EIGHT STRATEGIES
for Transforming Government

TRUST

EQUITY

WORKPLACE

OUTCOMES

DIGITAL

INSIGHTS

AGILITY

RESILIENCE

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IBM Center for
The Business
of Government

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Foreword

The IBM Center for The Business of Government connects research to practice, supporting work by scholars that benefits government through analysis of real-world experience that leads to practical, actionable recommendations. Our collaboration with recognized scholars and thought leaders is intended to spark the imagination—crafting new ways to think about government by identifying trends, new ideas, and best practices in public management and innovation.

Based on our recent research and perspectives shared by current and former government, academic, and nonprofit leaders, this special report identifies eight strategies for transforming government in the years to come. These strategies draw on significant insights from a research roundtable in 2020.

Importantly, the areas address both individual trends influencing government, and topics that can be addressed with even greater impact if assessed in a way that integrates across trends—such as driving an agile approach to digital innovation that improves outcomes. This integrative approach is especially true for how different trends relate to equity across government programs and foster trust in government institutions, information, and services—two new areas that government leaders and stakeholders have highlighted as important topics for Center research.

1. **Restoring Trust in Government:** Defining Strategies and Tools to Actively Engage the Public

2. **Driving Agility:** Enhancing Mission Support and Delivery

3. **Addressing Equity:** Understanding Distributional Effects of Services and Promoting Inclusion and Diversity in Operations

4. **Developing Actionable Insights:** Using Data and Evidence to Inform Decision Making and Achieve Results

5. **Attaining Effective Outcomes:** Supporting Program Performance and Performance Management Strategies

6. **Accelerating Digital:** Leveraging Innovation and Emerging Technologies to Modernize IT

7. **Fostering Resilient Institutions:** Managing Risk and Building Resiliency

8. **Reimagining the Government Workplace:** Preparing Today's Workforce for Tomorrow's Challenges

Through research into these eight topics, the Center will continue to communicate what leading experts know about effective practices and lessons learned for government leaders and stakeholders. Such communications can promote public understanding of the benefits that a well-functioning government delivers, which can help to drive trust in government.

IBM Center supported research can also help governments in the U.S. and across the world continue to focus on controlling costs while improving the performance of their operations, meeting the key challenge facing public sector executives to transform their organizations in an environment of constrained resources—a goal brought into clear focus from the response and recovery to the COVID-19 pandemic.

Moreover, driving meaningful and sustained change in government requires a focus on innovative, effective, equitable, and efficient decision making and implementation to achieve positive, significant, and lasting outcomes.

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Restoring Trust in Government

Defining Strategies and Tools to Actively Engage the Public

The Organization for Economic Cooperation and Development (OECD) defines trust as: "A person's belief that another person or institution will act consistently with their expectations of positive behavior."[1]The complexities around trust range from trust between individuals and small groups (interpersonal trust) to trust of governments and other institutions (institutional trust).

Our research focuses on institutional trust in government, reflected in OECD's 2017 analysis summary framework. In Figure 1, Values (Integrity, Openness, and Fairness) are distinguished from Competence (Responsiveness and Reliability). OECD has since expanded on this initial framework and provided more detailed ideas for improving trust in government.

Figure 1: Trust in Government OECD 2017 Framework

	COMPETENCIES	
POLICY DIMENSION Provide or regulate public services	**RESPONSIVENESS** 1 Provide or regulate public services	**RELIABILITY** 2 Anticipate change, protect citizens
INTEGRITY 3 Use power and public resources ethically	**OPENNESS** 4 Listen, consult, engage, and explain to citizens	**FAIRNESS** 5 Improve living conditions for all

VALUES

1.   OECD (2019), "Trust in government", in Government at a Glance 2019, OECD Publishing, Paris, https://doi.org/10.1787/7c8e6ca7-en.

Trust in government involves several additional facets. Geert Bouckaert has identified three aspects of trust that are key to government reform: "Reform strategies have been driven by agendas to increase trust in the public sector. Three clusters of trust are defined: from society to the public sector, from the public sector to society, and within the public sector."[2]

The public sector's trust of society is often reflected in their approach to regulation and policy development. The World Economic Forum (WEF) cited the Finnish government's efforts to trust the public in developing policies regarding innovation. "By moving away from a top-down dictated process to a more co-created—in some cases even crowdsourced and crowd-funded—process for public sector innovation, the government sought to generate an outcome-focused and adaptable platform that encourages grassroots innovation through multi-stakeholder collaboration."[3]

This speaks to the Values aspect of the OECD model—promoting Openness, increasing the perceived Fairness of the process, and promoting Integrity through inclusion.

How can research point to new ways to improve trust in government across the areas of policy development, regulation, and program implementation? The WEF has recognized "agile governance" as essential in policy and regulatory actions, particularly as they affect emerging technology. Program implementation can also benefit significantly by implementing agile governance.

As an example of improved program implementation leading to improved trust, the Department of Veterans Affairs (VA) faced a significant deficit in trust over poor practices in the care and treatment of veterans. This became acute in 2014 after massive wait times for veterans seeking health care were disclosed. Starting in 2015, VA launched a concerted effort to collect, analyze, and address veterans' concerns by developing a "comprehensive customer experience data framework to identify, collect, and analyze data on how veterans experienced their services."[4] By using this data and focusing on bolstering veteran's trust, VA improved trust measures over 24 percent in five years.

Wholesale and Retail Trust

Research can help determine the extent and feasibility for actions to alter all aspects of trust in government. A distinction between "wholesale trust" and "retail trust" comes from Don Kettl's 2017 book, *Can Governments Earn Our Trust?* According to Kettl, wholesale trust "depends on creating confidence in the ability of government and its institutions, at the highest level, to represent its people and to perform fairly on their behalf." In contrast, retail trust depends on "creating confidence in government's ability to deliver on its policies fairly and effectively at the operational level where government connects directly with its people."[5]

Kettl concludes that by focusing on execution of services and fulfillment of promises, government can improve trust, similar to the OECD focus on Responsiveness and Reliability. Moreover, Kettl's discussion of wholesale trust connects with OECD's description of the role of Values, though Kettl is less sanguine about government's ability to influence wholesale (Values based) trust—and suggests that some distrust is healthy for society.

2.   Geert Bouckaert, Administration, Vol.60, no.1 (2012).
3.   Agile Governance Reimagining Policy-making in the Fourth Industrial Revolution, The World Economic Forum Global Future Council on Agile Governance.
4.   https://ourpublicservice.org/our-work/time-for-a-change/.
5.   Donald F. Kettl, Can Governments Earn our Trust? (2017).

Trust in the Time of COVID

The pandemic has also made analysis of trust even more important for government leaders. The OECD notes that the pandemic has underscored the criticality of trust and transparency to maintaining public health given the need for people to understand and comply with extraordinary measures in extraordinary times: "They are also key to a society's capacity to absorb and bounce back from shocks."[6]

Georgetown scholar Donald Moynihan observes: "The longer the pandemic goes on, the more trust will decline in institutions that have to make visible, salient decisions amidst changing circumstances, information, and trade-offs while serving a population with wildly varying preferences." Moynihan suggests a focus on work to improve Responsiveness and Reliability to reverse the damage to the public's trust in government. This is true generally, but the effects of inequality during the pandemic must also be recognized.

As the Center for Budget and Policy Priorities observed in November of 2021: "The impacts of the pandemic and the economic fallout have been widespread, but remain particularly prevalent among Black adults, Latino adults, and other people of color. These disproportionate impacts reflect harsh, long-standing inequities—often stemming from structural racism—in education, employment, housing, and health care that the current crisis has exacerbated. Households with children also continue to face especially high hardship rates. Considerable evidence suggests that reducing childhood hardship and poverty would yield improvements in education and health, higher productivity and earnings, less incarceration, and other lasting benefits to children and society."[7]

Inequality continues to be corrosive to trust in government. Blue Wooldridge observes, "Inequality undermines trust and community. It renders government vulnerable to special interests seeking to maximize short-term profit. Inequality, especially rising inequality, promotes status competition, social divisiveness, and weakens the will of the many to organize to defend common interests against the specialized interests of the few. Inequality corrodes social bonds, erodes friendship, diminishes civic participation, and attenuates trust in government."[8]

The IBM Center released a report on using data to improve equity in health care based on expert insights from leaders in government and health care, which would address several aspects of building trust across communities of color.[9]

Measuring Trust

The United Nations has called trust in public institutions "crucial for building peaceful and inclusive societies."[10] The UN Secretary General highlighted the current trust deficit as follows:

"With turbulence on the rise, trust within and among nations is on the decline. We see this trust deficit also in streets across the world, as people vent their frustrations and voice their feeling that political establishments are out of touch, incapable, or unwilling to deliver."[11]

6.   OECD Government at a Glance 2021 p.5.
7.   https://www.cbpp.org/research/poverty-and-inequality/tracking-the-covid-19-economys-effects-on-food-housing-and.
8.   B. Wooldridge and B. Bilharz. (2018). Social Equity: The Fourth Pillar of Public Administration. In: Farazmand, A. (eds) Global Encyclopedia of Public Administration, Public Policy, and Governance. Springer, Cham. https://doi.org/10.1007/978-3-319-20928-9_2383.
9.   Temilola Afolabi and Matt Rumsey, *Using Data to Advance Racial Equity in Healthcare*, IBM Center for The Business of Government, 2022. https://www.businessofgovernment.org/report/using-data-advance-racial-equity-healthcare.
10. https://www.un.org/development/desa/dspd/2021/07/trust-public-institutions/.
11. https://www.un.org/press/en/2020/sgsm19934.doc.htm.

TRUST

In fact, the UN cites the lack of trust as threatening its Sustainable Development Goals (SDGs) especially, SDG 1 eliminating poverty, SDG 13 combatting climate change, and SDG 16 building peaceful and inclusive societies: "Trust is integral to the functioning of any society. Trust in each other, in our public institutions and in our leaders are all essential ingredients for social and economic progress, allowing people to cooperate with and express solidarity for one another. It allows public bodies to plan and execute policies and deliver services."[12]

The World Bank has found that countries with high levels of trust show lower levels of corruption, a higher quality of government, lower crime levels, higher levels of political participation, higher levels of compliance with the law, and higher levels of economic growth. These studies are based on the trust of the public in its government's values and ability to fulfill its promises.[13]

Measuring public trust in government is difficult but research can point to constructive efforts. Again, the UN cites OECD: "A comprehensive review by the OECD found that despite their limitations, opinion surveys remain a simple, intuitive and cost-effective method of measuring trust and in particular identifying general patterns and trends over time and across countries."[14]

Surveys can measure trust. Multi-country surveys include the Edelman Trust Barometer, the Gallup World Survey, the World Values Survey and the composite OECD Trust in Government Survey. Individual nations surveys exist for the United States, and more recently countries like Finland and South Korea.

The United States has two major single country surveys that have the benefit of a long history. The Pew Trust in Government Report: 1958-2021[15] shows current levels of trust in the United States at all-time lows, a result echoed by the Gallup Trust in Government Survey.[16] However, neither results helps policy makers on what actions to take to improve trust.

