

Accenture Federal Technology Vision 2020:

FIVE TRENDS DEFINING POST-DIGITAL GOVERNMENT

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About the Technology Vision

Overview Creating the post-digital government

We are now in a post-digital world.

Our personal lives are so intertwined with technology today that we often don't even think about digital as an option for engaging with the world around us—it has simply become our default. And this trend has only accelerated in the wake of the COVID-19 pandemic, with remote work, Zoom happy hours, and touchless transactions now the norm. The challenge is that many enterprises, including federal agencies, are struggling to keep pace, as they are still in the early stages of their digital transformation.

It seems much longer ago, but it has been only eight years since the federal government embarked upon a vision, called <u>Digital</u>. <u>Government: Building a 21st Century Platform to Better Serve the</u>. <u>American People</u>, to modernize itself as an entity that embraces innovation, operates digitally, and fully leverages data to enhance decision-making. While progress varies, most agencies today are well down the path of their digital makeovers. But no matter how much progress they make, they seem always to be playing catch-up with the expectations of the tech-savvy citizens they serve.

The national security community is not immune from these challenges either. Defense organizations, slowed by arcane business processes and an accumulated technical debt, often struggle to keep pace with the rapidly advancing state of commercial technology. This has given more nimble nation states the potential to reap battlefield advantages by incorporating these innovations more quickly. Introduction

To better appreciate the increasing importance and prevalence of technology today, consider these data points from new Accenture research:



of federal executives see technology as an inextricable part of the human experience (compared to 83 percent of executives globally).



of global consumers view technology as a fully integrated, ingrained, or prominent aspect of their day-to-day life.



Given this starring role technology increasingly plays in our lives, it makes sense that we take technology personally and expect much more from it. In fact, we are seeing signs that our unconditional love for unlimited technology is fading. People are reevaluating their digital relationships with businesses and governments and reexamining whether the value those enterprises deliver is fully aligned with their core values.

Citizens, for example, may chafe against government digital services that lack transparency in the decisions they make or the privacy protections they offer. They may bristle at having to fill in the same information about themselves with every digital interaction. They have concerns about the role that artificial intelligence plays in government decisions that affect their lives. Despite broadly using and benefitting from technology, people are expressing concerns about how it is used and what it is used for—and they are advocating for change. Government employees—from benefits administrators and nurses to warfighters and intelligence analysts experience similar frustrations on a daily basis. Too often, agencies operate based on technology constraints versus the needs of the mission. What workers need are empowering digital tools worthy of the often complex and critical challenges that they face.

We want technology that is more human-centered and that appreciates our personal values and desire for greater control in how we interact digitally with our government.

Tech-lash or Tech-clash?

Some are referring to today's environment as a "tech-lash," or backlash against technology. But that description fails to account for the fact that we're using technology more than ever. It would be more accurate to think of it as a tech-clash—a collision between old technology models that are incongruous with people's current expectations.

The chief take-away here is that we don't just want more technology in our products and services; we want technology that is more human-centered and that appreciates our personal values and desire for greater control in how we interact digitally with our government.

This presents an important opportunity for government agencies as they proceed along their transformation journeys. We can't simply continue to bolt-on digital technologies to legacy operating models. Rather, we need to reimagine how we work and deliver services to take full advantage of our new digital capabilities. This becomes especially important as we navigate the expansion of AI, creating the need to rebalance the relationship between humans and machines.

Agencies can diffuse this tech-clash and foster more trusting relationships by making transparency, accountability, and collaboration the new litmus tests for future engagements. They will need to empathize with the individual using their services by incorporating human-centered design models. In other words, success will require an innovative approach to innovation itself.



Building a better, human-centered future

By giving citizens greater voice and personal agency in their dealings with the government, federal agencies can create stronger bonds of trust and collaboration with the citizens they serve and thus advance their own mission aims.

One final point: while we frequently focus on meeting the needs of citizens and other external stakeholders, these lessons are equally important for the employee experience that we offer. Expecting federal workers to thrive and succeed in a digital world with antiquated technologies and legacy processes is unrealistic.

The focus of our Federal Technology Vision this year—Five Trends Shaping Post-Digital Government—describes what is happening now and outlines new ways for federal enterprises to build a better, human-centered future. Once again, technology is the catalyst to steer the realignment. Agencies that take the lead with a shared-success mindset—and invite collaboration with citizens, employees, ecosystem partners, and other stakeholders—will create new opportunities for positive government-citizen connections, increased citizen trust, and mission success in a way that benefits all.

In this report, we discuss five technology trends that showcase the many ways that our perceptions of technology are evolving and how federal agencies will need to adapt accordingly.

Trend snapshots

The Five Trends Defining Post-Digital Government

The following are five technology trends that we believe all enterprises will need to be mindful of and navigate with care. These trends apply globally, but they are especially relevant for federal leaders and organizations. If poorly managed, they can amplify today's tech-clash. But if agencies see them for the opportunities they are and address them thoughtfully, they can manage these trends successfully and produce tangible benefits for themselves and the constituencies they serve.



The I in Experience Enabling individual control over the experience

Build greater trust and engagement through a more collaborative, human-centered experience. When agencies become partners in experience creation—and not just providers of it—they can transform their relationships with citizen customers.

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Al and Me Unlock AI's full potential through human-machine collaboration

Civilian and national security agencies can achieve better overall outcomes by changing the nature of their work and empowering human employees with better information and greater capabilities.

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The Dilemma of Smart Things Avoid the perils of the "beta burden"

As both a provider and consumer of digital products that are in constant flux, the federal government has an opportunity to mitigate risks and enhance its supplier and consumer relationships.

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Robots in the Wild Viewing robots through a mission lens

The value and versatility of robots serving federal missions is growing rapidly. To capitalize, agencies will need focus, imagination, and education. **Innovation DNA** Thriving in an era of continuous change and advancement

Agencies know they cannot solve our biggest national challenges with conventional tools and approaches. But to adopt innovation as core to what they do, they will need to assemble the right mix of capabilities and partnerships.

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In the wake of the COVID-19 pandemic, the relevancy and urgency of each of our five trends has only grown. This means the actions federal leaders take today to transform how government operates will have a critical and long-lasting impact.

Exploring Tech Vision

Since 2001, the Accenture Technology Vision has provided an annual glimpse into the most important trends impacting business, government and society over the next three years. It is produced by <u>Accenture Labs</u> and <u>Accenture</u> <u>Research</u> with additional input from one hundred Accenture leaders and more than two dozen external experts. We also survey more than 6,000 government and business leaders and 2,000 consumers globally to produce our analysis.

This year's global report, <u>WE, THE POST-DIGITAL</u> <u>PEOPLE</u>, shows how these trends are forecasted to impact consumers and business globally. It features specific examples of how commercial leaders are trailblazing a new path into the postdigital world.

The <u>Accenture Federal Technology Vision 2020</u> builds on this foundation with added insight from more than 50 Accenture Federal Services experts and survey data from two hundred federal program, business and IT leaders.

Each year's Accenture Technology Vision is designed to address a three-year window. By reviewing the <u>Accenture Federal Technology</u> <u>Vision 2018</u>, readers can assess how accurate our predictions for the federal government are likely to prove. Trends that year included Citizen AI, Extended Reality, Data Veracity, Frictionless Business, and Internet of Thinking.

This year's research was conducted before the full impact of the COVID-19 pandemic was felt. Given the magnitude of the changes occurring throughout society, Accenture has produced additional analysis—<u>Driving Value and Values</u> <u>During COVID-19</u>—assessing the impact on our overall forecasts.



The I in Experience

Enabling individual control over the experience

Consumers increasingly hold liquid expectations, where their best customer experiences become new benchmarks for every interaction. This has prompted many government agencies to dramatically increase their focus on customer experience (CX) to close the gap with commercial leaders.

But as government agencies and commercial businesses alike work to further improve the service delivery experiences of their customers, they often discover something unexpected along the way: their customers are interested in more than just a better experience. They also want choice and what sociologists call agency or independence in how that experience takes shape.

Take, for example, the notion of personalized digital experiences. Demand for personalization is high. In a survey by Adobe, 67 percent of consumers said it is important for companies to customize content automatically based on a person's current context. And a sizable portion of those surveyed—42 percent—even went so far as to say that non-personalized content annoys them.

But the methods that organizations use to personalize delivery of their services and products are becoming a bigger concern for people. News stories regarding both potential bias in AI systems and deceptive online marketing practices have contributed to mistrust in data-gathering practices and sinking attitudes toward black-box personalization. In RSA Security's Data Privacy & Security Survey for 2019, only 17 percent of respondents said they thought personalized ads were ethical, and only 24 percent said personalizing newsfeeds is ethical.

