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How innovation in government can help break trade-offs and improve services

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Introduction

Life is filled with trade-offs: Have that extra piece of chocolate cake, or lose weight. Work more hours and make more money, but then spend less time with your family. Live in a comfortable home in the suburbs, but then spend an hour commuting to work.

TRADE-OFFS abound in government as well: Increased security at airports tends to lead to less convenience for travelers. Increased oversight over government spending often means increased paperwork and more bureaucracy. A common political debate is whether the value of regulatory protections offsets the accompanying burdens on businesses and citizens.

If you are a senior official in government, you must confront these kinds of trade-offs in your work on a daily basis. One of the main jobs of policymakers and senior government executives is to choose among these competing alternatives.

But what if you could actually have your cake and eat it too? What if you could break the kinds of trade-offs government officials encounter on a daily basis and increase not one or the other but instead both?

After all, we see this happening all around us in the broader economy. Mobile phones broke the trade-off between communication *and* mobility,

What if you could break the kinds of trade-offs government officials encounter on a daily basis and increase not one or the other but instead both?

then smartphones went further, offering performance *and* convenience. Amazon overturned a long-standing retail trade-off between local, convenient shopping with a limited selection and shopping at huge, cheaper, though inconveniently located stores. These innovators and others have built firms and fortunes by breaking old trade-offs, often producing dramatically better results for a lower cost.

Leaders and managers in government encounter difficult decisions and trade-offs every day. The pressure to balance trade-offs can feel like being trapped or backed into a corner. But the right set of tools can redraw the relationship between competing options, offering, in some instances, a way to escape the constraints that trade-offs enforce.

This paper explores how emerging technologies combined with new managerial techniques and tools can enable government leaders to break some of the most enduring trade-offs they face.

The five biggest trade-offs in government

Trade-off #1: Higher protection/compliance vs. lower regulatory burden

THE TRADE-OFF

One of the most high-profile trade-offs governments face involves regulatory burdens. In the trade-off of higher protection or compliance vs. lower regulatory burden, both objectives are desirable, but pursuit of one typically comes at the expense of the other. "Which one to pursue?" is a debate we've been having for decades.

> **TOOLS + STRATEGIES**
> • **Customer experience (CX) methods**
> • **Digital technologies**
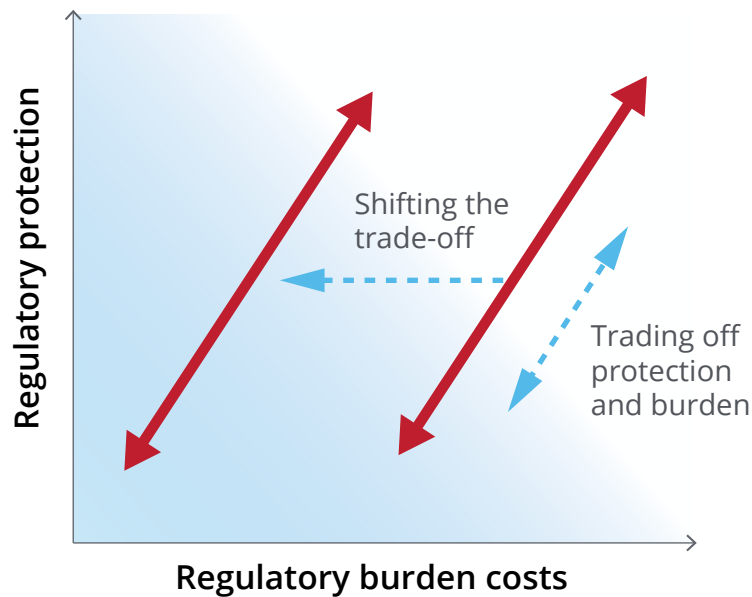
BREAKING THE TRADE-OFF

Cutting regulatory burden and maintaining protections may seem like contradictory objectives, but both can be achieved by making regulatory transactions (such as passing inspection or demonstrating compliance) as painless as possible.

