FROM DATA TO DECISIONS II

Building an Analytics Culture

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PARTNERSHIP FOR PUBLIC SERVICE

IBM Center for
The Business of Government

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INTRODUCTION

If you had told people 25 years ago that, in the future, nearly everyone on the street would be carrying a portable phone in their pocket or bag, they might have wondered if that was completely necessary, since there was a pay phone practically on every corner. If you had then told them to imagine that they also would be able to use that phone someday to listen to music, map out how to drive someplace, pay bills, make hotel and restaurant reservations and instantly type a message that would show up on another phone anywhere in the world, they might have assumed, at that point, that you had entered the realm of science fiction. But of course, as we now know, smartphones are in the hands of most people, and many of us feel lost if we leave home without one.

These days, federal managers and employees who are using analytics in their work are in a similar position to those early adopters of mobile phones decades ago. Many of their colleagues simply cannot envision the benefits that analytics could bring to their agencies. These early adopters, on the other hand, understand the value of analytics and why everyone should consider using such an approach. Many of them are attempting to convince the "I'm not so sure I need or want this" crowd why gathering data and using analytics will provide powerful tools for improving performance. They are trying to make the case that everyone should be using data analysis to achieve their agencies' missions. It can be a similarly tough sell. But since analytics have become a requirement in many cases, the debate is less, "Should we do it" and more, "Where and how do we start?" and "How do we make it the way we do business?"

Organizations that are successful at launching or expanding analytics programs employ certain strategies. They systematically examine their processes and activities to ensure that everything they do clearly connects to what they set out to achieve, and they use that examination to pinpoint weaknesses or areas for improvement. They incorporate analytics into their day-to-day business, and they bring in people whose backgrounds and experience can boost an analytics program or approach.

In our 2011 report on analytics use in the federal government, "From Data to Decisions: The Power of Analytics", the Partnership for Public Service, in collaboration with IBM's Public Sector Business Analytics and Optimization Practice, wrote about the tremendous budget pressures federal agencies face at a time when there is great public demand for government to be more effective and efficient. We set out to understand the extent to which agencies were using analytics and how analytics helped them achieve program results. We found that agencies' use of analytics varied across a wide spectrum, with some agencies having sophisticated analytics programs and others just beginning to build capabilities. Nearly all agencies we spoke with, however, recognized the value of using data to inform decision making and wanted to learn how to do it better. The report identified four common practices that others could replicate:

- Leaders focused on transparency, accountability and results
- Staff was given a clear line of sight to desired goals or outcomes
- Agencies invested in technology, tools and talent
- Agencies cultivated and leveraged partnerships within and outside the agency

"Ultimately, a staff function can never make analytics happen. Managers need to integrate it into how they manage, how they reward, how they build it into the culture of the organization."

—Malcolm Bertoni, assistant commissioner for planning, FDA

The specter of deficit reduction looms over government, threatening drastic cuts that could impact agencies considerably. It is fitting that agencies take stock of their priorities and activities, identify opportunities to improve how they deliver results, and use analytics to demonstrate they are meeting mission goals efficiently and could do so at less cost in the future.

An analytics[1] approach to management is at the heart of an agency's ability to know how well it is performing and helps it determine what it can do better. Agencies and departments can use analytics to monitor progress and unearth problems in their processes; identify where adjustments are needed to improve their performance; learn of weaknesses in the data they collect and use; confirm that their day-to-day activities are clearly linked to their goals and mission requirements, and are critically needed to do so; and reach desired goals using informed and logical solutions. Analytics also can help agencies communicate the impact of their work to key stakeholders.

Heightened scrutiny over how public dollars are spent and a drive for more transparency in all aspects of government operations resulted in changes to a 19-year-old law, with passage of the 2010 Government Performance and Results Act (GPRA) Modernization Act. The statute calls for agencies to focus on high-priority goals and create a culture where data and analytics play a larger role in policy, budget and management decisions. In a flurry of activity over the past year, the administration has undertaken a number of initiatives to implement the GPRA Modernization Act. For example, it has identified 14 cross-cutting high-priority goals and established guidelines for data-driven progress reviews.

The first report's release sparked an overwhelmingly positive response from agency leaders and federal performance management practitioners who asked, "Where do we go from here? How do we get an analytics program started?" Their reactions demonstrated a hunger for understanding how to develop and grow an analytics culture within their agencies and incorporate it into how they perform their mission.

That led the Partnership and IBM to join forces on another study to look at day-to-day practices that can help build and sustain an analytics culture, drive meaningful changes and achieve mission results. The goal of this report is to provide practical approaches, practices or strategies that agency program managers can apply. By sharing compelling stories of how agencies are developing, growing and sustaining their analytics and performance-management

1 Analytics is the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions to manage programs effectively.

approaches, we hope to shed light on key steps and processes that are transferable to other agencies.

We set out to learn what is working for managers and staff and what is not, specifically, how they are using analytics; how they got started; what conditions helped to grow their approaches; what challenges arose and why; and what success looks like. We found many parallels in approach across agencies and programs. Driven by budget realities and the push for more data-driven actions, agency managers were examining their programs in a disciplined, comprehensive way to determine how they conduct their business.

We held four focus groups representing a cross-section of agencies and a mix of roles—managers, program staff and analytics staff. We also reviewed analytics efforts at the program level in seven agencies that vary in their missions, size and reach: Federal Emergency Management Agency (FEMA) Recovery Directorate, FEMA Logistics Management Directorate and Transportation Security Administration (TSA), all within Department of Homeland Security; Bureau of Indian Affairs (BIA) at Department of Interior; Air Force at Department of Defense (DOD); Internal Revenue Service (IRS) at Department of Treasury; and Food and Drug Administration (FDA), Center for Drug Evaluation and Research (CDER), Center for Devices and Radiological Health (CDRH), National Institutes of Health (NIH), National Institute of Biomedical Imaging and Bioengineering (NIBIB) and National Institute of Allergy and Infectious Diseases (NIAID), all at Department of Health and Human Services. We targeted a range of agencies whose diverse missions would enhance the transferability of our findings. A full description of the agencies we studied and more details on why they were selected can be found in Appendix A.

The agency officials we interviewed for both analytics studies were overwhelmingly positive about the benefits their organizations gained from the use of analytics. We hope that the experiences and lessons learned and shared in this report will help others now building or enhancing their agency's analytics culture to reap similar benefits for their own agencies.

START WITH A SYSTEMATIC AND DISCIPLINED APPROACH

Where does an agency start in its effort to build or expand the use of analytics for making program decisions? What are key steps or actions that will create a culture that values and uses data for program management day to day?

The first step is to get a solid understanding of the agency's program goals and objectives. Revisit the basic activities an agency, unit or program performs and what resources, conditions and other factors go into those activities; tie those activities directly to what they are intended to achieve; and then link those results to the goals of the agency. Focusing on these details will help agencies employ a data-driven approach to managing programs, help them identify the critical information needed to gauge progress and measure results, and ensure that only those activities that are key or essential to meeting desired results are performed. For example, the National Institute of Biomedical Imaging and Bioengineering (NIBIB) analyzes the demographics of people in the researcher pipeline at the institute as part of its analytics activities. Examining scientists' ages, to cite one aspect of the data, helps to determine trends indicating whether new researchers are coming into the pipeline or if new talent is unable to gain access to research opportunities, and how that affects agency products and outcomes.

To improve airport security, for example, Dan Liddell, a federal security director with the Transportation Security Administration, who oversees security at seven upstate New York airports, worked with a team to break down the job of a transportation security officer (TSO) at checkpoint and baggage areas. The team identified the individual tasks for each of the 18 duty areas and analyzed the standards or expectations for each task and the conditions under which they are performed. The team brainstormed the knowledge and skills required to perform each task, and the values associated with meeting set standards. Team members then validated this analysis with expert security officers, identifying more than 1,300 knowledge areas, values and skills for a transportation security officer. Based on this analysis, they identified trends for performance improvement, using an airport-based covert testing approach known as Aviation Security Assessment Program. This process identified vulnerabilities in security screening and uncovered weaknesses in training, procedures or technology. By comprehensively studying the effect of individual tasks that TSOs perform, Liddell and his team were able to pinpoint what can be improved through training and better application of procedures or policy, and they identified where technology could support improved performance.

