BIT BY BIT

HOW GOVERNMENTS USED TECHNOLOGY TO MOVE
THE MISSION FORWARD DURING COVID-19

DECEMBER 2020

PARTNERSHIP FOR PUBLIC SERVICE

Microsoft

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Introduction
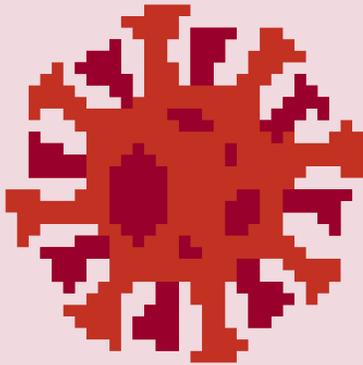
THE COVID-19 PANDEMIC has reshaped how people and organizations use technology. Already a critical element in our personal and professional lives before COVID-19, once the pandemic struck, technology became essential. In 2020, more than ever before, we connected to company networks remotely, signed and sent documents digitally, talked to friends and family via videoconferencing, and ordered food and supplies online.

Federal, state and local governments faced a similar transformation. Technologies ranging from digital communication to artificial intelligence became a larger element in how public servants tackled the challenges and disruptions brought on by COVID-19.

But the pandemic also highlighted the decades of neglect that left many governments relying on antiquated hardware and software, including the nation's public health systems that struggled to collect and report accurate data on the pandemic.[1] The IRS, responsible for distributing millions of dollars in economic stimulus payments, has computer systems created as far back as 1968,[2] the same year the use of the computer mouse was first successfully demonstrated in public.

These technology challenges are well known, with the Government Accountability Office listing IT management on its high-risk list of federal operations since 2015.[3] The pandemic further highlighted technology's importance to governments and demonstrated critical shortcomings.

"In the past, we tended to have the notion that technology and digital government were a bit of luxury, a novel or cool thing," said Santiago Garces, the city of Pittsburgh's director of innovation and performance. "Now we have come to terms with the fact that technology, in one sense, is the biggest enabler to maintaining operations in a safe way and protecting the lives of our employees and the public."

Despite the challenges, technology became a conduit for public service delivery nationwide as the pandemic unfolded. The most urgent requirement—replacing in-person services—drove many governments to quickly expand technology use. Technology also enabled government agencies to radically expand services beyond their prior capacities and even disrupt old ways of doing business altogether by using the crisis as an opportunity to innovate.

At the federal level, the Indian Health Service and its health care provider partners experienced a 15-fold increase in the use of one telehealth platform, said Chief Information Officer Mitchell Thornbrugh. The Department of Energy created the National Virtual Biotechnology Laboratory to connect national laboratories and allow researchers remote access to the technical and scientific capabilities of the labs to respond to COVID-19, said Office of Science Director Chris Fall.

Local governments also had to adapt to a new normal of doing business, and many cities and counties capitalized on the possibilities. In a survey of local government officials and staff, 95% of respondents said their government used software to maintain service delivery during COVID-19, and 76% believed they will adopt more public-facing technologies in the future.[4]

To highlight how federal, state and local government employees navigated the pandemic using technology, the Partnership for Public Service and Microsoft examined how three governmental entities adapted to the crisis by shifting from in-person to virtual functions, by expanding existing services and by launching an entirely new initiative. The examples offer a number of important lessons for government technology policy and management in the future.

1   Pien Huang and Selena Simmons-Duffin, "COVID-19 Hospital Data System That Bypasses CDC Plagued By Delays, Inaccuracies," NPR, July 31, 2020. Retrieved from https://n.pr/3iZvvau

2   Government Accountability Officer, "Information Technology: Agencies Need to Develop Modernization Plans for Critical Legacy Systems," GAO-19-471, June 2019, 50. Retrieved from https://bit.ly/34CEzOj

3   Government Accountability Office, "High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas," GAO-19-157SP, March 2019, 123. Retrieved from https://bit.ly/3mSKQMS

4   Atlas, Engaging Local Government Leaders and SeeClickFix, "Local Government's Next Normal," August 2020, 8. Retrieved from https://bit.ly/2EOtjE5

Evolve, Expand, Establish

Three Ways Governments Turned to Technology During the COVID-19 Pandemic

Governments turned to technology for varying purposes during the pandemic, and they incorporated technology into their operations to varying degrees. Some used it to evolve and remotely deliver previously in-person functions that needed to continue despite lockdowns and the need for social distancing; others used it to expand how they offer existing services to customers; and others used it to establish new functions to deal with the pandemic.