By skillfully combining new digital technologies such as data analytics and crowdsourcing with innovative techniques such as customer experience journey mapping, government agencies could significantly cut red tape costs while maintaining protections. In effect, this shifts the protection/burden trade-off as shown in figure 1.

Consider what Boston has done to streamline its permit system.[1] Through a hackathon, the city created a tool to identify a project's address on record, an app that explains which permits a project needs, and a program to track applications through the permit process. Boston also unveiled a beta version of a new online permit system that allows users to apply for multiple permits at once, organize permits by project, and include multiple people—say, a contractor and a homeowner—on the account. The effort has yielded significant results: Inspectional Services issued 12,500 more permits in the first year of reform than in the previous year; average review time for long-form permits was cut by five days, or 20 percent; and, most importantly, the hours contractors spent waiting have been drastically reduced.[2]

By listening to user concerns, governments can develop compliance tools that could reduce the burden on the user while promoting compliance. Consider E-Verify, a free and easy-to-use tool that electronically verifies whether an employee is eligible to

Figure 1. Breaking the trade-off between regulatory protection and burden

Note: One can debate the curvature of the straight-line trade-off shown here as well as where government is on that line. The figure is used here simply to illustrate the notion of shifting the trade-off.

Source: Center for Government Insights.

work in the United States. Traditionally, employers had a difficult time knowing if their prospective hires were legally eligible to work. The employers themselves had to decide whether the documents presented by a potential employee were genuine or counterfeit.[3] The key features of E-Verify are speed and ease of use. An employer enters details from an applicant's Form I-9 into the system, which quickly compares the submitted details with databases at the Department of Homeland Security, the Social Security Administration, and certain states' Department of Motor Vehicles, and then confirms a hire's eligibility for work—within three to five seconds.[4] About 99 percent of the cases are authorized instantly, or within 24 hours.[5]

Burden costs result from the interplay between the behaviors of the regulator and those who are regulated. The field of behavioral science explains how "nudges"—carefully designed prompts and activities that encourage better outcomes by leveraging how people naturally think and feel—can be

used to encourage greater rates of compliance without increasing costs. In Ontario, a single nudge-designed mailing to employers used "implementation intention" approaches that spell out the "how, when, where" of an action to raise compliance on Employer Health Tax filings by 13 percent.[6]

Trade-off #2: Greater security vs. greater convenience

THE TRADE-OFF

The traditional approach to promoting security is to make people jump through qualifying hoops before access is granted. Those hoops may be physical, like the lines and inspection that must be traversed to gain access to airport flight gates. They may be digital, like the all-too-familiar password requirements for "at least one lowercase and uppercase alphabetic character, at least one number,

and at least one symbol." Anyone who's struggled with setting up (and remembering!) such a password or risked missing a flight due to long lines at security knows that keeping something secure likely involves a certain amount of inconvenience.

There is a recognized trade-off between security and convenience, an understanding that security requires more effort, less ease. Debate, when it arises, has often focused on how much convenience we are willing to forego in the interests of security. But what if we didn't have to accept that trade-off? What if we could have security and convenience?

TOOLS + STRATEGIES
- **Predictive analytics**
- **Risk modeling**
- **Cognitive technologies**
- **Automation**

BREAKING THE TRADE-OFF

Risk modeling presents a way to achieve security without making the process painful for participants. Using data analytics, it's possible to apply stricter security and screening measures to identify certain individuals (or packages) as high risk, and expedite the process for those that are low risk who have been prescreened.

The US Transportation Security Administration's (TSA) PreCheck program breaks the trade-off between security and convenience by simultaneously improving both. PreCheck allows passengers who pass a background check to use special faster airport security lines. Travelers voluntarily provide data, which, when combined with other layers of security, allows TSA to direct more screening resources to higher-risk passengers and deliver on its mission of protecting the nation's transportation systems.[7] The additional data helps enhance security while also reducing the time customers spend waiting in security lineups.