By instituting these types of systematic processes, agencies start building analytic cultures so they can look critically at what they do and thoroughly understand how their activities can lead to better results. The reward for their meticulous appraisal is the enhanced ability to serve the American public cost-effectively and efficiently,

"The notion of 'key' is critical. It's what connects the dots. What are the key things you need to be looking at? What data do you need and will you use, the operative word being 'use,' for decisions going forward? What data or information is most useful to decision makers? The clarity of goal for a desired outcome is essential for developing key measures."

—Rich Beck, performance improvement officer, Department of Interior

the ultimate mission of government agencies. As part of this endeavor, agency program managers are examining what they do now, what they need to do to improve, and what resources are available. They are systematically mapping out the roles and activities of staff and stakeholders and refining performance goals, data and metrics that are in place, or should be. And, they are comparing data they need with what they collect and analyzing performance measures to examine how they affect results. These analyses highlight the causes and effects of individual and agency actions, including unintended consequences. Using this knowledge to make decisions holds great promise for improving agency performance.

At FDA's Center for Drug Evaluation and Research (CDER), for example, employees are using data-driven approaches together with risk-based methodologies to help ensure the safety and efficacy of consumer drugs. Staff members in CDER's Office of Compliance rely on agency data, as well as subject-matter experts, in the development of decision and risk models. One of these is the site selection model for inspection of domestic and international drug-manufacturing facilities. This model uses agency data resources and decision-science approaches to prioritize drug manufacturing facility sites for inspection. Although not the sole determining factor for site selection, the model facilitates the process. Members of the compliance office also perform quality checks to ensure that the correct information has been entered and the model outputs are accurate. Staff members use this output—the priority list that emerges—to assist with analyzing and selecting sites to be inspected. If, for example, CDER's resources were to allow for only 20 inspections out of 100 sites, the agency could base its decision on where to send inspectors using the information it gathered.

To travel down the analytics road, managers must challenge time-worn assumptions and embrace qualitative measures that are linked to impact. For instance, is it more important for a law enforcement agency to keep an equal number of police officers on each shift, or would additional staffing during shifts that deal with higher crime levels lead to more effective policing? As with any new activity, managers need to be comfortable experimenting and learning and then making changes that improve performance.

The agencies we reviewed also deemed it important to find a common language to make sure terms were defined the same way for all—whether they were working with program staff, analytics staff, subject-matter experts

Tip of the trade

FROM A FOCUS GROUP PARTICIPANT

"Keep the discussion as simple as possible—and focus on speaking in a language everyone can understand with standard, shared definitions."

"You need to identify the questions you want to answer, what data you will collect to answer them, and how you will organize information to make it useful and standardize how you present the analysis."

—Carlos Dávila, director of Business Management Division, FEMA Recovery Directorate

or stakeholders. Together, they challenged assumptions by re-examining and asking basic questions about performance measures. Are they meaningful? What do they measure? What should be measured? Are the right data being collected? Are they reliable? They revisited data that had been collected to see if it was useful for achieving results. They focused on the questions and the clarity of their goals rather than the systems or technologies for processing the data. And, they tried to be rigorous and disciplined about each stage so that the questions asked and actions taken were consistent each time. In some cases, they set up pilot programs and learned from interim results what needed to be adjusted.

Technology tools for analyzing data can range from simple spreadsheet software to sophisticated analysis programs. For example, FEMA's Recovery Directorate uses Excel's analytic and database functions for running comparisons of how well the directorate is applying agency resources against targets and reports the results in a dashboard, while the IRS Research Analysis and Statistics office develops, in a research lab environment, sophisticated analytic computer models for detecting fraud and improper payments that are later made available to program offices. Most managers we spoke with said there were limitations to the tools they had or the data itself, but they have learned to get the job done with the tools and technologies they have. They place a priority on getting agreement on answers to basic questions, which also helps them understand what tools they lack and what they may need in the future to expand their analytics efforts. It's important to clearly define objectives, according to Faiad Rahaman, an operations research analyst at FDA. "It's not necessarily that you need better technology, but to understand the limitations of what you have. We try to squeeze lime juice out of lemons," he said.

In looking methodically at what they do, how well they do it and how it is measured, agencies have applied a range of techniques, including logic models, systems thinking, process mapping and scientific method, sometimes combining several of them (Appendix B). Through a series questions, agencies gather information and data for descriptive analytics of their current activities, and then continue with higher-level analysis using methods such as predictive analytics. For example, the Bureau of Indian Affairs first pulled and analyzed data that tracked where crime was occurring, then moved into a more predictive mode to determine where crime would occur or how the agency would make changes that would deter crime. Although program complexity may have increased, the basic approaches and techniques for systematically assessing practices and results still hold.

Tips of the trade

FROM FOCUS GROUP PARTICIPANTS

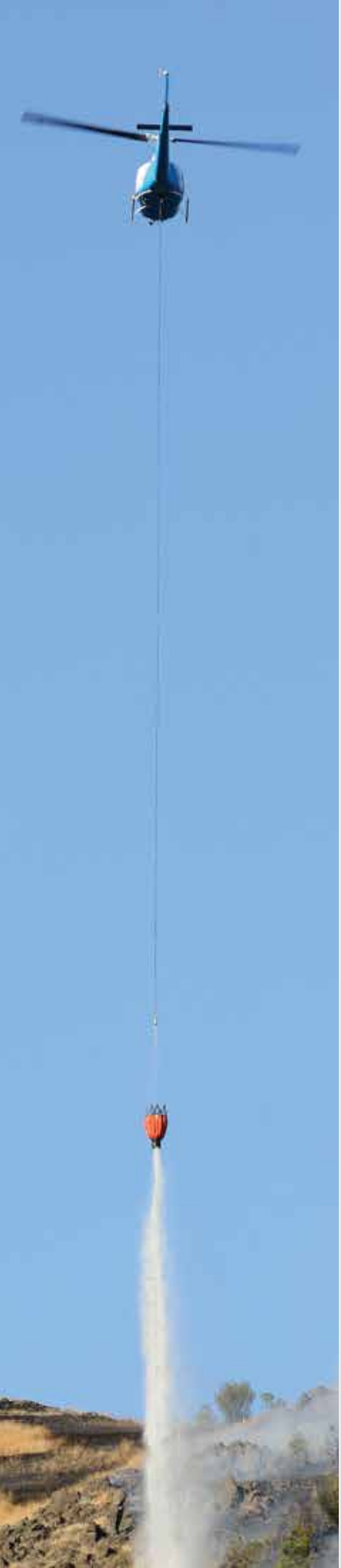
"Don't take too much on at one time. 'Chunk' your efforts to demonstrate they are doable and have value. Make use of intermediate outcomes to inform next steps."

"Acknowledge that the work is never done. It is iterative and will continue."

STEPS TO GET STARTED

Put together a team that includes people familiar with the work being performed; staff with analytical skills; and subject-matter experts. Bring in key partners and stakeholders, and include people who aren't part of the process but who have a vested interest in the outcome and are willing to challenge the status quo.

