learnings through communities of practice on our digital.gov platform.

In addition, to best serve the wide-ranging needs of the public and our government, TTS insists on diversity, equity, inclusion, and accessibility in our teams and in our services. This is particularly essential for developing, implementing, and responsibly scaling adoption of technology that works for everyone. TTS recognizes that the most effective teams are cross-functional and have diverse backgrounds, experiences, and skills — with high levels of cultural competency and inclusivity. By prioritizing an equity-focused, people-centered approach to our design practices, we can proactively reduce negative impacts and improve usability and accessibility of our products and for the public.

TTS Impact

TTS has partnered with many agencies since our inception, and the Office of Personnel Management's (OPM) journey is a great example of a collaboration striving to fundamentally change the way services are delivered to employees, federal agencies, and the public.

A longtime partner of GSA, OPM was looking at their health and benefits, retirement, and employee (human resources solutions) systems challenges and realized that expertise in understanding the entire landscape was needed. This required technology and data analysis and creation of an acquisition strategy, facing challenges like the impending loss of contracted support, lack of a data asset inventory, and lack of acquisition expertise. As mentioned by my colleagues from OMB and USDS, TTS' Centers of Excellence played a critical role in the recovery and modernization of OPM's mainframe. Focusing on the agency's key data assets provided insight at an enterprise level that was critical to transition OPM from disaster recovery to service continuity.

The seamless collaboration across GSA to quickly negotiate and implement a procurement solution that met our partner's needs, while also looking at the long-term needs of our partner's customers (in this case employees of the entire federal government) created a long-term and sustainable customer journey to a better experience. This meant aligning technology (from an infrastructure and data perspective), to people (with respect to change management and training), and implementation (related to the discovery, design, acquisition, and delivery of technology procurement). This sort of partnership is at the core of much of our work within TTS, and is exemplary of both the challenges associated with moving away

from legacy systems and the opportunity to sustainably foster better service delivery.

TTS has been honored to be a part of OPM's technology modernization journey by helping to bring improved trust and security to its systems. For example, Login.gov, a shared digital service for public authentication and another example of collaborative development with the US Digital Service, has been helping the public securely authenticate to USAJOBS since 2017. USAJOBS was an early adopter of Login.gov and brought multi-factor authentication to the federal government's primary job-listing website. Login.gov continues to support OPM in its adoption of zero-trust architecture across its public-facing properties. To date, Login.gov has helped over 15M users access and apply for federal job postings.

Conclusion

The next few years will bring increasingly complex challenges, and GSA, with our ability to implement cross-government solutions, is uniquely positioned to help agencies address them. GSA will continue its mission to deliver innovative and secure technology practices to help improve government efficiency.

By shifting how we think about building and maintaining technology, focusing on the impact on mission and customers, and looking to expertise and innovation in government and in collaboration with our industry partners, we can significantly improve federal technology and, ultimately, how agencies serve the public.

Thank you for the opportunity to appear before you today to discuss GSA's role in modernizing technology systems. I look forward to answering any questions you have.

**HSGAC Emerging Threats and Spending Oversight Subcommittee
Existing Resources and Innovations Needed to Replace Legacy IT Systems
September 28, 2021**

**Questions for the Record from Senator Sinema
For Clare Martorana**

- 1) **Given your prior experience, you have a unique perspective and understanding of both the steps needed for technology modernization and for workforce development as we move to retire legacy systems and modernize federal IT systems. What are some of the needs and challenges you have seen with workforce development, how should they be addressed, and what steps should Congress take to help address those needs?**

C-Suite Leaders Aligned to Enterprise Cyber & IT Modernization Plans. The path to modernizing government IT requires each agency's C-Suite team to be aligned and working together to build an operational model for investment, deployment, and sustainment of technology. Technology and data power each agency to execute on its mission for the American people. This C-Suite operational model is essential for agencies to deliver modern, secure services for the public. By following an enterprise plan, leadership teams can best utilize taxpayer dollars in delivering tools and technology to their workforce so they can deliver for their customers – your constituents – the American people.

Following an enterprise IT roadmap also enables CIOs and CISOs to identify the skill sets necessary to deliver a secure modern experience. Needed investments in training, reskilling, retention, and recruitment become clear.