Expect to have to exceed expectations

Expectations are changing dramatically, especially as digital natives enter the workforce. A popular book series, Choose Your Own Adventure, in the 1980s and 1990s allowed tween readers to personalize the storyline. Today's generation spends countless hours in Animal Crossing, Fortnite and Minecraft constructing their own societies. As they move into adulthood, they have fueled the growth of fast casual restaurants defined by highly customizable menus with meals constructed in front of them.

What's evident is that users want more customization and personalization, but they also want greater transparency into how these decisions are made, the ability to take the wheel in designing their experience, and assurances that their data won't be used inappropriately. As a result, enterprises increasingly recognize the need to partner with users to design experiences collaboratively. Organizations, ranging from Uber and SoFi to Hulu and Amazon, are ceding more control over their digital experiences to their customers to better suit their needs, preferences, and values. For example, Uber Comfort allows riders to let drivers know in advance if they want to chat or be left alone. And Hulu's personalization engine recognizes factors like time of day and allows viewers to provide direct feedback to improve recommendations.

Federal agencies are making strides in this area as well. For example, the Veterans Benefits Administration's redesigned appeals process provides veterans with new options that they can select to expedite their review, allowing what is typically a multiyear process to be completed in as little as four months in some cases. In short, experience is important to customers, but so is the context around that experience. Think of context as the balance between frictionless personalization and trust that is earned through customer collaboration. As digital experiences become richer and fuller, due to the prevalence of emerging technologies such as 5G and virtual reality, the customer's desire for greater agency will also inevitably increase.

Consequently, we are seeing a new generation of technology-driven experiences coming online that make the user an active participant in creating the experience, and, in effect, changing the paradigm to make choice and agency a central component of service delivery.

What do these trends mean for federal agencies?

Survey data show that most federal executives already understand these trends: 92 percent of federal executives believe that, to compete in a post-digital world, organizations need to elevate their relationships with customers as partners. Moreover, a sizable majority (78 percent) of federal executives agree that organizations need to dramatically reengineer the experiences that bring technology and people together in a more human-centric manner.

But how can they implement these ideas?



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Revisit personalization

What's clear is that consumers desire personalization but don't appreciate how it's delivered. In many cases, this is because enterprises take shortcuts or use personalization as a means to advance their own goals rather than meet the customer's needs.

Accenture's 4R Personalization Framework was created to help enterprises deliver more personal experiences at scale that are designed around customer needs. It adopts the premise that online customers expect to be recognized with their preferences remembered. Furthermore, each engagement should be relevant to the citizen's current circumstances—no promoting snow shovels in July. Moreover, customers value organizations that use their expertise in providing honest recommendations. Federal leaders should assess whether their personalization efforts are meeting these objectives and configure them accordingly. For example, StudentAid.gov now offers its 42 million borrowers a personalized portal combining detailed, consolidated loan information with an interactive recommendation engine for comparing specific repayment strategies. This approach addresses the 4Rs while also providing users with the ability to customize their scenarios.

Rethink data collection & privacy

Our research shows that 70 percent of global consumers are concerned about data privacy and commercial tracking of their online activities, behaviors, location, and interests. And two-thirds of consumers are just as concerned about the commercial use of their personal data and online identity for personalization purposes as they are about security threats and hackers.

Given the declining trust in public institutions, these concerns are even greater for government agencies. According to the Accenture 2019 Global Citizen Survey, 73 percent of U.S. respondents wanted more personalized government services but only 28 percent were definitely interested in sharing personal data to receive it. Likewise, just 39 percent were okay with agencies sharing data amongst themselves to deliver more consistent customer service. GSA's Login.gov is starting to fill this gap by building citizen trust in a common identity management platform. GSA's Identity Playbook stresses the need to work transparently and to proactively inform citizens of what's being collected and why, and provide mechanisms for controlling what's shared. GSA even shares its source code in a publicly accessible GitHub repository.

The same survey also found that 92 percent of U.S. respondents ranked protecting personal information as a top expectation for government CX, with 56 percent wanting to explicitly control the information that agencies share.



The data control conundrum

Expectations for privacy are growing, as many global organizations, including those operating within the U.S., are using the EU's General Data Protection Regulation (GDPR) as their standard for data collection. Likewise, the California Consumer Privacy Act (CCPA), which gives state residents the ability to control and even delete online data collected about them, may have a similar effect. Specifically, compliance costs may drive many organizations to make it a de facto standard nationwide.

In response, some companies, including Google, are adding new features to simplify the process, such as an <u>auto-delete</u> feature that purges customer data at set time periods. Moreover, Apple and other companies are taking steps to limit third-party tracking across their platforms. While federal agencies are generally exempt from CCPA, it does raise citizen expectations for privacy. The National Academy of Public Administration has listed data security and individual privacy as one of its top challenges in public administration. As a potential solution, NAPA fellows Dr. Nick Hart and Dr. Jane Fountain have advanced a <u>potential</u> <u>framework</u> that calls for:

- Providing federal workers with clear guidelines for ethical data use
- Promoting accountability by allowing individuals to access their data
- Limiting data collection to what is needed and communicated
- Implementing and enforcing strong protections to safeguard citizen data



Proactivity presents opportunity

While agencies can expect new constraints on how they use personal data, there's also an opportunity here. Because agencies are often burdened with legal and reputational constraints on how they can use data for personalization, they should seek to empower citizens more with better navigational tools. For example, agencies may consider using natural language processing (NLP) to navigate FAQ sections as well as configurable recommendation engines in place of more overt personalization features.

The VA's Veterans Experience Office enhanced its survey platform to quickly solicit real-time veteran feedback on issues surrounding COVID-19. The VA used this insight to develop a <u>Veterans Quick Start</u> <u>Guide for COVID-19</u> that allowed veterans to select specific services, such as secure messaging and telehealth, that best address their unique needs. As one indication of success of VA's customer-centered approach, <u>veterans' trust in VA</u> reached an all-time high in April 2020.

Keep in mind also that end user control need not be binary (yes or no), as it often is with, say, the approach many websites adopt when seeking approval to use cookies. Increasingly, organizations allow users to set these policies based on the amount of data that they are willing to exchange for increased ease-of-use and other perceived value.

Another common challenge citizens face is providing feedback—55 percent of U.S. respondents in the 2019 survey said they cannot easily do so with the agencies that they interact with. While new avenues for faster approvals are in progress, current regulations still make it difficult for many agencies to proactively solicit input from citizens. By making it easier to share feedback, federal agencies can get closer to their customers and better understand their needs.

Agencies should also pay attention to what's being said online via social media. According to <u>research</u> conducted by Accenture and the Partnership for Public Service, most social media posts regarding agencies are not positive or negative. Rather, many involved consumers asking questions or seeking advice. By closely monitoring these channels, agencies like the IRS are able to quickly identify and proactively resolve issues. By making it easier to share feedback, federal agencies can get closer to their customers and better understand their needs.

Replatform

Agencies should invest in digital platforms, which are more agile and adaptive environments that can meet emerging requirements faster. By leveraging dragand-drop interfaces that even non-technical audiences can use to create targeted applications, agencies can make it easier to serve specific audiences and offer more individualized services.

USDA built upon the Salesforce platform to create Farmers.gov, which consolidated seven digital platforms and 150 federal web resources into a single, mobile-friendly website delivering personalized business services to farmers, ranchers, foresters, and agriculture producers. It offers a number of interactive and self-service tools essential to running a modern agricultural enterprise that users can configure to their needs. The Veterans Benefits Administration (VBA) took a similar approach in modernizing the VA Loan Electronic Reporting Interface (VALERI) platform that manages and monitors servicing activity for VA-guaranteed home loans. Working with Accenture, they enhanced the Salesforce platform with analytics and advanced reporting capabilities to enable VBA and the loan servicer to proactively intercede, when needed, to keep veteran borrowers in their homes. This underscores the opportunity for federal agencies, powered with the right technology and the right data, to serve as a critical enabler in third-party relationships, whether they be with commercial partners or state and local affiliates.



They enhanced the platform with capabilities to enable the loan servicer to proactively intercede to keep veteran borrowers in their homes.