1. Ask questions even if they can't be answered with current data. The exercise will help highlight what data or information is needed. In fact, craft questions with the understanding that asking the questions will lead to data gathering. Questions would include:
   - What are we trying to achieve both short and long term? Can we measure results? How do we measure these results, using which methodologies and data? Are our goals and objectives clearly tied to the results we seek?
   - What are we doing to achieve those results? How do each of our processes and activities directly link to our goals and objectives?
   - How well are we doing in each of those activities and processes? What is working well and what is not? How do we know?
   - What are we doing today that is driven by gut instinct, and what is driven by solid, reliable data?
   - What are our current staff capabilities for performing and interpreting analytics?
   - What do the data we currently use to measure progress against goals, overall performance and results tell us, taking into account the resources and activities that go into them and the ends achieved? What don't the data tell us that we should know? Are we getting reliable and accurate data to answer the questions we want to answer? If not, why not?
   - Who on staff is receiving the data, and how are they acting on them?
   - How meaningful and useful are the performance measures we are using? Are we gaining sufficient insight to help us understand performance challenges and important success factors?
   - What should success look like? How will we know we have achieved it?
2. Using the questions as a starting point, brainstorm to define a current process or activity and what a future, improved version or result might be, focusing on top issues and agreeing on a desired outcome or outcomes.
   - Identify the essential ingredients for a good result and the data needed to assess what goes into a process or activity, what is produced, what the effect is and what the overall impact of the achievement is.
   - Identify roles and responsibilities for staff and managers and where roles intersect.
   - Identify barriers to be addressed and assets that can be leveraged, such as availability of technology, analytic staff assistance, resources, and the like.
3. Take large issues and break them into smaller, workable components. That will provide a quick demonstration of the value of data, which can stoke interest in analytics and convince staff to use analytics in their work. An incremental approach not only can rapidly show benefits, but also allows for testing the process, learning what can be improved and refining data analysis requirements—all helpful for determining what automated tools or systems are needed. Pilot projects also afford the opportunity to demonstrate proof of concept and the value of the planned actions for all involved, including that they are doable. The "proof" can go a long way toward laying the foundation for buy-in.
   - Develop an action plan or pilot test, depending on the task.
   - Evaluate the results and adjust plans.
   - Build on those successes and leverage the lessons learned.
   - Communicate those lessons to stakeholders.



In Focus
ON BUILDING A SYSTEMATIC APPROACH

FEMA's Recovery Directorate examines how it provides disaster services, from start to finish

To look more closely at how well it carries out its mission, FEMA's Recovery Directorate recently mapped out its operations and intended impact using a logic model, resulting in a Strategic Operations Framework that describes the agency's role in disaster recovery and the effect of its activities on disaster-stricken communities. The directorate's leadership wanted to assess whether the agency's actions and services—such as housing, financial assistance, legal services, funds for debris cleanup and removal, and assistance with rebuilding public facilities—were being made available in the best way and achieving the desired results.

The directorate set up a special team for the intensive effort of documenting its activities and their effect on communities. Comprising at least one representative from each headquarters division, the team met two hours a week for 10 weeks to build the framework and solicit feedback from others in team members' divisions. They produced a flowchart documenting what goes into disaster recovery, such as annual budget resources, time, expertise, technology and facilities. The flowchart also noted the recovery activities of the agency, including planning and assistance for communities and individuals, and the results, such as lower threats to public health and less displacement of survivors. And, finally, it documented the desired impact of those activities, such as more stable and functioning communities due to advanced planning. An accompanying narrative explains the relationships in the flowchart illustrating, for example, how public safety and physical security ultimately contribute to community resiliency and sustainability.

Another team, led by a GS-9 employee, is developing enhanced performance measures to gauge the directorate's effectiveness. Choosing this employee may have surprised some people, but by making that choice, Recovery leaders demonstrated to frontline staff the importance of their contributions to the development of meaningful measures and showed that leaders alone will not drive changes. The road to effective data analysis took a brief detour in an early stage of the effort. The team's first draft focused on the quantity of services the directorate provides to people and communities rather than on service quality, underscoring the fact that agencies aren't always able to define outcomes clearly in initial forays into analytics.

The team adjusted course, shifting the data focus to measuring the quality of services and the impact on people. "It's great to know how many people we've sheltered, and now we want to gauge the quality of the service we provided and know how that impacts them," said Carlos Dávila, director of FEMA Recovery Directorate's Business Management Division. In the next phase, the effort will be expanded to the field and other stakeholders will be brought in. This follows FEMA's "Whole Community" approach to emergency management, a concept that recognizes the benefits of working collectively with residents, government officials and others in the community. Bringing in outside people gives staff additional insights on processes and outcomes, and helps them develop a more informed and sophisticated perspective when measuring performance and defining success.

IRS identifies patterns, and predicts future problems, to increase tax return accuracy and halt fraud early

The IRS' newly created Office of Compliance Analytics wants to get to the bottom of operational and strategic problems and come up with quick solutions, according to Dean Silverman, director and senior advisor to the IRS commissioner, and it is applying systems thinking to do so. Staff works to identify problems, such as identity theft, and examines them critically, trying to determine when and where they might occur and what they might look like. Employees consider potential resolutions and then decide what data to collect to run pilots or simulations to test them.

Typically, projects focus on a primary strategic goal, such as reducing improper payouts resulting from tax fraud or identity theft. The project team frames the problem and determines what a successful remedy or result would be. Is the goal to prevent identity theft? Or is it to repair the damage that identity thieves cause, such as refunds to the wrong person? Identity theft continually takes on new forms, and remedies can become outdated quickly. The office tries to anticipate the next incarnation at the same time it diagnoses and fixes existing problems. It also looks for potential unintended consequences while attempting to curtail improper payments. "False positives"—determining that a return is fraudulent when it is not—could lead to inappropriate penalties or legal action and are unacceptable to the taxpayer and IRS. With analytics, IRS also can validate and measure results, such as higher voluntary compliance rates and increased tax dollars collected.

The goal of one pilot project was to identify tax preparers who were making errors early in the 2012 tax filing season and intervene to correct the problems so subsequent filings by these preparers during the same season would be more accurate. The agency looked at a couple of hundred tax preparers, using batch data and pulling real-time information daily, and within a couple of weeks was able to identify the problems. It successfully piloted the approach and achieved a savings of over $100 million in bad credit claims that did not have to be processed. IRS' next step is to scale this effort for the 2013 tax filing season.

The Bureau of Indian Affairs curbs crime through intelligence-led policing

BIA uses a systematic approach to address crime on all Indian lands, and its crime collection and analysis activities have become essential elements for assessing performance. Historically, little was known beyond the information police departments report to the FBI. Verifiable data wasn't collected. Typically, law-enforcement officers answered calls and reacted to incidents without looking strategically at crime data. A senior BIA official and former Indian law enforcement officer explained, "When I was in the field, we didn't look at the numbers we sent to the FBI. I knew to go to certain places because I knew from experience that I needed to go there. Neither the night crew, which we now know are on duty when most Indian crimes are committed, nor the sergeant on the swing shift, analyzed new crime-surge data." Therefore, he explained, at many reservations Indian Country police couldn't identify problems and make useful changes, such as expanding the midnight shift to more than two people. There was no data to support them. "We simply operated the way everyone operated, by dividing up the resources across the scheduled shifts. Collecting and analyzing the data fundamentally changed the way we allocate resources."

Indian Country is doing business differently now. After BIA decided to set the Safe Indian Communities program as a high-priority goal, the agency implemented an information-management system that allowed four Indian reservations in a pilot program to collect and share data, and moved crime reporting from pen and paper to automated systems that enable the chief of police and law enforcement officials to pull up facts about current and historical crime activity.

Today, for each incident, the type of crime and the date, time and location of the crime are collected, shared with other shifts and analyzed to identify patterns and trends. These data are being used to address crime by location and time of incident, and their use is enabling police patrols to quickly adjust their policing strategies. Research on the past three years of criminal activity is providing a baseline that, coupled with information obtained from community residents, are helping BIA and Indian Country law enforcement officers understand criminal activity and the policing strategies that work—or don't. There are many aspects to the Safe Indian Communities effort beyond better use of data, but enhanced crime information data collection and use significantly contributed to the 35 percent reduction in violent crime during the first 24 months of the program, far exceeding the agency's goal of lowering crime 5 percent.

BIA has since expanded the initiative to include two additional reservations, and the agency put together a comprehensive handbook with lessons to guide all Indian reservations seeking information on what helped to reduce crime and increase community safety. In addition, information from quarterly reporting on performance measures and results goes to leaders and stakeholders throughout the department and the participating Indian reservations.

MAKE ANALYTICS THE WAY YOU DO BUSINESS

Leaders at all levels need to live by example

For analytics to become an integral part of agency activities, leaders must live by example, using data for decisions in an open and transparent manner. Leaders can be at any level within an organization, but to make analytics a way of doing business requires them to be relentless in their efforts to make decisions based on facts, rather than to rely on gut instincts or conventional wisdom. Incorporating analytics into day-to-day management activities can change attitudes, transform how work is done and affect results. However, to allay fear in the workplace, the analytics emphasis needs to be on learning how to improve performance, not on placing blame.

