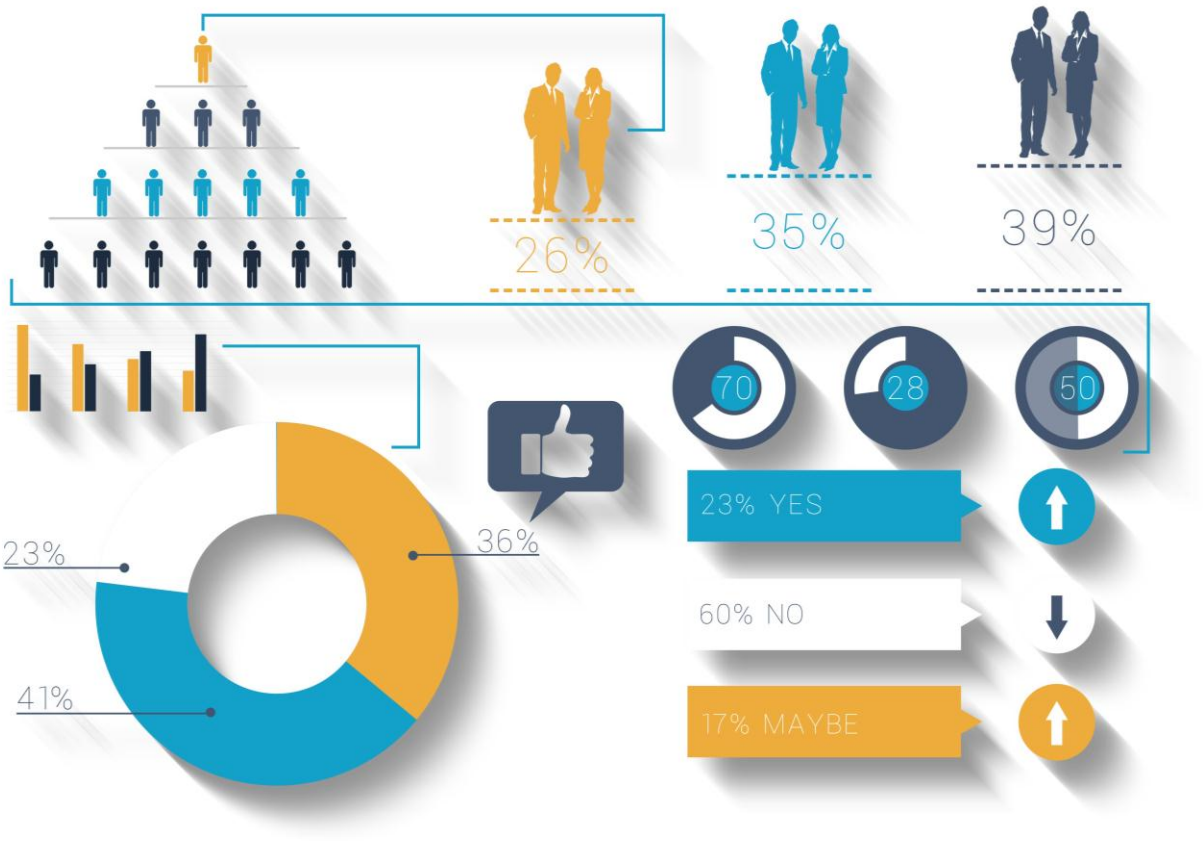
Data Powered Leadership Reform

A Business Case for Federal Operational Improvements Enabled by Quality Data



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Among the 4 million people who operate, oversee, and audit federal operations, there are nearly 8,000 senior executives who serve as the federal leaders responsible for the total cost and value of federal operations. Regardless of their career rank, each leader has a common responsibility to (a) refine the operational capability, (b) improve the operational performance, and (c) optimize the operational outcomes. For several reasons, these responsibilities are more complicated than they appear, especially within the context of a new Administration.

First, the business context is changing. Currently, federal leaders are responding to an opportunity to make deep and lasting changes to their operations. President Donald J. Trump issued an Executive Order[1] that required the Director of the Office of Management and Budget (OMB), Mick Mulvaney, to develop a plan for effective, efficient, and accountable operations throughout the federal government. In turn, Mr. Mulvaney issued an order[2] to all federal agencies to develop plans for reforming their operational capability and performance, including the performance of their respective employees. The two orders provide significant political coverage for federal leaders to be bold with the business case of their respective operational plans.

Second, the operational scopes are changing. When OMB uses the agency plans to organize government-wide reforms, they are essentially calling on each federal leader to be prepared for a broader engagement than their traditional chain of command. Federal leaders need to know how their operations are affected by other operations. The other operations may be support functions, such as information technology, human resources, or service contracting. Or, they are operations with overlapping or duplicative functions, where these functions can be consolidated or shared for cost-effectiveness. Outside of OMB, thinktanks are publishing helpful, detailed government-wide reorganization plans recommending pragmatic cures to longstanding and pervasive problems in the federal government[3]. There is now an opportunity for federal leaders to reexamine their operations' true cause-effect in federal outcomes.

Third, the agency structures are changing. Internally, agencies are structured by their ongoing re-combinations of communications and rules, technology and analytics, and workflows and teams, which in turn reinforces cultures and capabilities. President Trump issued a Memorandum[4] that established the White House Office of American Innovation (OAI). The OAI is charged with developing policies and plans to improve federal operations and their outcomes. In a recent statement OAI's Matt Lira, Special Assistant to the

[1] https://www.whitehouse.gov/the-press-office/2017/03/13/presidential-executive-order-comprehensive-plan-reorganizing-executive
[2] U.S. Office of Management and Budget, "M-17-22," April 2017. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2017/M-17-22.pdf
[3] David Muhlhausen, "Blueprint for Reorganization: An Analysis of Federal Departments and Agencies," The Heritage Foundation, June 2017. http://www.heritage.org/budget-and-spending/report/blueprint-reorganization-analysis-federal-departments-and-agencies
[4] https://www.whitehouse.gov/the-press-office/2017/03/27/presidential-memorandum-white-house-office-american-innovation

President for Innovation Policy and Initiatives, correctly identified that "the challenge is to build a culture and organizational structure that is continually updated[5]." Too often, federal leaders believe their work is limited to the design and status reporting of their respective operation; however, with OAI in place, they can also participate in improving the structure, and how it effects employee culture and internal business capability.