The 2017 publication, *OECD Guidelines on Measuring Trust*, has an ambitious but much needed objective. "With some notable exceptions, the measurement of trust does not have a long tradition, particularly within official statistics, and official measures that exist are not always collected in a regular and internationally comparable manner. These guidelines aim at contributing to filling this gap. Their main objective is to support data producers in their own initiatives to measuring trust."[17]

The OECD is expanding the number of single country surveys it conducts, and these tend to be more detailed in nature and more conducive to providing policy prescriptions. OECD recently issued its new report, *Building Trust to Reinforce Democracy*, which surveys drivers of trusts across OECD nations that update these perspectives.[18]

Even publications with long tenures like the Pew Trust in Government report and the Gallup Trust in Government poll lack detailed information to make them helpful to policy makers. By contrast, the OECD provides actionable insights based on their Trust in Government

12. https://www.un.org/development/desa/dspd/2021/07/trust-public-institutions/.
13. https://openknowledge.worldbank.org/bitstream/handle/10986/33346/Building-Trust-in- Government-through-Citizen-Engagement.pdf?sequence=5.
14. https://www.un.org/development/desa/dspd/2021/07/trust-public-institutions/.
15. https://www.pewresearch.org/politics/2021/05/17/public-trust-in-government-1958-2021/.
16. https://news.gallup.com/poll/5392/trust-government.aspx.
17. https://read.oecd-ilibrary.org/governance/oecd-guidelines-on-measuring-trust_9789264278219-en#page1.
18. https://www.oecd-ilibrary.org/sites/b407f99c-en/index.html?itemId=/content/publication/b407f99c-en.

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Framework. Detailed questions are focused on each of OECD's sectors of Values and Competence, while additional question—added by the government in question—are designed to inform policy choices. Research could help expand on this knowledge base.

CONCLUSION

Similarly, other international groups have underscored the importance of improving public trust in government, exploring ways to effectively measure this trust. For example, the World Bank states: "Trust in government and citizen engagement form a mutually reinforcing, interdependent dynamic in the policy arena that is affected by common attributes and affects development outcomes and effectiveness. . . . Citizen engagement, which enhances transparency and accountability, helps to build legitimacy and trust in government. Open, equitable, and inclusive policy making is most often promoted as a means of improving democratic performance and efficient and effective administration."[19]

An emphasis on civic engagement could result in greater trust in government, consistent with the OECD framework.

While trust in government has declined and COVID-19 has placed additional stresses on that trust, research can be done to address how to reverse the decline. A focus on competence and values, as suggested by OECD, and use of new country level data, should serve as a guide to improving trust.

19. Saki Kumagai and Federica Iorio. 2020. Building Trust in Government through Citizen Engagement. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/33346

Driving Agility

Enhancing Mission Support and Delivery

In his 2016 book, *Escaping Jurassic Government*, Donald F. Kettl wrote of the "growing gap . . . in what people expect government to do and what government can actually accomplish . . . the conflict of government's mission increased and the shared commitment to competence has eroded." He warned that failure to adapt and correct this dichotomy "could lead American government down the same path that devastated the Jurassic-age dinosaurs."[1] This is a chilling observation but not one without merit.

How can we improve government's competence and better address the values of inclusion, integrity, and fairness on which trust is based? Research on the use of more agile methods based on "Agile Government Principles" can point to a path forward.

What is Agile?

Agile actually started at a ski resort in Utah. A group of software engineers, practitioners and programmers met to discuss the need for "an alternative to documentation driven, heavyweight software development processes."[2] These processes led to failures to deliver projects on time and frustrations between managers and developers. The participants created the Agile Manifesto,[3] which consists of a set of values and principles that have revolutionized software development and project management.

Author Stephen Denning documents the transformation of the agile approach into an "unstoppable revolution" in the way organizations are managed. He presents agile management as: "The new paradigm (that) enables organizations to thrive in a world of rapid and unpredictable change. It enables a team, unit or an entire enterprise to nimbly adapt and upgrade products and services to meet rapidly changing technology and customer needs."

1.   Donald F. Kettl. Escaping Jurassic Government: How to Recover America's Lost Commitment to Competence, Brookings Institution Press, 2016.
2.   https://agilemanifesto.org/history.html.
3.   https://agilemanifesto.org/principles.html.

Can government be agile? Denning has pointed out instances in which the government—the Department of Defense (DoD) and the Government Accountability Office (GAO) in particular—have practiced agile behavior. He urges further adoption of agile to improve the public's satisfaction with government services.

Building on the success of the Agile Manifesto in transforming the way software was developed and projects were managed—and recognizing the benefits that an agile approach brings—the National Academy of Public Administration created an Agile Government Center (AGC) as a joint venture with the IBM Center for The Business of Government. The purpose of the AGC is presented in Figure 1.

Figure 1: Purpose of Agile Government Center

The Agile Government Center will serve as the hub a network that will bring together governments, nonprofits, foundations, academic institutions and private sector partners to assist in developing and disseminating agile government principles and case studies of agile policies and programs. This network will be a source of assistance to those who want to adopt and implement agile to provide public goods and services that fully meet customer needs and build public trust.

In November of 2021, the Agile Government Center released an updated version of the agile government principles illustrated in Figure 2. The principles have been tested in a series of case studies and have been found to be a helpful guide to action. For example, the U.S. Chief Financial Officer's Council used the principles in creating its "Workforce Modernization Strategy" which will guide the council through 2030.

Figure 2: Agile Principles

- **Mission:** This is at the heart of agile government. It should be crystal clear, laser focused, and easy to communicate and understand.
- **Metrics**: These should reflect the mission and be outcome-focused, widely agreed upon, evidence based, and easily tracked.
- **Customer Driven Behavior**: Customers should be intimately involved in design and redesign of the program and a focus on the customer journey should be ingrained in the culture of the organization.
- **Speed**: Speed should be encouraged and enabled by establishing clear deadlines that create a sense of urgency about meeting them.
- **Empowered, Highly Skilled, Cross-Functional Teams**: Team members should be expert in their role, diverse in their thinking, engage in continual face to face communication, and make well supported decisions that address the immediate challenge and advance the project.

- **External Networks**: Developing and sustaining networks is an integral part of leveraging the support of customers and the public in accomplishment of the mission of the organization.

- **Persistence**: Achieving successful outcomes requires continual experimentation, evaluation and improvement over time in order to learn from successes and failures.

- **Innovation**: Should be rewarded and there should be a preference for new approaches that test rules, regulations and past practices in order to deliver better results and higher levels of customer satisfaction.

- **Evidence-Informed Solutions**: Solid evidence should form the basis for designing and implementing policy, regulatory, and program options.

- **Organizational Leaders**: Leaders should eliminate roadblocks, aggregate and assume risks, empower teams to make decisions, hold them accountable and reward them.

The Agile Mindset

Agile government goes beyond software development and project management, to include policy and regulatory development and program implementation. Agile government can be applied at the project, program, or whole-of-government level. In each aspect of government and at all levels, an agile mindset can drive successful implementation of the agile government principles.

An early example of the agile mindset was the response to the Year 2000 computer challenge (Y2K). John Koskinen was chosen by President Bill Clinton to lead a team to address the problem and keep the world running smoothly.

Koskinen was extremely clear about his mission and immediately created a network across the world composed of small teams of experts in each industry. He empowered these teams and their counterparts in the U.S. and other governments to develop solutions to the Y2K problem on an industry-by-industry basis. U.S. teams they reached out to governments around the world to share information.

Koskinen and his small team kept these industry groups working at a rapid pace and helped them innovate solutions. As a result, airplanes did not crash, banks remained open, and hospitals operated normally. Koskinen's principles of management coincided directly with the Agile government principles. His mindset reflected an outstanding example of agility.

An agile mindset could help managers seeking to confront a crisis or bring about transformation. In today's world of rapid change, uncertain events, and increasing digitization of information, managers can use agile principles as a default mindset to move their organizations forward and better achieve their missions.

AGILITY

Agile Transformation

The concepts espoused by retired General Stanley McChrystal in *Team of Teams*[4] reflected his own development of an agile mindset. McChrystal's mission to defeat Al Qaeda reflected a transformation in both strategy and tactics. His entire command had to operate by new rules and procedures.[5] Continual communication with small teams in the field allowed McChrystal and his command to gain a significant advantage against the adversary.

Agile principles can continue to be refreshed, and research can contribute to such enhancements. Studies focus on how to use and disseminate these principles and improve them for new versions. Agile principles can help an organization to transform, via a "Learning Roadmap"[6] such as that shown in Figure 3. This roadmap traces the agile journey from strategy to organization to execution using agile government principles.

Figure 3: Agile Government Learning Roadmap
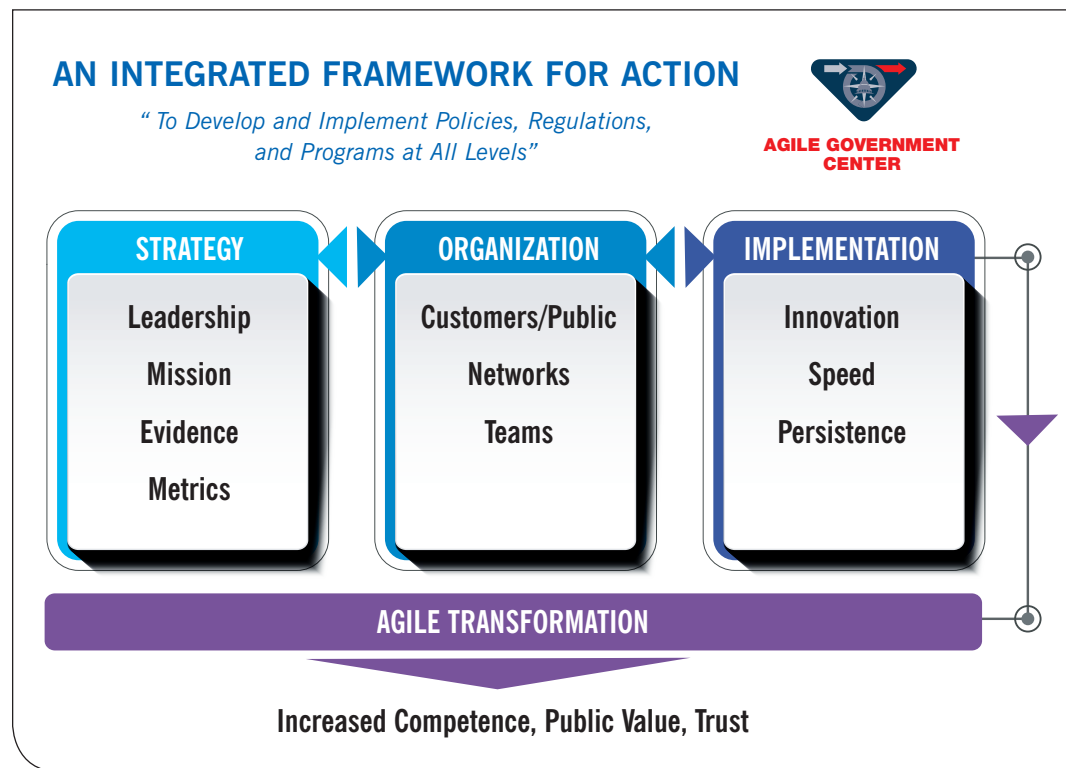
Agile and Trust

Agile principles are designed to improve competence and advance values as outlined in the OECD Trust framework (first referenced in the Restoring Trust essay in this report). Specifically, an organization can improve competence by clarifying and communicating its *Mission,* the first task of *Leadership*. Additional tasks of leadership are setting *Metrics,* developing and weighing *Evidence,* and *Organizing* and *Executing* a *Strategy.* The *Execution* should be done according to ambitious timing with all appropriate *Speed* and must learn from both successes and failure as it *Persists* despite setbacks. This will require continual *Innovation* in the approaches to achieving the *Mission.*

4.   https://www.mcchrystalgroup.com/library/team-teams-new-rules-engagement-complex-world/.
5.   From the Forward by Walter Isaacson to the book *Team of Teams* by General Stanley McChristal.
6.   See https://www.icagile.com/ for a full description of the concept of Learning Roadmap.