Leadership support is vital for a successful analytics program. Leaders set the vision and model the behavior they expect of others, so it is helpful to agency staff when leaders seek to understand analytics approaches used in programs and base their decisions on that data. According to Malcolm Bertoni, FDA's assistant commissioner for planning, it is important that leaders accountable for programs, who set the tone and establish expectations and accountability, understand the value of measurement and analytics. "In any organization, there is more to do than you have resources to do it," he said. Typically, government must comply with mandates, but agencies do not always receive funding to do so, he added. "People are busy and the question is, 'What's the payoff?' If management says this is where we want to go and this is how we will measure it, that will be communicated through the organization."

In the agencies we studied, leadership actions and practices carried great weight and drove changes in behavior. Leaders we interviewed who were actively using analytics, whether they were at the top of the organization or headed a work group, strongly believed in the power of analytics. They could point to ways they could use analytics to do their jobs better, improve organizational performance and exceed their goals. They repeatedly cited the importance of leadership support and buy-in. "TSA's effort was driven by top management," said Bob Scanlon, manager of TSA's Performance Management Branch. "It was a leadership decision to move to performance management with objectives and quantifiable data."

Similarly, it was the IRS commissioner who established a new compliance analytics office to focus on short-term projects and expose program staff to analytical thinking and data for examining improper payments. And, FDA's leadership supported an agency-wide performance management tracking system called FDA-TRACK, for monitoring projects and programs with key performance measures. "It helps to have a compelling need, and leadership that wants to take this on, to provide the authority to [get] people to take a little time from their other activities and make analytics a priority," Bertoni said.

"One of the most important factors was political leaders' decision to use data. That is not to be underestimated. When we have leadership committed to using data and [who are] not afraid, then we really can achieve."

—Focus group participant

Staff in agencies that track progress on high-priority goals also pointed out that the goals were helping to create a demand for analytics overall. The requirement that agencies identify and track those goals has cascaded down through agencies, bringing rigor into processes in other programs. Staff members are asking questions, using data and defining goals. Leadership also has become more actively involved since the GPRA Modernization Act was passed in 2010. It requires leaders to hold quarterly review meetings to follow progress on meeting goals and identify issues that require corrective action, which could lead to changes in the measures used. Leaders at all levels can set up their own review meetings to demonstrate their commitment to using data and analytics, and to create a safe environment for dialogue about what is working and what is not, and where improvement is possible.

FEMA's administrator established the high-priority performance goal of strengthening disaster preparedness and response by improving FEMA's operational capabilities and strengthening state, local and private-citizen preparedness. A key Logistics Management Directorate strategic performance measure for this high-priority goal is the percentage of orders arriving with the requested goods at the requested location by the agreed-upon delivery date. Originally, the goal was to deliver all shipments on time 85 percent of the time, which the agency surpassed in fiscal 2011, reaching 93.3 percent. That allowed the agency time to develop processes based on lessons learned and to mature the Logistics Supply Chain Management System to help track and manage the process. Leadership agreed to increase the goal incrementally to 95 percent to match the private industry standard. It's considered a challenge, since private industry operates under relatively normal conditions, while FEMA operates under emergency circumstances. The directorate also connects its organizational and individual performance to this measure.

Dispel fear: Promote data scrutiny as a way to enhance overall team performance

Agency staff with a clear vision of program results and their contributions to them, tend to be more enthusiastic about buying into an analytics approach, we found in our earlier study, "From Data to Decisions." Understanding how their work contributes to providing benefits to constituents seems to spark a passion for doing the job well. However, some employees fear, rationally or not, that closer scrutiny of their work might have unpleasant consequences for them individually. It is up to managers to dispel that fear by explaining that data measures are used to pinpoint and fix mistakes in processes, not to point fingers at employees. If, in fact, weak spots are discovered relating to an individual, specific assistance may help everyone. For example, managers

Tip of the trade

FROM FOCUS GROUP PARTICIPANTS

"Recognize and celebrate success in using analytics. At public forums or 'all-hands' meetings, have a program staff show how data and analytics have helped them in their work to promote [to others] the use of data analysis and metrics."

"Clearly communicate how analytics can help with understanding ways to better achieve program outcomes and impact."

"The myth is that someone gets thrown under the bus in a performance culture. Accountability is not throwing someone under the bus. Accountability is a learning environment."

—Focus group participant

might learn that a unit or a person hasn't received the appropriate training to do the job well and can rectify the situation.

Another way to boost enthusiasm for setting up or expanding an analytics program is to include employees in the efforts to develop the measures for boosting performance, instead of arriving at solutions and imposing them on staff. FEMA's Recovery Directorate learned in short order that foisting a model for analytics operations on employees wouldn't sit well. "In the past, many of us have assumed our employees would accept our operation models and there would be friction and anxiety, but that in the end their desire to help a survivor would make the bad feelings go away," said FEMA's Carlos Dávila. Recognizing now that employees would feel disenfranchised if they went that route again, leaders make a deliberate effort to include staff when developing analytics measures. "We want to make sure the way we run our programs doesn't have a negative impact on morale," said Dávila.

Tip of the trade

FROM A FOCUS GROUP PARTICIPANT

"Remember that the perfect is the enemy of the good. Even with incomplete information, data can still aid in decision making."

"There's still very much a culture of fear of metrics—fear that the data can be used against your program. People are afraid of the metrics, and without the metrics, you can't get to the analytics part."

—Focus group participant

STEPS TO GET STARTED

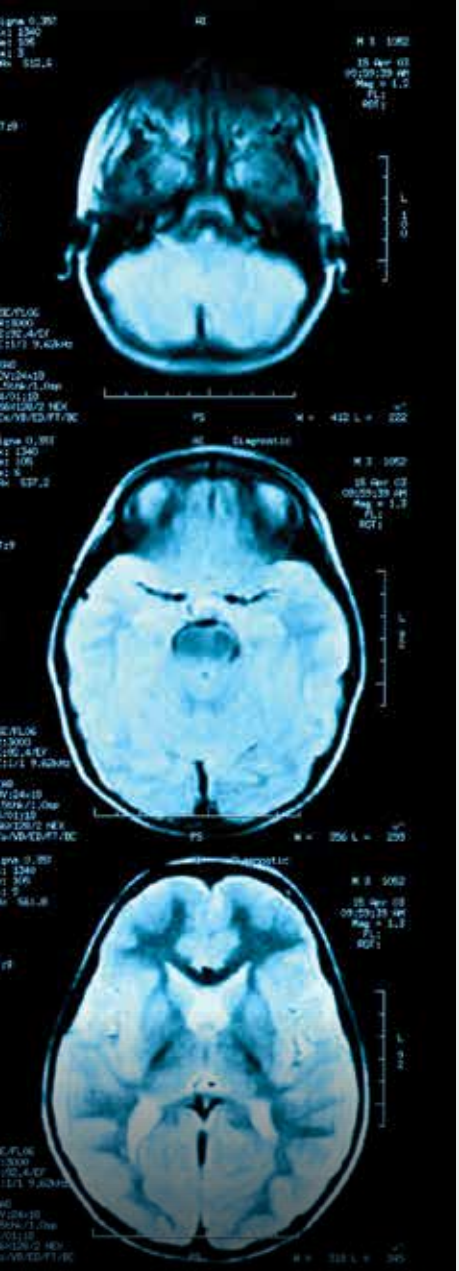
1. "Prepare the troops" by explaining the importance of data and communicating a vision for how that data will be used in decision making. Share, share, share. Provide clear and meaningful information to employees and important stakeholders that communicate what the team is doing and learning, as well as the next steps. Everyone directly impacted by the work of the team needs to be kept in the loop.

2. Get to know the data and understand what they mean. Then lead by example, using information from the data to make decisions.
   - Ask questions about the information being used to inform decision making.
   - Challenge assumptions to encourage dialogue.
   - Focus on the importance of learning from the data and whether they adequately answer key questions. Clearly communicate how data has informed decisions.

3. Encourage collaborative partnerships across the agency, with other agencies and with key partners and stakeholders outside the federal government.
   - Involve, engage and listen. Value input.
   - Share results openly and transparently.

4. Take the initiative and show passion for working on problems that stymie organizational performance. Fight complacency and seek opportunities for changing business as usual.