Reinvent the user experience

Anticipating and proactively addressing specific needs creates confidence while empowering users. With one-third of residents suspicious that their responses might be used against them, executives at the U.S. Census Bureau face real challenges in building trust. In advance of the 2020 Census, the agency undertook extensive user research, creating personas and journey maps to better understand citizen expectations and concerns. And as the first digital census kicked off, the agency used online analytics to assess performance and mitigate potential roadblocks. By taking this approach, approximately four out of five self-responses were submitted online (as of 5/27/20), which is 9.2 percentage points higher than Census Bureau projections.

Even small steps can make a positive impact by offering customers proactive measures to help them better navigate federal digital services. For example, when a Social Security Administration website customer inputs her email address twice to create an account, the site validates whether the addresses match in real time so the user can correct the mistake right away. The Veterans Affairs Department's website informs customers how long a given task will take and displays progress markers as users proceed.

Reconsider the need for explainability

Are we ready to trust important decisions made by Al-based systems if they can't explain their rationale? In many cases, no, which is driving greater focus on the need for explainable Al. Federal agencies like DARPA have emerged as leaders in proposing approaches that "enable human users to understand, appropriately trust, and effectively manage the emerging generation of artificially intelligent partners." By offering transparency into decision making, these systems provide citizens with an informed ability to opt into an agency's recommendations.

Refresh—it's never "done"

It is important to approach digital services with a mindset of iterative and continuous improvement. Take a step here, add a new function there, collect metrics and user feedback, adjust, and repeat.

A great example of this is at the Veterans Affairs Department, which migrated its many digital services for veterans to its main website, va.gov, in November 2018. Since then, the VA has seen significant increases in virtually every metric for customer traffic and usage. The biggest jump was in veterans engaging with their own personal profiles on the website: Roughly 684,000 veterans updated their online profiles in 2019, a 479 percent increase over the previous year.¹ Until then, it was impossible to update one's own personal information once, such as adding a new address, and have that change filter through the many service branches across the VA enterprise. VA officials have attributed their success to their focus on continuous improvement—they updated the profile tool five times in just the first year—applying user-centered design practices.

 Aaron Boyd, "More Vets Are Taking Advantage of Digital Services Through New VA.gov," Nextgov, <u>https://www.nextgov.com/it-modernization/2019/11/</u> more-vets-are-taking-advantage-digital-services-through-new-vagov/161190/

The impact of COVID-19

In the wake of the COVID-19 pandemic, the nation sheltered, making digital experiences more important and pervasive than ever in people's lives. For federal agencies, these channels may be the only way that many individuals feel safe or comfortable engaging with government. Consider these steps:

Short-term:

In the short term, government agencies should pursue greater agility in deploying additional self-service options. For example, a number of agencies quickly implemented chatbots to handle the onslaught of unemployment and healthcare queries overwhelming traditional call centers. At the same time, agencies like the Department of Agriculture, the Social Security Administration and the Internal Revenue Services have enabled self-service by expanding their acceptance of digital signatures.

Long-term:

In the long term, federal leaders should double-down on their commitment to digital channels. COVID-19 is a behavior-changing event. Not only will individuals continue to prefer and pursue more convenient alternatives to in-person services and meetings, but businesses will accelerate their innovation to provide them with more vital, personalized, and interactive digital experiences. This will further raise the stakes for government to keep pace.



AI and Me

Unlock Al's full potential through human-machine collaboration

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A catalyst for change. Virtually every government agency is employing artificial intelligence (AI) in one way or another, and the range of government use cases appears limitless.

The Defense Department, for example, is using AI to predict aircraft maintenance needs for improved readiness. The Coast Guard uses it to analyze satellite imagery in deciding which vessels to inspect for possible smuggling. The Postal Service employs AI to process mail delivery and has tested transporting mail via autonomous vehicles. And the Health and Human Services Department is using AI to analyze departmentwide contracting data to develop smarter procurement practices.

These impressive examples represent only a tiny glimpse of how federal agencies are incorporating AI today. In an Accenture survey, **91 percent of federal executives reported that their agencies are piloting or adopting AI.** That compares favorably to only 73 percent of global executives who said their organizations are using AI to some extent.

Unleash people potential with the power of AI

Yet while the potential for AI in government is enormous, and the use cases are many and varied, experts agree that the vast majority of AI projects today steer towards automating routine administrative tasks. "So far, most agencies have focused on automating simple manual workloads, taking baby steps in exploring AI," said former Federal CIO Suzette Kent.¹

Certainly, automation—which employs robotic processing automation (RPA), data capture, natural language processing (NLP), and other technologies is a ripe goal for AI initiatives in government. There is no shortage of repetitive, routine, manual, rulesbased tasks and procedures that tie up federal employees and contractors for countless hours when they could be using that time for far more important work that better aligns with their human strengths. But automation should be viewed as merely the ground floor of AI's potential value to any enterprise. Research shows its far greater value lies in actually changing the nature of work and empowering federal employees with better information and capabilities to improve enterprise effectiveness and achieve better outcomes. For example, Accenture found that 49 percent of the average federal worker's time is <u>potentially augmentable with AI</u>, trailing only the education, health and social work, and financial sectors in this potential.

Today, more and more agency leaders are coming to realize this and beginning to leverage the potential of Al systems to transform not just how they do their work, but also what work humans and machines should be doing separately and together. In short, Al is increasingly becoming a catalyst for change across the government.



of the average federal worker's time is potentially augmentable with AI

Billy Mitchell, Suzette Kent: Toughest challenges in federal AI adoption will be in 'middle' layer, FedScoop, July 26, 2019, https://www.fedscoop.com/ suzette-kent-toughest-challenges-ai-adoption/



A new approach to disaster response

Consider, for example, how numerous federal agencies are collaborating today to reexamine how they approach disaster response and preparedness. The biggest challenges response teams face during a disaster are to quickly assess multiple streams of information, establish real-time situational awareness, and effectively coordinate and execute responses to limit damage, rescue survivors, and deliver medical and other aid.

Agencies such as the Defense Department's Joint Artificial Intelligence Center (JAIC), the military services, the Federal Emergency Management Agency (FEMA), the U.S. Agency for International Development (USAID), NASA, the State Department, NOAA, the National Geospatial-Intelligence Agency, the Civil Air Patrol, the Department of Energy and various academic institutions have been working to tackle these challenges using AI-enabled tools and approaches. Many of these organizations, for example, are partnering to develop an AI-enabled flood and damage assessment that uses overhead imagery from aircraft and satellites to identify areas where water should not be present and then assess damage based on FEMA's assessment categories. The assessment tool also uses overhead imagery to locate road obstructions and identify routes to safely deliver supplies and remove flood victims. The net effect of this will be to increase disaster resilience, save lives, and lessen the impacts of disasters. The JAIC's Humanitarian and Disaster Relief team has already conducted a successful first test of a prototype with the Indiana National Guard.¹

Joint Artificial Intelligence Center, DoD AI in Disaster Response Demonstrates Progress, Promise for Future, Jan. 31, 2020, https://www.ai.mil/blog_01_31_20dod-ai-hadr-in-disaster-response-demonstrates-progress.html

2 Al and Me

Working with the workforce

Such a capability can be a game-changer for government response teams in the future. With this, responders can quickly combine numerous data streams—such as weather, transportation, power grid, manpower, commerce, and satellite imagery data—to answer critical questions, such as "where to place response teams during a disaster?"

Kent said researchers are now taking this capability a step further to pose the question,

"How can we recover faster?"

"Where will there be trees and debris that need to be removed?" Kent said. "And what is the workforce that we need to repair flood damage? So [we can] not only use the capabilities to minimize impact, but to speed up recovery. So when you think about this type of scenario, that fundamentally changes our end-to-end workforce. ... So to train our workforce, to leverage the powerful capabilities, we need not only the commitment from the technical side, but [also] mission operations and the business teams who understand and have the insights to help us identify, deconstruct, and reconstruct some of those complex interactions."¹

Planners of this effort were not interested in automating existing work processes—instead, they sought to develop entirely new approaches to addressing complex mission challenges by allowing responders to engage with richer information in new ways. In this way, AI is expanding the capacities and capabilities of government disaster response teams.

 Federal CIO Suzette Kent, remarks on the podcast AI Today, April 29, 2020, https://www.cognilytica.com/2020/04/29/ai-today-podcast-139-interviewwith-suzette-kent-us-federal-cio/



Rebalancing the human + machine equation

Too often, the conversation around Al occurs through a narrow and negative narrative that machines and humans are in competition with each other. Instead, we should acknowledge and build upon a different view where Al's role is to enhance human potential.