Fourth, the leadership support is changing. Through the Congress, federal leaders now gain support through multiple sources. The *Government Performance and Reporting Modernization Act* (GPRMA)[6] established leadership support from politically appointed executives, namely the offices of Deputy Secretaries; and in OMB, through President Trump's next U.S. Chief Performance Officer[7]. Additionally, the *Digital Accountability and Transparency Act* (DATA Act)[8] required all federal spending information to be standardized and structured for open publication and bulk use, which enables the pursuit of operation-specific costs of business. Meanwhile, the U.S. Government Accountability Office is actively assessing the leadership support in GPRMA[9], and has an implementation status report due on the DATA Act this November 2017. These laws, and their subsequent policies, demonstrate that federal leaders are increasingly supported by the Congress and the Administration.

Together, changes to the business context, operational scopes, agency structures, and leadership support create an unprecedented opportunity for federal leaders. The changes are in the fundamentals of doing business. Federal leaders no longer must restrict themselves to the legacy controls of the bureaucracy; rather, they can test and rebuild their operational capabilities, performance, and outcomes.

While the President and the Congress are moving forward in multiple aspects of reforming the federal government, each federal leader will face unique barriers. These barriers will become increasingly apparent when federal leaders develop and reveal their business cases for operational improvements.

The following is a business case that federal leaders can use to develop practical improvements, while addressing some of the likely barriers. It includes ten critical areas where federal leaders can influence improvements in federal operations.

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[5] Meredith Somers, "White House Office of American Innovation not interested in making magic, but building culture," Federal News Radio, June 2017.
[6] U.S. 111th Congress, "GPRA Modernization Act of 2010," P.L. 111-352, January 2011. https://www.gpo.gov/fdsys/pkg/PLAW-111publ352/pdf/PLAW-111publ352.pdf
[7] David Paschane, "How Donald Trump Can Make Government Work Again," Government Executive, November 2016. http://www.govexec.com/excellence/promising-practices/2016/11/how-donald-trump-can-make-government-work-again/133537/?oref=river
[8] U.S. 113th Congress, "Digital Accountability and Transparency Act of 2014," P.L. 113-101. https://www.congress.gov/113/plaws/publ101/PLAW-113publ101.pdf
[9] U.S. Government Accountability Office, "Managing for Results: Implementation of GPRA Modernization Act Has Yielded Mixed Progress in Addressing Pressing Governance Challenges," Report to Congressional Committees, September 2015. https://www.gao.gov/assets/680/672862.pdf

The timing is important. Now, with the help of the DATA Act and its supporters, federal leaders have access to the first government-wide open financial data standard, presenting the opportunity to link together agency administrative data sets for relevant personnel management, information technology, and program performance improvement analyses. In support of this progress, we provide guidance on how federal leaders, with the help of the Administration, can further define and pursue quality, structured data.

Contents

Federal Leaders' Business Case for 10 Improvement Initiatives

Business cases help prepare operational leaders, and their teams, for suitable and strategic actions. In the case of federal leaders, three key questions determine if they can develop a business case that will be an effective set of initiatives.

First, how are the legal and political conditions affecting their operations? If supportive, the political conditions will allow leaders to openly review the organizational architecture and its effects on the operation they lead. Currently, the President and the Congress largely support federal leaders in this regard.

Second, is it possible to conduct useful analyses for the operations? If quality data and adaptive analysts exist, useful analyses will enable the leader and the operational teams to understand the changing, detailed factors affecting capability and performance, and co-author testable improvements. It is possible that the President will call on OMB to provide federal leaders the support they need to mature these analyses.

Third, how well do the technologies reinforce the improvements? With the pervasiveness of mobile device applications, leaders are seeing the possibility of fitting cognitive technologies[10] to nudge employees[11], automate required artifacts[12], sustain accurate performance feedback[13], and organize streamlined tasks and transactions in support of optimized outcomes[14]. The next U.S. Chief Performance Officer may be in the best position to organize the review and application of such reinforcing technologies in operations.

If these positive changes continue, it is likely that federal leaders will have sufficient support for their operational improvement business cases. Assuming as much, federal leaders can make groundbreaking improvements that address the causes of capability,

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[10] Cognitive technologies are component-based platforms that use algorithms to combine many interactions among many classes of uses, fitted to operations through recursive analyses of optimized transactions, as well as analyses of organizational and data structures, producing an automated set of work signals, taskings, artifacts, reports, and other transactions, producing a minimization of time requirements and maximization of awareness and influence over causes of operational and employee value.

[11] See the WorkWire example on work space, though nudging can be for any objective: http://www.workwire.nl/en/workplace-nudging/

[12] William Eggers, David Schatsky, Peter Viechnicki, "How artificial intelligence could transform government," Deloitte University Press, April 2017. https://dupress.deloitte.com/dup-us-en/focus/cognitive-technologies/artificial-intelligence-government-summary.html

[13] U.S. Office of Personnel Management, https://www.opm.gov/policy-data-oversight/performance-management/performance-management-cycle/monitoring/feedback-is-critical-to-improving-performance/

[14] Tom Davenport interview: Nicole Laskowski, "Start at the 'dumb' end when implementing cognitive technologies," TechTarget Network, June 2017. http://searchcio.techtarget.com/video/Start-at-the-dumb-end-when-implementing-cognitive-technologies

performance, and outcomes, as well as the more elusive nature of culture, as *performance leadership*[15].

The following are the ten initiatives we think are critical to government reform, and practical improvement targets in every federal operation. Our major assumptions are that federal leaders will continue to get the support they need to (a) access quality data, and (b) overcome legacy bureaucratization—topics we discuss in the subsequent sections.

1. Sustain Employee Motivation
2. Amplify Employee Concentration
3. Broaden Employee Awareness
4. Enable Employee Discretion
5. Specify Operational Causality
6. Pursue Structural Adaptations
7. Optimize Management Algorithms
8. Clarify Outcome Attribution
9. Integrate Citizen Advocacy
10. Enable Political Oversight

Sustain Employee Motivation

Federal leaders need to sustain employees' motivation, especially when they are working in an operation that is surrounded by a large bureaucracy. A major driver in employee motivation is sustained and effective feedback on evidence that their work adds measurable value. The feedback must be clear and consistent, based on reliable data, and adaptive to changing work requirements.

The feedback analyses should partition the work and its associated achievements, as well as show the combined achievement through teams. Routine use of feedback requires basic task and transaction data within an operation. It also requires a means of determining the measurable complexity of work tasks, so they can be weighed against a standard set of performance requirements. Ideally, the feedback analyses are presented to employees automatically, through their operational management system. This allows the leader to focus on reinforcing the analytic messages, with an emphasis on targeting in-work training.