The values that OECD discusses for improving trust in government include integrity, openness, and fairness to guide an organization in assuring that the voices of *Customers* are included.

In fact, inclusion of *Customers* and their satisfaction is essential to the agile mindset. In government, the word "customer" has a broader meaning than in the world of commerce, with three roles:

- **As Recipients of Direct Services**—Services such as Social Security, trash collection, and the postal service, that individuals use every day.

- **As Beneficiaries**—Individuals receive benefits indirectly, such as public safety, clean air, good roads, clean safe water, and public health. In this case, the benefit is clear and measurable but not directly provided to a single individual.

- **As Participants**—The role of the public here includes voting, participating in protests, serving on oversight boards, commenting on regulations and policies and other areas that reflect the full exercise of Constitutional and legal rights.

Research can frame how all three roles should be recognized in order to increase the trust that the public has in government.

Finally, integrity can be improved by using third party networks to oversee waste, fraud, and abuse. Currently, the Pandemic Response Accountability Committee (PRAC) has created an Agile Products Tool Kit to help oversee the more than five trillion dollars that the network of Inspectors General and others are overseeing.[7] This tool kit provides rapid useful information to improve the *Integrity* of various legislative initiatives for which they are responsible.

CONCLUSION

Government leaders and stakeholders are at the beginning of the agile journey in many organizations. Agile is not a new "flavor of the month" in government management Rather, the times and our people demand it These common-sense agile principles will evolve with use and experience. The current COVID-19 pandemic has spawned rapid, agile responses to the crisis Research on agility in government can help government officials seek to deliver better programs, policies, and regulations at all levels. Agile government is designed to create a new mindset to replace the default mindset of bureaucracy that constituted "Jurassic Government." The rapid pace of changes in society, particularly those involving technology, require a new form of management that can delivery mission results reliably, responsively, and with integrity, fairness, and openness.

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7.   https://www.pandemicoversight.gov/media/file/agile-products-toolkit2022pdf.

Addressing Equity

Understanding Distributional Effects of Services and Promoting Inclusion and Diversity in Operations

As noted in the IBM Center's research agenda, effective implementation of government programs carries a pressing and growing imperative to address racial, ethnic, gender and similar social equity issues. Connected to challenges facing government programs, equity has long been important to the field of public administration; the National Academy of Public Administration (NAPA) has written that "Social equity is often named as the fourth pillar of public administration . . . which addresses fairness, justice and equity for all."[1]

This essential principle matters because effective and efficient government must also include equitable government. This includes ensuring the government agency staffs reflect the diversity of the people who they served. Moreover, the federal government workforce has benefitted for decades from significant contributions by leaders from diverse communities, who have served the nation in defense and civilian roles as heads of agencies and programs and who have led talented teams of entry-, mid- and senior level staff. Research is needed on strengthening leadership in government from communities of color, including practical, actionable recommendations to achieve this goal.

Developing and delivering sound leadership and management that leads to effective government must also involve an inclusive and diverse government. Research that addresses important social equity issues and represents points of view from across racial and ethnic groups will broaden our understanding of how to bring social equity considerations to the fore in the work of government. Research into government programs can include addressing practices that have inequitable effects.

Additionally, the impacts of equity on governance are not separable from other elements of policy design and program delivery. Equity considerations cross-cut with multiple functions of government and with multiple elements of the IBM Center Research Agenda, including development of an effective workforce and workplace for the future, building resiliency across communities, and trust in government. Specific questions for further exploration include:

1.   https://napawash.org/grand-challenges-blog/statement-from-national-academy-of-public-administration-president-and-ceo-terry-gerton-on-social-equity.

- How can large human services systems be delivered in more equitable ways to provide benefits across diverse communities?

- How can more efficient government allow case workers to focus on serving a broad range of clients and not spend inordinate time addressing bureaucratic process requirements, resulting in better distribution of benefits to diverse communities in service areas like education, housing, food, and unemployment insurance?

- What measurements can help leaders understand the current state and future progress in delivering government in a more equitable way?

- What different methodologies provide a pathway toward using practical and actionable metrics effectively?

Research on the interconnections of equity and these other critical areas of governance will add to government's understanding of how best to serve a nation that continues to grow more diverse over time.

Using Data and AI to Understand and Improve Equity

Another element where research can inform practice around supporting goals of equity involves how government uses data, which can be key to understanding challenges in social equity and recommending response strategies. The Center for Open Data Enterprise (CODE) has identified several areas where research and insights can inform more equitable solutions. Research in each of these areas can help inform government leaders and stakeholders on benchmarks and forward-leaning data resources and methods to guide policy and practice, including fair housing, health care access, and the government workforce. A recent report for our Center authored by several CODE experts did a deep exploration on the use of open data to drive greater equity in health care.[2]

This report found that as the COVID-19 pandemic has evolved, multiple studies and reports have documented that people of color are at higher risk of adverse health outcomes. Existing health disparities in the U.S. are heavily influenced by the conditions in which people are born, grow, live, work, and age, known as the social determinants of health (SDOH). Health outcomes can also be influenced by differential applications of emerging technology and differential effects of climate change.

Governments can use open data about the impact of the SDOH, technology, and climate change to manage health care programs and services in ways that drive more equitable outcomes for patients and their families. Moreover, better and more available data, combined with the use of emerging technologies, can help illuminate the problem and support new solutions to address health risk and access in a way that reduces the potential for bias.

The report identified several themes for future research on how to bring the power of data to bear on the existing inequities in areas beyond health care: trust and data collection, use, privacy, and security; equitable data governance, data sovereignty and data ownership, access to data, data quality and gaps, data standards, and interoperability and data sharing. Some of the report's specific recommendations also focused on enhancing research capacity for around equity, including:

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2. Temilola Afolabi and Matt Rumsey, *Using Data to Advance Racial Equity in Healthcare*, IBM Center for The Business of Government, 2022. https://www.businessofgovernment.org/report/using-data-advance-racial-equity-healthcare.

- Expanded access to geocoded data at the sub-Census tract/ZIP code level.

- Expanded access to racially/ethnically disaggregated data.

- Investment in data and technical capacity through grants and other financial support mechanisms.

Additionally, using research on differential effects of artificial intelligence and intelligent automation in government programs and services, how can government ensure access by communities where outdated technology may limit their participation? Or how can government build systems that reduce risk from biased data or algorithms? As IBM's CEO Arvind Krishna has noted, "Users of AI systems have a shared responsibility to ensure that AI is tested for bias . . . and that such bias testing is audited and reported."[3]

Indeed, AI can drive greater social equity to improve service. Research can promote understanding and implementation of best practice, in areas including:

- Security and privacy for sensitive data.

- Human review of algorithms to ensure the data and autonomous decisions in such systems represent the diversity of the state of the world.

- Explain-ability and transparency of data, to build confidence across communities that they contribute to decision making with reduced bias.

- How best to collective diverse user feedback so that AI developers can program with an eye to how recipients of government programs experience such actions.

- Auditing for fairness and building in risk management, building on models such as the government of Canada's algorithmic impact assessment.[4]

- How best to apply ethical AI principles like those of the Organization for Economic Cooperation and Development (OECD)[5] in a way that also promotes social equity.

3. https://www.ibm.com/policy/facial-recognition-sunset-racial-justice-reforms/.
4. https://www.businessofgovernment.org/blog/future-has-begun-using-artificial-intelligence-transform-government.
5. https://oecd.ai/en/ai-principles.

Developing Actionable Insights
Using Data and Evidence to Inform Decision Making and Achieve Results

In recent years, the U.S. federal government has developed a data strategy and institutional infrastructure to leverage its wealth of statistical and administrative data. Congress, via a series of laws, has promoted a greater supply of information and invested in strengthened analytic capabilities in agencies. Executive branch agencies have data leaders and developed administrative routines to better leverage information in existing and new decision-making processes.

Codifying the Importance of Collecting and Using Data

The Foundations for Evidence-Based Policymaking Act (Evidence Act) of 2018[1] represents a significant governmentwide reform to the national data infrastructure, building off prior legislation, such as the Government Performance and Results Act of 1993, the Government Performance Results Modernization Act of 2010, and the Digital Accountability and Transparency Act of 2014. The Evidence Act created chief data officers[2] and chief evaluation officers in federal agencies, established processes for planning data priorities and research needs, required government data to be open by default, and enabled new data sharing capabilities within one of the world's strongest privacy-protective frameworks. The Open, Public, Electronic and Necessary (OPEN) Government Data Act, contained in Title II of the Evidence Act, requires agencies to publish all their information as open data using standardized, non-proprietary formats.[3]

In July 2020, resources.data.gov was relaunched as an online repository of policies, tools, case studies, and other resources to support data governance, management, exchange, and use throughout the federal government. The site is a joint effort of the White House Office of Management and Budget (OMB), the Office of Government Information Services of the National Archives, and the General Services Administration (GSA).

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1.   https://www.congress.gov/115/plaws/publ435/PLAW-115publ435.pdf.
2.   Jane M. Wiseman, *Data-Driven Government: The Role of Chief Data Officers*, IBM Center for The Business of Government, 2018. https://www.businessofgovernment.org/sites/default/files/Data-Driven%20Government_0.pdf.
3.   Websites promoting data and evidence sharing: https://www.data.gov/, https://www.pandemicoversight.gov/, https://usafacts.org/, https://www.datafoundation.org/survey-of-federal-evaluation-officials-2021; https://www.datafoundation.org/cdo-insights-report-2021.

The legal authority of the Evidence Act changes how the federal government responsibly manages and uses data, and the work to implement the Evidence Act continues across federal agencies. In the past few years, many federal agencies have filled chief data officer and evaluation officer positions. The White House Office of Science and Technology Policy established a chief data scientist position in 2015, who acts as an evangelist for new applications of big data across all areas of government.

Delivering on Annual Action Plans to Achieve the Federal Data Strategy

In 2020, the first governmentwide Federal Data Strategy (FDS) was issued that encompasses a ten-year vision for how the federal government will accelerate the use of data to deliver on mission, serve the public, and steward resources while protecting security, privacy, and confidentiality. The FDS has an accompanying annual Action Plan that identifies annual concrete steps for agencies to achieve the long-term vision. The 2020 Action Plan identified initial actions for agencies that are essential for establishing processes, building capacity, and aligning existing efforts to better leverage data as a strategic asset. In addition, the 2020 Action Plan included a series of pilot projects already underway at individual agencies and a set of governmentwide efforts designed to support all agencies through the development of tools and resources.

Annual Action Plans are developed iteratively with stakeholder feedback and input incorporated along the way. For example, in response to the global pandemic, the 2020 Action Plan was updated in May 2020 to extend certain due dates and called for agencies to prioritize data assets and projects, and that agencies make COVID-19 response data their highest priority. In 2020, collectively, the federal chief data officers (CDOs) formed the first-ever Federal Chief Data Officer (CDO) Council to promote best practices in leveraging data for decision making and operations. The FDS 2021 Action Plan[4] builds upon the progress agencies made in 2020 and identifies 40 practices that will require a sustained, iterative, and systematic effort over a ten-year implementation period.