Research involving 1,500 companies has found that firms achieve the greatest performance improvements when humans and machines work together.¹ Through their interaction and collaboration, humans and AI can enhance each other's complementary strengths. For humans, those strengths include leadership, teamwork, creativity, and social skills. Computers are best at speed, scalability, and quantitative capabilities. For organizations to take full advantage of this collaboration, they must understand how humans can most effectively augment machines, how machines can bring out what humans do best, and, finally, how business processes can be redesigned to support the partnership.

1. Paul R. Daugherty, H. James Wilson, Human + Machine: Reimagining Work in the Age of AI, Harvard Business Review Press, 2018

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AI-empowered humans are overhauling claims processing

So what does it take for government agencies to start reimagining the work itself and facilitate true human-Al collaboration? For one, they must think beyond a linear "command and response" approach and, instead, create an interactive, exploratory, and adaptable relationship. This requires an innovative set of practices that most enterprises aren't actively building today.

Automation requires replicating specific tasks to get a job done. Using AI for augmentation, however, demands the ability to communicate and iterate with these systems. To foster human and AI collaboration, businesses will need to explore and master the tools and advancements that enable humans and machines to better engage each other—for example, new breakthroughs in natural language processing that translate into improved machine understanding of human speech and syntax.

Many commercial enterprises are also going down this path. Lemonade, a startup natively designed to use human-Al collaboration to disrupt the insurance industry, is one example with considerable applicability for customer-facing government agencies. At Lemonade, AI is embedded in the organization and present in nearly every workflow. In particular, the company's claims payment process was designed to play to the strength of AI and humans working together. Customers file claims with a chatbot that both logs the claim details and instantly compares the claim to others within the Lemonade database—a first wave of defense against fraud. If everything looks okay, the claim can be paid out immediately to the customer. If a claim is too complex or problematic, the AI shares the information with a human agent, who steps in to manage the case.

Fraud and the administrative costs of complex bureaucracies are two of the largest costs to insurance companies, and the company solves both by making AI a key part of the process. Meanwhile, it also provides the customer with a simplified, seamless insurance experience while making a human touchpoint available when it is needed.

To foster human and AI collaboration, businesses will need to explore and master the tools and advancements that enable humans and machines to better engage each other.



of federal executives acknowledge that collaboration between humans and machines will be critical to innovation in the future.

Don't just automate, collaborate

The notion that Al's greatest value is not in replacing humans, but rather in enhancing the capability and potential of human employees is not new. We saw this with the advent of personal computers in the last quarter of the 20th century. While computers did assume many rote, manual tasks, such as clerical and record-keeping functions, their greatest value by far was in augmenting government and commercial employees with powerful tools—such as productivity, collaboration, advanced computation, and database software packages—to make them more informed, capable, adaptable, and independent.

Federal executives get this. In our research, 85 percent of federal executives (compared to 79 percent of executives globally) acknowledge that collaboration between humans and machines will be critical to innovation in the future. The problem, however, is that many agencies struggle with how to do that exactly. Only 18 percent of federal executives (vs. 23 percent of executives globally) reported that they are preparing their workforces for collaborative, interactive, and explainable AI-based systems. And only 22 percent of federal executives report that they have inclusive design or human-centric design principles in place to support human-machine collaboration.

Getting the agency ready for human-AI collaboration

It is not enough to simply have machines and humans capable of interacting—their interactions need to be well thought-out and optimized for the business or mission at hand. Agencies must think through how human-machine collaborations can advance their success and what that would look like.

With this in mind, agency leaders should evaluate AI's potential in two ways—opportunities where AI can work independently to streamline operations and where it can be used collaboratively with human workers to improve their performance.

For the former, AI can play a role in preprocessing or prioritizing critical information to reduce the administrative burden. For example, the Social Security Administration is using AI to identify medical documentation that is most useful in supporting a disability claim. In many cases, agencies will need to rethink legacy process flow with AI used earlier to minimize bottlenecks and shif workers to more complex analysis or roles requiring empathy.

For the latter, it's about considering how AI can aid the worker's decision making and analysis. A good example is the role that AI is playing in many call centers. In addition to prepopulating forms, it can monitor a conversation to coach and recommend potential solutions to a call center representative. It's not hard to imagine similar approaches being widely applied in fields like medicine and law enforcement.

> By taking these steps, federal leaders can unlock the full potential of their workforce to operate with greater agility and effectiveness to achieve better outcomes.



Keys to unlocking effective human-machine interactions

So how can federal agencies do more to bring out the full power of their people? They can start by moving beyond deploying AI for automation alone and push into the new frontier of co-creation between people and machines.

Natural language processing (NLP), explainable AI, and extended reality (XR) are among the tools that can unlock new ways for humans to interact with machines and for machines to interact with us.



Natural language processing

Meaningful collaboration always begins with communication, and traditional language barriers between humans and machines are disappearing for both written and spoken text through advancements in NLP. In many cases, these advances are pushing Al outside the realm of data scientists alone and into the core operations of the organization, giving average users the ability to command powerful systems that were unimaginable just a few years ago.

By leveraging these advances, businesses can deepen human-AI collaboration. Google's BERT and Baidu's ERNIE—which are both open-source frameworks—enabled AI systems to move from understanding just one word to understanding phrases in context.

Explainable AI

Collaboration can't just be one-wayorganizations must complete the feedback loop and build capabilities that allow humans to better understand machines. The growing field of explainable AI is letting humans de-mystify the output of previously "black-box" AI systemsmaking human-machine collaboration possible even if the AI wasn't designed to explain its decision-making process, through approaches like counterfactual explanations. If a citizen is denied a loan or benefit, for example, the system needs to be able to explain the reasons for the denial and offer the smallest number of changes the applicant would need to make to have the application approved. Making AI explainable turns a human-Al interaction into a relationship.



Extended reality

Likewise, machines can be valuable collaborators when they can understand the physical context of humans and can sense—and make sense of—a person's surroundings. For example, image recognition and machine learning allow Microsoft's HoloLens 2 mixed reality headset to not only see, but also understand the wearer's physical environment. This contextual understanding of the environment unlocks new capabilities for the device, like being able to identify dangerous equipment and warn the wearer if the equipment is operating hazardously. This significance will grow dramatically with the deployment of 5G and adoption of edge computing models.

On the Exploring AI in Government podcast series, Dr. Tim Persons, GAO's chief scientist, shared **"I think we're** still underestimating how much we're going to get out of [AI] over time as it evolves. I think it's going to surprise us... we're going to look back and say, I can't believe we used to do things that way." Federal leaders will need to approach AI with a similar sense of both wonder and ambition to realize its full potential.

> The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.



The impact of COVID-19

The mixed response to the COVID-19 pandemic has underscored both the criticality of transforming available data into real insight and our current gaps. It also demonstrates the need and potential for automated systems that can address dynamic requirements. Here are considerations to keep in mind:

Short-term:

In the short term, federal workers will need to make decisions faster and increase their capacity and AI can help. But in our haste to deploy, we should not overlook our commitment to transparency and appropriate use, as any misuse can set user trust back significantly.

Long-term:

In the long term, the future is likely to be more virtual, highlighting the need to get human + AI collaboration right. Federal workers will become more reliant on AI-based systems. In fact, Accenture research finds that AI tools may impact as much as 30 percent of the average federal employee's time by 2028. However, our research also suggests that many agencies may face gaps in reskilling their workforces to effectively collaborate with AI.


The Dilemma of Smart Things4

The Dilemma of Smart Things

Avoid the perils of the "beta burden"



Accenture Federal Technology Vision 2020: Five Trends Defining Post-Digital Government

Overcome the "beta burden".

Earlier this year, some Tesla models began to automatically recognize and respond to traffic lights and stop signs. For many brands, this type of enhancement would require a trip to the dealership for a hardware upgrade; for Tesla owners, it was simply a software update delivered over-the-air. Consumers are growing accustomed to seeing their software-enabled things continuously evolve long after they buy them—everything from the apps on their phones and the operating systems on their computers to their computer-enabled cars and virtual reality headsets.

Enterprises are beginning to design updateable products with the ability to expand services and experiences in the future, making it possible to respond to changing customer demands and expectations at a moment's notice. This sets the stage for feedback loops that support true partnerships, where customers can see the value and utility of products grow over time rather than fade.



However, as we inhabit this state of "forever beta," our traditional perspectives on ownership are being challenged. Products that consumers think of as "theirs" are being redefined at the drop of a code release. The risk is that customers are having to constantly play catch-up, not knowing if the next system update is bringing exciting new capabilities, a critical security refresh, a new user interface to learn or a dramatic change to functionality. It's not surprising that some customers are growing weary of what's around the corner. As products increasingly transition into platforms that deliver digital experiences, new challenges arise that, if left unaddressed, will alienate customers and erode their trust. The true value of a product is increasingly being driven by the experience, a facet of the product that manufacturers today retain strict control over.