[15] Performance leadership is an operational state of individual work value where the employee is supported by the organization to readily test enhancements in work factors to improve work effects. David Paschane, "Performance Leadership," Workshop on Information and Organizational Architecture, European Institute for Advanced Studies in Management, March 2012. http://www.eiasm.be/userfiles/file/2002/Ws%20on%20Information%20Programme(1).pdf, and as guidance in federal analytics: https://www.vendorportal.ecms.va.gov/FBODocumentServer/DocumentServer.aspx?DocumentId=900778&FileName=VA119A-13-R-0134-A00001001.docx

Consultants are starting to advise federal leaders to sustain employee motivation through feedback data[16], and at least one successful case in the federal government has been published for review[17]. A perfect feedback loop is not required from the beginning of an initiative. The reality of feedback is that it requires continuous adjustment to determine which analyses are most effective among employees, given the uniqueness of their respective work.

Amplify Employee Concentration

Work concentration can be difficult for anybody, but made even more difficult in bureaucracies, as the culture can create an emphasis on merely being physically present, while allowing for unplanned interactions, ambiguous work plans, and delayed work transactions.

Leaders need only a few key data to amplify employee concentration. The data are discrete, prioritized, time-weighted tasks to individual employees, as in an individualized worklog. The worklog is empowering to employees. They can rely on it to self-manage performance, justify changes in work conditions (e.g., telework, standing desk), and concentrate on tasks without worrying about the ambiguity of the larger array of work tasks. Even among teams and complex transactions, nearly every type of work can be organized as tasks in a worklog.

Worklogs can be very simple individualized data sheets, or they can be integrated into a team's workflow management tools, such as a management analytic platform (MAP)[18]. We have seen many cases where worklogs are integrated into work design. Among federal leaders, these include (a) organizing effective responses to customers' service feedback[19], (b) producing all major artifacts among several offices[20], and (c) preparing business cases for contracts and budget justifications[21]. In each of these cases, the employees co-author the worklog design, thus enhancing their on-going concentration.

[16] Marcus Buckingham and Ashley Goodall, "Reinventing Performance Management," Harvard Business Review, April 2015. https://hbr.org/2015/04/reinventing-performance-management
[17] Tracy Mayor, "IT to the rescue: Unraveling bureaucracy at the VA, one project at a time," Computerworld, April 2013. http://www.computerworld.com/article/2497166/it-management/it-to-the-rescue--unraveling-bureaucracy-at-the-va--one-project-at-a-time.html
[18] Management Analytic Platform is a pre-coded architecture that is fitted to most any case-based processing to ensure case control, multi-user changes, productivity and audit reporting, and efficient throughput of actions.
[19] U.S. Department of Veterans Affairs, Deputy Assistant Secretary for the Office of Administration: Customer Feedback MAP.
[20] U.S. Department of Veterans Affairs, Undersecretary for Benefits: Headquarters Production MAP.
[21] U.S. Department of Veterans Affairs, Chief Learning Officer for the Veterans Health Administration: Employee Training MAP.

Broaden Employee Awareness

Broad awareness is key to converting employees from task-takers to performance leaders[22]. As employees better understand the cause-effect of their work in the total operation, the more they can participate in monitoring and influencing factors affecting the operation. In contrast, a lack of broad awareness can lead employees into isolated thinking, where they are discouraged from increasing value, and become disenfranchised from the agency mission.

Broad awareness includes a trending of the scope and performance in work. An adaptive set of trending factors, presented to employees, produces an analytic culture based on broad awareness, and comprehensive influence over capabilities. The challenge is in making sure the trending factors are relative and visible. Relative trends are adaptive to emerging operational needs, and they are expected to change over time, as employees interact with the data. The visible trends are those presented directly to employees, which can include managers and executives, but often in formats, aggregated or disaggregated, as is suitable to the user.

Two examples offer a useful contrast. The Federal IT Dashboard[23], for all its utility, does not broaden employee awareness because it is not relevant to specific cause-effect factors in specific IT operations. However, the *IT Dashboard* for the 200 technicians at the VA headquarters, designed by the lead author, did detail cause-effect trending for individuals and teams, thus increasing their broad awareness. The latter example resulted in nearly a third of the employees volunteering to improve work designs.

Enable Employee Discretion

Enabling employee discretion is foundational to empowering employees[24], as you ensure they can analyze and test changes in work designs. Employees are the most effective at identifying where practices and capabilities affect tasks and transactions in work. The goal is to organize discretion that is reasonable for the organization and the employee.

The lead author tested methods of enabling employee discretion at the VA, with the U.S. Office of Personnel Management (OPM) in 2013. OPM was actively providing advisory services to federal leaders, but had not yet focused on means of empowering employees within the process of improving work designs. The six-month demonstration project[25] focused on a 200-employee office responsible for technology services to 10,000 headquarters staff. Over 30% of the technologist volunteered, and were organized into small teams. Each volunteer was allowed up to 2 hours a week for evaluating and testing

[22] See *Performance Leadership* above.
[23] https://www.itdashboard.gov
[24] Darrol Stanley, "The Impact of Empowered Employees on Corporate Value," Graziadio Business Review, Volume 8, 2005. https://gbr.pepperdine.edu/2010/08/empowered-employees/
[25] David Paschane, "Case for Performance Architecture Science Systems in Personnel Service Strategies," paper presented to HR Strategy and Evaluation Solutions, HR Solutions Division, U.S. Office of Personnel Management, June 2013.

enhancements to 5 types of services, and all plans and actions were measured and reported back to an internal advisory team. The measured changes in general productivity, by work stream, rose 15% to 300%.

The example demonstrates that having organizationally-structured opportunities for value-added discretion, whether used or not, creates a positive effect on performance among all employees. The path to reasonable employee discretion is first engaging them in defining and measuring work tasks and transactions[26], and then organize time for testing alternative work designs. Formally allowing employees time to volunteer helps, as they are motivated to engage different aspects of the work, and gain credit for improving work designs.

Specify Operational Causality

Every operation needs a working model of what it takes, or will take, to improve capability, performance, and outcomes. The model is used to organize and measure the causal factors in the tasks, transactions, talent, data, and artifacts; as well as the structure and culture.

A leaders' influence on an operation's performance is largely shaped by knowledge of true operational causality. If the operational causality is readily specified, then the operation can avoid disjointed or miss-fitted actions. The flawed actions can be costly and have unwanted consequences, such as disengaging employees, overlooking their real development needs, wasting resources on overly complex plans or products, or reinforcing unnecessary bureaucratization.

Operational causality is necessary for determining the return on investments, especially in employee development. Most employee development should focus on how it effects the operational performance, thus the specific causes of operational capability. If the operational causality is specific and accurate, then cost-effective training can be calibrated to fit the development of in-work skills. An example is the *Training Value Indicator*[27], which pinpoints the analytic line between an emerging operational need and an available employee development investment. While there are many causes in operational performances, the leading cause is employee-based capability (skills and their engagement factors noted above), followed by their data, their tools, and the organizational structure and any of its overlooked bureaucratization (discussed below).