Coordinating Across All Levels of Government

The Evidence Act also has significant implications for state and local governments, federal grantees, researchers, and even partners on the international stage. The law positions the United States as a clear leader in the dialogue about producing useful evidence for decision making, while also shifting the discourse about the role of data infrastructure in supporting basic program administration.

The global pandemic has demonstrated the criticality of using data and evidence at all levels of government, along with the private sector and the public, to address a national emergency. Now, governments face the challenge of how to best leverage new authorities and routines in making better decisions and gaining useful insights. The U.S. and other national governments can also reach beyond existing routines to engage state, local, nonprofit, and contractor delivery partners in delivering public services. In parallel, all levels of government must encourage the use of data and evidence by both the public and private sectors to inform decisions—whether for weather, traffic, or safety.

INSIGHTS

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4.   https://strategy.data.gov/assets/docs/2021-Federal-Data-Strategy-Action-Plan.pdf.

Innovative analytics strategies have reduced the cost of collecting and reporting such data and achieving evidence-based insights. Emerging technologies also open new vistas, such as using artificial intelligence (AI) to assist in making complex decisions in diverse areas including bene-fits determination, public safety, financial management, acquisition, and intelligence.[5] Agencies like the U.S. Department of Agriculture are launching new enterprise data capabilities.

Coordination across new data leaders is producing new innovations like the use of natural language processing to accelerate the review of comments on federal rules, breaking down the barriers and silos of data within agencies, and promoting more public access.[6]

In addition, governments must have the capacity to ensure that data used to derive insights, inform decisions, and improve delivery is of the appropriate quality. Managing and improving data quality requires continuous assessment to determine that data provenance reflects an objective and unbiased source, and that the data is complete and accurate. Research can help government emphasize the importance of deriving value from data, showing how data will assist in solving major issues facing society, driving economic growth, and measuring programs to determine their impact. The use of technologies, such as intelligent automation and machine learning, can assist agencies in cleansing and validating data, and improving the collection of data in more easily accessible ways. Leveraging technology to improve data quality reduces the amount of time that staff must spend on data entry and crosschecking information to increase time for analyzing data to derive insights.[7]

Using Evidence-Based Insights to Inform Decisions

The more robust supply of useful data and performance information serve as the foundation for evidence-based insights and decisions. Examples of this trend follow:

- **The greater range of availability of open data** has contributed to a growing supply of useful information. This has occurred via administrative and legal channels, including the adoption of the OPEN Government Data Act, presidential commitments to open data, and an administrative commitment to making routine administrative data more widely available. For example, the federal one-stop website, data.gov, makes more than 335,000 data sets available to other agencies, the public, and entrepreneurs.

- **Technology innovations** in recent years have made it possible to collect, organize, share, and interpret data on a much grander scale than ever before, with greater immediacy. For example, the public can track the more than $5 trillion in spending of the six economic stimulus legislations that were passed in response to the economic fallout of the COVID-19 pandemic in the United States on an interactive website of the Pandemic Response Accountability Committee (PRAC) here: https://www.pandemicoversight.gov/. The site includes numerous interactive tools and dashboards with the ability to search for pandemic-relief spending down to a zip code.

5. Kevin C. Desouza, *Artificial Intelligence in the Public Sector: A Maturity Model*, IBM Center for The Business of Government, 2021. https://businessofgovernment.org/report/artificial-intelligence-public-sector-maturity-model.
6. Jenna Yeager, *Using Technology and Analytics to Enhance Stakeholder Engagement in Environmental Decision-Making*, IBM Center for The Business of Government, 2021. https://businessofgovernment.org/report/using-technology-and-analytics-enhance-stake-holder-engagement-environmental-decision-making.
7. Kevin C. Desouza, *Artificial Intelligence in the Public Sector: A Maturity Model*, IBM Center for The Business of Government, 2021. https://businessofgovernment.org/report/artificial-intelligence-public-sector-maturity-model.

- **More government data** will be available on the horizon with the growth of micro-data via the "Internet of Things" (IoT). IoT is already making the delivery of some public services smarter and more efficient, including real-time information on public parking, water management, public facility management, safety alerts for the elderly, traffic control, and air quality monitoring.[8]

- **Agencies can access "big data"** from multiple sources, from inside the government as well as external platforms including social media. This rich variety allows the compilation of information from existing sources, including administrative data sets, instead of developing unique and costly data sets as typically done by evaluators in the past. The recent creation of USAFacts.org, which provides a snapshot of key indicators of national progress based on data from more than 60 public and private sources, serves as a model of this approach. A new portal for researchers to have a one-stop-shop for applying to access restricted data is under development. New pilot projects of privacy-preserving technologies are underway as public-private partnerships. All of these activities will lead to greater capacity to use data and, therefore, better information to solve the government's most challenging problems.

- **Increased use of technology** can be used to facilitate customer and stakeholder engagement to inform decisions that public officials make or that they are proposing to do. Dedicated agency apps can provide relevant content to stakeholders regarding proposed actions. Technology can be used to collaborate more directly with stakeholders and gather more relevant data to perform analyses to inform policy making.

- **Increased sharing of raw data** is also on the upswing, in part because of the greater use of data standards and schema—especially at the state and local levels. Sharing Medicaid data across states, for example, has led to a reduction in fraudulent claims.

CONCLUSION

To achieve the goal of a government that uses data to extract insights for better decisions, researchers can help public leaders and stakeholders better understand and adopt promising practices. Such studies can drive data and analyses that help support policy or program decisions that measurably improve government operations and results.

Federal agencies should align resources to advance data and evaluation programming. Those agencies that are moving more quickly toward using data and evidence for decision making are doing just that and identifying the technology necessary to work smarter, analyze data, and collect evidence for meaningful evaluation of programs. Many agencies are investing in reskilling their workforce to thrive in this new culture. As more agencies invest in these methods and demonstrate that data and evaluation impact the outcome of decisions, the public will have greater trust in government.

While significant progress has been made over the past few years—in the middle of a global pandemic—the federal government would benefit from more resources and focus on collecting data, promoting best practices, and sharing the results of program evaluations to validate the best use of federal funds.

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8.   Gwanhoo Lee, *Creating Public Value using the AI-Driven Internet of Things*, IBM Center for The Business of Government, 2021. https://www.businessofgovernment.org/report/creating-public-value-using-ai-driven-internet-things.

Attaining Effective Outcomes
Supporting Program Performance and Performance Management Strategies

Governments are expected to deliver results. This expectation seems to have only grown in recent years. With uncertainty as the operational backdrop for most government agencies, the increased demand for transparency, accountability, and quality services has emphasized the continued need for government executives to measure, monitor, and track performance of its mission programs and activities. Program managers across government are indeed collecting and using program outcome data to make management decisions on how to best get results in delivering their programs. They are using performance outcome information to manage programs, trigger corrective actions, identify and encourage "best practices," motivate employees, and make planning and budget decisions.[1]

Performance management initiatives over the past two decades helped shift the conversation within and across U.S. government agencies—from a focus on measuring program activities and outputs to a focus on achieving mission outcomes. This refocus represents a fundamental shift in thinking, acting, and managing within the public sector, away from a focus on process and on what one needs to do, to a focus on benefits[2] and ensuring the desired impact of government programs. This is no small feat because technical discussions around outcomes are sticky. In the performance management discipline, focusing on outcomes is harder, more complex because the impact of a program may take years to materialize and many external factors outside the control of a program manager may come into play.[3] Regardless, attaining effective outcomes simply means building the discipline and forging a process that drives one towards achieving a desired result. A successful outcome management program includes a process to measure outcomes plus the use of that information to help manage and improve services and organizational outcomes.[4]

1.   Harry Hatry, Elaine Morley, Shelli Rossman, and Joseph Wholey, *How Federal Programs Use Outcome Information: Opportunities for Federal Managers*, IBM Center for The Business of Government, 2003. https://www.businessofgovernment.org/report/how-federal-programs-use-outcome-information-opportunities-federal-managers.
2.   Burt Perrin, *Moving from Outputs to Outcomes: Practical Advice from Governments Around the World*, IBM Center for The Business of Government, 2006. https://www.businessofgovernment.org/report/moving-outputs-outcomes-practical-advice-governments-around-world.
3.   Stacy Barr, *How to Measure Government Outcomes: White Paper. August 2019*
4.   *Key Steps in Outcome Management*: Series on Outcome Management for Nonprofit Organizations, The Urban Institute. 2003.

This essay offers a firsthand account of the value of building robust performance management routines, how establishing "outcome brokers" in federal government grant programs can improve outcomes, how federal agencies are using emerging technologies to improve outcomes, and why putting customers first goes a long way to attaining effective government outcomes.

Build Performance Management Routines

Understanding whether government programs have achieved desired outcomes is facilitated and made possible using a robust performance management approach. The IBM Center report, *A Practitioner's Framework for Measuring Results: Using "C-Stat" at the Colorado Department of Human Services (CDHS[5])* underscores this point and offers a first-hand account on how the department developed a new leadership framework called C-Stat to manage programs on a day-to-day basis. C-Stat is comprised of a set of routines for collecting, analyzing, deciding, and acting upon performance information on a regular basis. C-Stat routines changed how top-level and mid-level managers managed, and how county officials and contractors did their work. It incentivized leaders to focus on the use of data and learning strategies. It also helped top-level, mid-level, and frontline managers to be more strategic in measuring the outcomes and outputs that define success.

The department's executive leadership team began to approach performance anomalies with a greater sense of urgency. They became relentless in collecting and analyzing data to diagnose and solve problems. "C-Stat is not an administrative function to comply with in addition to the 'real work.' C-Stat is about the real work."[6]

As a result, the statewide performance for processing food and cash assistance applications exceeded the court-mandated 95 percent goal for the first time in April 2016. It also led to improved performance in other programs virtually eliminating the use of seclusion for mental health patients; it doubled the number of children receiving childcare subsidies; and it nearly doubled the number of timely monthly contacts for at-risk adults.

This example illustrates how important it is for government agencies to build performance management routines as a foundation towards improving outcomes. Identifying case studies of organization's that have do this successful would be worthwhile. Such research may include focusing on identifying strategies and best practices to incentive behaviors and attitudes coming from the field of behavioral science. There is also a value in pursuing research that identifies industry benchmarks, measures, and tools (analytic, cognitive, or social) that best demonstrate effectiveness of outcome focused management. There is a value in pursuing best practices that help government agency develop "learning agendas" that prioritize the development and use of data and other evidence for decision making. There is also a need to identify how best to bridge performance management and program evaluation disciplines in a way that can create greater insights for agencies—providing agency leaders with more data to focus on near-term performance issues and longer-term program outcomes.

5.   Melissa Wavelet, *A Practitioner's Framework for Measuring Results: Using "C-Stat" at the Colorado Department of Human Services,* IBM Center for The Business of Government, 2019. https://www.businessofgovernment.org/report/practitioner%E2%80%99s-framework-measuring-results-using-%E2%80%9Cc-stat%E2%80%9D-colorado-department-human-services.