Call it the beta burden: the unintended consequences when products, and their contained experiences, are constantly in flux.

Experiencing a new reality

Government agencies are encountering this new reality as both a provider of digital experiences and a consumer of them. As a provider, agencies are looking at a range of things like <u>wearable devices</u>, <u>virtual reality apps</u>, <u>robots</u>, and <u>voice-activated apps</u> for smart speakers to meet needs ranging from field operations to home healthcare. In many instances, the business case requires the ability to revise and update periodically in response to ever-changing environmental situations.

As agencies roll out and maintain their digital services and products, they must ask themselves: How involved will they be with their products' lifecycles? How much transparency and choice over their products' experience will they extend to end users? How might this new reality change the frequency and ways in which agencies interface with their constituencies? How much continuity will they maintain over their products' features and experiences as they are updated? And what cybersecurity responsibilities and liabilities do they have?



Agencies also experience the beta burden as consumers and end users. They buy cars, trucks, planes and even <u>spacecraft</u>—all laden with smart technology features subject to updates. Equipment in federal data centers, the software that powers day-today government workloads, logistics equipment, office appliances, even the smart systems that control the climate and utilities in the buildings government employees work in—they all constantly evolve as they receive periodic updates from their makers. This trend will become even more prevalent in the coming months and years with the rollout of 5G networks, which will greatly accelerate the proliferation of smart, connected things.

As consumers, government agencies will increasingly confront questions about the impact of relying on things that always morph: How much transparency and choice over product experience will they require and insist on? Can product and service providers issue updates whenever and for whatever reasons they want or will there be limits, and what should those limits look like? What risks to government supply chains and cybersecurity do these constant updates introduce, and how can those be addressed? What happens when a critical feature disappears or existing integration breaks?

For example, automated patch updates may require agencies to choose between ensuring the integrity of classified systems and maintaining cybersecurity. This means they may need to sacrifice efficiency for manual vetting or accept that some solutions are incompatible with their operating model.

This trend will become even more prevalent in the coming months and years with the rollout of **5G networks**, which will greatly accelerate the proliferation of smart, connected things.

Disconnected

Accenture research shows these are not merely academic concerns. Of federal executives surveyed by Accenture, 92 percent say their organization's connected products and services will have more, or significantly more, updates over the next three years. This compares to 74 percent of global executives saying the same thing. Moreover, 85 percent of federal executives (compared to 79 percent of executives globally) report their industry is moving toward offering more variety in ownership models for their connected products and services.

Interestingly, our research reveals a pronounced disconnect that federal agencies should be mindful of: 80 percent of federal executives (compared to 68 percent of executives globally) believe customers generally do not mind—or even welcome—software updates to their organizations' connected products and services. Yet a large portion of consumers surveyed—47 percent—say they just want to buy something without constant updates. And the same percentage of consumers believe that updates are an increasing burden on users as they try to keep abreast of newly installed security patches, changes in functionality, and new interfaces.

So what implications might all this hold for federal agencies and how can they address them smartly? And how can they address this disconnect by enabling consumers to retain agency and authority over their digital experience and interactions with technology products and services?

The following pages contain several suggestions on how agencies might think about these themes.



of consumers surveyed say they just want to buy something without constant updates

Design for the journey

3

As providers of products and experiences, federal agencies—either by themselves or in collaboration with vendors—will need to become comfortable designing products that evolve and transform over time while simultaneously becoming more comfortable releasing products they might conventionally see as "unfinished." They will need to make products and services seamless to the end user, even as they are always evolving.

To do this, agencies will need to apply design thinking principles to their product planning and think through the entire lifecycles of their products from the perspectives of their end users. For example, the military increasingly provides their personnel with immersive training equipment, such as virtual reality headsets. As military personnel train and respond to their virtual environments and scenarios, their performance is carefully logged and those metrics shape and adjust subsequent training scenarios that focus on areas where more attention and improvement is needed.

> The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.



Understand and address the many security implications of "forever beta"

Products and services that are in constant flux present significant security concerns that must be addressed. Keep in mind that the side channels that vendors use to update their products are also targeted by hackers to cause harm. This presents serious supply chain risks: How can the government be assured that a component three or four tiers deep in a weapon system's or IT system's supply chain is secure against outside intervention if it can be remotely updated at any time, even if that update is a cybersecurity patch?

In short, as the universe of updatable products expands, so does the vulnerable attack surface. Current federal cybersecurity processes and programs, such as FedRAMP, were not designed to address this challenge. New, standardized approaches will be needed to help agencies see, assess, and proactively secure the growing cacophony of digital correspondence that will be flowing between federal infrastructures and their manufacturers. As consumers, agencies will also need to think through the terms of service they negotiate with vendors for the products and services they purchase. This is especially true as ownership and control may change over the product lifecycle. These agreements can help impose needed governance around releases and updates, such as by enabling previews, preapprovals, and pre-disapprovals, if necessary, before they are made and regulating their timing, so they do not interfere with existing needs and operations.

As providers of products, agencies will need to adopt disciplined, rigorous, documented approaches for how they push out and update new capabilities, such as through DevSecOps practices and FedRAMP-like controls that apply to extended devices. In short, agencies will need to think about how they extend their current cybersecurity controls to address smart devices and other software capabilities over their entire lifecycles.

Develop agile product management as a discipline within government

Product managers have long served a critical function in the commercial world: they bridge product development and sustainment teams to ensure the stated and unstated needs of the customer are met. In today's "forever beta" age, this function is increasingly important in government as well. As organizations like the <u>U.S. Digital Service have suggested</u>, agile product managers can bridge gaps that often exist between the mission side of the agency and the IT side as they collaborate to serve their constituencies.

Agile product managers can help ensure that the capabilities their agencies are pushing out and updating serve and benefit their intended customers and, importantly, coincide with their customers' values. One helpful approach is to set up regular feedback loops to gather customer input on current and upcoming offerings. In this role, agile product managers can be important conduits in helping consumers gain greater authority over their digital experiences and interactions with federal products and services.

Leverage collective power for acceptable terms

Many blindly accept standard terms and conditions for digital service that they feel powerless to amend. However, federal agencies can potentially leverage their collective buying power to have an actual say. They should consider creating common contract language that sets minimum standards for support, autonomy and performance.

At a minimum, they should demand complete and accurate disclosure of all data collected by the devices and shared externally, even if ostensibly for performance improvements. They may also require that those features be disabled as the government sees fit. Agile product managers can bridge gaps that often exist between the mission side of the agency and the IT side as they collaborate to serve their constituencies.

Consider the burden of governance and product support

Whether as a consumer or provider of "forever beta" products and services, federal agencies will eventually find themselves overwhelmed with the task of supporting and governing boundless quantities of smart stuff. Consider, for example, the swarms of smart appliances and sensors likely to proliferate across federal environments with the advent of 5G networks. The military, for example, is looking at "smart uniforms" laden with high-tech fabrics, sensors and connectors that can improve situational awareness and survivability on the battlefield. The Common Access Cards (CAC) in every government employee's wallet may be enriched with greater digital capabilities. How can government agencies manage those inventories if they are constantly evolving? Instead of going it alone, working with industry partners can be a viable strategy. This can allow agencies to innovate and scale faster by leveraging third-party expertise to manage the underlying product complexity spanning vast ecosystems.

One final consideration: in addition to upgrades delivered by product developers, agencies also need to manage changes produced by the devices themselves. Specifically, AI-equipped products using machine learning algorithms, operating increasingly at the edge, can independently enact their own powerful but disruptive changes. This creates added incentive to solve the dilemma of smart things.



The impact of COVID-19

The COVID-19 pandemic showed the important role that smart devices can play in monitoring personal health and enabling more contactless operations. Some considerations to bear in mind:

Short-term:

In the short term, expect a heightened focus on the privacy implications of smart devices. The debate around autonomous contact tracing (e.g. via people's smart phones) reminds Americans how dependent they are on smart devices and the pervasiveness of monitoring associated with those devices.

Long-term:

In the long term, prepare for telehealth to go mainstream. One of the relative successes of the pandemic responses was the expanded use of telehealth. With patients and providers having renewed appreciation for its potential, expect to see remote monitoring gather steam with new devices that expand coverage.