Recruiting Tech Talent & Modernizing Federal IT Workforce. We want technologists at all stages of their career path to consider joining the Federal Government for a either a tour of service or a competitive career path. Early career technologists can find an onramp via the [U.S. Digital Corps](#) while senior technologists can make an outsized impact by serving with the [U.S. Digital Service](#).

As we're focused on deploying modern tools and technology to meet today's customer needs, we must ensure current federal technologists are able to transition from a project management mindset – focused on how to deliver customer services -- to a *product* management mindset – one that places customers, like your constituents, at the center of everything they do. By designing with our users, we're able to understand their needs and deliver them an exceptional customer experience. By understanding that federal technologists are themselves users of government services, the possibilities for long-term, empathetically designed, and agile products will compound as more technologists join public service.

We must also make the Federal Government a great place to work - one that invests in its people, creates a welcoming and inclusive environment, empowers and rewards

employees for making decisions that are focused on improving the customer experience our citizens have when interacting with our government. The Biden Administration believes a diverse IT workforce is essential – this means we need everyday people to say yes to being part of something bigger. To deliver great products and services, we need teams that look like America – from all over America – to represent our citizens, so we can eliminate or minimize bias in the services we deliver.

Hiring challenges, such as outdated position descriptions and a job series for modern technology positions, in addition to the ability to bring people on quickly, impede our ability to recruit top talent. We need creative ways to encourage top talent to join us, like working with private sector to stand up civic leave programs enabling their employees to serve our country, even for a short timeframe. We also need to promote the substantial advantages of choosing a public sector term or career, including our unique missions and work-life flexibilities.

The government has seen success in innovative tech talent pipelines like the United States Digital Service, the Presidential Innovation Fellowship (PIF), and the General Service Administration's Technology Transformation Service (TTS), which make the application process simple and rapid – while meeting federal hiring standards. USDS, PIF, and TTS are able to build teams with modern engineering, product management, and human centered design skills and partner them to work side-by-side with civil servants to deliver on urgent and ongoing programs. This framework enables agencies to deliver modern services and demonstrates to the federal workforce what's possible within their agency.

- 2) **The Department of Veterans' Affairs created the Veterans Experience Office to provide a higher quality customer experience to the veterans, families, caregivers, and survivors the VA serves. This effort has been very successful. I am a cosponsor of the Trust in Public Service Act, a bill that Senators Murphy and Lankford introduced to increase the focus on the customer experience across all federal Agencies. It creates a new Chief Customer Experience Officer at the Office of Management and Budget (OMB) and each Agency to incorporate "Human Center Design" practices that start with the customer perspective. It also provides accountability, establishing the customer experience as a central measure for agency success. Can you speak more to the importance of Federal agencies adopting Human Center Design practices and what impact that would have on government operations for the customer and potential savings for the taxpayer?**

If every agency in the Federal Government put its customers at the center of everything they do, your constituents would get an exceptional customer experience when interacting with our government. They deserve no less. Our job in Government is to work across silos to deliver the American people the services they deserve. In the Biden Administration, we are committed to designing with our users, understanding their needs, launching services that people of all abilities can navigate, and deliver a more equitable and effective government for all. This is the expectation of each federal agency and as Federal CIO, I will ensure agency CIOs are aligned to this priority. As mentioned earlier,

it will also take the C-Suites of each agency to be aligned to an enterprise plan to build an operational model for investment, deployment, and sustainment of technology.

Further, in my role at OMB, in particular collaboration with the Deputy Director for Management, Administrator of the Office of Information and Regulatory Affairs, Administrator of the U.S. Digital Service, and our Resource Management Offices, we remain committed to working across government to better orient our management of service design and delivery around the experiences of actual people, not organizational silos. The Administration's annual update to OMB Circular A-11 Section 280 further built out the accountability of High Impact Service Providers and the President's Management Council to improve their delivery for the American public. By deploying secure enterprise technology, using human-centered design principles, and aligning agency employees to the enterprise IT roadmap, it will lead to efficiencies and cost savings, and reduce administrative burden for the federal workforce so they can focus their efforts on delivering for our citizens. This model will enable our government to build trust with the public and help inspire the next generation to join us in serving the American people.