Customs and Border Protection (CBP) has piloted a similar program for air cargo, called Air Cargo Advance Screening, which provides CBP with data concerning the parties and commodities involved in air cargo prior to loading on an aircraft. This risk-based approach helps speed the movement of lower-risk shipments, while resources can focus on higher-risk shipments for additional screening.

Even the scrambled, inconvenient passwords we commonly use today may become a thing of the past. Back in 2003, Bill Burr was a midlevel manager at the National Institute of Standards and Technology (NIST) when he wrote the eight-page primer that promulgated the awkward, frequently changed password with obscure characters so common today. In a recent *Wall Street Journal* interview, Burr expressed his regrets for promoting this approach, recognizing that the added complexity and inconvenience could have been avoided.[8] The most recent

Using data analytics, it's possible to apply stricter security and screening measures to identify certain individuals (or packages) as high risk, and expedite the process for those that are low risk who have been prescreened.

set of NIST guidelines combine greater security with greater convenience, recommending the use of long passphrases rather than a nonsense word. There are also technologies and design approaches that eliminate the possibility of forgetting a password and can make security a lot more painless without making it any less robust. Biometric identification, voice recognition, face recognition, and two-factor authentication are some examples.

Trade-off #3: Better service vs. lower costs

THE TRADE-OFF

It is almost taken as a tautology that more services, or a higher level of service, requires more resources. In the commercial sector, the saying goes, "You get what you pay for." The traditional government path to improving or expanding customer service has been through expending resources—more staff, more call centers, more time and money. For government leaders, this is one of the trade-offs that pinches most often as leaders at all levels are being

> **TOOLS + STRATEGIES**
> - **Crowdsourcing**
> - **Predictive analytics**
> - **Sensors**
> - **Digital technologies**
> - **CX methods**

asked to "do more with less."

Today, new technologies, insights, and techniques offer opportunities to break this trade-off in many settings.

BREAKING THE TRADE-OFF

In the private sector, we've seen the service/cost trade-off broken time and time again—often through innovative use of enabling technologies.

Netflix offers a compelling case of leveraging technology for better service and lower cost than offered by video rental stores, but there are even more dramatic examples. Rapid advances in 3D printing technology are revolutionizing biomedical engineering and prosthetics. Not only are these 3D-printed limbs significantly cheaper than traditional prosthetics, they are better—made with fewer errors and customized to fit perfectly.[9]

Government also has the potential to radically improve services, not by expanding budgets but through innovation and better deployment of existing resources.

For decades, the New York City Department of Buildings focused on complaints when deciding which properties to inspect for unsafe conditions and structural hazards. But in 2011, the city received almost 25,000 complaints about just one type of problem, illegal conversions, and had only 200 inspectors to cover the workload. These illegal conversions, in which landlords would divide apartments into smaller units to accommodate more people than the apartment was zoned for, could generate issues in terms of fire safety, crime, and public health.[10]

In response, the Mayor's Office of Data Analytics, a crew of scientifically minded problem solvers then led by Michael Flowers, was able to radically improve inspection efficiency by using predictive analytics. They incorporated data on property age, foreclosure proceedings, tax payments, among others, to build new algorithms that took into account factors related to past dangerous events, such as fire.

Previously, only 13 percent of investigations identified seriously high-risk conditions that led to vacate orders. After Flowers's team began utilizing its new algorithms to prioritize complaints, the share of investigations finding seriously high-risk conditions escalated to a sustained *70 percent*.[11]

The city simply started making better decisions by using modern methods of data analysis. It found, for instance, that improved building inspections lowered risks for firefighters, since fires in illegal conversions were 15 times more likely than other fires to result in injury or death for firefighters.[12] Thanks in part to this analytics-driven approach,

Thanks in part to this analytics-driven approach, in June 2015, New York City experienced zero fire deaths for the first time since 1916.

Changing how resources were allocated—by focusing on data-based insights—enabled the city to achieve drastically better results.