Robots in the Wild

Viewing robots through a mission lens



The field of robotics is advancing so fast it's hard to keep up. **Designers are developing and fielding** new materials, miniaturization technologies, artificial intelligence, sensors, and locomotion capabilities at such a dizzying rate that almost any robot imaginable, it seems, is becoming feasible. These advances, combined with shrinking hardware costs, are making robots far more accessible for organizations that have not traditionally used them.

Armed with these newfound capabilities, robots are literally pushing new boundaries. Once relegated to the controlled confines of warehouse and factory floors, robots are now being called on to venture out into the wild frontier of uncontrolled environments where they are increasingly interacting with the world as it is. Think self-driving cars, sorting and delivery drones for food and parcels, autonomous farm hands, and more. They are transitioning from highly specialized industries where they perform specific tasks to operating in virtually any industry, performing a wide array of tasks, and even providing companionship.

Consider Amazon's small delivery vehicle, "<u>Scout</u>," which autonomously navigates real-world obstacles like trash cans, pets, and snow blowers, and features a cute exterior deliberately designed to delight customers. Or Walmart's new fleet of <u>Bossa Nova</u> robots that scrub floors, check shelf inventory, and sort inbound packages, freeing up associates to better engage customers.

And Boston Dynamics is releasing "<u>Spot</u>," its first commercially available robot for open world use. Spot is a quadrupedal bot with a long robotic arm, designed so customers can apply it to a range of use cases like pipeline inspection or 3D mapping of construction sites. During the coronavirus pandemic, Brigham and Women's Hospital in Boston deployed Spot with an iPad mounted on its back as a mobile telemedicine platform. The robot enabled hospital staff to remotely interact with patients and triage them in testing tents outside the hospital, thereby reducing the exposure of front-line hospital staff to the virus.



The advance of the robots

There is even a nascent but fast-growing Robotics-asa-Service (RaaS) industry that allows companies to outsource the often prohibitive, up-front costs of automation, thereby offloading risk. The RaaS installed base is projected to experience a massive increase, from approximately 4,000 units in 2016 to more than a million in 2026.

Moreover, we already see signs that robots will soon evolve from primarily stand-alone intelligent things to swarms of collaborative intelligent things where multiple devices work together, either with or without human input.

Contributing to these developments is the imminent rollout of 5G networks, which will further accelerate data streams and connectivity, creating more ideal conditions for robots to thrive around us. Eighty-five percent of federal executives expect that 5G networks will expand opportunities for robots to operate in uncontrolled environments in their organizations. As robots become more accessible and versatile, enterprises will discover new opportunities to push the intelligence of the digital world out into the physical world. New use cases are sure to proliferate across many more industry sectors and government missions. IDC predicts that the global robotics market will reach \$241 billion by 2023 with only half of that in manufacturing, the traditional mainstay of robotics sales.

This tracks with Accenture's own research, which shows that 61 percent of global executives surveyed expect their organizations will use robotics in uncontrolled environments within the next two years. Interestingly, federal executives are even more bullish: Ninety-four percent of those surveyed said they expect their organizations will use robotics in uncontrolled environments within the next three years.

Viewing robots through a mission lens

As this robot proliferation unfolds, government leaders may be asking what this will mean for them and their agencies.

First, it will mean that mission-focused methods and approaches will need to be reassessed through a lens of robotics. Where will agencies find the greatest value in robotics, and what partners will they need to unlock it? What challenges will they face as they undergo this transformation, and what new responsibilities will they need to assume to their customers and society at large as they incorporate robots into their day-to-day operations? And is the workforce skilled and ready to support these changes?

Many agencies are already thinking through these issues as they enlist robots for a wide array of potential use cases that cut across the government's vast mission set. Not surprisingly, the military has been a trailblazer within government. It employs—and envisions employing at even greater scale—robots to assist with explosive ordnance disposal, clear mines and roadside bombs, schlep gear and supplies in combat zones, serve as targets for firearms practice, scout battlefield terrain, conduct surveillance and reconnaissance, target and attack enemies, refurbish aircraft parts, and more.



Where will agencies find the greatest value in robotics, and what partners will they need to unlock it?

Others have followed suit

The Veterans Affairs Department uses robots to assist with surgeries; transport supplies, lab specimens, medications, and dinner trays at medical centers; and even provide comfort care to residents at VA senior community centers in the form of robotic cats and dogs.

The Postal Service has explored the use of robots within its sorting centers for three decades and more recently has tested autonomous vehicles for long-haul transport. The EPA, National Institutes of Health, and Food and Drug Administration collaborate to employ robots to conduct large-scale toxicology tests. The Maritime Administration is exploring their use to clean up oil spills.

And the Department of Homeland Security is using them or exploring their use for surveillance and reconnaissance, search and rescue, tunnel inspections, border patrol, and situational awareness in dangerous environments. And, of course, few robots have become as renowned as NASA's Mars rover, Opportunity.

While many agencies are looking to robots to assist with mission-related tasks, some agencies are also viewing them through a regulatory lens. For example, NASA, the FAA, the National Highway Traffic Safety Administration, and the Defense Advanced Research Projects Agency (DARPA) all have a hand in defining rules of the road for robots and autonomous vehicles to operate safely in public spaces, while others are considering the privacy implications as robots increasingly interact with citizens.



The potential for deployment is enormous

Even with this progress, the government's adoption of robots is considerably behind what we see in the commercial sector. Roughly a third of federal executives surveyed by Accenture said their organizations are making use of robots to some degree in controlled environments, while only 4 percent said they are using them outside of controlled environments. By comparison, slightly more than half of global executives surveyed said their organizations are making use of robots in controlled environments and 9 percent said they are using them in uncontrolled environments.

These figures seem surprising given the vast number of potential federal use cases one can imagine. Robots come to mind first for jobs that are dirty, dull, and dangerous, and federal agencies certainly work in risky and grimy environments: Consider traditional lines of work like emergency management, homeland security, logistics, maintenance, facilities management, law enforcement, wildfire management, and military operations. Robots also enable a wide array of physical interactions in remote and hard-toreach areas. And more recently, robots have made in-roads into other fields such as healthcare, therapy, customer service, and more.

So, what does it take to view one's mission through a lens of robotics? In a nutshell, it takes focus, imagination, and education. DARPA, for example, has run numerous robotic challenges to assess current capabilities as they might apply to DoD missions.

The National Science Foundation (NSF), NASA, the Occupational Safety and Health Administration (OSHA), and the Department of Agriculture have teamed up to sponsor the U.S. National Robotics Initiative, which aims to accelerate development and use of collaborative robots (known as co-robots) that work beside or cooperatively with people.

And the Homeland Security Department—through its Science and Technology Directorate—has partnered with the National Institute of Standards and Technology (NIST) to develop performance standards and conduct evaluations of robots that could help with various DHS missions. More than half of global executives surveyed said their organizations are making use of robots in controlled environments

The matter of trust

4 Robots in the Wild

As agencies begin deploying robots in service of their varied missions, they will confront another big consideration: Making sure those robots are trusted, safe, and secure. How will agencies build trust for robots among the variety of stakeholders who will encounter them? How will they design and govern the way robots interact with people and environments? And how will they address legal, liability, privacy, and ethical issues that may come up with their use?

These are critical points to get right. Increasing percentages of consumers that we surveyed believe robots can make their lives easier (48 percent) and more efficient (41 percent)—yet, a similar number (39 percent) say they are concerned robots will introduce more problems than they fix.

Federal executives have even greater concerns: 71 percent of federal executives surveyed compared to 59 percent of global executivesbelieve social and service robots in public spaces will raise major ethical, legal, and societal concerns, including security threats and privacy risks.

These are complex issues that will require study and a survey of best practices. It will be important for agencies to proactively help people who interact with these devices to understand machine behavior. Agency leaders will need to think about the types of expertise they may need—such as in the fields of user experience and human-machine interaction—to navigate these uncertain waters.

To help minimize potential disruptions that robots may cause in uncontrolled environments, agencies can design devices in a way that clearly conveys intent. They can use simulations to explore and address specific safety issues. And they will need to work with industry partners to standardize these systems where possible.

Are agencies ready for robots?

Potential use cases and opportunities may be evident, but there can be little progress without a receptive organization. Are agencies' cultures and leadership ready for robots? How about their stakeholders? And do they possess the skill sets needed?

Our research suggests these will likely be sizeable hurdles for some agencies considering forays into robotics. Three-quarters of federal executives surveyed said they expect their employees would resist any near-term moves to adopt robots; 73 percent said they expect their customers would resist; and 71 percent said they expect society would resist it.