5. Raise issues, demonstrate knowledge of those issues and suggest ways to do a job better or achieve better results. Question data and help identify ways to improve data quality and usefulness.



"The staff knows I love data. They say 'you can't go see Belinda without data', so they now bring data."

—Dr. Belinda Seto, deputy director, NIBIB

In Focus

ON MAKING ANALYTICS THE WAY YOU DO BUSINESS

Leadership at the National Institute of Biomedical Imaging and Bioengineering shifted focus in measuring research progress to refine how it plans for the future

Four years ago, a top leader at the National Institute of Biomedical Imaging and Bioengineering (NIBIB) started taking a comprehensive look at the work the institute was doing in selected research areas, an approach she knew had been happening in other institutes. Dr. Belinda Seto, deputy director, wanted information on a body of research, what projects were being funded in a particular area, and the progress scientists were making on them. That knowledge would help decide the future direction for that area of research. The institute supports and conducts research that promotes patient health through the development and use of biomedical technologies, such as ultrasound, computed tomography (CT), magnetic resolution imaging (MRI), diagnostic devices and drug delivery systems. It does so by funding grants for groundbreaking medical technology research and development. She said she wondered, "Are we moving toward development of an emerging technology? Are there more fundamental questions that should be asked?"

Dr. Seto focused on research portfolios rather than individual grants, building a framework grounded in data that is used for assessing an aggregated grant portfolio and future directions. This was not business as usual, and it has changed the way the institute decides where to invest its dollars. A portfolio assessment involves analyzing grants' objectives and measures of success; the investment in dollars; measurable output, such as number of publications; licensing agreements for the biomedical products or devices developed; and research outcomes including potential commercial products stemming directly from the work; the number of scientists and collaborators involved in the topic area; and spinoffs for additional studies. The institute uses these analytics as a tool to guide discussions of future research directions and to set priorities. More importantly, they are the starting point for discussions with institute leaders, key staff and outside experts. "All of this information—the analytics and the input from experts—helps us develop our program progress reports," Seto said. "These analytics allow us to be deliberate and assess progress in an entire program and not just individual grants. As a result, we are better informed and able to make data-driven decisions and set priorities, as well as decide which areas to de-emphasize."

Since incorporating data analysis into the portfolio review and assessment process, Seto has been using it to pose "what if" questions to help the institute set priorities. Sensitive to the researcher pipeline, for example, she will ask whether there will be trained scientists in the future to meet the institute's medical research needs. "What if we want to invest in an emerging area of science and technology? Do we have appropriately trained investigators to engage in the research?"

The assessments also help with risk management. Seto wants to be sure that the risks associated with a $50 million project in one portfolio, for example, and a $10 million project in another are appropriate and "well-calibrated to the scientific opportunities," and that these investment decisions are based on objective measures and expert discussion. Promoting this portfolio-analysis approach "has allowed me to be more systematic and orderly in terms of prioritization, and it has forced us to be much more informed about our portfolio through data analytics," she said. "I'd say we have very positively benefited from this, knowing that our decisions are data driven and knowing that we are using the brainpower of lots of very smart, unbiased people. It's so critical when resources are limited."

Building team performance at the Transportation Security Administration to strengthen airport security and protect the flying public

Staff's ability to detect security risks is crucial for traveler safety. As mentioned earlier, TSA's Dan Liddell identified the strong link between training and staff performance, and the effect on good security, and implemented an analytics program to improve performance. But he didn't want employees to fear that the approach would be used to select individuals to punish for mistakes. A key element of his approach was to eliminate individual blame and focus on team performance, assuring that no one would be fired. If supervisors discover weaknesses in security activities, the next step is to figure out what assistance or changes are needed to improve the process. The covert testing process he and his team developed systematically identifies security vulnerabilities and pins down weaknesses in training, procedures or technology that employees are using. The idea is to address those weaknesses by changing or adding training, altering procedures or policies, or providing better technology.

Under Liddell's approach, frontline supervisors diagnose problems and areas that need attention. They collect real-time data based on how transportation security officers perform. For example, TSOs might be tested with fake explosive components sent through X-ray or baggage. In building the team testing approach, Liddell partnered with managers, supervisors and TSOs and brought in airport security experts, who were given an overview of the analytic approach, to identify the knowledge, skills and values needed to perform the job. By breaking down the work into components, TSOs and supervisors were able to identify failures and examine the reasons for the failures. Using trend analysis, they located problems on the security line and where the airports needed to focus attention. After evaluating TSO processes and analyzing performance trends, Liddell and his team designed and developed methods for evaluating and improving the solutions.

After covert tests are conducted, and while the event is still fresh in everyone's mind, TSOs are pulled off the line and the team gathers information on what occurred. The team working on that particular test goes through the procedures and equipment; examines what each person was doing, seeing and sensing; and identifies the knowledge, values and skills that could be improved. The team might set up a development plan for an individual, for example. Within 24 hours of the team debriefing, a summary or record of the tests and lessons learned are sent to TSOs at all seven airports to reinforce behavior and build team performance. Liddell and his managers also look at trends and decide which areas need improvement, by examining weekly data from the New York airports and monthly national data.

Performance has improved markedly, according to Liddell. TSOs have been highly successful in detecting covert threats, despite having to rely on relatively older technology at the airports. He believes that the human element is the most important factor in security, and one that drives training and other decisions on improving performance. "If you get it right with the people, they can quickly interpret and do a better job than just the technology itself," he said.

Tip of the trade

FROM A FOCUS GROUP PARTICIPANT

"Obtain as much consensus as possible on what the data are telling and in developing or refining performance measures. Focus on the endgame."

GETTING THE PEOPLE PIECE RIGHT

People are a critical piece of the analytics puzzle. Leaders need to communicate the importance of analytics and build the staff capacity to take advantage of them. They also need to understand how employee morale and performance are connected to how well an organization functions. "The biggest lesson I've learned in my 30 years of service is that people matter," said TSA's Liddell. "People are the driver to improve equipment and technology, and they are also the driver for rules because they apply them. If you're going to start anywhere, you have to focus on the people first and if you get that right, the rest will follow." Other agency officials, staff and focus group participants we spoke with echoed that sentiment, and repeatedly identified the human factor as critical to building and sustaining an environment that fosters successful use of analytics.

Driving change is difficult. Employees typically want to know, "Why should I spend my time on this?" It is important to demonstrate why changes are essential to the organization and to the individual. "You have to communicate value," said Jason Urban, of FDA's drug evaluation and research center. Leaders should demonstrate the benefits of data and analytics to program staff, managers and stakeholders at all agency levels. When individuals understand the merits of analytics, it is easier for leaders and managers to create an analytics mindset and get buy-in and support. One way to increase acceptance is to highlight how employees can improve their performance by using analytics. Agencies also can shift entrenched thinking and minimize the frustration that can accompany a new work approach by providing tools, resources and reliable assistance for putting in place analytics programs and projects.

An effective way to institute or expand an analytics program is by working with program staff individually or on a project to demonstrate the usefulness of data analytics, according to agency analytics teams we spoke with. The staff typically receives positive feedback for its efforts, which can lead to other groups and project teams requesting analytics information and assistance. They are more likely to take advantage of an approach that has been demonstrated as effective and has become more of a known factor. Seeing other employees or departments benefiting from analytics makes it more alluring for them to jump in.

Part of the effort includes using change-management strategies as an agency builds and grows an analytics culture. The shift in how agency work is done challenges business as usual and compels employees to do things differently, and it can cause great unease. Steps for introducing change and gaining acceptance for it include communicating purpose and vision, engaging staff and stakeholders, eliciting feedback and sharing information. "Fundamental change doesn't bubble up. It has to be led," said Greg Hutto, a wing operations analyst with the Air Force's 96th Test Wing, which employs analytics in its work. "That's change management. Someone has to have a vision and strategy to get there. Someone must build a sense of urgency, charter demonstration projects and then continue it year after year until the change is sunk deep into the culture. That's the journey we're on."

All in it together: Partnering to reach a common goal

Agencies we spoke with are bringing in frontline program people, analytics staff, subject-matter experts and stakeholders as they apply systematic approaches for gaining a deeper understanding of their activities. They hope to improve performance and make it routine to achieve results based on analytics. They are building relationships within and between agencies, and identifying shared goals among stakeholders. The approach also helps to break down silos that have walled these partners off in the past.