6.   Ibid.

Think Outside the Box: How "Outcome Brokers" Can Improve Outcomes

From a state agency effort to improve outcomes to a focus on improving outcomes in federal grants management, the IBM Center always seeks to connect research to practice. Given the priorities of the Biden-Harris administration and the enormous influx of grant dollars to address the health and economic impacts of the pandemic, Dr. Shelly Metzenbaum sees this as an opportune time to rethink and reframe how the federal government manages grant programs.

Grant programs need to set outcome-focused goals and objectives guided by enabling law and informed by evidence about what is happening in the world. In her IBM Center report, *Federal Grants Management: Improving Outcomes*, she argues that the federal grants management system needs to shift from an emphasis on administrative matters to one on improving outcomes. She recommends the establishment of "outcome brokers" for every grant program's objective. They would be responsible for coordinating and, where necessary, catalyzing efforts that inform where to focus, find ways to improve, and successfully encourage adoption of increasingly effective practices.[7] In addition, designating outcome brokers—and where appropriate, outcome improvement teams—for grant programs would support cross-program collaboration and learning, both to improve grants outcomes and to improve grant efficiency as well as other aspects of operational quality.

It is critical when focusing on meeting effective outcomes that government executives find new and innovative ways of doing business. This approach would be complemented with further research in what readily available innovations exists to propel effectiveness in delivering targeted outcomes and optimizing return on investments. Such research may involve focusing on barriers to achieving efficiencies, economies of scale, and benefits of specialization with the ultimate goal of overcoming these barriers.

Leverage Emerging Technologies to Improve Government Outcomes

In *Delivering Outcomes, Building Trust*, the American Council for Technology and Industry Advisory Council (ACT-IAC) states that federal agencies can leverage emerging technology, such as intelligent automation and other emerging technologies, to deliver better outcomes for the public they serve.[8]

The IBM Center and the Partnership for Public Service conducted a series of webinars, titled, *Improving Outcomes in Government through Data and Intelligent Automation,*[9] with government leaders to discuss how they are using these technologies to improve both how they work internally, how they provide services externally, and most of all how these technologies can help them meet mission outcomes. For example, the U.S. Department of Health and Human Services (HHS) has been using intelligent automation and intelligent workflows to improve grants management through its ReInvent Grants Management initiative.

7.   Dr. Shelley H. Metzenbaum, *Federal Grants Management: Improving Outcomes*, IBM Center for The Business of Government, 2019. https://www.businessofgovernment.org/report/federal-grants-management-improving-outcomes.
8.   Agenda 2021: Delivering Outcomes, Building Trust, American Council for Technology-Industry Advisory Council (ACT-IAC), October 2020.
9.   *Improving Outcomes in Government through Data and Intelligent Automation*, IBM Center for The Business of Government and the Partnership for Public Service, 2021. https://www.businessofgovernment.org/report/intelligent-automation.

About 70 percent of federal grant funding comes from HHS—the department distributed almost $500 billion in grants in fiscal 2017. So, the department's efforts to make grants management more efficient could substantially benefit federal grants management overall.[10]

HHS leaders recognized that even small changes could save time and taxpayer dollars. For example, the department is working to improve the customer experience by reducing the time it takes for grantees to access information about the grants process. One improvement is a single sign-on process—a single credential users can use to log into the many grants-management systems with one username and password, rather than having to log into multiple systems using different login information.

Additionally, HHS found that artificial intelligence and blockchain can improve how grant administrators evaluate risks in awarding grants. AI could potentially save the agency about $142 million annually.[11] And as AI tools analyze more and more information, they could identify patterns in data that could predict if grantees are engaging in fraudulent behavior and thus ensure that this program more effectively serves stakeholders and meets program outcomes.

The HHS example illustrates the need for further practical and actionable research on how emerging technologies can help government agencies realize greater efficiencies, use resources more effectively, and ultimately leverage these benefits to achieve mission outcomes. This research may include how best to employ intelligent automation to transform how agency work is done by eliminating repetitive processes and freeing up staff to focus on more value-added activities. Agencies would benefit from research that documents case studies and highlights critical success factors and best practices in the evolving use and application of artificial intelligence and other emerging technology in government.

Focus on the Customer

Customer-centric design is integral to any strategy that focuses on outcomes. Government programs impact those they are intended to service. The Biden administration has recognized the importance of putting emphasis on the customer. It has made it one of its three key priorities in its President's Management Agenda[12] as well as an Executive Order on Transforming Federal Customer Experience and Service Delivery to Rebuild Trust in Government.[13] The administration acknowledges the challenge that some federal services have not always been designed with the public's needs and priorities in mind, nor have these services always kept up with these needs. Poorly designed, out of date, and inequitable government services are a cost to the nation.

John Kamensky, emeritus fellow of IBM Center, outlines key aspects of the administration's customer experience priority.[14] The directive requires the State Department to design and deliver a new online passport renewal experience that does not require any physical docu-

10. Dan Chenok, *Successful Adoption of Intelligent Automation in Government: Insights from HHS' ReImagine Grants Initiative*, IBM Center for The Business of Government and the Partnership for Public Service, January 8, 2021. https://www.businessofgovernment.org/blog/successful-adoption-intelligent-automation-government-insights-hhs%E2%80%99-reimagine-grants-initiative.
11. *Improving Outcomes in Government through Data and Intelligent Automation*, IBM Center for The Business of Government and the Partnership for Public Service, 2021. https://www.businessofgovernment.org/report/intelligent-automation.
12. https://assets.performance.gov/PMA/Biden-Harris_Management_Agenda_Vision_11-18.pdf.
13. https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/13/executive-order-on-transforming-federal-customer-experience-and-service-delivery-to-rebuild-trust-in-government/.
14. John Kamensky, *Can Biden Deliver Better 'Customer Experience' for Americans Than His Predecessors?*, Government Executive, December 17, 2021. https://www.govexec.com/management/2022/01/govexec-daily-customer-experience-under-biden-administration/360259/.

OUTCOMES

ments to be mailed. This effort focuses on organizing around "life experiences" using industry best practices such as "journey mapping" and "human-centered design."

Understanding the customers' needs through gathering feedback, conducting research, sharing insights, and testing new approaches will help government executives design programs and services with customers in mind every step of the way, better positioning these programs to deliver on outcomes and attain desired results.

Government agencies would benefit from further research into the most effective ways to organize mission delivery around "life experiences." This research would include but not be limited to documenting cases studies of government and industry success stories in using customer centered design to better target program populations and ensure target outcomes.

Integral to this line of research would be to identify recognized industry best practices in the use of such tools as journey mapping, design thinking, and human-centered design to help government agencies develop the most effective ways to service their constituents.

CONCLUSION

Government has made substantial progress over the past twenty years in shifting the conversation within and across U.S. government agencies—from a focus on measuring program activities and outputs to a focus on achieving mission outcomes. Some of the progress has been iterative, with some setbacks. If the future is anything like the last decade, then according to Results for America: A Decade of Progress and Impact,[15] there's much to be positive about going forward. However, given the size and complexity of government and its various programs, a cautious optimism may be warranted. Here are some things to keep in mind: these efforts take time, effort, and commitment; linking performance information to decisions is less a technical issue than a human behavioral issue; and performance information is increasingly used by a broader set of government and public users. For these reasons and more, the IBM Center identified attaining effective outcomes as one of eight key research areas.

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15.   https://results4america.org/tools/a-decade-of-progress-and-impact/.

Accelerating Digital

Leveraging Innovation and Emerging Technologies to Modernize IT

Throughout history there have been inflection points that have tested the ability of governments to meet challenges and resolve issues for the greater good of their citizens. However, seldom has there been a convergence of multiple crises such as a global pandemic, economic upheaval, civil unrest due to social inequity, and environmental instability due to climate change. Addressing these circumstances effectively requires research that helps government encourage and embrace technology innovation as part of the solution.

Accelerating the Pace of Change

Emerging and existing technologies have rapidly evolved to support digital transformation, and the pace of change is increasing. Digitization does not involve simply automating existing business or mission delivery models, but enables completely reimagining that model through digital platforms and tools.

Digitization harnesses technology to transform government, while enhancing cybersecurity and maintaining the ability of agencies to focus on their mission. Governments are moving toward a "continuous improvement" model for IT modernization and technology delivery. Emerging technologies such as artificial intelligence and data analytics, and the power of digital platforms such as hybrid cloud services and quantum computing, allow for curating information to help government address pressing societal issues.

Managing and improving data quality will be fundamental to this overall transformation. Government can benefit from research on how to use digital tools to derive value from data. Deriving insights from data will assist in operating government well and measuring programs to determine if they are achieving their intended goals. At the same time, government must be cognizant of unintended consequences and build the important guardrails to protect privacy, ensure security and mitigate data bias.

Emerging Technologies and Digital Innovation: Addressing Complex Issues

Governments face many pressing and complex issues. Research can demonstrate how emerging technologies and digital innovation offer significant promise in addressing these issues and helping government agencies mitigate their impact.

Climate Change

Climate change represents one of the most pressing global issues that the nation and the world face today. The impact on the global population is becoming more and more devastating. Research can highlight how digital innovation can help government address climate change.

Some clear examples have emerged of governments leveraging new technologies to affect trajectory of climate change. Technology, including predictive analysis, has long been used to forecast severe weather events and the early warning systems that allow governments to move populations out of harm's way. In October of 2020, the National Oceanic and Atmospheric Administration entered into a public-private partnership to use artificial intelligence/machine learning (AI/ML) to "enhance and amplify NOAA's use of satellite and environmental data to improve environmental monitoring, weather forecasting, climate research, and technical innovation."[1]

Additionally, more frequent and stronger storms have an increasing impact on infrastructure and energy grids. Citizens sometimes lose power for months after a severe weather event; for those who need refrigeration for medication or power to run medical devices this can be a matter of life and death. The impact is often worse for the very young, the elderly, and the poorest of communities. Severe weather occurs more frequently now during all seasons, straining electric grids across the country and around the world.

According to a recent article in *The Washington Post*, "As storms grow fiercer and more frequent, environmental groups are pushing states to completely reimagine the electrical grid, incorporating more batteries, renewable energy sources and localized systems known as 'microgrids,' which they say could reduce the incidence of wide-scale outages. Utility companies have proposed their own storm-proofing measures, including burying power lines underground. But state regulators largely have rejected these ideas, citing pressure to keep energy rates affordable."[2]

Energy production and use contribute to and are negatively impacted by climate change, making energy production less resilient. Transportation and agriculture also fall in this category. A report from arXiv.org, "Tackling Climate Change with Machine Learning,"[3] outlines multiple areas of interest where technology can be used to combat climate change and improve the resiliency of infrastructure, including AI for simulation and modeling to balance outcomes. Approaches such as microgrid development and precision farming can leverage technology to optimize output from scarce resources.

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1.   https://www.noaa.gov/media-release/ai-agreement-to-enhance-environmental-monitoring-weather-prediction.
2.   https://www.washingtonpost.com/business/2021/10/24/climate-change-power-outages/.
3.   https://arxiv.org/pdf/1906.05433.pdf.

DIGITAL

The U.S. Department of Agriculture/U.S. Forest Service utilizes geospatial technology and analytics to identify areas where reforestation would have the greatest impact. In addition, urban planners use climate data analytics to integrate climate change principles into sustainable development approaches as a key mitigating strategy.

Technology can assist with meeting sustainability commitments by ensuring emissions are monitored, opportunities for action identified, and progress measured. With the advent of the Internet of Things, every step of the supply chain can be metered and monitored for emissions. Arial technology such as airplanes and drones can be used to gather emissions data. Sophisticated satellite imagery also gives governments an even broader view of emissions status.