- 3) **Given the significant funding Congress has already provided, and additional funding under consideration, for departments and agencies to modernize systems and upgrade cybersecurity, I want to better understand how agencies are making their choices about purchasing security products and services and encouraging a competitive marketplace. Specifically, I am concerned that some of our contracting and acquisition practices make it easier to buy products that might not be the best solutions for the environment. How is your office working with agencies to ensure that:**
- i) **Our contracting officers are educated and working in tandem with our CIOs/CISOs?**
 - ii) **Software that is advised as being "Free", typically sold as part of a bundled solution by companies with market power, does not take precedence over picking the most secure solutions?**
 - iii) **The federal government is promoting a vibrant and competitive cyber security market?**

The Office of Management and Budget (OMB) has multiple touchpoints with federal agencies, orchestrating dialogue among key stakeholders to exchange and build on the lessons learned to ensure interagency success in acquisition decisions. We routinely use the Chief Information Officer Council and Chief Acquisition Officer Council to engage with agency IT and procurement leadership and facilitate cross-Council collaboration. OMB's policies, at the direction of statute, call for CIOs to play a central role in all procurement decisions involving technology.

Specifically, in fiscal year 2020, OMB worked with General Services Administration (GSA), National Aeronautics and Space Administration (NASA) and Department of Health and Human Services (HHS) to establish the IT Vendor Management Office

(ITVMO), a new office that will advance the goals of Category Management and optimize government wide IT acquisition. The ITVMO serves as a trusted independent advisor and advocate to help agencies buy common IT goods and services in compliance with procurement laws. As a one stop shop, the ITVMO leverages governmentwide IT procurement data, conducts market research, and develops shared agency acquisition knowledge to support agencies in procurement decisions. Another key function of the ITVMO is to upskill agencies on contract practices by educating agency buyers on vendor-specific acquisition techniques and best practices. This includes standardizing requirements, terms and conditions related to cybersecurity, for example, partnering with industry to broker relationships between IT vendors and agencies, and promoting a competitive marketplace. Additionally, OMB supports several GSA programs that help agencies to accelerate modern technology adoption by making it easier to acquire secure, governmentwide solutions – these include the Federal Risk and Authorization Management Program (FedRAMP) or Enterprise Infrastructure Solutions (EIS) for network infrastructure, for example.

**HSGAC Emerging Threats and Spending Oversight Subcommittee
Existing Resources and Innovations Needed to Replace Legacy IT Systems
September 28, 2021**

**Questions for the Record from Senator Sinema
For Mina Hsiang**

- 1) **During your testimony, you provided a unique perspective and understanding of the steps needed for technology modernization as we move to retire legacy systems and modernize federal IT systems. Bringing along the workforce is also critical to undertaking this tech modernization.**
- i) **What are some of the needs and challenges you have seen with workforce development in this regard?**

Generally speaking, many agencies have less capacity than they need to develop and deliver modern digital products and services, and the ability to effectively manage and oversee the modernization of existing systems. Technology development and modernization requires individuals with relevant skills and experience doing similar work. Individuals must have the appropriate experience and expertise, and must also have an environment that encourages them to build and modernize in the best possible ways. Best practices in technology development and modernization are deeply iterative with processes and targets that adapt based on real-world findings from earlier parts in the process. It is extremely rare that modernization projects play out as planned or expected on “day one,” and therefore the best teams plan for updates and changes. This requires the right expertise, the right prioritization, the right incentives, and the right flexibilities for the workforce. These things are just as critical for managing contracts as for executing work directly. As you noted in your question, workforce development is critical, and agencies have been challenged in closing gaps in talent and skills in the following areas:

- Workforce gaps in development and delivery talent. The specific expertise required for development and modernization work requires many different subspecialties. Yet the federal government has had limited experience hiring and developing these specific roles, as compared to the private sector, such as for the roles of product manager, customer experience/designer, software engineer, site reliability engineer, and data scientist. However, awareness of this gap and work to address it is increasing. The United States Digital Service (USDS) has worked with the Office of Personnel Management (OPM) and federal agencies, over several years to hire technical talent into the federal government, and we learned that many federal agencies hiring into technical civil service positions do not currently have the internal capacity or processes to determine both exactly what expertise is required for the positions and who has the required expertise. Due to these challenges in hiring processes, hiring managers sometimes receive lists of candidates they do not consider qualified for the open positions, and they may cancel the entire hiring effort, wasting time and resources for the government and the public. Hiring managers with negative

experiences sometimes avoid competitive hiring altogether, which may limit how both public and private-sector applicants are able to identify and compete for vacant positions in the federal government. We also know that HR departments frequently do not have the resources to develop and undertake an adequate examining process based on a job analysis and designed to test for relevant knowledge, skills and abilities (e.g. competency-based evaluation).

- Workforce gaps in acquisition and financial management skills. Also, acquiring digital products and services requires agency financial managers and acquisition professionals to develop new and different skills and tools to facilitate the necessarily iterative and more frequent delivery of digital products and services. Agencies have significant authorities and flexibilities, but perceived limitations, norms, and risk aversion often inhibits agency personnel from effectively conducting market research, planning procurements, or selecting the appropriate contract type, and understand and effectively request and use the appropriate ‘color of money’ for their IT projects.

ii) How should they be addressed?

U.S. Digital Service (USDS) contributions. USDS has undertaken a few initiatives to address the gaps in digital services’ talent across the federal government:

- Development and Delivery Talent: USDS leverages capabilities, tools, and best practices from across sectors and industries to strengthen essential government programs, building agency capacity through engagements, resources, and tools.
 - Capacity-building. During USDS engagements with certain agencies, we work with them to make services more straightforward and sustainable, and easier for the public, families, small businesses, and Veterans to get the services they need, while still recognizing the applicable hiring rules. We also aim to increase accessibility to these more straightforward and sustainable models by making it simpler for agencies to launch new services with more efficient business processes and simpler for IT organizations to build and maintain necessary tools. This includes exposing agency staff to digital services work, principles, and resources to expand their skills and toolkits. For example, in 2014, USDS developed a [Digital Services Playbook](#) of 13 key “plays” drawn from successful practices from the private sector and government, to help agencies navigate how to establish and scale digital products and services in a government context.
 - Evolving Hiring Processes. Since January 2019, using discretion under existing law and regulation, USDS and OPM have worked with agencies filling technical positions to try an approach we called Subject Matter Expert - Qualification Assessments ([SME-QA](#)), a process where SMEs help determine the level of relevant knowledge, skills, and abilities required to successfully perform the position being filled, alongside HR specialists, and use their expertise to assess whether applicants have the requisite technical competencies and qualifications through structured interviews and sample

work assignments. Only the applicants who pass the assessments are considered qualified in the examination, and eligible for preference under law. Starting in early 2019, in consultation with OPM, USDS tested the SME-QA process for technical positions with the Department of Health and Human Services (HHS) and the National Park Service at the Department of the Interior (DOI). Compared with data from previous hiring events at the agencies, SMEs participating in both SME-QA pilots found fewer applicants to be “qualified” (11 percent at DOI and 22 percent at HHS); however, they ultimately selected more applicants to be hired (13 applicants at DOI and 7 applicants at HHS). The applicants hired through the pilots are diverse and included Veterans.

- Acquisition Skills: Traditional federal government training and procurement practices often inhibit agencies’ ability to effectively acquire and implement modern IT/Digital Services, because those practices lag behind the rapidly changing technology and markets. Timely, relevant, and continuous training for acquisition professionals is the key to keeping pace. Accordingly, USDS and the Office of Federal Procurement Policy (OFPP) collaborated to develop a specialized and immersive training and development program called the Digital IT Acquisition Program (DITAP). DITAP teaches federal government acquisition professionals to design innovative and flexible procurements for IT/Digital Services, and how to become change ambassadors. Due to DITAP, the Federal Acquisition Institute (FAI) has issued specialized digital service procurement certificates to more than 600 professionals from 46 federal agencies. We are refreshing this program and look forward to the next cohort of robust agency participation. We are also in the process of updating a resource USDS published for agencies in 2014 – the [TechFAR Hub](#), which helps agencies understand and use existing flexibilities in Federal Acquisition Regulation (FAR) that are well-suited to acquiring IT and digital products and services, providing case studies and tactics for navigating digital service development and delivery.