Pursue Structural Adaptations

Every operation is significantly affected by its surrounding organizational structure. The structure of the organization includes policies and rules, workflows of transactions and decisions, data collection and delivery, messages and communication delivery, and

[26] Lean methods are often used to define and measure tasks, but this is not necessarily required for such.
[27] Training Value Indicator is a component algorithm in the Enterprise Optimized Personnel Skilling (EOPS) architecture, and VA used a portion of EOPS to address conference training among their medical teams. EOPS addresses the eight major functions that create a capability-ready workforce.

workforce development and teaming. Likewise, culture and structure reinforce each other. It is necessary that operational leaders evaluate and help improve the structure.

Routine analysis of structural elements allows for the pursuit of structural adaptations. The leaders' basic analyses include on-going awareness of the cause-effect relationships between structural factors and operational factors. A helpful framework for anticipating the factors in structural analysis is *Performance Architectural Science Systems*[28], or PASS. PASS was developed from the behavioral-organizational sciences, and is used to organize and design assessments and tools used to know and influence operational, cultural, structural, and contextual factors. An example of using PASS was the comprehensive research on veteran employment outcomes, at the request of Congress (P.L. 108-454, Section 211)[29].

According to PASS cases, there are many common findings in organizational structure that lend themselves to reasonable structural adaptations. For those operations in large organizations, the structural adaptations may require cooperation from among multiple federal leaders, especially if there are inherent bureaucratic barriers.

The following three actions can help resolve these barriers when leaders cooperate within the total organization:

Replace narrow-purpose offices with dynamic teaming. Large organizations tend to create narrow-purpose offices, where they have limited operational value. An effective response is to replace the narrow-purpose office with a robust coordination of cross-operational employees, where they can bring various mixes of expertise, and work as temporary or as-needed within the operations. Dynamic teams help avoid unnecessary duplicative budgets, and the lengthy transactions that narrow-purpose operations tend to create.

Consolidate employee development analytics. Often, an organization will create multiple offices to manage divergent, and often misaligned, investments in employee development. All employee development needs to be a single investment portfolio, with analyses to determine the return on investment, given improvements in operations. If analytically consolidated, the organization gains up-skilling efficacy, control over operational effects, and deliberate increases in measurable value among teams and operational issues.

Integrate standard analytic functions. The typical organization has many operational analyses that are isolated from the organizational whole, thus miss opportunities to understand and influence structure. An integrated analytic function helps federal leaders

[28] David Paschane, "Performance Architectural Science Systems," Aplin Labs, June 1994. See reference to limited federal use in VA contracting portal, VA119A-13-R-0134-A00001001.
[29] Abt Associates, "Employment Histories Report" Report to the U.S. Department of Veterans Affairs, September 2007. Revised version:
https://www.va.gov/vetdata/docs/SurveysAndStudies/Employment_History_080324.pdf

acquire structured, consistent, unadulterated data and analyses that can readily explain the interactions between operations and within the changing structure. Furthermore, integrated analyses can simplify and automate much of the oversight requirements on the operations, and the total organization.

Optimize Management Algorithms

The center of every successful management design is the use of an algorithm, where the small and large decisions are guided by a mathematical equation that accounts for the many-to-many relationships in operations, such as services-to-customers or trainings-to-employees[30]. The purpose of an algorithm is to apply necessary measures of alternative conditions or parameters to a decision. Management algorithms can operate on a simple spreadsheet, or in a large integrated workflow.

The contemporary method of optimizing management algorithms is through cognitive technologies (defined above), where the algorithm, or integrated algorithms, are used to reinforce multiple actions. These actions can include the timing and review of tasks and transactions, the automatic delivery of work signals to employees, the production of work artifacts, and others.

There are many examples of optimized, well-fitted management algorithms in use throughout the federal government. Hopefully, future uses will be engineered to address some of our most critical and complicated needs. For example, the Congress requires the U.S. Food and Drug Administration to measure and manage the effects we have on food safety training among millions of private sector employees who participate in food production and distribution, globally[31]. The many-to-many relationships in food safety are complicated by those decisions in food risks and those in employer's compliance. All of which argues for optimized management algorithms.

Clarify Outcome Attribution

As the goal of each federal operation is to create an optimized outcome, it is logical that we determine to what degree is a specific operation contributing to the varied outcomes in people, institutions, markets, and the environment. Clear outcome attribution requires analyses of what other operations are servicing to the same issues or jurisdictions. Otherwise, we cannot say how a specific issue is affected by a specific operation.

Jurisdictional analyses are essentially geographic analyses, that account for the government authorities who may overlap in the geography. For example, a federal operation may deliver funding to a state, and the state distributes the funds to counties,

[30] The trainings-to-employees requirement is most notable in large groups of employees that require continuous monitoring and improvement in critical skills, such as Foreign Service Officers (State), Special Forces Operators (DoD), Ship Builders (Navy), Medical Staff (VA), Food Chain Operators (FDA), Intelligence Analysts (IC), Case Arbitrators (SSA), and Border Patrol Officers (DHS).
[31] U.S. 111th Congress, "FDA Food Safety Modernization Act" P.L. 111-353, January 2011. https://www.gpo.gov/fdsys/pkg/PLAW-111publ353/pdf/PLAW-111publ353.pdf

and each county has a mix of services that are tailored to the specific needs of the constituents. In this example, the analyses are unique to each county, and consider the mix of services. The jurisdictional analyses help with outcome attribution because the analyses can localize the nuances of service causality.

In a similar way, geographic analyses allow an operation to analyze outcome attribution by statistically controlling for the localized nuances that may affect a specific issue. For example, if the U.S. Department of Housing and Urban Development is committing funds to relieve homelessness, then the unique demographics and market housing supply are accounted for among jurisdictions, by mathematically separating their effects on the total funding initiative. The geo-analytic approach to outcome attribution has many benefits, including the on-going planning of operational offices, personnel, interventions, training, and other elements, based on evidence of its relative effects.

Integrate Citizen Advocacy

Federal leaders need citizen feedback to determine the true, net value of their operations. The feedback is delivered in two common formats. First, citizens can, and should, provide convenient feedback at points of government services, or soon after through online applications. Second, community and jurisdictional leaders can provide feedback on the services of operations, as these are contextualized to local conditions and needs. Both sources of feedback are critical for determining value.