Many federal programs are set up as partnerships, and some agencies quite literally cannot deliver services without working with other government, nonprofit and private-sector partners. Knowing how each participant carries out its role assists with choosing the data needed for understanding how to improve the process. When a disaster strikes, for example, many organizations offer vital resources and commodities to help victims. FEMA's Logistics Management Directorate works with a regional logistics team to identify requirements and ensure that materials and goods requested are delivered by an agreed-upon date. The directorate also co-leads—with the General Services Administration—a unique inter-

agency partnership with the U.S. Northern Command, Defense Logistics Agency, National Guard Bureau and the U.S. Army Corps of Engineers, known as the Emergency Support Function 7.

This team has worked to strengthen its business processes and leverage best practices by enhancing relationships with public and private-sector partners. Under the "Whole Community" approach, the directorate serves as logistics coordinator for supply chain planning when the agency responds to domestic emergencies and special events.

The directorate has no direct authority over these partners, hence strong relationships are crucial. Its job is to coordinate shipments, which are tracked through an automated supply-chain system. Staff has created a map of the supply chain, called the "race track," which details the steps from order to delivery. It tracks the time required for each step and the role of each player. It allows staff to see immediately problems that arise and stop them before they become widespread. Discipline in the delivery process "drives everything," according to Ron Goins, senior advisor in the directorate. "We're only as good as our partners. Even when you have tracking systems, it is imperative that everyone performs their essential functions."

Another example of the power of these relationships is the Safe Indian Communities initiative, described earlier. Together, the BIA, federal and tribal partners, social workers and mental health providers, the Indian Health Service, the community and many other stakeholders, work together to reduce violent crime. That first-ever community-wide perspective led to a shared sense of responsibility, according to Darren Cruzan, deputy director of BIA's Office of Justice Services. Regular community meetings among the partners have become a program centerpiece.

Tapping a mix of people with different backgrounds and strengths

Enhancing staff capacity to analyze data and getting staff to share knowledge within and across agencies are important ingredients for sustaining an analytics program. The more that staff members understand how to analyze and use data, the more they appreciate the power of analytics to carry out an agency's or program's work effectively. Agencies we reviewed focused on building bench strength and sharing employees' expertise, recognizing that such efforts were important for making analytics a way of doing business. These agencies are educating staff on examining data and solving problems analytically, through instructional programs, conferences and web-based knowledge-sharing programs.

Agencies are exposing staff to hands-on experience, getting people involved in project teams or sending them on details or rotational assignments to expose them to how other organizations use analytic approaches and tools. The organizations enthusiastic about analytics make it routine to spread their ideas and practices widely. Sharing lessons learned and publicizing results is a big part of the Air Force's mission, according to Hutto of the Air Force's 96th Test Wing, which helps design and perform tests on bombs, munitions, computer software and other devices and equipment. The research and development units of the Air Force Test Wings have been so successful using analytics for test performance that DOD is beginning to use their methods. To further expand staff capacity for analytics, DOD created a scientific test and analysis technique center of excellence to promote experimental design in each of the military services over the next three years. Essentially, the center is training people to be data detectives.

Background and experience also matter. Individuals have knowledge and perspectives that can accelerate the development and acceptance of ana-

Tips of the trade

FROM FOCUS GROUP PARTICIPANTS

"Don't just focus on the tools. Focus on the objectives and goals and develop the best methods for measuring and achieving those goals."

"Think through what you are asking for and be prepared for what you get. The data may reveal something very different from what you expected. Always be on the lookout for unintended consequences."

lytics, and significantly affect a program's success. The Partnership's report, "Mission-Driven Mobility: Strengthening Our Government Through a Mobile Leadership Corps", highlighted the benefits of executive mobility for improving agency performance and enhancing the ability to fulfill its mission. Strikingly, the individuals taking the lead in analytics efforts had gained analytics experience from working in other organizations, according to many of the people we interviewed for this report, either coming from other program areas or having served as a member of an analytics team that provided support to programs. They were able to view their agency's activities in a new light and see opportunities for change, and that led to the expansion of analytics in their agencies. Some individuals had private-sector backgrounds or experience in other agencies. Others had a mix of experience within their agency, working at headquarters and in the field, in staff offices and in customer service. Many had backgrounds in more than one discipline.

For example, the experience that FEMA's Carlos Dávila had in the private sector and as the agency's deputy chief information officer helped him recognize that data reliability problems in the agency performance scorecards he had worked on were not technological. Errors resulted from people not paying enough attention to the data, which needed to go through a more robust verification and correction process before being published in the scorecard. He instituted quality-control processes for data entry to correct the recurring problem.

TSA's Bob Scanlon started his career as a metallurgical engineer in the private sector and served for 13 years as a member of the Board of Examiners for the Malcolm Baldrige National Quality Award, which recognizes organizations for performance excellence through continuous improvement. That provided him with analytics experience, and he has become the agency's "metrics guy," demonstrating how data analytics and performance metrics can help the agency achieve its mission. He oversees TSA's performance-management information system, a data collection and business intelligence tool that employees use to create performance-management reports, and produces a scorecard for operations centering on security, efficiency and people metrics.

Often, there's a wild card in an agency someone who sparks the creation of an analytics program. Individuals can hold a lot of sway as catalysts for an analytics approach, getting the ball rolling and then receiving support from colleagues and leadership to continue. Listening to and encouraging those who express interest can boost an agency's analytics efforts. We saw many examples of these catalytic personalities during this study.

For instance, Shauna Henline, an IRS program coordinator for the Frivolous Return Program, almost singlehandedly established and documented a process to systematically analyze returns for patterns and trends of abuse by income tax evasion perpetrators. She applied her past experience in Criminal Investigations and crafted an analytics approach that has led to impressive results, helping to raise the fine for promoting or filing frivolous returns from $500 to $5,000 per return and convincing stakeholders throughout IRS that tax evasion promoters should be charged with criminal fraud or pursued with civil injunctions. She has also trained IRS initial reviewers in service centers across the nation on proper identification and treatment of frivolous claims. Henline gives IRS leaders credit for supporting her work and realizing the potential benefits of expanding it to the other service centers. "I came with my background to get the ball rolling," Henline said, "and over the years [the analytics approach] has gotten better and better."

Tip of the trade

FROM A FOCUS GROUP PARTICIPANT

"Teach by example. Show how to use available tools to help analyze data and collect metrics. Create new tools using available software—it can be as simple as Excel—to help program staff work with data. Pick a project or program to demonstrate a data-driven approach that can provide new insights to staff."

"You have to question everything—not from a cynical standpoint but a critical thinking standpoint. Agencies need to have folks with passion."

—Carlos Dávila, director of Business Management Division, FEMA Recovery Directorate

STEPS TO GET STARTED

1. Tap the expertise of others—inside and outside of the program, workgroup and agency—by building networks and communities of practice and sharing knowledge and expertise with colleagues.

2. Recruit multidisciplinary staff and people with experiences outside the agency or immediate workgroup who can challenge conventional wisdom, think beyond the status quo and bring valuable insights, knowledge and lessons learned from other experiences. Get a fresh perspective by tapping people from different disciplines to look at data and approaches.

3. Provide opportunities for employees to move from program or line offices to analytics staff offices within one agency, and among line and staff offices in other agency organizations, to broaden knowledge and perspective and to share their expertise. It can be done through details, cross-functional teams, rotational assignments or reassignments, and can benefit both staff and the agency.

   - Build bench strength by offering training, sharing knowledge and establishing communities of practice. Mentoring, whether formal or informal, can be a vehicle for knowledge-sharing.

In Focus
ON GETTING THE PEOPLE PIECE RIGHT

National Institute of Allergy and Infectious Disease provides analytics tools to help programs gauge performance and measure outcomes

For more than 60 years, the National Institute of Allergy and Infectious Diseases (NIAID) has conducted and supported basic and applied research to understand, treat and prevent infectious, immunologic and allergic diseases. It produces new therapies, vaccines, diagnostic tests and other technologies that have improved the health of millions of people. The institute relies on its Strategic Planning and Evaluation office to guide the development of good data and information to be able to assess and report on the performance of the institute's programs.