Moreover, 57 percent of federal executives say their employees will be challenged to figure out how to work with robots, while 43 percent believe their employees will easily figure out how to work with robots.

Getting the right skills in place to execute and sustain robotic endeavors can also present challenges. There have been large increases in demand for robotics technicians (a 121 percent increase since 2017) and for data scientists (an 88 percent increase between 2018 and 2019). A good way to start is by launching discovery initiatives to understand the state of robotics capability—and limitations—as it relates to an agency's missions and operations. Although autonomous capabilities offer many exciting possibilities, they cannot match the human brain's breadth of intelligence and dynamic, general-purpose learning. Instead, focus robots on well-scoped purposes, particularly for automating routine or 3D human tasks.

Agencies can bring needed focus by assembling a cross-functional working group, led by a senior departmental executive, to identify, explore and pilot opportunities that will deliver compelling business outcomes. They should craft strategies for building, buying, or partnering with the right organizations to develop needed skills, expertise, and capabilities. Along the way, it will be critical to proactively solicit and address the concerns of affected stakeholders, including employees, through robust interactions and communications. To more easily scale these efforts, agencies should consider establishing centers of excellence to concentrate capabilities, maximize visibility, and address regulations and standards that can ease wider adoption and applicability.



of federal executives believe that their employees will be challenged to figure out how to work with robots.



The impact of COVID-19

The rapid shift towards 'contactless engagement' has reinforced the role that robots can play in performing dirty, dangerous, and dull work. At the same time, it has also underscored their potential to provide companionship within a virtual world. Consider these steps:

Short-term:

In the short term, agencies can benefit by identifying additional opportunities to use robots to maintain business operations. Beyond traditional use cases, governments like Singapore are using robots to encourage social distancing.

Long-term:

In the long term, agencies should prepare for robotics to become more pervasive even faster. Shifts in consumer behavior and new economic realities will likely accelerate the development of autonomous robotics and new use cases. For example, the <u>Wall Street Journal</u> reports that robot makers have increased their focus on the home delivery market in the wake of the COVID-19 pandemic.



Innovation DNA

Thriving in an era of continuous change and advancement

Accenture Federal Technology Vision 2020: Five Trends Defining Post-Digital Government

The world is changing rapidly,

and countless powerful new tools and capabilities are hurtling into view all around us. Yesterday, it was the internet, the cloud, and smartphones. Today, it's artificial intelligence, automation, genomic editing, everything-as-a-service, and adaptable architectures. Tomorrow, it will be 3D printing, blockchain, and quantum computing. With unprecedented opportunities coming from emerging and maturing technologies, innovation is more critical than ever for achieving its potential. Leading organizations, regardless of their mission or business focus, are proactively exploring these new tools and capabilities with fresh thinking and leveraging them to devise new, better approaches to the challenges they confront.

For commercial companies, the drive to innovate is about unlocking new revenue streams, achieving greater efficiencies, and re-imagining existing business models.



For federal organizations, however, innovation is key to taking on some of our nation's biggest challenges:



The Defense Department and Intelligence Community view it as a critical strategic pillar in their efforts to maintain a clear strategic edge. ్యిం

The U.S. Agency for International Development's search for new solutions to global development challenges.



Federal healthcare agencies' efforts to achieve better healthcare outcomes and more efficient payment models.



FEMA's mission of building greater preparedness and resiliency across the country for when disasters strike.



The EPA's desire to transform sustainability and environmental protection.

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And the Agriculture Department's goal of increasing food production and last mile delivery to meet U.S. and global needs while reducing agriculture's environmental footprint.



Get disruptive with your DNA

In these examples, an agency's innovation DNA identifies where it has an imperative to pursue new, more disruptive approaches as well as unique strengths to leverage. This becomes their north star guiding innovation. Having this focus and deliberate approach is critical given the challenges that organizations face in harnessing innovation, which include today's accelerating pace of change, uncertain planning horizons, and increasing organizational complexity.

What has the potential to accelerate or amplify this process is the convergence of three underlying trends: digital technologies that enable more fluid and adaptive operations; scientific advancements that are blurring traditional boundaries to create new fields of study; and emerging DARQ (Distributed ledgers, Artificial intelligence, extended Reality and Quantum computing) technologies that can be a force multiplier by enabling new approaches to problem solving.

Forty-six percent of federal executives believe that these scientific and technology advances are poised to disrupt government. By embedding this DNA into their organizational fabric, agencies can harness these disruptions to advance their mission.





Federal executives report that the following areas of scientific research and advancement will drive the next wave of innovation in government:



Sustainable Development



Material Science/ **Smart Materials**



Biocomputing



16% Genetics

Cognitive Neuroscience







The government's innovation track record

Every presidential management agenda in recent years has emphasized the need for more innovation in government. And it is hard to find an agency that has not stood up an innovation office or launched an innovation initiative of some kind.

But how much progress—and success—are agencies having as they try to incorporate innovation into their day-to-day activities so they can more effectively address today's complex challenges? What we see today are pockets of innovation across government, but with few organizations achieving widespread success at adapting and scaling innovation across their enterprise.

On the surface, this track record may seem at odds with the government's rich history as perhaps the biggest innovation engine in the world. After all, nuclear energy, the moon landing, the internet, supercomputers, stealth technologies, smartphone technologies, and untold numbers of medical breakthroughs and cures, among other innovations, can all be traced to federal research and programs. In fact, a quarter of the 270 Americans that received the Nobel Prize for innovation and ingenuity in the last century were federal employees.¹ The problem, as some government innovation experts have noted, is not that federal agencies lack the ability to come up with innovative ideas and approaches. Rather, legacy operating models make it difficult to grow and sustain this innovation. As Steven Walker, the former director of the Defense Advanced Research Projects Agency, explained it, the hard part for agencies, is "organizing, training, equipping—taking that new technology, that new innovation, and making it operational. That's the hard part. That's where we're struggling."²

- Partnership for Public Service, The Federal Government: A Nobel Profession A Report on Pathbreaking Nobel Laureates in Government, 1901 - 2002, <u>https://ourpublicservice.org/wp-content/uploads/2002/12/</u> <u>193690852dfe6b696a3d8216af41ee89-1414079066.pdf</u>
- Aaron Boyd, For DOD, Innovation Isn't the Problem. So What Is?, NextGov, Sept. 5, 2019, <u>https://www.nextgov.com/cio-briefing/2019/09/dodinnovation-isnt-problem-so-what/159670/</u>

Improvise, adapt, overcome

The Defense Department's National Defense Strategy acknowledges this shortfall. "Success no longer goes to the country that develops a new technology first, but rather to the one that better integrates it and adapts its way of fighting," the strategy says. "Our response will be to prioritize speed of delivery, continuous adaptation, and frequent modular upgrades. We must not accept cumbersome approval chains, wasteful applications of resources in uncompetitive space, or overly risk-averse thinking that impedes change. Delivering performance means we will shed outdated management practices and structures while integrating insights from business innovation."¹

Across government, agencies have often found their efforts to adopt new approaches and technologies stymied by various constraints and challenges, including outdated policies and regulations, inflexible procurement processes, unsupportive leadership, a risk-averse culture, skills gaps, and more. It is increasingly important that government agencies overcome these challenges because citizens and federal executives alike see just how critical modern technologies are in our lives—and the important role that innovation plays in tapping into those technologies. A recent Accenture survey showed that 70 percent of consumers globally—and 78 percent in the United States—expect that their relationship with technology will be more prominent or significantly more prominent in their lives over the next three years. Moreover, 74 percent of federal executives surveyed believe that the stakes for innovation have never been higher-and that getting it "right" will require new ways of innovating with ecosystem partners and third-party organizations. Clearly, there are real imperatives for federal agencies to gain greater proficiency at adopting innovation.

 U.S. Department of Defense, Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge, October 2018, https://dod.defense.gov/Portals/1/ Documents/pubs/2018-National-Defense-Strategy-Summary.pdf





Tips for developing an innovation DNA

So how can federal agencies do better at developing a culture and metabolism for innovation that enables them to continuously evolve and thrive in our increasingly complex, digital world and effectively take on the big challenges of today and tomorrow?

There are six foundational ingredients needed to build a successful innovation-oriented enterprise:



Here are some suggested steps that can help federal agencies with each:

Vision

Establish a vision to prepare for, measure against, and inspire with.

Goals give organizations a shared objective to align around. Agencies can use their vision to define their innovation goals and set corresponding investment priorities. There should be a strong emphasis on measuring innovation success and value realization, with a particular focus on evaluating short- and long-term milestones for transitioning or scaling initiatives.