Consider one of government's perennial challenges—paperwork burdens. In 2017, just as in 1917, government employees spend huge amounts of time on paperwork. A recent *Governing* survey of state and local officials found that 53 percent had trouble getting their work done in a 35–40-hour week due to excessive paperwork burdens.[14] Colorado's recent Child Welfare County Workload Study department found caseworkers spending 37.5 percent of their time on documentation and administration, versus just 9 percent on actual contact with children and their families.[15] At the federal level, research indicates simply documenting and recording information consumes half a billion staff hours each year at a cost of more than $16 billion.[16]

Hiring more people would reduce the backlog and create more hours to devote to higher-impact activities, but it would do so at a higher cost. However, modern automation enabled by robotic process automation and artificial intelligence (AI) can take over the burden of low-value paperwork and allow frontline employees to provide more service on mission-focused work without the need to add staff.

For example, Aspiranet, a California nonprofit, uses cognitive tools to perform natural language inquiry of unstructured data to find safe housing for transitional-age youth in areas that also offer potential jobs, public transportation, and grocery stores. According to Aspiranet CEO Vernon Brown, cognitive technology helps free up caseworkers' time, enabling them to focus on what matters most: human connection.[17]

Trade-off #4: Enhanced personalization vs. scale economies

THE TRADE-OFF

People like personalized services, but traditionally these services have been difficult to deliver. The more customers involved, the harder it was to deliver a personalized experience for each individual. It was either too costly, strained resources, or simply took too much time to know the particular needs and desires of each individual.

TOOLS + STRATEGIES
- **Predictive analytics**
- **Cognitive technologies (AI)**
- **Digital technologies**
- **Behavioral nudges**
- **Design thinking**

BREAKING THE TRADE-OFF

Today, personalization is no longer constrained by the size of the group involved. We've become accustomed to providers such as Amazon and Netflix who can simultaneously exploit scale economies and still make recommendations based on our personal preferences. Through the Internet and mobile devices—and soon sensors and the Internet of Things—the crowd has become personal.

Taking your specific characteristics and behavior, and contextualizing them with data on thou-

sands or millions of other individuals allow designers to deliver products and services that are, or at least feel, unique.

Consider the example of the US Army. Prospective recruits and other visitors to the Army website can use SGT STAR, an interactive virtual assistant that uses AI to answer questions, check users' qualifications, and refer them to human recruiters. The Army's analysis discovered that SGT STAR does the work of 55 recruiters, with an accuracy rate of more than 94 percent; the time visitors spend on the site has increased from 4.0 to 10.4 minutes.[18] As of 2016, the virtual assistant had answered more than 16 million user questions.[19]

Through its efficiency, SGT STAR breaks the service/cost trade-off. But it also goes further, exploiting cognitive technology to break the personalization/scale trade-off. SGT STAR uses machine learning to recognize data patterns that help it distinguish helpful answers from unhelpful ones. The more questions it answers, the more it learns, and the better it gets. Not only does this lead to more efficiency, it enables better service—not just in terms of timeliness and accuracy, but in the system's ability to craft responses specific to the needs of the individual, thus providing a personalized experience.

In a similarly personalized vein, the mobile app Text4baby, which has partnered with the Center for Medicare and Medicaid Services since 2012, delivers maternal and child health information that is tailored to pregnant women and infants. The California Department of Public Health and Immunize Nevada partnered with Text4baby to implement appointment reminders for well-baby visits and the Hepatitis B vaccination. It found that appointment reminders increased the show rate by six percentage points for doctor visits and five percentage points for immunizations.[20]

When it comes to public services, different customers have different needs. Instead of a one-size-fits-all approach to service delivery, leaders are exploring the clever application of design thinking and digital technologies to build solutions based on customer needs that offer personalized services while retaining scale economies. With governments increasingly adopting digital modes of delivering services to citizens, there is still greater potential for economical personalization of services.