The integration of citizen advocacy is in how the two sources of feedback are matched into two other sources of data[32]. First, the case-by-case analysis of operational performance, where cases receive valid feedback, are examined and resolved, and the findings are used to understand and improve services in the future[33]. Second, the aggregated, publicly reported analyses of operational services and their outcomes are examined against the feedback of community and jurisdictional leaders to also improve performance, capability, and value, to better address the nuances of local needs.

Without integrated citizen advocacy, arguments regarding the value of operations is merely a fight for attention without evidence of consequences. Federal leaders need verified cause-effect data from the full range of feedback sources. Citizen advocacy, in these integrated formats, is fundamental to the very justification of government activities. If the citizens routinely complain about the services, then the operations should be given the most intense scrutiny, both in terms of performance and approval to operate at all. In the instances where two agencies provide a similar service—high quality data will help clarify

[32] Customer experience is a central measurement in the commercial market; and, a popular integration tool among the Fortune 100 and U.S. business schools is the Qualtrics Customer Experience platform.
[33] An example of this analysis is in the U.S. Department of Veterans Affairs, Office of Administration, and is used to improve customer services, where the customer is internal employees.

which agencies better serve citizens, who may then shift their demands to the better government provider[34].

Enable Political Oversight

It is rare to hear that a federal leader is working to enable political oversight, but it is this very oversight that builds support for optimizing operational outcomes through all the nine actions noted above. Members of Congress, the Government Accountability Office, Inspector Generals, and external oversight organizations need operations to be transparent, through quality data, if they are to readily analyze and support the resources and plans that make an operation successful and valuable in disparate communities.

The customers of federal operations are U.S. citizens, and they rely on political oversight to ensure that their major investments in government operations, through taxes, are used prudently and have their intended effects. Regardless of their political interests, every citizen knows that federal agencies are expensive, but they expect their elected leaders to oversee efficiency reforms[35].

Political oversight requires unadulterated, secure, audited, and validated data because the findings of such analyses have significant impacts on the course of federal operations. If the data are of high quality, and shared, it helps expand political oversight beyond Capitol Hill to the private sector. These outside eyes provide a check against self-interested governmental agencies and their advocates. For example, software developers use government data to create new apps and interfaces, such as GovTrack.us. Researchers at universities and think-tanks regularly compile and analyze government data to assess government programs and activities[36]. These same researchers frequently find themselves testifying before Congress about their research and findings. Additionally, due to the rapid course of political issues, even the best investigative oversight is forgotten in the typical information cycle. Non-government analysts can help sustain attention on the accurate causality, cure, and progress of changes.

[34] Citizens seeking to obtain or renew their passports would shop differently if they knew whether they would receive more expeditious service if they apply at U.S. Postal Service Offices or State Department passport offices.

[35] While most citizens may not pay attention to the management details of the federal government, they directly experience the costs of government. Among those who pay taxes, on average, a third of their work life is paid as taxes to government operations without a clear report on measures of effects or efficiency; and while many services are provided, whether individuals need them or not, most of the funds are for payments to others, often delivered inefficiently, without the intention of changing others' need for the payments, which, is a systemic inefficiency of government operations. Nobody would pay a doctor to treat them if there is no plan for a cure.

[36] Kevin Kosar, "Outsourcing Oversight through Open Government Data," Public Administration Times, December 2015. http://patimes.org/outsourcing-oversight-open-government-data/

Pursuing Secure and Shared Quality Data

The complex history of federal operations has produced a bad data environment. Much of the required data are either poor in quality, or unavailable[37]. As a result, federal leaders are forced to work around the data, rather than use the data to improve their operations.

Federal leaders pursue quality data for basic management needs, which are evaluating cause-effect in performance, and testing alternative operational designs. They need the data to know how their changes in operational or structural designs will affect employees' performance, the cost of operations, the delivery of services, and the outcomes of services as they impact citizens.

The lack of quality data for operational analyses in any one instance may not seem significant to the nation, but when examined in total federal leaders' discretionary spending, it is at least $1.2 trillion[38]. This is a significant, unclear financial burden on the taxpayer. It is especially unwarranted when federal leaders do not have the data to determine the return on these annual investments.

Quality Data

We define quality data as having three main characteristics.

Accurate

Data **accurately represent specific measures** of objects, times, places, and actions, and those measures can be verified as accurate and trustworthy. Descriptive information is not necessarily data, and to rely on arbitrary descriptions without verifiable measures is to allow for operational ambiguity and misrepresentation of facts.

Consistent

Data are **formatted consistently** to ensure measures have the same meaning, regardless of management differences in operations or organizations. Standard data are essential to making data useful. Units of measures and rules for rounding numbers must be the same within and across all operations.

[37] Even federal financial data, which merely aim to clarify where funds are spent, are notoriously conflicting and unreliable. U.S. Congressional Research Service, "Federal Financial Reporting: An Overview," R42975, October 2013. https://www.everycrsreport.com/reports/R42975.html

[38] U.S. Congressional Budget Office, "A Closer Look at Discretionary Spending," February 2017. https://www.cbo.gov/sites/default/files/115th-congress-2017-2018/graphic/52410-budgetdiscretionary.pdf

Controlled

The **handling of the data is controlled** to prevent human errors or adulteration. The basic requirement of information technology is to control the data so that it follows a consistent format and is reliably accurate. At a minimum, every data collection should be technically controlled to prevent errors, and once collected and verified, it cannot be changed to suit arbitrary interests.

These characteristics align with both generally accepted principles of quality data[39] and federally recognized core principles of open data.[40] Make no mistake, pursuing **accurate**, **consistent**, and **controlled** data requires significant attention on two fundamental issues – how the data are secured, and how they are shared.

Secured Quality Data

The Administration needs an advocate and facilitator for standard methods of data security across all federal agencies. We have federal standards for information audits[41] and IT infrastructures[42], but not necessarily methods of building data security from the ground up. Ideally, federal leaders would have access to a research-based service team that is readily available to assist them. The same team would be responsible for testing, promoting, and verifying methods among federal agencies. The scope of their methods would include means of optimizing data user governance and metadata standards, and verifying controls over data on-boarding, access and authentication, and data decoupling, keying, and encryption.

A key feature in data security methodology is the ongoing analyses of all cases where changes are planned or made to rules, products, and conditions. The rigorous analyses of these many cases and many changes can require a MAP (described above), which can also allow for greater consolidation of data security functions. Another feature of data security is testing and validating how all federal technology is built and used to prevent malicious or neglectful actors from corrupting our technology in its supply chain[43].