### Using technology to expand existing functions: Department of Veterans Affairs

The Department of Veterans Affairs had to adapt quickly to the COVID-19 pandemic to continue serving America's estimated 19.5 million veterans.[5]

The department faced an overwhelming number of new inquiries from veterans about the coronavirus and its impact on VA services. Building on a commitment to a seamless veteran experience, the availability of an existing technology contract that could be expanded to include new technology tools, and clear and consistent messaging around VA services, the department's employees deployed a chatbot in just three weeks to respond to an increased volume of inquiries. Chatbots are internet-based software applications that give answers through text or by turning text into speech.

The need for a chatbot appeared early in the pandemic. By March 2020, call volumes at VA call centers significantly increased as veterans sought answers for their coronavirus-related concerns. Callers wanted to know, for example, "how the coronavirus pandemic would affect their existing benefits and services, how they should interact with the health care system and what they could do to prevent COVID-19," said Kaeli Yuen, a Presidential Innovation Fellow at the VA.

On top of coronavirus-related queries, veterans continued to call the VA about standard services, such as medical checkups, drug prescriptions and disability benefits.

The VA immediately started looking for ways to address the influx of inquiries. Frontline employees were
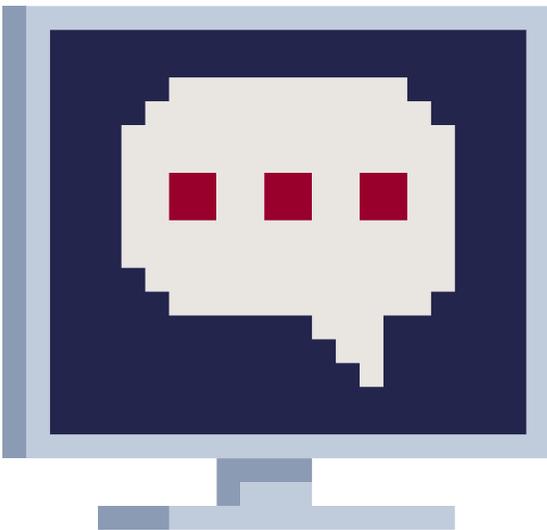
5   Department of Veterans Affairs, "Veteran Population Model 2018." Retrieved from https://bit.ly/31xiUpb

committed to providing the best customer services to veterans while leaders were supportive of the need to address changing demands.

A chatbot emerged as an ideal option. It could answer repeated questions about the same topic anytime without veterans having to wait to reach call center representatives since wait times were longer than normal. It went live on VA.gov, the department's website, in late April 2020.

"It includes questions with which you might call a contact center, questions on our frequently asked questions pages or on VA policies, as well as a screening tool for COVID-19," said Lauren Alexanderson, VA's deputy chief technology officer for health delivery.

New answers are regularly added. After Congress passed the Coronavirus Aid, Relief and Economic Security Act and the Department of the Treasury started disbursing direct payments to individuals under the law, the VA ensured the chatbot could answers questions such as "Is VA helping to make sure I get my stimulus check?" or "Will the stimulus check affect my VA benefits?"

While the chatbot handles routine questions and provides basic information, call center staff time is freed up to focus on calls about urgent medical issues[6] or more personal requests.[7]

Response from veterans has been positive. Within the first few months, the chatbot saw more than 53,000 unique user sessions. During peak usage, the chatbot responded to twice as many coronavirus-related queries as did the VA tier 1 contact center over the same period of time. More than two-thirds of veterans were either very satisfied or satisfied with their experience with the chatbot, Yuen said.

The VA's success depended on existing partnerships to get the new service ready for veterans as quickly as possible. A technology contract in place with a private company[8] allowed VA to expand this collaboration to include a chatbot. The Centers for Disease Control and Prevention also was using the private company's health care chatbot platform for its Clara coronavirus chatbot, as were many other health care organizations around the world. This gave the VA the building blocks for its own tool.

Medical information fed into the chatbot about the coronavirus and its symptoms came from the CDC. By using existing content from other sources, the VA was able to spend more time adding information helpful to veterans.

Previous efforts by VA to set standards for how it interacts with customers online and the experience veterans have on VA websites also were vital to success. A previous content style guide outlining how VA consistently describes its benefits and services allowed staff to feed the chatbot clear answers very quickly. When the pandemic hit, the department expanded the guide to include policies on new words and phrases that entered our collective vocabularies, such as how to spell or capitalize COVID-19 or the coronavirus, or whether to use the phrase social or physical distancing.