The Strategic and Planning and Evaluation Office, which helps the institute meet GPRA requirements, often finds that program staff view requests for data not as useful for carrying out their day-to-day program responsibilities but as additional work they must do to satisfy an externally imposed demand. While the office was the primary source of institute-wide analytics, it became increasingly clear that both the planning office and the program divisions could benefit from increased analytics and the tools to enable effective data collection and use. Four years ago, the office began developing and providing tools to the program staff for collecting and analyzing data. The staff is using them to help consider what results they are measuring and to evaluate what their grants are achieving, according to Jane Lockmuller, the planning office director. With these analytics, staff can look at the full body of work in their area and make informed decisions about how to manage the research and projects for a better impact on society.

Program staff had not always looked at their work this way. "The culture of science is such that people think there is an element of serendipity to science and that things will coalesce," Lockmuller said. "Researchers will think hard about things their peers are talking about, and in this way, they will help move the field forward." Looking at quantitative data involved in their work was not their mindset. "It is easy to measure things like publications, patents, and licenses … but that it isn't exceptionally meaningful. There can be a project that produces only two papers, yet they are such exceptional papers that they have advanced the field."

Strategic-planning office staff have introduced a set of questions focused on the whole portfolio of research being conducted, made the data more useful and accessible to the research divisions, and developed tools to help them use the information. The changes have led to a greater acceptance of using data for the type of insights the institute needs for decision making. "People aren't averse to new performance measures and ways of analyzing data," said Kevin Wright, deputy director in the planning and evaluation office. "It just hasn't been part of their day job. They are much more focused on the individual research projects, working with scientists or in the labs doing the science. Our role here is to help by improving tools and to do some of the analysis for them. Making the data more useful and accessible and giving them the tools to play with the data have been most important." The approach is changing scientists' perception of data collection and analysis. Expert opinion is still important, but adding systematic data to the conversations improves how decisions are made about future research.

Wright spoke of a leader in one of the institute's divisions who was trying to analyze what was happening in a particular research area. It was taking a lot of his time and effort given the analytics he had to develop and refine, and trying to piece everything together was time consuming. Lockmuller's office developed a tool that would automate the data collection and analysis, saving him time and making the process more useful for him. It also illustrated that it is critical to know and understand what people at the program level are trying to do and work with them from there.

Tip of the trade

FROM A FOCUS GROUP PARTICIPANT

"If you are in an analytics office, meet with program staff to understand the challenges they face in accessing and using data. Offer user-friendly analytics tools and staff time to do data analysis for them. Package data to be useful for people you most want to use it."

The FDA and industry both have "skin in the game" when setting goals for protecting public health

The FDA's Center for Devices and Radiological Health (CDRH) has the job of ensuring that marketed medical devices are safe and effective. Its relations with industry are critical to the agency's ability to carry out this mission and meet its performance goals. By law—the Medical Device User Fee and Modernization Act of 2002 and its subsequent 5-year reauthorizations—FDA collects user fees to supplement its annual appropriation for resources to review medical device applications. The law also requires FDA to consult with industry representatives to develop performance goals for the review process and report on its progress toward those targets.

For each reauthorization, FDA has worked with the medical devices industry to analyze data and establish goals for the review and approval of new devices. Modifications to existing devices are reviewed through the premarket 501(k) program, under which the applicant must demonstrate that the device is sufficiently similar to one already on the market. A key performance goal, for example, is that 90 percent of the time FDA will complete its initial review in 90 days. Devices that are new must go through a more stringent review process, known as premarket approval, with evidence and reasonable assurance provided that the device is safe and effective.

Historically, performance goals focused on the time an application was under review at FDA—and not the times when an application may be back with the device firm to respond to questions. However, during the most recent negotiations, performance goals for the entire review process—from submission to decision—were developed by industry and government together. As of October 1, 2012, stages of the process largely under the control of industry applicants also must be measured and tracked. These new targets represent a shared understanding that FDA and the device companies have the same overarching goals—to protect public health and get safe and effective devices on the market as quickly as possible. "You need to identify what are your common interests and what are your unique interests," said Barbara Zimmerman, CDRH deputy director for premarket program management. "We have a shared goal [with industry], which is to protect and promote the public health. We tried to always center ourselves back to that shared goal whenever we would negotiate a topic. At the end of the day, anything we had negotiated had to meet our common goal of protecting and promoting the common health."

Attaining agreement on the new goals required a comprehensive assessment of the application review process and the root causes of delays because, despite meeting or exceeding most of its past goals for the 501(k) review process, FDA's device reviews were showing a steady increase in the time to reach final approval. Similarly, the industry criticized FDA for taking too long to review devices, inconsistency in its reviews, and not sufficiently communicating with industry. The in-depth analysis of the review process revealed that overall review timeframes were rising primarily due to an increase in the number of review cycles and the time device firms took to respond to questions. FDA contributed to the problem by making unnecessary requests for additional information. This thorough analysis has resulted a number of corrective actions, including enhancing training for FDA staff and setting an interim target of 60 days to work with companies to identify issues, questions or additional information required for approval of devices in the program. The agency also put in place quality controls to monitor performance and unearth any other problems that could lead to missing goals. The data analysis and the monitoring helped FDA reach agreement on new shared goals with industry that are meant to help lessen the time it takes for getting approved medical devices into the marketplace.

Tip of the trade

FROM A FOCUS GROUP PARTICIPANT

"Don't make your findings more complicated than they need to be. It needs to make sense to people."

IRS employees gain hands-on analytics know-how and skills through project assignments

One of the overarching goals at IRS' Office of Compliance Analytics is to help agency employees think critically about their processes. Assigning people from business units to help analytics staff on projects is a powerful way to expose people from various programs to analytics approaches. When they have completed the project, they can share what they've learned with others in their business unit. The compliance office serves as a consulting group, leading IRS operational and strategic projects. It is staffed by a mix of permanently assigned employees, external consultants and staff from business units assigned to the office for a particular project. "There is real value in sending up-and-coming leaders to work in an analytics group to problem-solve," said Dean Silverman, director.

Those opportunities help emerging leaders find daily uses for analytics when they return to their unit. "Businesses are starting to recognize the value in getting leaders to work with us and learn how to problem-solve in a new way," Silverman said. He believes that the agency needs to evolve and that innovation requires strategic thinking and data-analysis skills. His office is trying to encourage daily use of data and additional training through rotations among other offices and projects so more staff members gain analytics knowledge and new skills. The employees who learn about analytics from working on a project will more thoroughly understand the benefits and return to their program unit with a greater appreciation for data and how it can be used in their work, according to Silverman.

FDA grows an analytics program by bringing in people with a mix of disciplines and perspectives

A 2007 FDA Board of Science report found that FDA did not have a sufficient number of skilled people to support its needs. As a result, the agency embarked on a major, multiyear hiring effort, bringing on board employees with science and systems-analysis backgrounds. Since then the hires have become part of a core staff with a greater understanding of analytics and have helped to grow analytic approaches in the agency's drug evaluation and research center. As a result, the agency has improved the quality of data collected and analyzed.

Employees in CDER's compliance office come from a variety of backgrounds. They are scientists, industrial engineers, systems engineers and information technology employees. When FDA's Faiad Rahaman joined the office more than three years ago, there were only a few groups within the office focused on data-driven and risk analytic approaches. During this time, the office went through a reorganization and placed an increased emphasis on the development of data-driven decision making and analysis. Dedicated offices within CDER now are providing analytics across the agency. "We now have specific areas that we are looking at and analyzing the data, bringing in people with specializations and different backgrounds and incorporating them into the entire process," he said.

Employees with a variety of work experience are helping the center carry out its mission more effectively. His colleague Jason Urban added, "You need to have the right people, and within the agency we have those people looking at the information in the right way. We are doing more recruitment for people who are interdisciplinary and understand science and analytics. With a constantly evolving market, we have to anticipate and stay ahead of the field. In the end, it is about the mission of the agency protecting the public health by assuring the safety, efficacy and security of FDA-regulated products."