A good place to start would be to define and demystify the word innovation itself. Definitions vary widely across government, so aligning around a common definition is foundational to building agency processes and culture around innovation. Innovation is not technology adoption or even digital transformation (although digital transformation is often necessary to unlock and scale innovation). At its core, innovation simply means coming up with a new way of doing something that solves a problem or adds or unlocks value.

The Pentagon launched the Joint AI Center (JAIC) in 2018 to galvanize the military's resources in response to a potentially existential threat: AI-enabled military adversaries. With a vision to "transform the DoD through artificial intelligence," the JAIC focuses on near-term goals of achieving incremental progress and operating transparently to build accountability.







Community

Foster a culture of innovation through continuous engagement with all stakeholders.

Agency employees and stakeholders need to play active roles in thinking creatively about how the agency could improve and solve problems. Employees can be an especially rich vein of innovation because of their front-line insights and experience of meeting mission and business needs, often in the face of budget or other constraints. Agencies will need processes in place that encourage, incentivize, capture, cultivate, develop, and reward those ideas so they keep coming.

Organizations must focus on building their innovation communities through a constant process of identifying, mapping, and connecting key players in the community and be mindful throughout that the most effective innovation cultures champion diversity, inclusivity, and multidisciplinary team environments. Once those communities are established, agencies must also prioritize engagement, motivation, and communication.

Teams should be encouraged to learn fast through experimentation and responsible risk-taking as they continuously ask and answer the question, "What if?" Agencies should be prepared for periodic failures and regard those failures as valuable investments in learning and progress.

Governance

Scaled innovation requires a defined management process.

From collecting ideas and managing the pipeline to maintaining milestones for key decisions in the process, an organization's governance model ensures that ideas come to fruition in an effective and secure way. Organizations must also understand and manage funding from innovative idea to scaled deployment. Lastly, establishing executive-level support is crucial for a successful innovation engine.





Skills

Invest in new skills to deliver the innovations that are right for your organization.

The integration of science and technology is creating a number of new interdisciplinary fields, such as the use of brainwaves to interface with computers. This means agencies should reexamine the skill sets within their workforce and consider adding emerging disciplines that can serve as a catalyst for innovation. For example, the Department of Veterans Affairs recently launched the National Artificial Intelligence Institute (NAII) under the leadership of Dr. Gil Alterovitz, an expert in biomedical engineering, to explore how Al can be used to address veterans' issues.

In terms of how agencies innovate, design thinking techniques can be powerful tools for viewing old problems from a new perspective. Developing these skills offers teams a shared methodology for pursuing innovation. Agencies should adopt a mindset of continuous learning that occurs both formally and informally. The rate of technology change and the demands on governments are increasing—the workforce must be agile and nimble to maintain the skills to be innovative.

At the same time, the federal government should shift some of its focus from project management to product management. Instead of developing skills solely for on-time, on-budget delivery, consider developing disciplines around building solutions that uniquely address a <u>Big Hairy Audacious Goal</u> like sending an astronaut to the moon and back safely.

Tools

Leverage the right tools to incubate, assess, and scale innovation.

Purpose-built tools can help agencies manage and track ideas, facilitate collaboration, prototype solutions, and scale programs. A growing number of on-demand platforms make these tools accessible and affordable for even early stage ventures.

A large federal agency worked with Accenture to create an Innovation Hub, a dedicated space at the Accenture Federal Digital Studio optimized to foster innovation and continually bring emerging capabilities forward. The first of its kind in the federal marketplace, this Innovation Hub enables the agency to ideate, design, and test disruptive, boundary-pushing ideas including artificial intelligence (AI), optical character recognition (OCR) and next generation UI/UX. Using a rapid prototyping model, the agency can quickly prove the desirability, feasibility, and viability of cutting-edge solutions for real customer needs.

The world is awash in data and federal agencies are no exception: over <u>59 zettabytes (ZB) of data</u> (IDC) will be created globally in 2020 with the next three years seeing more data generated than the previous 30. Investing in tools to mine that data for insight can lead to innovation, such as curing disease or identifying new energy sources, and should become a core competency for federal agencies.

For example, the U.S. Postal Service is investing in <u>AI at</u> <u>the edge</u> in an effort to process packages 10 times faster with higher accuracy.





Network

Innovation cannot happen in a vacuum it requires strong relationships and an understanding of the broader ecosystem.

Organizations need to establish how they will identify trends and use them to inform overarching priorities. Establishing a process for evaluating and building relationships with ecosystem partners is key. When it comes to growing knowledge, organizations should look outside their typical peer set in building out their innovation network. Seek out and learn from leading organizations that are solving similar problems and emulate their best practices.

Create effective partnerships and tap into broad ecosystems that will help you better understand how new technologies and approaches can enhance your missions. Your agency's ability to innovate around multiple innovation frontiers will depend on looking outward and understanding advances that are happening. A strong set of partners is necessary for this to succeed. This may also require new business models and performance-based contracting that incentivize risk-taking and allow partners to capture realized benefits.

A recent example of this is NASA's partnership with Virgin Galactic to explore more economically and environmentally viable approaches to high-speed technologies and applications. The work aims to advance today's capabilities of producing ultrafast, next-generation flight vehicles capable of point-topoint air travel across the planet.

The always on innovation engine

Ultimately, innovation must be championed at the top if it is to become a priority. Leaders need to set clear objectives, assign responsibilities and accountability, and get buy-in from key internal and external stakeholders. Agencies can do this by emphasizing the importance of fostering innovation as they promote, hire, and develop their leaders.



The impact of COVID-19

One consequence of the COVID-19 pandemic is forcing organization to more carefully consider what they previously thought of as unimaginable. Going forward, business continuity will require a greater emphasis on resiliency, agility, and the ability to quickly reinvent oneself.

Short-term:

In the short term, agencies should consider viewing the pandemic as a stress test for their ability to innovate. Nearly every federal agency has needed to rethink or reimagine a core business process in response to the pandemic while shifting to a new virtual operating model. Agencies should take stock of what has worked and what hasn't and adjust accordingly.

Long-term:

In the long term, agencies must embrace more agile and intelligent operations to thrive in a more dynamic world. Governments have long faced asymmetrical threats, but what is changing is the speed at which those threats and changes can propagate. Having a strong innovation DNA will be fundamental to surviving in this new world.
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About the Accenture Technology Vision

Every year, the Technology Vision team partners with Accenture Research to pinpoint the emerging IT developments that will have the greatest impact on companies, government agencies and other organizations in the coming years. These trends have significant impact across industries and are actionable for businesses today.

The research process begins by gathering input from the Technology Vision External Advisory Board, a group of more than two dozen experienced individuals from the public and private sectors, academia, venture capital and entrepreneurial companies. In addition, the Technology Vision team conducts interviews with technology luminaries and industry experts, as well as nearly 100 Accenture business leaders from across the organization.

The research process also includes a global survey of thousands of business and IT executives, to understand their perspectives on the impact of technology in business. Survey responses help to identify the technology strategies and priority investments of companies from across industries and geographies. Accenture Research interviewed more than 6,074 executives from 25 countries and 21 industries, including 200 US federal program, business and IT leaders. The survey was fielded from November 2019 through January 2020.

In parallel, a consumer survey was conducted to understand the use and role of technology in people's live. Accenture Research surveyed 2,000 globally, including 500 in the US, with respondents representing different age and demographic groups.

The <u>Accenture Federal Technology Vision 2020</u> builds on this foundation with added insight from more than 50 Accenture Federal Services experts and survey data from two hundred federal program, business and IT leaders.

About Accenture Federal Services

Accenture Federal Services, a wholly owned subsidiary of Accenture LLP, is a U.S. company with offices in Arlington, Virginia. Accenture's federal business has served every cabinet-level department and 30 of the largest federal organizations. Accenture Federal Services transforms bold ideas into breakthrough outcomes for clients at defense, intelligence, public safety, civilian and military health organizations.

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About Accenture Research

Accenture Research shapes trends and creates data driven insights about the most pressing issues global organizations face. Combining the power of innovative research techniques with a deep understanding of our clients' industries, our team of 300 researchers and analysts spans 20 countries and publishes hundreds of reports, articles and points of view every year. Our thought-provoking research—supported by proprietary data and partnerships with leading organizations, such as MIT and Harvard—guides our innovations and allows us to transform theories and fresh ideas into real-world solutions for our clients.

For more information, visit www.accenture.com/research

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