Similarly, a planned United States-New Zealand space initiative, MethaneSAT, is due for launch in 2022. This observation satellite will monitor and study global methane emissions. Data will supplied to countries, industry, and citizens in order to help identify the best places for intervention and investment to reduce methane emissions.

Cybersecurity

The adverse use of cyber tools by nation states and by other actors threatens national security, disrupts government service delivery, and our daily existence and supports criminal activity. And AI can both defend against nefarious activity, and also be an enabler. Research on areas where progress can be made is essential. Some of these areas were outlined in the Presidential Executive Order 14028 on Improving the Nation's Cybersecurity,[4] and include:

- Improvements in threat information sharing between the government and private sector

- Government use of stronger cybersecurity standards such as zero trust architectures, encryption and multifactor authentication

- Improvements in software supply chain assurance

- Improvements in detection, response to and recovery from cyber incidents

One recent cyber incident illustrated gaps in security in government, commercial enterprises, and critical infrastructure. The Solar Winds incident showed vulnerabilities in the software development lifecycle process and the global supply chain. In the area of software supply chain assurance, "DevSecOps" principles can drive ecosystems for developing software based on those principles. As a recent IBM Center report highlighted,[5] using DevSecOps supports a preapproved software development environment where developers can experiment. Developers can code, test, prove, or disprove initial hypotheses about how the code will work, adjust the software build according to what they learn, and then continue iterating. Capability and features are developed into viable products. Security is incorporated into the build, and continuously tested.

Another recent incident, the ransomware attack on Colonial Pipeline, illustrated another vulnerability. The White House has initiated international partnerships to accelerate cooperation on improving network resilience, addressing the financial systems that make ransomware profitable, disrupting the ransomware ecosystem via law enforcement collaboration, and leveraging the tools of diplomacy to address safe harbors and improve partner capacity. AI has emerged as a key tool to guard against such attacks.

4.   https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/12/executive-order-on-improving-the-nations-cybersecurity/.
5.   Margie Graves, *Achieving Mission Outcomes Through DevSecOps*, IBM Center for The Business of Government, 2021. https://www.businessofgovernment.org/sites/default/files/Achieving%20Mission%20Outcomes%20Through%20DevSecOps.pdf.

DIGITAL

According to a recent article by the IEEE Computer Society, "The Use of Artificial Intelligence in Cyber Security,"[6] AI enables public and private sector organizations to improve the cyber posture of environments worldwide. AI can improve defenses in the areas of detecting new threats, recognizing bots, improving breach risk prediction and endpoint protection.

AI and machine learning help build a thorough understanding of website traffic and distinguish between good bots (like search engine crawlers), bad bots, and humans. AI systems help determine the IT asset inventory, an accurate and detailed record of all devices, users, and applications with different levels of access to various systems. AI-based systems can predict likelihood of compromise to plan and allocate resources towards areas of most vulnerability.

COVID-19 Response and Recovery

AI been critical to the COVID-19 pandemic response and recovery. The onset of the pandemic highlighted the lack of preparedness and flaws/gaps in the country's medical infrastructure, global supply chain, and policy and governance constructs. Technology played a key role in helping the global community improve the speed to market for key therapeutics and vaccines, track the spread of the virus and the emergence of variants, and monitor the efficacy of medical and physical mitigation approaches.

According to an OECD Policy Response to the Coronavirus,[7] AI can help predict old and new drugs or treatments that might treat COVID-19, and can be used to predict the structure of proteins associated with SARS-CoV-2 (the virus that causes COVID-19). In addition, dedicated AI learning platforms can more rapidly share coronavirus literature to accelerate research, though access to datasets in epidemiology, bioinformatics and molecular modelling. Computing power for AI is also being made available by technology companies and by public-private efforts like the COVID-19 High Performance Computing Consortium and AI for Health.

Multiple opportunities now exist to leverage technology as the nation continues to recover from the pandemic and prepares for future health crises. AI can help identify emerging variants and track their geographic epidemiological path—allowing governments to share scientific breakthroughs to accelerate the development of therapeutics and vaccines, and to improve logistics and supply chains for PPE and other critical medical supplies.

CONCLUSION

The next phase of digital government will advance with research showing how emerging technologies can help government and improve operations and address crises. Technology exponentially improves human ability to respond under rapidly evolving circumstances. Technology, analytics, and AI enable government to access curated data to derive insights, enhance decision making, model and simulate actions, perform predictive analyses, focus activities, and measure results.

6.   https://www.computer.org/publications/tech-news/trends/the-use-of-artificial-intelligence-in-cybersecurity.
7.   https://www.oecd.org/coronavirus/policy-responses/using-artificial-intelligence-to-help-combat-covid-19-ae4c5c21/.

DIGITAL

Fostering Resilient Institutions
Managing Risk and Building Resiliency

The safety, security, and resiliency of nations and their institutions face a vast array of risks and hazards, including pandemics, malicious cyber activity, terrorism, accidents, transnational crime, fraud, natural disasters, and climate change. High impact and hard to predict events like COVID-19 reveal vulnerabilities and weaknesses in systems and across sectors. The pandemic highlighted serious weaknesses in the global supply chain, hampering government responses to life-threatening situations. When governments do respond by creating assistance programs to offset financial hardship resulting from economic impacts, these programs can increase exposure to fraud, waste, and abuse.

Crises of the past few years have underscored the need for U.S. federal agencies to strengthen and mature robust and rigorous enterprise risk management programs. In an increasingly volatile and uncertain period, agency leaders must complement these risk management efforts by inculcating resilience management approaches that go beyond event-specific business continuity or crisis management plans. Pursuing these disciplines simultaneously better positions agencies to understand acceptable risks, enabling them to redirect resources and get ahead of new and emerging threats—building resilient organizations that can turn disruption into opportunity.

Understanding a Complex Risk Landscape

COVID-19 revealed the evolving and complex risks that government agencies confront. Yet as the pandemic recedes, this risk landscape will remain. Many risks—aging IT systems, cybersecurity threats, supply chain vulnerabilities, impacts of climate change, workforce skills gaps, or program integrity—have the potential to disrupt agency programs, mission support operations, and the ability of federal agencies to conduct the business of government. Government resilience follows from the resilience of its institutions.

The Biden-Harris administration has recognized the significance of these risks and has issued Executives Orders[1] and guidance on how agencies should manage and mitigate them.

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1.   *Executive Order 14028, Improving the Nation's Cybersecurity*: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/12/executive-order-on-improving-the-nations-cybersecurity/; *Executive Order 14030: Climate-Related Financial Risk*, and *Executive Order 14008: Tackling the Climate Crisis at Home and Abroad*.

For example, the use of technologies such as social media, the Internet of Things, mobility, artificial intelligence, and cloud computing by government agencies has great benefits, but has also increased potential cyber risks. Cyberattacks against government are becoming more common and more severe—a trend made more pronounced as agencies have increased reliance on digital networks for distance work in the response and recovery efforts around COVID-19.

Technological advances have made federal agency systems, infrastructure, processes, and technologies interconnected and interdependent, such that a risk encountered in one area has the potential to cascade. Given this interconnected operational environment, managing risk across enterprises becomes s more necessary than ever. As noted in the U.S. Government Accountability Office (GAO) report, Cybersecurity: Agencies Need to Fully Establish Risk Management (GAO-19-384), cybersecurity risks must be addressed and integrated into an enterprisewide risk management program.

Today's risk landscape requires a unified, coordinated, disciplined, and consistent approach, no longer focused on risk management as a compliance exercise or perceiving risks solely as problems to avoid. Research is needed on reconceiving risk management as a value-creating activity integral to strategic planning, decision making, and organizational resiliency. As former federal Chief Information Officer Suzette Kent so aptly notes, "People and operational changes due to service delivery being significantly more digital, workforce in hybrid location mode and massive growth in automation and artificial intelligence . . . drive the need to reexamine workforce, risk practices, and operational resiliency."[2]

The IBM Center recently launched an initiative to help governments grow more resilient in the face of increasing risks. This effort promotes research on preparing for and responding to shocks that increase in frequency and magnitude.[3]

Strengthen and Mature Enterprise Risk Management

In 2016, Office of Management and Budget (OMB) updated Circular No. A-123, requiring federal agencies to implement enterprise risk management (ERM) to ensure agencies effectively manage risks that can potentially derail mission delivery. These flexible requirements offered agencies considerable latitude in how they set up ERM programs. This approach tied ERM to the structure, culture, and needs of each agency, avoiding the treatment of ERM as a compliance exercise.[4] IBM Center research has validated ERM as a strategy to address agency exposure to risks that impact mission, strategic goals, and operations, enabling agencies to manage risks and foster organizational resiliency.

2.   Jason Miller. 2021. "Cyber, customer experience will continue to drive major federal technology changes", Federal News Network, December 22, 2021: https://federalnewsnetwork.com/reporters-notebook-jason-miller/2021/12/cyber-customer-experience-will-continue-to-drive-major-federal-technology-changes/.
3.   https://www.businessofgovernment.org/blog/preparing-governments-future-shocks.
4.   Michael J. Keegan. 2021. "Managing Enterprise Risk: Insights from Tom Brandt, Chief Risk Officer, U.S. Internal Revenue Service", *The Business of Government* Magazine, Winter 2019/2020: https://www.businessofgovernment.org/sites/default/files/Managing%20Enterprise%20Risk.pdf.

In almost six years since the A-123 update, a growing number of agencies have implemented effective and integrated ERM programs, establishing governance, developing risk identification and assessment processes, preparing risk profiles, and improving their overall risk readiness and response—helping them better manage risks and improve decision making. However, some agencies have not. "Progress across government has been very uneven," admits Tom Brandt, former chief risk officer at IRS and past president of Association of Federal Enterprise Risk Management (AFERM),[5] "and, in some cases, ERM programs that had gotten off to a good start, faded after leadership and organizational changes occurred."

The pandemic underscored the need for continued strengthening, maturing, and expanding of ERM across federal agencies. "Doing so," according to Brandt, "can help ensure that we are thinking through the range of risks to agency mission, taking the steps necessary to prioritize those risks, and then acting to reduce the likelihood and impact should they occur." But he, like many government risk professionals, sees challenges that identify risks only to find limited support or resources to enable action.

What can research contribute to strengthen and mature ERM? First and foremost, this is a leadership imperative. The disruption of the current pandemic heightens this reality. The Partnership for Public Service in its report, Mastering Risk: Ways to Advance Enterprise Risk Management Across Government,[6] outlines steps federal agencies should consider as a path to strengthen and mature ERM within agency operations:

- **Push, don't just pull, risk information**. Rather than simply gathering risk information from core programs, add value by analyzing the information—such as for a risk appetite statement—and delivering it in a timely way to stakeholders who perform vital management and program functions.

- **Increase the use of data and analytics**. Use data to support an agency's ability to identify and analyze risk, to aid stakeholder decision making and to track the ERM program's progress in responding to risks.

- **Use technology to integrate** a wider range of existing internal and external data (and move away from manual data calls in spreadsheets) to generate evidence-based risk analysis and targeted response activities that build senior leaders' commitment to ERM

- **Integrate ERM both at the enterprise and program levels**. Increase integration between the ERM program and individual office risk management activities.

- **Use ERM to strengthen response** and future risk preparedness. ERM programs can help anticipate threats to effective crisis response—including identifying potential subsequent impacts. This could enable agencies to develop scenario-based contingency plans, test response plans, and continually scan for the next emerging risk.