Success rested on "resources VA could lean on when we were trying to quickly turn around tools, resources, content, materials and information that would allow veterans to access their health care and other things from home quickly," Alexanderson said.

At the same time, the VA's attention to its customers—a focus that was renewed in 2014 through the myVA initiative, a department-wide restructuring launched by Veterans Affairs Secretary Robert McDonald—ensured that veterans got their say during the chatbot's development.

"We had the initial tool built and out in the field within two weeks. That included testing with veterans," Alexanderson said.

Despite the need for speed, testing the tool with veterans was crucial. "It is a critical part of our digital modernization strategy at VA to make

6   Department of Veterans Affairs, "OIT Releases New Coronavirus Chatbot," June 11, 2020. Retrieved from https://bit.ly/32ddDmQ

7   Department of Veterans Affairs, "VA coronavirus chatbot," 2020. Retrieved from https://bit.ly/33bLwUl

8   The chatbot builds on the Microsoft Healthcare Bot. The Partnership for Public Service worked with Microsoft on this white paper.
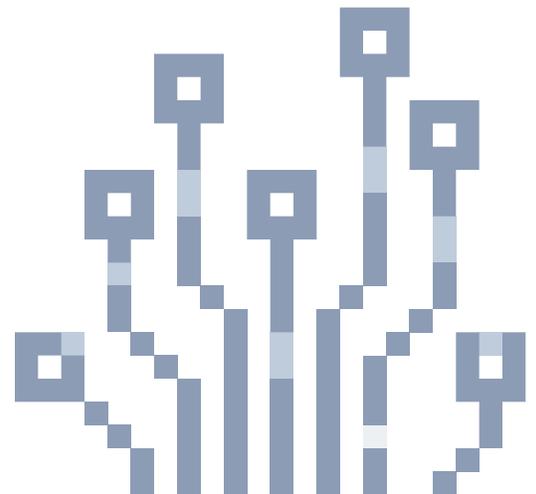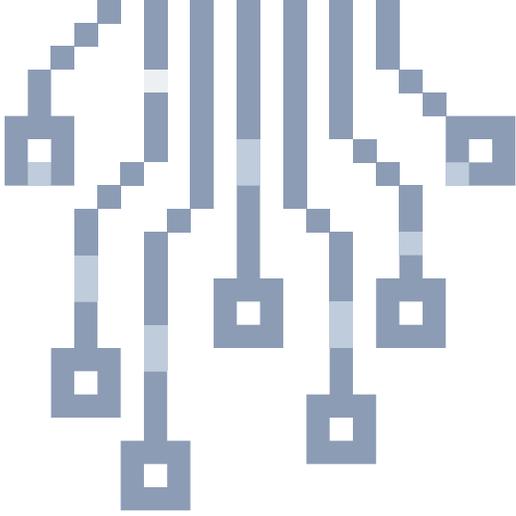
sure that we are doing human-centered design and building user-centered products," Alexanderson added. Human-centered design places users at the center of technology development and seeks their constant feedback at every step of the design process.

Overall, the chatbot demonstrated that technology can help provide veterans with access to the benefits and resources needed to stay safe and healthy. Using technology, the VA could "minimize the risk for our veterans, their caregivers and their loved ones," Alexanderson said.

"Technology is making it possible for us to meet people where they are and make it as easy as possible for them to continue to safely interact with their government online," she added.

Using technology to evolve a core function: South Bend, Indiana

The pandemic has disrupted government operations nationwide. The Supreme Court conducted oral arguments by telephone for the first time in its history. The House of Representatives changed its rules to allow members to vote by proxy if they were unable to travel to Washington, D.C. And many immigration courts and Social Security hearing offices were forced to turn to phone and video hearings to prevent their case backlogs from increasing.

Additionally, many governing bodies continued managing their cities and counties by switching from in-person to virtual meetings.

The South Bend Common Council in Indiana, for example, has weathered the storm with help from the city's Department of Innovation and Technology. The technology department provided critical support to make sure council members and the public had a seamless transfer to a virtual meeting format, with council members able to discuss and vote on issues that matter to the city, and members of the public able to have their voices heard.

The department's previous work implementing and transitioning to new technologies ensured that staff could help the city and its governing council transition to a virtual platform. "The journey we went on before COVID-19 really helped with internal operations at the city when we really needed it," said Denise Riedl, South Bend's chief innovation officer.