Steps agencies can take:

Echoing the 2021 President's Management Agenda, agencies need to improve the quality of their federal hiring processes and expand flexible work arrangements, to improve recruitment and retention.

- Multi-agency competitive hiring. The SME-QA partnership with OPM, OMB (USDS and the Office of Performance and Personnel Management (PPM)), and federal agencies has demonstrated that it is possible for agencies to use existing competitive service authorities to onboard digital services talent, and USDS and PPM are working with OPM and agencies to help expand their capacity by pooling demand for digital services talent to generate multi-agency hiring actions, under the Competitive Services Act, so that multiple agencies can benefit from available product managers, user research/designers, and engineering candidates. Agencies are beginning to include Competitive Service Act language in their own announcements to be able to share high quality certificates with other agencies.
- Emphasize digital services and competencies in agency Talent Teams. USDS encourages agencies that implement the concept of Agency Talent Teams to consider

emphasizing hiring digital services talent from within our federal workforce and from the private sector using SME-QA and the Competitive Services Act.

- Capture the talent within. The SME-QA partnership with federal agencies, USDS/OMB, and OPM focuses on closing the digital services talent gap by hiring new federal workers into new roles. Such skills and abilities also exist within the federal workforce, but agencies do not consistently or comprehensively inventory the skills and abilities of staff, and current government position descriptions, career fields, and career development activities do not always recognize the skills and talent. Due to these factors, the potential of those individuals who would take on these roles sometimes goes undeveloped.

iii) What steps should Congress take to help address those needs?

Agencies already have significant discretion and flexibility to develop and implement workforce development activities and interagency councils are available to coordinate across the government. However, there are steps that Congress can take to encourage agencies to: 1) use existing authorities, and 2) demonstrate progress implementing reforms that elevate the role of digital services and improving the public's "customer experience".

- Support agencies maximizing use of existing flexibilities in competitive service hiring. Although agencies have discretion to do more, including sharing certificates under current law (the Competitive Service Act), they are frequently hesitant to do so. Agency use of the fullness of their hiring discretion, including the appropriate use of subject matter experts in evaluating candidates through custom technical assessments such as structured interviews, in order to assess whether applicants are truly qualified for the position before they are further assessed and ranked, is an important element in the existing hiring toolbox, and leads to improved hiring outcomes.
- Learn from the use of special hiring authorities for technical talent across the government. Further, due to both actual and perceived constraints under the current statutory scheme, agencies have requested--and Congress has authorized—a wide variety of special hiring authorities for technical talent. Understanding the use and effectiveness of these hiring authorities related to information technology and digital services to date and capturing lessons learned can support consideration of additional authorities.
- Survey industry organizations and practices for how the private sector recruits and retains their technical talent. A study on industry best practices could help inform the changes needed in the government to better recruit top talent.

Although your question was directed specifically at workforce development, there are other aspects of IT modernization that are foundational to workforce development initiatives being successful: 1) Leadership and Organizational Alignment, 2) Digital Infrastructure and Tools, and 3) Resource Planning, Programming, and Budgeting. I

would welcome the opportunity to discuss these further with you, perhaps in coordination with fellow witnesses Clare Martorana, Federal Chief Information Officer, OMB, and Dave Zvenyach, Director of Technology Transformation Services, General Services Administration, at your discretion.