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[39] Center for Open Data Enterprise, "Briefing Paper on Open Data and Data Quality," April 2016. http://reports.opendataenterprise.org/BriefingPaperonOpenDataandImprovingDataQuality.pdf

[40] CIO.gov "Project Open Data: Open Data Principles," Accessed July 10th, 2017. https://project-open-data.cio.gov/principles/

[41] Ron Ross, Patrick Viscuso, Gary Guissanie, Kelley Dempsey, Mark Riddle, "Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations," U.S. National Institute of Standards and Technology, 800-171, June 2015. http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-171.pdf

[42] https://www.fedramp.gov

[43] Jon Boyens Celia Paulsen Rama Moorthy Nadya Bartol, "Supply Chain Risk Management Practices for Federal Information Systems and Organizations," U.S. National Institute of Standards and Technology, 800-161, April 2015. http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-161.pdf

In addition to the technical methodology of data security, there is also a need to address the culture of data security among all federal employees. As noted above, culture drives the operations, including their data security. Employee attitudes about data security will affect the extent to which specific individuals follow formal rules.

For example, the Department of Veterans Affairs (VA) has struggled with data security violation and failed data security audits for many years[44], and has lost or publicly exposed millions of veterans' data[45]. In 2012, VA examined how it might change its data security culture. They used a prototype Security Learning Integrated Network (SLIN)[46] to facilitated automatic enterprise-wide delivery of issue-specific artifacts. The artifacts included priority work actions, including messages, guides, briefs, videos, surveys, and cases that supported how all 365,000 employees could reinforce data security. The uniqueness of the SLIN was that it used an algorithm to infer the fit between the users and the artifacts, thus increasing the likelihood of their use. The SLIN demonstrated a culture change, in that during the delivery of millions of artifacts, 58% of employees reported they had actively used such artifacts, at their discretion, to change data security conditions.

Shared Quality Data

Sharing data raises the question: Which kinds of data can be shared with whom? Who has access to shared data is less of a problem when we know and use effective methods of defining properly define data access what can be shared and in what apply format controls on, and, as outlined above, the security of the properly secured data (as discussed above) access. There are essentially two types of data, *material* and *operational*.

Material data

Data that represent persons, places, and things. These are generally reported as aggregated measures to avoid the chance of releasing private or sensitive data elements. The sensitive data requires specialized protections, both technologically and legally. If summarized or transformed into a proxy measure, most material data can be shared without violating privacy rules or security protocols.

[44] U.S. Department of Veterans Affairs, Office of the Inspector General, "Federal Information Security Modernization Act Audit for Fiscal Year 2015," 15-01957-100, March 2016. https://www.va.gov/oig/pubs/VAOIG-15-01957-100.pdf

[45] Gautham Nagesh, "VA loses another laptop with veterans' personal data, prompting inquiry," The Hill, May 2010. http://thehill.com/policy/technology/97817-va-loses-another-laptop-with-veterans-personal-information

[46] The progress of the Security Learning Integrated Network (part of the Continuous Readiness in Information Security Program) was reported by VA in the 2012 March/April issue of Vanguard (VA magazine), page 4. No follow up verification of the demonstration project was reported by VA.

Operational data

Data that represent the resources, decisions, transactions, outputs, and outcomes of work. These data are generally non-sensitive and can be readily shared. Federal leaders have a lot to gain from sharing operational data. If properly maintained and widely accessible, operational data can be used to trace, explain, and improve the cause-effect relationships in operations, organizations, markets, and citizen experiences. Among federal employees and outside analysts, alike, shared operational data encourages collaborative testing, modeling, and designing of improved operations and teams. In short, the availability and verified maintenance of these data foster natural innovation from the ground up.

In addition to data types, there are meaningful differences in data credibility, as determined by the robustness of its representation. Data are more credible when they represent the true complexity of a phenomenon. Therefore, data sharing is valuable because it increases the likelihood that data can be properly refined and then combined and used by different analysts.

The credibility of data is determined differently, depending on the use.

Case data is the most common data used by federal leaders. It organizes the workforce for specific tasks, organizes a means of performance evaluation, promotes an interest in innovation, and justifies a specific budget. Case data are credible when they clarify enough cause-effect factors to support a decision or action. If the case data are robust, the evidence can explain the capability, efficiency, effectiveness, and impact of actions.

Comparative data is employed to promote a broad, peer-review of cases, where the collective experience of the leaders helps determine the potential veracity of the cause-effects in different contexts. Comparative data are often used to determine the best cases to emulate, or average cases by which to compare measures of future cases. Comparative data are credible when the standards and structures of the data allows analysts to examine the differences between cases.

Validated data is case data that are highly comparative and produces findings that allow for generalizability to future cases. Because of its credible generalizability, the results of validated data are often published. Wherever possible, full datasets should be published to be used repeatedly to improve the operations that they represent. Validated data are credible when analysts have significant control over the variables that create differences between cases. This is the traditional testing method, where extraneous or conflicting factors are physically removed from each case, or statically controlled to minimize their effects on outcomes.

Federal leaders are not obligated to use data in the same way; however, they should be encouraged to use highly credible data, regardless if it is used for case, comparative, or validated analyses.

Addressing the Realities of Federal Bureaucratization

The quality and utility of data reflects the organization's true nature. And in most cases, federal agencies are long-time bureaucracies, that continue to be in a state of bureaucratization.

Bureaucratization is a tendency to layer controls into work practices at the expense of adaptive, or growing work capability. There are many reasons for bureaucratization, and they are driven by hundreds of factors in internal operations, culture, and structure, and the general context of politics, laws, and markets. A popular response to bureaucratization is to call for more innovation. The problem with this request is that it ignores the bureaucratization that is already dominating the organization, and affecting the internal operations.

Conceptually, organizations vary in their state of bureaucratization from a *light enterprise*, where bureaucratization is actively resisted, to a *heavy bureaucracy*, where bureaucratization is the overwhelming interests of its leaders, though not intentionally. Bureaucratization is a never-ending challenge for federal leaders. While they may lead many people and use advanced systems, they also face bureaucratization factors that slowly diminish the effectiveness of their analytic and decision control.

Bureaucratization is a process that is examined in the PASS discipline[47], where there is a concentration on six sets common cause-effect trends:

1. General tolerance for low-utility data, due to disintegrated data and tasks.
2. Ambiguous cause-effect pathways, due to over-complicated transactions.
3. Inefficient causality awareness in the hierarchy, due to disengaged employees.
4. Inflexible work designs, due to entrenched structural controls.
5. Temporary risky carve-out project, due to diffused operational responsibilities.
6. Isolated and devalued expertise, due to imprecise capability development.