Most changes began in 2012 when Pete Buttigieg became mayor. That year, many departments lacked the technology to operate efficiently.[9] The city then began modernizing internal IT systems, moving resource management systems used for accounting, procurement and project management to the cloud, and working with residents to redesign the city's website to highlight the most sought-after content on the home page. City data was put online for public viewing, including performance metrics around city services. Technology procurement was centralized so the city can leverage its size to purchase in bulk and save money for taxpayers.[10]

Much of this effort was continued by the city's Department of Innovation and Technology that was created a few years later, in 2015. While primarily focusing on supporting city staff, the department also supports South Bend's Technology Resource Center, which offers data analytics, coding, innovation method and technology training to the public.[11]

When the pandemic began, city council meetings were not the only function the city had to transform; employees had to be able to work from the safety

9 Paul Tullis, "Pete Buttigieg Revived South Bend With Tech. Up Next: America," Wired, April 11, 2019. Retrieved from https://bit.ly/3hJKXWY

10   City of South Bend, "Department of Innovation and Technology 2016 Annual Report," 2. Retrieved from https://bit.ly/3kIrtnG

11   South Bend Department of Innovation and Technology, "South Bend's Technology Resource Center," Dec. 30, 2019. Retrieved from https://bit.ly/2FNUj6S

of their homes while city services had to continue unimpeded. One service the city transitioned successfully was its 311 call center. As the pandemic began, 311 phone operators continued to respond to resident complaints and requests, including a growing number of questions about COVID-19, from their homes or other sites outside their offices.

With a plan in place to continue city operations remotely, the department turned to the city council meetings. First, the city needed to make sure virtual meetings were compatible with regulations governing elected council operations. Many states have rules requiring public access to meetings for government transparency. Several states, including Minnesota, New York and Texas, changed their rules to allow local councils to conduct business remotely.[12]

Recognizing these challenges, Indiana Governor Eric Holcomb issued an executive order on March 16, 2020, waiving requirements that a certain number of council members be physically present at council meetings or that localities establish explicit electronic participation policies before holding remote meetings.[13] The governor's order removed the legal barriers to fully remote council meetings, Riedl said.

Other barriers remained, however. Although city employees had been using videoconferencing internally for some time, most council members had little or no experience participating in remote meetings. Additionally, the city clerk's office, while experienced in managing in-person meetings, had no experience facilitating virtual ones.

The Department of Innovation and Technology took the lead to make sure everyone was comfortable with the platform, familiar with every step of accessing and participating in virtual meetings, and ready for virtual facilitation. In doing so, they worked with each council member individually.

"We one-on-one coached each person," Riedl said.

With meetings conducted by videoconference, South Bend's Common Council kept working and "the clerk's office is now an expert facilitator for virtual meetings," Riedl said.

The council follows normal procedures to discuss and pass legislation. In March and April 2020, for example, the council quickly addressed challenges residents were facing due to the pandemic, such as creating new programs to support small businesses. Being able to vote remotely allowed the city to pass additional appropriations to financially support the city's response to COVID-19.

The remote meetings also have drawn public participation the same way in-person council meetings would.

"If a hot button issue is covered in a meeting, we see a lot of people signed in just the way we would see a lot of people attending an in-person meeting," Riedl said. And while the clerk's office was trained on how to handle possible uninvited guests who might gate-crash city council meetings, the city has not had disorderly participants so far.

Yet participation presented another challenge: Some residents who wanted to attend meetings did not have internet access at home.

"The digital divide presents a challenge around equity with accessing city services and meetings," Riedl said. To address this issue, the city continued to livestream meetings on the local public access TV channel so residents without internet access could have another way of viewing the proceedings.

And the city wants to take steps to ensure that equitable access to services continues even after the pandemic. "That is something we want to improve in the short- and long-term," Riedl said. To that end, in September 2020, South Bend announced a new initiative to provide internet access to students across the city so they can continue their education remotely, she added.

12   The Civic Federation, "How City Councils in Major Cities are Governing During COVID-19," April 10, 2020. Retrieved from https://bit.ly/2ZQroX1

13   State of Indiana, "Further Orders and Directives in Response to the Coronavirus Disease 2019 Epidemic," Executive Order 20-04, March 16, 2020. Retrieved from https://bit.ly/327aqVU

Using technology to establish a new function: National Institute of Biomedical Imaging and Bioengineering
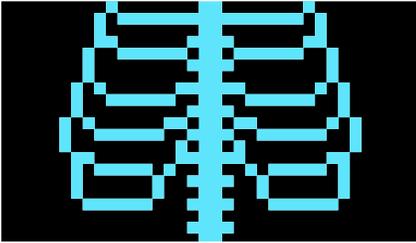
Among the tools the scientific and medical communities have used to fight the COVID-19 pandemic is artificial intelligence, a technology that can sift through reams of data and quickly collect, analyze and disseminate accurate information.