- 2) **Given the significant funding Congress has already provided, and additional funding under consideration, for departments and agencies to modernize systems and upgrade cybersecurity, I want to better understand how agencies are making their choices about purchasing security products and services and encouraging a competitive marketplace. Specifically, I am concerned that some of our contracting and acquisition practices make it easier to buy products that might not be the best solutions for the environment. How is your office working with agencies to ensure that:**
- i) Our contracting officers are educated and working in tandem with our CIOs/CISOs?**
 - ii) Software that is advised as being “Free”, typically sold as part of a bundled solution by companies with market power, does not take precedence over picking the most secure solutions?**
 - iii) The federal government is promoting a vibrant and competitive cyber security market?**

As described in the prior response, USDS has been working with acquisition professionals and organizations across the federal government to incorporate proven best practices in support of delivering digital services through the DITAP training program. This helps acquisition professionals understand the specific flexibilities in the FAR, pertaining to digital services and IT, along with commercial best practices, so they can design innovative and flexible acquisition approaches. USDS is sought out by vendors looking to work with the government for the first time. Reaching out to these vendors has proven to provide a more competitive marketplace and agencies have had great success working with both new and previous vendors who provide digital products. USDS holds meetings and industry days with vendors and continues to help agencies complete thorough market research to reach a depth of vendors who provide digital products. Thorough market research best practices are also taught during the DITAP program, which helps employ the right team by engaging the vendors during the request for information and market research acquisition phases. As part of the DITAP training, USDS/OFP/OMB support acquisition professionals in working with others in the procurement ecosystem, to include Chief Information Officers, Chief Information Security Officers, and others in order to deliver digital products in a secure manner.

In addition, organizations with modern cybersecurity practices employ critical teams with modern cybersecurity teams to manage their processes, tools, and decision making. The right team is the most critical input for a good strategy and decision making. For all the reasons outlined above in question 1, agencies have also struggled to hire and maintain appropriate cybersecurity talent, who make the important decisions that you outline.

**HSGAC Emerging Threats and Spending Oversight Subcommittee
Existing Resources and Innovations Needed to Replace Legacy IT Systems
September 28, 2021**

**Questions for the Record from Senator Sinema
For V. David Zvenyach**

- 1) During your testimony, you provided a unique perspective and understanding of the steps needed for technology modernization as we move to retire legacy systems and modernize federal IT systems. Bringing along the workforce is also critical to undertaking this tech modernization.
 - i) What are some of the needs and challenges you have seen with workforce development in this regard?
 - ii) How should they be addressed?
 - iii) What steps should Congress take to help address those needs?

I believe that many of the workforce challenges we face as a government are rooted in three areas: (1) limited use of cross-functional team structures; (2) underinvestment in workforce-centered tools and resources to enable delivery products and services; and (3) the federal government's recruitment and retention processes that do not reflect market realities. Collectively, these issues make it difficult to hire and empower technical talent within government, and make it challenging for industry to meaningfully partner with the public sector in a manner similar to that of the private sector.

Empower cross-functional teams

Legacy government structures fragment the responsibilities for delivery of products and services across divisional boundaries. The delivery of products and services has many path dependencies. This means that in order for a product or service to be delivered to an end user, the project must pass through several different offices and each office must sign off on the project to move it to the next office. The best analogy is that of a slow-moving local train. Delivery path dependencies typically include *at least*: program offices (responsible for program policy), CIO offices (responsible for tech policy and governance and often contract management), contracting offices (responsible for the procurement), CFO offices (responsible for ensuring sufficiency of funds and managing vendor payments), legal counsel (responsible for, among other things, reviewing contracts and program decisions for legal sufficiency), and vendors. Delivery of a product or service will be delayed if multiple offices fail at close coordination or if they have conflicting interests.

Conflicting organizational priorities and the lack of a clearly aligned mission creates challenges for cross-functional teams to align on product vision and adapt to changing requirements or conditions. A lack of organizational cohesion can affect morale and impact results. To address this, TTS has advocated for the adoption of modular-contracting practices and governance structures and policies that empower technical teams to work directly with end users and drive technical and design decisions.

Congress can help through oversight and appropriations processes by ensuring that there are adequate funding and full-time employee (FTE) billets for teams (not just projects) that are responsible for technical delivery and ensuring that projects have appropriate cross-functional teams working throughout delivery.

Invest in workforce-centered tools and resources

In the development of technological tools, a motivated and innovative workforce are our most valuable resource. Leading private technology companies recognize this reality and make substantial investments in their workforce to remove barriers to productivity, including providing access to the best possible tools for a given job. In government, however, it is common for a developer to be blocked from using the most efficient commercially available tools because of federal compliance and acquisition practices.