This last point illustrates how a complementary focus on resiliency management would benefit agencies and further embed the critical importance of strengthening and maturing risk management at the enterprise level—getting ahead of known risks offers an opportunity to build organizational resilience.

5.   Thomas Brandt. 2021. *"Federal Enterprise Risk Management Turns Five",* The Business of Government Blog. July 21, *2021*: https://www.businessofgovernment.org/blog/federal-enterprise-risk-management-turns-five.
6.   The Partnership for Public Service. *Mastering Risk: Ways to Advance Enterprise Risk Management Across Government*. May 26, 2020: https://ourpublicservice.org/wp-content/uploads/2020/05/Mastering-Risk.pdf.

Pursuing Organizational Resiliency as a Strategic Imperative

Gartner recently identified organizational resilience as a strategic imperative, complementing the work of a fully functioning risk management program. By using ERM to provide visibility, leaders can monitor identified risks and mitigate them before they turn into disruptions or crises. The Department of Defense (DoD) recognized this reality when it announced a supply chain resiliency working group to address systemic barriers limiting supply chain visibility, conduct resiliency assessments, and develop effective mitigation actions. The working group will look at ways to increase visibility into the supply chain, identify risks and issues early, and implement proactive remedies.

Organizational resiliency is "the ability of an organization to resist, absorb, recover, and adapt to . . . disruption in an ever-changing and increasingly complex environment to enable it to deliver its objectives, and rebound and prosper."[7] Research into a strategic approach to resilience can enable agencies to go beyond simply developing business continuity and crisis management plans, which tend to be event specific. "Instead of perpetuating the illusion that we can anticipate the future, risk management should [also] try to reduce the impact of threats we don't understand."[8]

Focusing resources in this direction positions agencies to effectively handle risks and threats that may be unknown or unlikely, but have the potential to totally disable and disrupt their operations. These sorts of risks are typically characterized as low-probability and high impact. Getting a better handle on how best to prepare and respond to them rests on a solid enterprise view of managing risk, complemented by a disciplined focus on strategic resilience management. It is about continuing to manage risks we understand, but also placing greater emphasis on establishing processes and mechanisms that can help agencies absorb unexpected system shocks and not only bounce back but bounce forward. Bouncing forward means learning from these situations and using that knowledge to strengthen capacity to respond with agility and adaptiveness.

During the pandemic, many federal agencies continued to deliver on their missions amidst uncertainty. The Internal Revenue Service distributed billions of dollars in stimulus payments to millions of individuals in only two months, and the Department of Veterans Affairs handled an almost fifteenfold increase in telehealth appointments for veterans' physical and mental health services. These and many other agencies experimented and adapted to unprecedented demand for government services. Even DoD proved nimble enough to support large-scale telework in response to the pandemic, taking only a handful of weeks to move millions of workers into a viable and secure "work from anywhere" environment.[9]

7.   Roberta Willy. 2020. "Building Organizational Resilience Is a Strategic Imperative", Gartner. August 21, 2020: https://www.gartner.com/en/documents/3989336/building-organizational-resilience-is-a-strategic-impera.
8.   https://hbr.org/2009/10/the-six-mistakes-executives-make-in-risk-management.
9.   David C. Wyld, *The Age of Remote Work: How COVID-19 Transformed Organizations in Real Time*, IBM Center for The Business of Government, 2022. https://www.businessofgovernment.org/report/age-remote-work-how-covid-19-transformed-organizations-real-time.

Similarly, FEMA turned crisis into opportunity by using desktop validation instead of on-site inspection to issue public assistance (PA) disaster grants; this protected workers from COVID-19 exposure and expedited the disaster grant process.[10] The Transportation Security Administration (TSA) used feedback from agents to identify the best way to protects workers; input from employees in the field now help shape future requirements for personal protective equipment (PPE), shielding and technology, to keep both passengers and officers safe.[11] These are just a handful of examples of organizational resiliency across federal agencies in the wake of the pandemic.

Planning for Future Disruptions

Agencies would benefit from research on how best to engage in early warning activities to foster resiliency. Leveraging strategic foresight—a planning tool[12] to develop the critical thinking, planning, and management competencies for considering the impact of long-term uncertainties on near-term decision making—can help. It is a necessary frame for making strategically important decisions in an increasingly complex world to reduce the risks of unanticipated consequences.

It is both a mindset that keeps future impacts in mind in all decision making, and a set of activities that aid and improve the planning processes.[13] It is important to note that foresight is not about predicting the future so much as it is identifying plausible alternative futures. Engaging in foresight works best when informed by the agency's ERM efforts. Better understanding an agency's risk profile, risk appetite, and risk registry allows leaders to identify and prepare for low-probability, high impact risks that most often test organizational resiliency.

A range of tools and techniques can help agency leadership think outside the box in exercising foresight. For example, **s**cenario planning and simulation are key tools in envisioning the future. These involve crafting multiple future scenarios to explore and learn from in terms of implications for present. actions.

When engaging in these exercises, key questions include:

- What programs and operations are mission critical?

- What level of disruption could be absorbed from a major event?

- At what level of disruption, would activities be temporarily or permanently impaired?

- Where is redundancy or additional support required and how can it be put in place and readied for the time when needed?

10. Daniella Datskovska, Stacey Floam, Raymond Kulisch and Matt Lyttle. 2021. "Disaster recovery assistance in post-COVID environment: Mitigating risks of fraud while maintaining benefits of desktop validation," Federal News Network, March 23, 2021: https://federalnewsnetwork.com/commentary/2021/03/disaster-recovery-assistance-in-post-covid-environment-mitigating-risks-of-fraud-while-maintaining-benefits-of-desktop-validation/.

11. The Partnership for Public Service. RESILIENT: Keeping Your Wits—Workforce, Innovation, Technology, Security—About You. January 2021: https://ourpublicservice.org/wp-content/uploads/2021/01/Resilient.pdf.

12. Joseph M. Greenbolt, Thomas O'Farrell, Robert Olson, Beth Burchard. "Strategic Foresight in the Federal Government: A Survey of Methods, Resources, and Institutional Arrangements," World Future Reviews. December 13, 2018: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=OSA&dirEntryId=343983.

13. National Academy of Public Administration. Governing with Foresight: Bringing Strategic Foresight to Bear in Policy Planning and Management. April 12, 2016: https://napawash.org/standing-panel-blog/governing-with-foresight-bringing-strategic-foresight-to-bear-in-policy-pla.

Complementing this type of planning is horizon scanning, a formal examination of information flows to identify potential threats, risks, emerging issues, and opportunities. Research here can help leaders plan for disruption, but also assist them to anticipate and prepare organizations to survive and thrive. Engaging in scenario planning and horizon scanning exercises can result in the development of playbooks that outline response programs for potential events, which support the development of resilience capabilities and justify funding such efforts.

CONCLUSION

The COVID-19 pandemic has demonstrated that federal agencies must continue to strengthen and mature ERM programs while also pursuing organizational resilience as a strategic imperative. It is about dedicating time and resources to create mechanisms and capacity with the goal of being better prepared for future disruptive events. As observed in the IBM Center report, *Managing The Next Crisis: Twelve Principles For Dealing With Viral Uncertainty*, governments confront a cascade of "unknown unknowns" (the category of unknowable events that tend to be the difficult ones), for which anticipatory measures can take years or decades to develop. Indeed, the nation will likely face far more uncertainty in the future, making effective responses more important. This new operating reality affords government leaders an opportunity to reflect, learn, and build organizations that are more agile, adaptive, innovative, and able to mobilize swiftly and operate in new ways. Now more than ever, government leaders can take a holistic view of the managing of risk and building resiliency, prioritizing what they do know and preparing for what they don't.

Reimagining the Government Workplace
Preparing Today's Workforce for Tomorrow's Challenges

Many public and private sector organizations seek to operationalize the often-cited notion that *people are the most important asset*. Employees now change jobs in record numbers, suggesting a redefinition of workforce expectations and a major shift in workplace dynamics. Reimagining the U.S. government workplace has never been more critical.

Understanding the Future of Work

In the IBM Center's 2018 book *Government for the Future*, Brookings' scholar Darrell West wrote, "In the near team, the increased use of artificial intelligence and data analytics, greater deployment of personal digital assistants, and new employee performance rating systems could enable greater labor productivity and enhanced accountability."[1]

In the longer term, automation will continue to advance and disrupt how work gets done, including productivity increases that support a 30-hour work week. Estimates vary regarding the workforce impact from robots, AI, and automation. The Organization for Economic Cooperation and Development (OECD) found that a focus on "tasks" as opposed to "jobs" would lead to fewer job losses.

These actions will be taken at a time when workplace realities have shifted dramatically due to the pandemic, The 2020 IBM Center report, *Distance Work Arrangements: The Workplace of the Future is Now,*[2] found that slow adoption of distance work arrangements accelerated when the pandemic hit, when virtually every organization pivoted to a new workplace. Home. federal, state, and local governments not only had to transition their workforces to work from home, but also had to change how they delivered services so they could be done remotely, such as using electronic signatures for contracts.

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1.   Darrell West, "The Future of Work," p.214, *Government For The Future: Reflection and Vision for Tomorrow's Leaders*, The IBM Center for The Business of Government, 2018. https://www.businessofgovernment.org/node/3057.

2.   Edited by John M. Kamensky, *Distance Work Arrangements: The Workplace of the Future Is Now*, IBM Center for The Business of Government, 2020. https://www.businessofgovernment.org/sites/default/files/Distance%20Work%20Arrangements_0.pdf.

As managers and workers became more adept with the technology and tempo, organizations—both public and private—have become more open to distance work becoming the "new normal." Still, certain jobs cannot be done from home—such as customer service, intelligence, and safety inspections.

Organizations not only invested in distance work technologies such as laptops and greater access to the Internet, but they invested in developing new ways to manage in order to ensure continuity in order to get work done. These parallel investments result in new ways to manage—oneself, others, and teams. Distance work has significant benefits for a positive future workplace, including greater flexibility, autonomy, and job satisfaction.

Given the experience since 2020, a spectrum of workplace futures has emerged:

- **Recreating the office online**. This is where most traditional organizations have landed. More effective companies offer access to e-tools, but without any redesign of how work gets done.

- **Adapting to the medium**. These organizations are investing in better equipment (for example, they may provide employees with a cash grant to improve their lighting for video calls). Their work favors text-based communication, with fewer meetings that have clear agendas and include only 'must have' participants.

- **Asynchronous communication**. These organizations are structured more in line with how work gets done than where or when. They are typically global and recognize that presence does not equate to productivity.

- **Nirvana.** These organizations field purely distributed teams that work better than in-person teams. There are a handful of companies like this, and most are in the tech industry.

Research can help government overcome multiple challenges to achieve West's "rosy scenario"—including isolation, childcare needs, technical inequities, measuring productivity, developing new work routines, working in a blended workplace (government and contractor), and promoting flexibility to move and out of government.

The IBM Center later initiated a Challenge Grant Competition soliciting essays from academics and practitioners describing how government can best transform the way it works, operates, and delivers services to the public in light of the impact of this pandemic.[3] In reframing government management and operations, this 2021 compendium of essays from the field highlighted several key themes:

- **Changing the nature of how government works** focuses on government jobs best suited to shift virtually, the new "workday," best practices, government as a model workplace, and workplace health, safety, and privacy.