In August 2020, the National Institute of Biomedical Imaging and Bioengineering announced a new AI initiative, the Medical Imaging and Data Resource Center. The effort involves NIBIB; the University of Chicago, where the center is housed; medical associations; and federal agencies such as the Food and Drug Administration and the National Institute of Standards and Technology.

The MIDRC is helping researchers around the world use AI to analyze medical images to detect and treat the coronavirus. Analyzing medical images, such as MRI scans, is a gateway to understanding illnesses; it helps doctors "detect, diagnose and monitor disease," according to the American College of Radiology, a medical imaging association.[14]

The medical imaging community has been working on AI applications for years. Physicians are trained to detect disease in medical images, but AI can quickly analyze thousands of pictures. AI also can connect different medical image repositories and find patterns in the data that might indicate various strains of a disease or variations in how it affects certain groups of people. Simply, AI could "transform medical imaging, thereby reducing diagnostic errors, improving patient outcomes, enhancing efficiency, and reducing costs."[15]

When the coronavirus began spreading throughout the United States, it gave scientists a deluge of new information, often too much for doctors and researchers to analyze on their own. This stood in contrast with the problem the medical imaging community had faced in the past: not enough curated and organized data about a particular disease, which could allow researchers using AI to study all aspects of that illness. Additionally, different organizations' data often did not contain enough variation to accurately represent all facets of how a disease might appear in the real world. For example, it might have included medical images of healthy patients, not those with underlying medical conditions.

But with COVID-19, researchers could test and apply what they learned about AI-assisted medical imaging during the past few years, said Dr. Krishna Kandarpa, director of research sciences and strategic directions at NIBIB.

The pandemic's rapid spread required that NIBIB act quickly. The effort to organize the medical imaging community around the new center started in April 2020, and the agency awarded a two-year contract to launch the center at the University of Chicago in early August. The community was already working together to explore the use of AI in medical imaging through conferences, workshops and research articles. In 2019, the community published a roadmap for the future of AI in medical imaging, outlining research priorities for maximizing AI's positive impact on the field. This helped researchers quickly come together again when the pandemic began.

"We did this much faster than would occur in normal times," Kandarpa said. He said the contract for the center was reviewed thoroughly and quickly, but "something that might have taken months or years in the past was now being measured in weeks and months," Kandarpa added.

14 American College of Radiology, "ACR, RSNA and AAPM to Develop Massive Open-Source COVID-19 Medical Image Database," Aug. 5, 2020. Retrieved from https://bit.ly/3jAfqZd

15 Curtis P. Langlotz et al., "A Roadmap for Foundational Research on Artificial Intelligence in Medical Imaging: From the 2018 NIH/RSNA/ACR/The Academy Workshop," Radiology 291(3), April 2019, 781–782. DOI: 10.1148/radiol.2019190613. Retrieved from https://bit.ly/31RsEKU

The MIDRC collects a large set of thoracic or chest CT scans, X-ray images and MRIs. COVID-19 seems to primarily affect the lung and heart, so researchers decided to focus their efforts on these two organs. Other medical data about patients has been added as well, so researchers can study how COVID-19 interacts with other medical conditions or what impact an individual's medical history might have on their response to the coronavirus.

The initial batch of about 10,000 medical images came from the Radiological Society of North America and the American College of Radiology, two medical organizations that have existing databases on COVID-19 with medical images provided by their radiologist members.[16] All data is stripped of personally identifiable information to ensure privacy. NIBIB relies on previously established data privacy standards in the health care community. These include the Fast Healthcare Interoperability Resources—international data standards used when connecting disparate data sources over the internet.[17]

The MIDRC curates, annotates and stores the data in one secure network. The network is accessible to researchers working in the field, who then use their own AI algorithms and tools to analyze the information in the data center.

"It is basically a sandbox where everybody can write their AI algorithms and test them on this large repository," Kandarpa said. Researchers will be able to validate the accuracy of their AI tools by working alongside others and using common foundational data to build and test comparable algorithms.

The FDA's involvement means that some of the AI tools using the MIDRC data could one day become regulated and approved medical devices. FDA can keep track of the different AI algorithms the community uses and can advise researchers, as appropriate, about the necessary steps to make their AI tools available to others outside the MIDRC. The center could thus help researchers "come up with products that can hit the market after regulatory approval," Kandarpa added.