CONCLUSION

Analytics is an essential component of good management and a foundation for effective performance management and sound decision making. However, there is no single path to success for building, growing and sustaining the use of analytics for better performance. As our stories show, there are many roads to get there. It is a learning process.

Curiosity and the desire to perform well drive the use of analytics. For the agencies we studied, success often bred success. The examples we found highlight the benefits of trials and testing, as well as attacking and solving individual problems before moving on to address the next set of challenges. These organizations approached analytics efforts in a systematic, disciplined way that everyone in the organization could observe and understand. Revisiting the basics—mission, goals, objectives, inputs, processes, activities, outputs and outcomes—and studying how all the aspects connect, are fundamental to identifying the data needed for an agency to effectively manage and attain the desired results.

Along with a disciplined approach for data collection and analysis, which lends supports for good management practices, the way to sustain improvement is to gain acceptance from staff and stakeholders and support from leadership. Tapping a wide range of expertise, from both agency employees and outside stakeholders, is sure to lead to new ways of thinking, challenge the status quo, achieve agreement on shared goals and measures, and guide an organization toward desired outcomes. Top leaders can be in the analytics driver's seat or support initiatives started elsewhere in the agency, but along the way, it is critical for people to feel ownership in the processes. Most important is that leaders incorporate analytics as a way of doing business, making data-driven decisions transparent and a fundamental approach to day-to-day management. When an analytics culture is built openly, and the lessons are applied routinely and shared widely, an agency can embed valuable management practices in its DNA, to the mutual benefit of the agency and the public it serves.

APPENDIX A
METHODOLOGY

In this second collaboration with IBM's Business Analytics & Optimization practice and IBM Center for The Business of Government, the Partnership for Public Service set out to build upon earlier findings, which identified promising analytics practices agencies were using to drive decision making and improve performance. In this follow-on study, we focused primarily on the program level within agencies, seeking compelling examples of agencies that are using analytics on a day-to-day basis and how analytics practices are built and integrated into the culture of agencies. We wanted to understand how analytics approaches got started, what conditions helped to grow them, what conditions created challenges and what success looks like.

During April 2012, we conducted a series of focus groups and engaged in conversations with representatives of government agencies who pinpointed key themes around which we structured further research. Joining these conversations were agency and program representatives from the Bureau of Indian Affairs (BIA), Food and Drug Administration (FDA) and FDA's Center for Drug Evaluation and Research (CDER), Customs and Border Protection (CBP), Department of Health and Human Services (HHS), Department of the Interior (DOI), Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), General Services Administration (GSA), Small Business Administration (SBA) and the United States Coast Guard (USCG).

After reviewing the insights garnered from the focus groups, we selected seven agencies for interviews in May and June. We targeted a range of agencies whose diverse missions would enhance the transferability of our findings. Within these seven agencies—FDA, FEMA, Transportation Security Administration (TSA), DOI, Department of the Air Force, Internal Revenue Service (IRS), and National Institutes of Health (NIH)—we selected specific programs to consider in greater depth. They include: BIA's Safe Indian Communities Initiative; FDA's CDER and Center for Devices and Radiological Health (CDRH); National Institute of Allergy and Infectious Diseases (NIAID); and National Institute of Biomedical Imaging and Bioengineering (NIBIB). We performed a literature review, analyzed agency documents and interviewed more than 30 officials, including program and analytics staff, to identify the conditions and practices needed to cultivate an analytics culture and change the way of doing business to achieve better results. We concentrated on identifying hands-on strategies and the steps and processes that program managers within agencies can apply to build, grow and sustain their use of analytics in decision making and achieving mission outcomes.

APPENDIX B
ANALYTIC APPROACHES

The agencies we looked at applied a variety of analytic approaches to document what they do, assess how well they do it and how they measure it, and then determine changes needed to improve program performance and achieve better results. These approaches included logic models, systems thinking, the scientific method and process mapping, among others—and often a combination of them. Fundamental to all was the use of a structured, comprehensive and methodological process to document steps or activities and understand inputs/resources (who does what) and outputs/results (what is being accomplished)—all aimed at identifying ways to improve performance and achieve mission outcomes more cost-effectively. All approaches entailed data collection and analysis and the use of measures to gauge success, and all involved teams comprising stakeholders.

While program complexity and the nature of problems have changed over time, the analytic practices and techniques for tackling them are not really new and have some striking similarities. And while these approaches may sound complex, they don't need to be. In fact, when program managers and staff examine the key elements, they may find that they are quite familiar.

- **Logic model**

  A logic model is a structured and visual framework often used for assessing program effectiveness and problem solving. It is a linear, stepwise approach that illustrates the sequence of events, problems and interventions (causes and effects), and relationships among partners. It typically starts with first identifying inputs (resources), then activities and tasks, followed by outputs (services/products), outcomes (results), and finally, impact (what's changed). It usually includes identifying short-, mid- and long-term outcomes, and action plans or strategies to achieve intended results. The process of developing the logic model is helpful for building consensus among stakeholders and implementing change.

- **Systems thinking**

  Systems thinking is a form of critical thinking that focuses on the "big picture" and how things within the picture are related. Outcome oriented, it is used in complex problem solving to examine interrelationships among parts and always starts with the end—or the desired outcome (what do we want to achieve)—and moves backward. It is rooted in systems theory, which defines a system as a set of elements or components that work together toward an overall goal.

  Systems thinking focuses on relationships within an organization or program, whether among employees, processes or programs, and how they interact and connect to achieve a shared vision. It is used to examine problems and develop solutions with a strategic or long view, and affords a way to see multiple relationships and unexpected connections among the parts or players. It also helps to identify how policies, procedures, and structures can create patterns of behavior in the organization or program. Feedback loops are an important element of this approach. Other important components include clearly identifying the outcome and objectives, establishing performance measures to assess success, collecting and analyzing data, performing an environmental scan, examining cause-and-effect relationships to diagnose the issue or problem, and creating solutions that take into account that there may be unanticipated consequences and that every new solution can potentially engender a new problem.

- **Scientific method**

  The scientific method generally focuses on cause-and-effect relationships—it involves questions, observations, collection of data, predictions or hypotheses, testing and evaluation. It focuses on how observed changes can cause other changes in a predictable way. It is an iterative process, as the outcome of a test may disprove a prediction or hypothesis, which will lead to another round of new hypotheses to test. The process always starts with a question and then moves to background research, information gathering and data collection to develop a prediction and test. Test results are then analyzed, and this data analysis drives the conclusions and related action steps.

- **Process mapping**

  Process mapping is a structured set of activities that involve identifying processes, steps and tasks, usually graphically in a sequential and often time-measured workflow, to understand how they link to accomplish a goal. Typically, process mapping involves documenting the current state (how things are done today) and designing the future state (how we want things to be done in the future) and includes the development or refinement of performance measures. Often, the approach is applied in combination with other systematic approaches.

  Process mapping visually illustrates the sequence of events that occur to produce a result—essentially, what is happening, where, when and by whom; how inputs and outputs are handled; and where decision points are—and includes the roles of stakeholders and what they are required to do. Applying this method can help to clarify roles, responsibilities and boundaries among stakeholders from the beginning to the end of a process.

Once an organization understands how its day-to-day activities connect to goals, objectives, resources and desired outcomes, it is in a stronger position to identify data needed to gauge progress, assess performance and increase effectiveness. Agencies then can take advantage of advanced statistical analysis to study trends and patterns, and predict behaviors, activities and results. Sophisticated analytics provides a greater understanding of the significance of program elements, steps or design features, how these elements are inter-related and whether one plays a greater role than another. The approaches described above provide a foundation for the use of advanced analytics.

- **Advanced analytics**

  Advanced analytics includes applications and technologies that leverage historical, current and predictive data to help an organization make decisions that optimize its operations. It includes data mining, predictive modeling, "what if" simulation, statistics risk management and text analytics, which are used to identify meaningful patterns and correlations in data sets to predict future events and potential outcomes. With advanced analytics, an agency can discover subtle patterns and associations and develop and deploy predictive models to optimize decision making. Risk-management tools enable agencies to make decisions while fully aware of the possible consequences, and to meet regulatory requirements with smarter risk-management programs and strategies.

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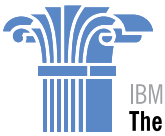

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