- **Reimagining how government operates** and delivers its missions to the public explores ways to improve operational effectiveness by addressing engagement, equity, and culture in government service delivery.

3.   Richard Feiock, Gurdeep Gill, Laura Goddeeris, Sherri Greenberg, Rob Handfield, Zach Huitink, Rodney Scott, Tad McGalliard, Maya McKenzie and Eleanor Merton, *COVID-19 and its Impact: Seven Essays on Reframing Government Management and Operations*, IBM Center for The Business of Government, 2020. https://www.businessofgovernment.org/sites/default/files/COVID%2019%20and%20 its%20Impact_0.pdf.

- **Managing risk and building resilience** focuses on building supply chain resiliency making them immune to unpredictable shocks, emphasizing the critical importance of managing risks and vulnerabilities effectively while also identifying principles that fosters trust in institutions and how they operate in times of crisis.

In 2022, the IBM Center published a new report from scholar David Wyld looking further at the impact of the pandemic on the future of work.[4] Wyld found that almost two years into the pandemic, remote work experience has markedly changed attitudes and expectations about where, how, and even when work should be done. Indeed, survey after survey shows that those who have worked remotely for the first time in the wake of the pandemic want to continue doing so permanently for at least part of their workweek (in which case an employee would be said to engage in "hybrid work"). In response, managers across the United States, and globally as well, have largely come to the same uniform conclusion: remote work should be a key part of the way work is done moving forward.

New research can build on this existing body of work to help the government take action today to move toward a positive future workplace tomorrow. This objective can guide policy and process improvements around human resource practices and civil service modernization going forward.

Research Needed on New Tools that Move Government Toward an Evolving Future

Given these imperatives, for research to identify pathways for reimagining the government workplace, four pillars of talent management could be considered: Talent Identification, Talent Acquisition, Talent Development, and Talent Application.

Pillar I: Talent Identification
How can the government better identify and attract candidates for employment?

The government often follows a "moths to a light" approach to recruitment: posting approved vacancies on a government website and waiting for responses, hoping that the right candidate will both notice the advertised position and expend the energy to apply. This reactive process is not effective given the high competition for talent in today's marketplace.

Rather, early identification and focused cultivation are key. The full *identification-to-hire* process can benefit from research on how to become more proactive and data-driven. Recruiters need to learn about how best to leverage the right tools to aggregate and assess multiple sources to identify and engage potential candidates. Multiple current data sources can assist with talent identification—including the government's USAJOBS site as well as numerous commercial matching sites—to develop an integrated candidate pool to address ever-shifting talent requirements with flexibility. As stated in the *Harvard Business Review* (arguably, with just a touch of pessimism): "Talent identification is an ongoing process of trial and error, and the point is not to get it right, but to find better ways to be wrong."[5]

4. David C. Wyld, *The Age of Remote Work: How COVID-19 Transformed Organizations in Real Time*, IBM Center for The Business of Government, 2022. https://www.businessofgovernment.org/sites/default/files/How%20COVID-19%20Transformed%20Organizations%20in%20Real%20Time_0.pdf.
5. https://hbr.org/2020/01/how-the-best-managers-identify-and-develop-talent.

Pillar II: Talent Acquisition

What data and tools will improve the effectiveness of hiring and onboarding at the agency level?

Once identified, candidates for employment enter a process in which they have varying levels of confidence. Multiple interviews, security clearance processing, undefined avenues for growth, and inconsistent engagement by recruiters add stress to the process. Add to that an overall national discourse about government that has grown in contention and division in recent years, successfully acquiring talent by federal agencies has become significantly more challenging.

Research on several tools could help agencies increase early engagement and improve the overall effectiveness of hiring at the agency level. These include:

- **Share agency history.** An agency's history reflects and reinforces its culture. Generally, candidates for employment have already expressed interest in the agency. Early engagement that includes the robust sharing of historical knowledge about the agency and its mission will help align a candidate with agency culture prior to onboarding. Culture fit is the glue that holds an organization together.

- **Gamification.** Virtual hiring offers a greater range of technical engagement, and gamified testing can assess performance in a simulated environment mirroring that of the agency. Gamification can influence, motivate, and connect candidates for employment, and can also help accelerate the candidate's preparation for employment.

- **Artificial Intelligence.** AI and intelligent automation will make the hiring process faster and more accurate, both at the agency level and governmentwide. Augmenting the hiring process with AI and machine-learning provides recruiters, talent managers, and agency executives with advanced data assessment and decision-making tools.

Pillar III: Talent Development

Can agencies adopt more flexible training and development models that accelerate the time to proficiency for their employees?

Each agency has unique requirements to build essential knowledge, skills and abilities, all of which maps directly to that agency's mission. Within that highly customized framework are advances in training and learning, and research can assess how best to help accelerate performance and arm employees for tomorrow's challenges. For example:

- **Pioneer innovative learning opportunities**. Broaden outreach to academia and industry, identifying new opportunities for external assignments. Particularly in new technology and data-focused occupations, learning from academic labs and industry leaders offers new insight and a broader range of knowledge to each employee.

- **Optimize the internal learning landscape**. Agencies can leverage internal centers of excellence and align training outcomes across their organization. Optimizing the balance between centralized training (e.g., leadership, collaboration, innovation) and decentralized training (skills-building, occupation-focused) will improve overall efficiency and accelerate employee development.

- **Adopt agile learning processes**. Effective talent development incorporates new models of highly personalized and increasingly agile learning. Agency talent development for today's workforce should be more employee-centric, requiring more in-depth knowledge of employee potential and incorporating a wider range of learning and training opportunities. Training must be globally accessible and tailored to mission requirements. New training and development methods include:

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- **Simulation**. Gives employees a chance to problem-solve in real time—in a team or individually.

- **Microlearning**. Focuses on essential content and is available when needed.

- **Technology-based training**. Improves traditional computer-based training (CBT) models by increasing scalability, collaboration, and mobility.

- **Virtual learning**. Creates a virtual learning platform customized to the unique mission environment of your agency.

With rapid advances in smart technology, high performance computing, adaptive learning, and global mobility, agencies need to focus on the training and development models that best meet current and future workforce needs.

Pillar IV: Talent Application
How can emerging technologies, such as AI and virtual reality, fuel a shift in workplace practices that will increase employee engagement and support a more productive workforce?

Emerging technologies have fundamentally changed the workplace for today's employees. The historical career "ladder"—a step-by-step, rung-by-rung approach to professional development—now often resembles a career "lattice," with vertical and horizontal progression. The workforce increasingly wants a more diverse, customized learning framework.

Emerging technologies allow a blending of three traditionally distinct elements of any agency's learning program:
- **Learning FOR action**—The agency's training and education programs and infrastructure.

- **Learning IN action**—Professional experiences designed to advance the occupational skills and leadership of individual employees.

- **Learning FROM action**—Lessons learned, post-action reviews, peer-to-peer discussions, and another knowledge developed and made available corporately.

Research on the application of AI, machine-learning, virtual reality, smart technology, quantum computing and other leading technologies can provide managers with:
- **New insights** into organizational performance

- **New tools** for accelerating collaboration

- **New measures** of effectiveness

- **New options** for performance improvement (at the employee and team levels)

This technology-fueled insight, collaboration, and focus on performance will ultimately re-shape the workplace for speed, innovation and mission success.

CONCLUSION
Research to support the next wave of government workplace change can support a future workforce that is digitally astute, highly collaborative, exceedingly mobile, and naturally diverse. To acquire and retain the talent the government needs for success, the workplace for this new generation of government employee must be increasingly digital, fuel the collaboration the workforce demands, include remote work and work-from-anywhere capabilities, and allow the unique skills of each employee to be recognized, developed and applied to the agency's mission effectively.

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Margie has also held numerous industry leadership positions in Nonprofit organizations, including past president of the government-led American Council for Technology (ACT) and the Executive Vice Chair and then Chair of the industry-led Industry Advisory Council (IAC). She is a fellow of the National Academy of Public Administration and a CIO Senior Advisor to Government Executives (SAGE) for the Partnership for Public Service. Margie has private sector experience in the management consulting industry, where she held executive positions and performed consulting engagements for clients.

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Michael J. Keegan is the leadership fellow at the IBM Center for The Business of Government and host of *The Business of Government Hour*. He leads the IBM Center for The Business of Government's leadership research, which is at the nexus of the Center's mission—connecting research to practice. He is also the host and producer the IBM Center's *The Business of Government Hour*. He has interviewed and profiled hundreds of senior government executives from all levels of government as well as recognized thought leaders focusing on a range of public management issues and leadership trends. Michael is also the editor of *The Business of Government* magazine, with a targeted audience of close to 14,000 government and nongovernment professionals.

He has more than two decades of experience in both the private and public sectors, encompassing strategic planning, business process redesign, strategic communications and marketing, performance management, change management, executive and team coaching, and risk-financing. Prior to joining the IBM Center, he worked as a senior managing consultant with IBM Global Business Services and as a principal consultant with PricewaterhouseCoopers' Washington Consulting Practice (WCP) . He led projects in the private and federal civilian sectors, including the U .S . Department of Energy, U .S . Department of Homeland Security, Centers for Medicare and Medicaid Services, the Federal Emergency Management Agency, and the Veterans Health Administration .

Michael has been a reviewer for the Association of Government Accountants Certificate of Excellence in Accountability Reporting (CEAR©) program, keeping abreast of the most recent developments in authoritative standards affecting federal accounting, financial reporting, and performance measurement.

He holds a Master of Public Administration and Management from New York University and was the founder of its Washington, D.C., alumni group, as well as previous treasurer of the NYU graduate school's alumni board.

Mark Newsome is Healthcare Fellow with the IBM Center for The Business of Government and is Vice President & Senior Partner leading IBM U.S. Federal Healthcare - Veterans Affairs, Military Health System, Social Security Administration within IBM Consulting. Mark is an IBM Industry Academy member, a Fellow with the IBM Center for The Business of Government, and a member of the IBM Former Government Executives Council.

Prior to IBM, Mark served 25 years in the U.S. Army as an Army Medical Service Corps Chief Financial Officer (CFO) and Army Medical Congressional Budget Liaison with ASA (FM&C), Pentagon.

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Mark is a 2021 Federal Computer Week (FCW) Fed100 Award recipient.

Karin O'Leary is the shared services fellow at the IBM Center for The Business of Government and lead account partner for the U.S. Department of Justice and the U.S. Courts. Karin is an expert in federal budgeting and financial management, shared services, and change management. She has extensive experience in managing complex organizational change in federal agencies, with over 25 years of government service. In June 2019, Karin was named as a fellow for The Center for The Business of Government.

Before joining IBM in June 2018, Karin was a career executive in both the Judicial and Executive branches of government. She was the chief financial officer of the Judicial Branch, where she led a team that implemented a single financial and procurement system to over 450 court locations in 3 years and transitioned local disbursing to the U.S. Treasury. Before that, Karin was the budget director for the U.S. Department of Justice for nearly a decade, with responsibility for developing, promoting, and executing a budget exceeding $30 billion per year, as well as departmental strategic planning and performance management. Karin also held senior positions at the Drug Enforcement Administration, and the Court Services and Offender Supervision Agency for the District of Columbia, which she helped to establish. She began her federal public service career at the Corporation for National and Community Service and, prior to that, worked at the local level for the Lackawanna County Government in Pennsylvania.

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