For the two years of the initial contract's duration, NIBIB hopes that the different AI tools will help researchers answer a variety of questions about COVID-19. How does the virus affect people's lungs and hearts throughout the course of the disease? What is the prognosis for different groups of patients, perhaps with underlying health conditions or having a certain genetic makeup? Are there signs that point to the disease recurring in a patient? Or how do different treatments affect the disease itself?

The answers to these questions could inform the long-term response to COVID-19, from how doctors treat individual patients to how governments manage the pandemic around the world.

16 American College of Radiology, "ACR, RSNA and AAPM to Develop Massive Open-Source COVID-19 Medical Image Database," Aug. 5, 2020. Retrieved from https://bit.ly/3jAfqZd

17 Jennifer Bresnick, "4 Basics to Know about the Role of FHIR in Interoperability," Health IT Analytics, March 22, 2016. Retrieved from https://bit.ly/2ZN9DaU

Lessons Learned

Many federal agencies and local governments turned to technology as the COVID-19 pandemic took hold to change how they operated and provided services to the public.

Those that adapted successfully pointed to several building blocks that contributed to their success. These included having had a technology foundation in place; access to skilled technologists; paying close attention to cybersecurity concerns; an ability to evaluate how technology can enable mission delivery; understanding the need to design technology with the user in mind; and being cognizant of the need for the public to have access to technology and the internet.

Building a technology foundation

Many governments that successfully adapted to altered operations and service delivery during the COVID-19 pandemic built on a technology foundation in place before the outbreak.

"Having the groundwork was critically important," said Lauren Alexanderson, deputy chief technology officer for health delivery at the Department of Veterans Affairs, pointing to VA's digital transformation strategy as its foundation. Launched in 2016, the strategy focuses on prioritizing the customer experience, adopting modern technology tools, changing outdated procurement processes and boosting cybersecurity. It also emphasizes hiring, training and reskilling technologists.[18]

The VA's strategy offers a guide for other agencies looking to expand technology operations in light of the pandemic. For one, COVID-19 highlighted the value of acting and launching new services quickly, which requires agencies to rethink procurement rules and processes in order to get new digital services in the hands of users in a shorter timeframe.

And at a time when technology is a lifeline, the integrity of the technology is critical. Agencies therefore need to ensure the systems they use are protected from malicious actors. For example, governments could boost cybersecurity training resources while also highlighting employees' responsibility for cybersecurity, including using secure passwords, recognizing phishing attempts or using multi-factor identification to access online resources, said Santiago Garces, director of innovation and performance for the city of Pittsburgh.

Agencies also could invest in building an expert technology staff to drive technology implementation and
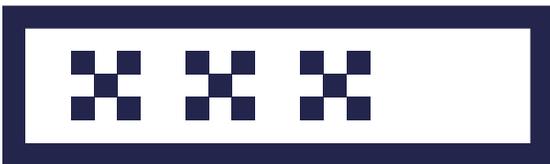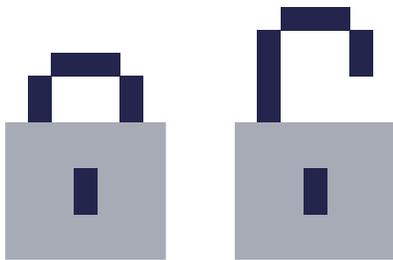
18 Department of Veterans Affairs, "VA Digital Transformation Strategy," 2020. Retrieved from https://bit.ly/3hEtxMa

navigate a changing technology landscape, said Lon Gowen, chief technologist and special advisor to the chief information officer at the U.S. Agency for International Development.

"You need a group of people working with the chief technology officer to cover different sectors of technology and report back so the CTO can make decisions on which ones to start investing in," Gowen said.

Overall, government agencies should reevaluate their technology strategies and investments, and focus on plans and steps that will enable them to support remote operations and digital service delivery to a larger extent.

Pittsburgh, for example, was able to capitalize on its existing technology and expertise to navigate the pandemic. For years the city has been expanding online service offerings to residents. Since 2018 a permitting and licensing website has allowed residents to request or pay for a new business license or check the status of building code violation notices. The website became essential during the pandemic to help Pittsburgh minimize the number of in-person interactions it requires for permitting and licensing services.

Building on the previous years' work, the city expanded the types of licensing and permitting services available online in May 2020 and added a chat function so residents can interact with city staff directly on the website.