Trade-off #5: Increased privacy vs. increased transparency

THE TRADE-OFF

We live in a world where data and analytics have unprecedented power—particularly when it comes to problem-solving. Greater transparency and openness can maximize the value of data. But some of today's most pressing challenges come from areas such as health care, where data privacy sensitivities and security concerns are high. What if you could break this trade-off by simultaneously

TOOLS + STRATEGIES
- **Predictive analytics**
- **Cognitive technologies (AI)**
- **Digital technologies**
- **Blockchain**

protecting privacy and security while increasing the transparency and availability of data? As it turns out, you can.

BREAKING THE TRADE-OFF

Advances in AI systems and neural networks are making it possible to generate highly valuable and accurate insights from the analysis of data sets without compromising on confidentiality and privacy.

For example, systems called Generational Adversarial Networks, or GANs can synthesize artificial data that is very similar to real data. Two opposing networks work together to achieve this—a generative network that is trained to produce data, and a discriminative network that tries to distinguish the real data from the fake.[21] These data sets are virtually indistinguishable from the real thing and can be used to develop and test methods and algorithms to study problems such as the opioid epidemic and fraud, without any privacy concerns (because the

Generative adversarial networks could enable the production of entirely fabricated patient data sets that are just as useful as the real thing.

data is not from real people). Once potentially effective algorithms are identified, someone can then run them behind a firewall on actual data to find those critical patterns and insights that can help move the needle in the real world.

Blockchain is another trade-off-breaking technology. It provides a distributed ledger that helps to ensure both security and transparency. Blockchain records are visible to all members of a network, so they can be easily monitored and audited. At the same time, blockchain is highly secure due to its peer-to-peer validation and encryption features. As a result, blockchain technology has the potential to break the security/transparency trade-off across the public sector—from identity management, property title registration, and supply chain management to tax collection and voting.[22]

Consider voting. Security around voting processes is critical and demands that the data be tam-per-proof. At the same time, there is also a desire for greater transparency, with waning trust in what happens behind the scenes.

Using blockchain, citizens can potentially cast votes the same way they initiate other secure transactions, validate that their vote was cast, or even verify the election results. Potential solutions are currently working to blend secure digital identity management, anonymous vote-casting, individualized ballot processes (for example, a vote "token"), and ballot-casting confirmation verifiable by (and only by) the voter.[23]

Ukraine, Australia, and Denmark are testing the technology in unregulated elections,[24] while the United States' Libertarian Party successfully used it in its New York and Texas conventions.[25]
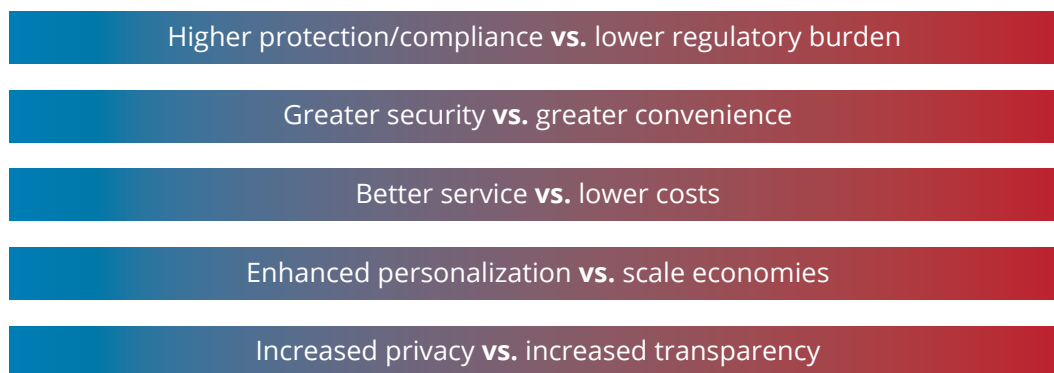
Conclusion

MANAGING trade-offs is a difficult fact of life for senior officials in all levels of government. This article has highlighted some of their most common and most painful trade-offs (figure 2). There are, of course, other trade-offs: specialized vs. easy-to-use technology; state-of-the-art IT vs. minimizing investment; and even federal vs. state, to name just a few.