At GSA, we have made significant investments over the years to ensure that technologists have access to many of the tools and resources they need to deliver top quality products and services. For example, we worked to bring SaaS developer tools into government through investments in FedRAMP and agency policies and practices. Similarly, we have guides and resources to help teams work through the authority to operate process. This sort of investment is still the exception, however, and more can and should be done to remove compliance barriers to enable delivery.

Without these investments to empower our workforce, technologists waste time and money trying to “make it work with what you’ve got.” And because technologists are not using the same tools and practices that the rest of the industry uses, there is an increasing “drift” between the skillsets of government technologists and those in the private sector. This problem applies not just to federal employees but also to the contractors that support federal projects.

Lack of investment in tools and resources also contribute to the inability to modernize legacy systems. Many legacy systems were built without adequate documentation of the existing system because technologists lack documentation tools and resources. A lack of documentation to explain the foundational structure of a system makes it extremely difficult for later technologists to improve the system using modern tools. Underinvestment in tools and resources for documentation increases the likelihood that the government systems being built today will become costly, legacy systems in the future.

To avoid these problems, Congress can focus its oversight authorities and appropriations process to ensure that agencies are making adequate investments in their technological workforce, requiring appropriate documentation as tools are developed, and encouraging the adoption of policies that balance the need for compliance with an increase in productivity.

Align recruiting and retention practices with market realities

The labor market for skilled technologists is extremely competitive and private sector companies have a major competitive advantage over the government in their efficient hiring practices. In the private sector, hiring timelines are measured in weeks — not months — and compensation often includes both cash and equity compensation at levels beyond what the government offers. While

public service has intangible benefits, the government must move more quickly to secure the services of top technical talent as we compete with private sector companies.

In addition, workforce retention in government is challenged by practical constraints of position-management practices that differ from private-sector norms. Government must do better at demonstrating opportunities for career advancement and mobility across organizational boundaries.

- 2) Given the significant funding Congress has already provided, and additional funding under consideration, for departments and agencies to modernize systems and upgrade cybersecurity, I want to better understand how agencies are making their choices about purchasing security products and services and encouraging a competitive marketplace. Specifically, I am concerned that some of our contracting and acquisition practices make it easier to buy products that might not be the best solutions for the environment. How is your office working with agencies to ensure that:
 - i) Our contracting officers are educated and working in tandem with our CIOs/CISOs?
 - ii) Software that is advised as being “Free”, typically sold as part of a bundled solution by companies with market power, does not take precedence over picking the most secure solutions?
 - iii) The federal government is promoting a vibrant and competitive cyber security market?

I share your concern that traditional procurement practices often make it easier to buy products and services that are not the best solutions for the environment. At TTS, we are advocates of using modular contracting practices to increase the likelihood of success for software delivery. Additionally, programs such as the Digital IT Acquisition Program, GSA’s FAC-C IT + program, and the Department of Homeland Security’s Procurement Innovation Lab are useful in helping train contracting officers and the broader technological community on best practices related to software procurement.

A challenge in government procurement is that pricing considerations will occasionally become the primary driver of decision making, rather than considering the best value for the product being offered. At TTS, we believe that technology decisions should be made based on validated user and business needs. Furthermore, even though software is marketed as “free,” these solutions sometimes involve additional high-cost add-ins and services, or make it expensive to switch technologies. We, therefore, often counsel agencies to ensure that as part of its acquisition strategy—even those involving free software—the government considers its ability to effectively “offramp” a vendor.

One of the most important things the government can do to ensure best value in procurement and to promote a more vibrant and competitive cybersecurity market is to be as aligned with private-sector practices as possible. Although the federal government spends \$100 billion annually on IT, the technology industry is a multi-trillion dollar industry. Indeed, the market size of the cybersecurity industry alone already exceeds all federal spending on technology. But whenever

the government imposes requirements that are unique to government or adds additional friction on participation, we limit our own ability to leverage that marketplace. As a result, the government should be careful to make sure that any government-specific requirements are value-added to the government. Ensuring this requires technologists and the acquisition workforce to work closely together, to conduct meaningful market research through active participation and partnership with industry, and to be judicious about government-specific requirements.