"The things that we had been investing in paid off," Garces said, adding that thanks to these past investments in digital service capacity, the city "was able to provide continuous services to residents" during the pandemic.

Rethinking mission delivery through technology

The pandemic has altered the view of many government employees regarding the use of technology in the workplace. "It was a moment that forced a lot of people who were either against

technology or technology agnostic into getting comfortable with it," said Brian Donoghue, director of civic innovation for the city of South Bend, Indiana.

Governments can take advantage of changed attitudes to alter their approach to technology for operations and service delivery. A return to the technology status quo from before the pandemic should not be the goal.

Technology could allow agencies to reach a larger number of people, provide more seamless services and reduce the burden on employees providing those services. Governments should evaluate "not only how to use technology to mimic previous processes, but also complement them and fill in gaps that those processes did not fill," said Denise Riedl, South Bend's chief innovation officer.

"I think we are going to see a permanent change in where government sets the bar" for technology, Riedl added.

Government could start by evaluating how technology fits into how it serves customers. Digital services could replace in-person or paper-based services if the online process saves time and effort for the public. Agencies could base their decisions on whether customer satisfaction improves with digital services that were previously delivered in person.

Elsewhere, digital services could augment in-person services to ensure people who might not have access to technology can still receive benefits or services by phone or by visiting an office and interacting with a government employee in person. Shifting some citizen interactions online could rebalance the workload of call centers as well as office staff who might then have more time to spend with each customer.

Beyond service delivery, agencies also should rethink how they operate to better achieve their missions. Building on previous technology initiatives, for example, the Department of Energy is among those considering the expansion of its virtual capabilities at the national laboratories.

"A great deal of what we do already had virtual elements built in," said Chris Fall, director at DOE's Office of Science. For example, scientists ran physics experiments at the Large Hadron Collider, a particle accelerator in Europe, from their laboratories in the United States. Now the agency is contemplating expanding that model to other fields beyond particle physics. Within areas requiring more manual work and in-person interaction between teams, such as biotechnology and material science, the agency is asking, "How do we enable virtual science across more of what we do?" Fall said.

Putting users first when designing technology solutions

Users should come first when an agency designs and manages a process or service using technology. "Technology transformations are not only about the technology. They are about the process and about the people who are benefiting from the services and the people who are executing those services," Garces said.

Practicing human-centered design is a good place to start. Agencies should create technology based on user needs and expectations, and users should constantly give feedback during development and afterwards so the technology can evolve based on new user input.[19]

Additionally, agencies should ensure that customers are heard outside of technology development and establish a process to track and measure the customer experience. Agency leaders and managers can use that feedback to make decisions about agency operations and services that impact customers.

19   Partnership for Public Service and Tech Talent Project, "Tech Talent for 21st Century Government," April 2020, 22. Available at https://bit.ly/3hDdnCN

The agency focus on customers should extend to the processes supporting service delivery. Agencies should not simply build a new app or website, but also minimize the burden on the customer borne by the process behind the tools. Improving the customer experience might "require policy changes, rethinking how enrollment processes work and their timing, how information is presented and framed, how choices are presented, how we structure incentives, or even connecting people between Federal programs or broader systems of support," according to the Office of Management and Budget.[20]

The city of Miami followed this advice with sidewalk café permitting, allowing dining establishments to set up tables for patrons on public sidewalks during the pandemic.

When the city replicated its paper-based process online to limit the need for in-person applications, no submissions were received during the first week. The city took a step back and redesigned the process so that business owners could start an application without the full information about their businesses, with the city's staff able to provide additional details, such as business tax receipt numbers, located in city databases. This reduced the burden on business owners by cutting the time it took to locate the necessary documents and fill out the application.

"For people who are about to lose their business, we do not want them to spend three extra days pulling together paperwork if they have enough to submit in a day," said Michael Sarasti, Miami's chief information officer. City leaders partly credit this customer-focused change with an uptick in applications and the number of permits granted.

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20   Office of Management and Budget, "Improving the Customer Experience Government-wide," June 20, 2019. Retrieved from https://bit.ly/3kvsH5s

Taking steps to narrow the digital divide

Equitable service delivery through technology requires that governments take steps to address Americans' inequitable access to technology and the internet.

"The digital divide has a significant impact on our ability to leverage technology," said Mitchell Thornbrugh, chief information officer at the Indian Health Service. Internet access is especially critical.

"If you live in rural areas with no broadband internet, you have less access to health care," Thornbrugh said.