There are few studies that explicitly examine bureaucratization and its effects in government operations. Still, there are a few indications of its measured effects. Studies demonstrate through various organizations, that 40% of mangers' time is in working on reports, and another 30% to 60% is in coordination meetings[48]; 50% of office work is only

[47] David Paschane, "Performance Architectural Science Systems," Aplin Labs, June 1994. See reference to limited federal use in VA contracting portal, VA119A-13-R-0134-A00001001.
[48] Yves Morieux, "Smart Rules: Six Ways to Get People to Solve Problems Without You," Harvard Business Review, September 2011. https://hbr.org/2011/09/smart-rules-six-ways-to-get-people-to-solve-problems-without-you

managing information[49]; 80% of commonly used spreadsheets have errors[50], 70% of business change efforts consistently fail[51] [52]; and 13% of risks in patients is attributed to bureaucratization[53]. The estimated direct U.S. costs is to businesses is $900 billion[54], and the estimated cost through government bureaucracy is $1.75 trillion[55].

One could also argue that many of the mission failures in government are attributed to bureaucratization. For example, in 2015, the Inspector General of the Social Security Administration reported that citizens are waiting 270 days for a hearing, and 450 days for a decision on their claims[56]. It is unbelievable that among some of the most needy and vulnerable citizens in our nation[57], they are waiting two years to get a response from the federal government. The report received political oversight, but the attention waned as new issues emerged. Meanwhile, there is a constant flow of major government failures, attributable to specific federal operations, that have historical significance because of deaths and abuses of taxpayers[58], but these are quickly forgotten because of a lack of

[49] Jonathan Spira, "Information Overload: Now $900 Billion – What is Your Organization's Exposure?" Basex, December 2008. http://www.basexblog.com/2008/12/19/information-overload-now-900-billion-what-is-your-organizations-exposure/

[50] Thomas Wailgum, "Eight of the Worst Spreadsheet Blunders," CIO Magazine, August 2007. http://www.cio.com/article/2438188/enterprise-software/eight-of-the-worst-spreadsheet-blunders.html

[51] John Kotter, "Leasing Change: Why Transformation Efforts Fail," Harvard Business Review, January 2007. https://hbr.org/2007/01/leading-change-why-transformation-efforts-fail

[52] Carolyn Aiken, Scott Keller, "The Irrational Side of Change Management," McKinsey Quarterly, April 2009. http://www.mckinsey.com/business-functions/organization/our-insights/the-irrational-side-of-change-management

[53] David Paschane, "A theoretical framework for the medical geography of health service politics," Dissertation, University of Washington, June 2003. http://www.worldcat.org/title/theoretical-framework-for-the-medical-geography-of-health-service-politics/oclc/55084292&referer=brief_results

[54] Jonathan Spira, "Information Overload: Now $900 Billion – What is Your Organization's Exposure?" Basex, December 2008. http://www.basexblog.com/2008/12/19/information-overload-now-900-billion-what-is-your-organizations-exposure/

[55] U.S. Small Business Administration, Office of Advocacy, "The Impact of Regulatory Costs on Small Firms," September 2010. https://www.sba.gov/advocacy/impact-regulatory-costs-small-firms

[56] U.S. Social Security Administration, Office of the Inspector General, "The Social Security Administration's Efforts to Eliminate the Hearings Backlog," A-12-15-15005, September 2015. http://oig.ssa.gov/sites/default/files/audit/full/pdf/A-12-15-15005.pdf

[57] Another notable example of a vulnerable population that federal operations are supposed to serve directly is the wounded who are released from the military as veterans.

[58] In 2009, (1) 13 dead and 43 wounded by shooter at Ft. Hood, and (2) a bomb was found on a U.S. flight to Detroit. In 2010, (3) federal employees caught spending $823,000 in Las Vegas, and (4) 11 die from 87 days of oil pollution near our gulf shores. In 2011, (5) the postal service is bankrupt and closes many services, and (6) 1 U.S. officer killed by our firearm distribution in Mexico. In 2012, (7) 13 Secret Service officers are caught violating polices overseas, (8) federal employees caught spending $6.1 million in Orlando, and (9) 4 U.S. agents are killed in a Benghazi terrorist attack. In 2013, (10) the IRS is found illegally mistreating thousands of citizens, (11) 3 killed and 250 wounded in a Boston terrorist attack, (12) 12 killed and 3 wounded in Navy Yard shooting, (13) 14 killed in preventable ammonium nitrate explosion in Texas, (14) federal contractor stole 250,000 secret files, and (15) millions are unable to use the U.S. health insurance registry. In 2014, (16) 40 die while 57,000 are put at risk because federal employees manipulate treatment scheduling data. In 2015, (17) 3 states face poisoned water from a 3-million-gallon toxic spill in Colorado, (18) 22.1 million are put at risk because of stolen personnel records at OPM, (19) a $1 billion military surveillance blimp crashed

federal requirements for reporting to the public their cause-effects, cure, or change to operational designs.

The long-term damage of bureaucratization is that it traps federal employees in a state of value confusion and collective stagnation. If bureaucratization is allowed to overtake federal agencies, we can expect poor quality data, incomplete analyses, and ineffective federal operations, regardless of who leads them or oversees them.

Recommendations for the Administration

The business case outlined above is meant to help federal leaders pursue practical, feasible actions in improving operational capability, performance, and outcomes. Some federal leaders will feel that these initiatives are out of their reach, given the barriers they face, or have faced in the past.

We believe there are two main barriers: (1) Overbearing bureaucratization (including the chain of command), and (2) the ability to conduct cross-operational analyses (due to lack of quality, secure, and defined data). The Administration can help.

1. **Utilize high-quality data in government-wide management.** The most fundamental support the Administration can provide is fostering the propagation of secured and shared high-quality data schemas for federal leaders to utilize within their agency lines of business. With such data, leaders can sustain improvements in operational capability, performance, and outcomes.
    a. OMB should adopt the DATA Act Information Model Schema (DIAMS) as the primary government-wide *operational data* format to align various agency business functions. With over 400 unique data elements the DAIMS represents the most comprehensive and unified schema of federal operations in US history[59]. The DAIMS's open documentation architecture allows for ready expansion and linkage to other administrative datasets.

in Pennsylvania, and (20) 14 killed and 22 wounded in terrorist attack in San Bernardino. In 2016, (21) 49 killed and 59 wounded in terrorist attack in Orlando.