What is exciting about this moment in time is the emergence of a combination of innovative technologies and management techniques that offer the

opportunity to break these trade-offs. A number of tools and strategies have been highlighted, but perhaps the most important has not been mentioned.

Before any of these tools can be applied, leaders should consider changing their mind-set: Trade-offs should be seen as a challenge to be broken, not a constraint to be accepted. As with any innovation, senior officials must be willing to challenge the status quo. Only then is it possible to break trade-offs to improve government services.

Figure 2. Common trade-offs in government that can be broken

Higher protection/compliance **vs.** lower regulatory burden

Greater security **vs.** greater convenience

Better service **vs.** lower costs

Enhanced personalization **vs.** scale economies

Increased privacy **vs.** increased transparency

Source: Center for Government Insights.

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ENDNOTES

1. William D. Eggers and Pankaj Kishnani, *Compliance without tears: Improving the government-to-business experience,* Deloitte Insights, August 2016.

2. Alex Lawrence, "How Boston is making permitting and licensing easier," Data Smart City Solutions, January 20, 2015.

3. Subcommittee on Immigration and Border Security, *How E-Verify works and how it benefits American employers and workers*, February 27, 2013.

4. US Citizenship and Immigration Services website.

5. Ibid.

6. John O'Leary and Timothy Murphy, *Beyond carrots and sticks: How state and local governments can apply nudge thinking to improve outcomes*, Deloitte University Press, May 16, 2017.

7. "TSA security equipment and technology," Transport Security Administration, May 9, 2012.

8. Robert McMillan, "The man who wrote those password rules has a new tip: N3v$r M1^d!, "*Wall Street Journal*, August 7, 2017.

9. Ian Birrell, "The promise of 3-D printing body parts," *Atlantic*, February 22, 2017.

10. William D. Eggers, *Delivering on Digital: The Innovators and Technologies That Are Transforming Government* (Rosetta Books, 2016).

11. Alex Howard, "Predictive data analytics is saving lives and taxpayer dollars in New York City," *O'Reilly Radar*, June 26, 2012.

12. Viktor Schönberger and Kenneth Cukier, "Big data in the Big Apple," *Slate*, March 6, 2013.

13. FDNY Foundation, "FDNY records first month with zero fire-related deaths in department history," July 5, 2015.

14. Katherine Barrett and Richard Greene, "Is a 40-hour workweek enough in government?," *Governing*, July 21, 2016.

15. Colorado Department of Human Services, *Colorado child welfare county workload study*, August 2014.

---

16. William D. Eggers, David Schatsky, and Dr. Peter Viechnicki, *AI-augmented government: Using cognitive technologies to redesign public sector work*, Deloitte University Press, April 26, 2017.

17. "Transforming social services," IBM, accessed October 31, 2017.

18. "SGT STAR helps potential recruits learn about Army life," Next IT, accessed March 16, 2017.

19. Frost & Sullivan, *2016 global conversational AI and intelligent assistants Technology Innovation Award*, April 2016.

20. "Text4baby research and evaluation," Text4baby, accessed December 2016.

21. Darrell Etherington, "Google's adversarial AIs could lead to less reliance on real-world data," *TechCrunch*, April 11, 2017.

22. R. J. Krawiec and Jason Killmeyer, "Blockchain technologies could transform government services," *TechCrunch*, November 21, 2016.

23. Deloitte Center for Government Insights spring 2017 analysis via collaboration with the Fletcher School at Tufts University.

24. Ben Dickson, "Blockchain tech could fight voter fraud—and these countries are testing it," *Venture Beat*, October 22, 2016.

25. Michael del Castillo, "Libertarian Party of Texas to store election results on three blockchains," *Coindesk*, April 8, 2016.

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