Lauren Alexanderson, VA's deputy chief technology officer for health delivery, agreed on the importance of making services accessible to all. "We need to be able to come to our customers and meet them using the tools they are able to use, using the technology they are comfortable with," she said.

That could mean virtual city council meetings broadcast not only on videotelephone platforms, such as Zoom, but also on social media, cable TV and radio, said Mary Van Sickle, executive director at Dakota Media Access, a nonprofit working with the cities of Bismarck and Mandan, North Dakota, to broadcast their city meetings. At the federal level, this could mean offering a service online and in person so customers can interact with government using the tools and resources to which they have access.

User feedback could provide valuable insights for narrowing the digital divide as well. Agencies could assess whether customers are requesting that in-person offerings be made available, which might indicate that those customers lack ways to access digital services.

Moreover, governments could take steps to narrow the digital divide among their own employees, as many already did during the pandemic.

Agencies could purchase and distribute laptops and cell phones or create Wi-Fi hotspots to ensure employees can work remotely.

Small, deliberate steps can make a difference, as the Indian Health Service has shown. As COVID-19 was spreading throughout the country, it prevented many people from visiting their friends and family at the health service's facilities across the country. To help those in isolation, the facility in Chinle, Arizona, and a few others across the country extended their Wi-Fi into the parking lot so families without internet access at home could use donated tablet devices to connect with loved ones.

"The challenge still is that visitors had to drive to our facility so they could connect on that local Wi-Fi network," Thornburgh said. Nonetheless, he said it still was an innovative way to "improve outcomes for patients."
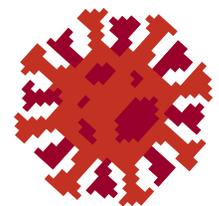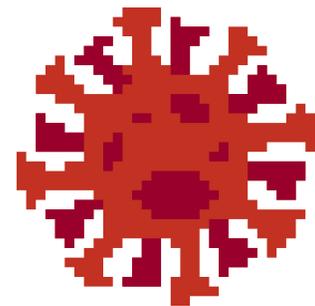
Conclusion

THE COVID-19 PANDEMIC has impacted every aspect of our lives, including the operations of governments. Facing unprecedented obstacles, the federal government and many state and local agencies turned to technology to navigate the challenges.

They reimagined their work through the use of technology, including videoconferencing, chatbots and artificial intelligence. For example, the Department of Veterans Affairs built a chatbot to handle the increasing volume of inquiries relating to the coronavirus. The city of South Bend, Indiana, used videoconferencing to continue governing remotely. And the National Institute of Biomedical Imaging and Bioengineering turned to artificial intelligence to boost research related to COVID-19.

These examples contain lessons learned for other agencies and show how changes to operations and service delivery during the pandemic could help them become more effective in the long run. Governments should not only make use of modern technologies, but also hire skilled technologists, update procurement rules and institute stringent cybersecurity protections. Agencies would be wise to evaluate what services can be offered through technology to reach new people or provide a more streamlined customer experience. When designing and rolling out these technology options, the customer experience should be the primary concern. And if technology is to play an even bigger role in mission achievement, governments should take steps to ensure Americans have access to digital services.

The federal government could be well positioned to navigate the new normal and any future crises by strengthening its capacity to innovate and access world-class talent. The federal government also could support state and local governments in their technology transformations.

Appendix I
Methodology

The Partnership for Public Service and Microsoft's goal for this white paper was to highlight how federal, state and local governments have used technology to continue delivering on their missions during the COVID-19 pandemic. We focused on three areas: remote governance, digital or remote service delivery, and COVID-19 research and development using artificial intelligence. Between July and September 2020, we interviewed 16 federal, state or local government employees and experts in technology or government management.

> **Defining Artificial Intelligence**
>
> Artificial intelligence means computers and software performing tasks we typically associate with people, such as recognizing speech or images, predicting events based on past information or making decisions. AI tools use data to learn a task, and they continue to improve at functions such as transferring information from paper into computers, answering questions by quickly finding relevant information in databases or documents, detecting patterns in data, making decisions about simple queries and predicting someone's behavior based on past conduct.

Appendix II
Acknowledgements

The individuals listed below generously offered their input on technology use in federal, state and local governments during the COVID-19 pandemic. We greatly appreciate their time and counsel. The contents of this white paper do not necessarily reflect the views of those with whom we spoke, and the views of participating federal, state and local officials do not necessarily reflect positions or policies of federal, state or local governments or their agencies.

Appendix III
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