[59] The DAIMS links budget, accounting, procurement, and financial assistance datasets that were previously segmented across agency systems and databases. Currently the DAIMS includes 24 data elements related to *budget*, 48 elements representing *accounting*, 272 elements covering *procurement*, and 62 elements capturing *grants* information. See: https://fedspendingtransparency.github.io//data-model/

i. OMB's required *Annual Performance*[60] and *Annual Financial Report*[61] processes should be modernized in a machine-readable, DAIMS aligned schema.
ii. In accordance with the DATA Act's Section 5 vision for a grant reporting modernization and the work completed by the HHS *DATA Act Program Management Office* pilot project[62], OMB should create a centralized grant reporting process to extend the DAIMS's ability to track post-award federal spending.

b. OMB should adopt and codify the governance body of the National Information Exchange Model (NIEM) [63] and encourage the schema's use as the primary government-wide *material data* format to facilitate inter-agency and state-local records exchange around shared missions. The NIEM project, currently administered voluntarily by DHS, manages the expansion of community based schema governance processes (there are currently fourteen specific domains including human services, justice, emergency management, etc.)[64]. In coordination with the data standardization work of GSA's US Data Federation[65] (an outgrowth of the Data.gov effort) and Project Open Data[66], NIEM stands poised to foster a base of standardized material data to inform the natural harmonization of common mission data within agency environments.
c. OMB's initiative to adopt a government-wide Technology Business Model (TBM) taxonomy, to enable standardized federal technology investment data, should be commended. As referenced in the Fiscal Year 2018 budget request, OMB should build upon the DAIMS as they integrate the TBM[67] within the context of the annual Capital Planning and Investment Control (CPIC) process[68].

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[60] Office of Management and Budget, "Circular NO. A-11 - Part 6 Strategic Plans, Annual Performance Plans, Performance Reviews, and Annual Program Performance Reports," 2016. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/a11_current_year/a11_2016.pdf
[61] Office of Management and Budget, "Circular NO. A-136 – Financial Reporting Requirements," October 7, 2016. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A136/a136_revised_2016.pdf
[62] https://www.hhs.gov/about/agencies/asfr/data-act-program-management-office/section-5-grants-pilot/index.html
[63] https://www.niem.gov/communities/niem-community
[64] https://www.niem.gov/communities/domain-governance
[65] https://federation.data.gov/initiatives/
[66] https://project-open-data.cio.gov/
[67] Mark Rockwell, Ben Berliner, "What's next for spending data?," Federal Computer Week, June 30, 2017. https://fcw.com/articles/2017/06/30/whats-next-for-spending-data.aspx
[68] See page 195, Office of Management and Budget, "Fiscal Year 2018 Budget of the U.S. Government Analytical Perspectives: Chapter 16 – Information Technology", May 2017. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/ap_16_it.pdf

2. **Require public sharing of quality operation data.** The Administration can save money and improve performance by making operational data more readily available to the public, including stakeholders and Congress. Reliable availability of unadulterated operational data would strengthen the performance oversight in operations, and save taxpayers many billions of dollars in reporting costs[69]. And, share the DATA Act's full, source-level publication of agency-reported data in a format available for bulk download and analysis by third-parties[70]. The change in internal and external analytic capability would help focus federal leaders on the needs of employees and their respective operations, rather than completing reports to oversight bodies. In a similar way, the Administration can require agencies to investigate every operation that has a many-to-many requirement in actions-to-people, and specific the data sharing that would mitigate the risks in such complex operations.

3. **Require all senior executive to report operations in a standard format.** Citizens and federal employees would benefit from transparency among the nearly 8,000 senior executives. The Administration can require every member of the senior executive service to acquire quality data, and report, in a standard format, their respective operations, risks, analyses, cases, and rigorous methods of improvements[71]. The consistency in the executives will reinforce the political cover already being created by the Administration.

4. **Define the office of the U.S. Chief Performance Officer (CPO).** The Office of the CPO can provide on-going, specialized support in resolving bureaucratization, adopting quality data, and organizing cross-operational inefficiencies.
    a. Require the CPO to operate dedicated "SWAT-like" teams[72] that provide rigorous cross-government capability and performance analyses.
    b. Require the CPO to manage a cross-agency team for studying and promoting shared and secure data in federal operation, including the interoperability of datasets.

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[69] An estimate provided by Congressman Issa is that each request to an agency generates an average workforce cost of $100,000 to complete. If each member of Congress made one request of each operation in a year, the cost would come to $174 billion a year.
[70] https://api.usaspending.gov/
[71] David Paschane, "5 Necessary Actions by SESers," Federal News Radio, April 2017. https://federalnewsradio.com/commentary/2017/04/5-necessary-actions-sesers/
[72] A poplar version of the teaming concept is the "SWAT" team where the group is empowered to be rigorous and decisive, as in this federal government example: Tracy Mayor, "IT to the rescue: Unraveling bureaucracy at the VA, one project at a time," June 2013, Computerworld, http://www.computerworld.com/article/2497166/it-management/it-to-the-rescue--unraveling-bureaucracy-at-the-va--one-project-at-a-time.html

c. Require the CPO to organize shared geo-analytics[73] to clarify the multiple causes of outcomes, community effects, and local interactions to optimize outcome value.

5. **Establish a research agenda on bureaucratization.** Structural bureaucratization is an overwhelming challenge to federal leaders. The Administration can establish an explicit research agenda that examines bureaucratization, and specifies its effects in government operations and how these can be corrected through common analytic controls, or changes in federal policies. The support would help shift attention away from structural distractions and focus on unambiguous business case strategies.

6. **Establish cross-operational analyses of outcome attributions.** The longstanding ambiguity in outcome attribution undermines reforms by federal employees. The Administration can help specify the most effective operational designs in similar work functions. These analyses would ensure that federal operations are not duplicative, working against each other, or obfuscating the emergence of superior specializations. Between 2011 and 2016, the Government Accountability Office (GAO) "identified 645 actions in 249 areas for Congress or executive branch agencies to reduce, eliminate, or better manage fragmentation, overlap, or duplication; achieve cost savings; or enhance revenue[74]." The agency estimates tens of billions of dollars can be saved by eliminating duplicative operations[75].

We are confident that the Administration can further support federal leaders, and their operational improvement business cases, if they follow these recommendations to address the common barriers of access to data quality and reversing structural bureaucratization

This is an achievement that is long sought after by all Americans.

[73] David Paschane, "A theoretical framework for the medical geography of health service politics," Dissertation, University of Washington, June 2003. http://www.worldcat.org/title/theoretical-framework-for-the-medical-geography-of-health-service-politics/oclc/55084292&referer=brief_results
[74] U.S. Government Accountability Office, "Government Efficiency and Effectiveness: Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve Other Financial Benefits," GAO-17-562T, April 2017. https://www.gao.gov/assets/690/684296.pdf
[75] In some instance, the production of redundant government programs is due to corruption, as federal leaders direct agencies to expand their missions into new programs. More frequently, redundancy is the natural product of representative government, which brings new legislators to Congress, who advocate for new programs, unaware of existing ones.

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