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Government Analytics FOR **DUMMIES®**

Learn:

- How government analytics can improve performance and decision-making
- To promote security, defense, and public safety systems through government analytics
- To easily apply government analytics in your organization to improve outcomes



**Larry Miller
Robert Dolan, Jr.**

The analytics journey is not for the faint of heart.

We learn much from spectacular success, but we learn even more from failure. Such is the case with the use of analytics in both the public and private sectors. Most organizations believe that having data/information and technology are enough to become an analytics-driven organization. But that will only get you so far. Often missing, and what contributes to a souring to the use of analytics, is the lack of a clear analytics strategy that helps define process and create a culture for analytics throughout the organization. That's why it's so important to know and understand the strategic goals of your organization. The success or failure of those goals will decide whether or not you and your leadership can claim success or failure. Those strategic goals determine the direction the organization heads and the investments made. They also define the key performance measures for each part of the institution.

So how do you start? Here is a step-by-step approach that we've seen work countless times in government:

1. Focus on the biggest and highest value opportunities.
2. Start with questions, not with data.
3. Imbed insights to drive actions and deliver value.
4. Keep existing capabilities while adding new ones.
5. Develop a long-term analytics plan.

Go get started!

The IBM Public Sector Business Analytics Team

Government *Analytics*

FOR
DUMMIES®

IBM U.S. LIMITED EDITION

by Larry Miller and
Robert Dolan, Jr.



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Introduction



Federal, state, and local government agencies today have enormous amounts of data but not enough decision-ready information. Additionally, these agencies are more pressed than ever to find new ways to improve — and report on — their performance and results. They need visibility into their data, so they can improve operational readiness, efficiency and effectiveness, responsiveness, budget planning, and accountability.

Analytics solutions can help public sector agencies at all levels of government better understand the results of spending, track progress against goals, and share information with other agencies, regulatory and legislative authorities, and citizens.

About This Book

Government Analytics For Dummies, IBM U.S. Limited Edition, showcases how business analytics enables federal, state, and local agencies to drive better outcomes in government through better prediction capabilities, visibility into performance, and data access for dynamic decision making.

This book is written primarily for mid-to-senior level military officers and government officials in defense, civilian, state, and local government agencies. Whether you're an agency or program director/manager, agency or department head, Chief Financial Officer (CFO) or budget officer, Chief Information Officer (CIO) or information technology/systems analyst, technical or operational manager, or public safety/emergency management official, this book is for you!

Icons Used in This Book

Throughout this book, we occasionally use special icons to call attention to important information. No smiley faces winking at you or any other cute little emoticons, but you'll definitely want to take note. Here's what you can expect:



This icon points out information that may well be worth committing to your nonvolatile memory, your gray matter, or your noggin — along with anniversaries and birthdays!



This icon points out helpful suggestions and useful nuggets of information.



Proceed at your own risk . . . well, okay — it's actually nothing *that* hazardous. These helpful alerts offer practical advice to help you avoid making potentially costly mistakes.



You won't find a map of the human genome — or maybe you will . . . hmm. This icon explains the jargon beneath the jargon!

Where to Go from Here

Which way do you go from here? It doesn't matter which way you go! If you don't know where you're going, any chapter will get you there — but Chapter 1 may be a good place to start! However, if you see a particular topic that piques your interest, feel free to jump ahead to that chapter. Each chapter is written to stand on its own, so feel free to start reading anywhere and skip around! Read this book in any order that suits you (though we don't recommend upside down or backwards).

Chapter 1

What Is Analytics for Government?

In This Chapter

- ▶ Understanding how analytics aids critical decision making
- ▶ Leveraging actionable information in data
- ▶ Uncovering key drivers in government

Public sector agencies today must be focused on producing positive and effective results. Both citizens and legislators are holding government leaders accountable for the results of public spending and programs. Scrutiny is even more pronounced in times of economic uncertainty, large deficits, and budget pressures. Are government efforts enhancing citizen service, economic activity, and quality of life? Citizens want to know and are increasingly empowered to find out.

In this chapter, you discover business analytics, what it is and isn't, its uses in government, and the growth and the challenges of structured and unstructured data (known as “big” data).

Defining Analytics for Government

Business analytics refers to a broad approach that combines advanced business intelligence (BI) and financial performance management capabilities with the science of predictive analytics. The BI and financial performance management aspects of this definition provide insight into decisions and the effects of those decisions in meeting agency goals and objectives.

Predictive analytics employs advanced analytical algorithms to process data and create models that can make empirical predictions about future outcomes. Each of these capabilities is powerful in and of themselves. When combined as business analytics, they provide breakthrough capabilities for improving agency performance and outcomes.

Business analytics helps connect data to effective action by drawing reliable conclusions about current conditions and future events. It enables agencies to make predictions and then proactively act on that insight to drive better outcomes, achieve measurable objectives, and meet strategic goals. Business analytics enables agencies to adopt a “predict and act” approach to critical decision making by answering the following questions:

- ✓ **How are we doing?** The answer to this question consists of two separate perspectives: how an agency internally measures the performance of a given process and how citizens regard their experiences.
- ✓ **Why are we doing what we’re doing?** This question can be answered by digging into and making sense of massive amounts of data by using a wide range of analytical techniques. For example, agencies can uncover patterns that determine the potential for fraud and the impact on the agency’s mission. This helps agencies better manage their revenues and perform more effectively.
- ✓ **What should we be doing in the future?** Answering this question helps to optimize actions at the point of impact — in real-time — through an analytics-driven management process.



Business analytics provides access to reliable, timely information that enables better decision-making and drives better outcomes.

The demand for results and much-needed transparency drives agencies in two ways.

- ✓ They must communicate their performance and results to citizens.
- ✓ They must spend efficiently and achieve positive results against the mission of the agency and the government as a whole.

Without access to reliable, cross-department mission, financial and operational performance information, these two challenges remain largely insurmountable.

Identifying Analytics Capabilities for Government

To build a strong decision support system, business analytics relies on four technological and informational tiers that include business intelligence, analytic applications, financial performance and strategy management, and advanced analytics — all discussed in this section.

Business intelligence

Business intelligence (BI) includes the concepts, methods, and technologies that gather and analyze data to drive better decision-making. BI uses querying, reporting, analysis, scorecards, and dashboards to make it easier for users to find, analyze, and share the information they need to improve decision-making.



With BI tools, government agencies can analyze a variety of information, data in motion, and extreme volumes (as in petabytes) of structured and unstructured data (discussed in the next section).

Analytic applications

Analytic applications include software that measures operational performance — and sets the stage for better outcomes. Analytic applications rely on historical data, along with software tools that crunch numbers and slice and dice data from different perspectives to give decision makers the actionable insights they require and empower workers and systems on the front lines to get the most out of every interaction with citizens.

Financial performance and strategy management

Financial performance and strategy management tools simplify, structure, and automate dynamic and sustainable financial performance and strategy management practices, related to

- ✓ Budgeting and planning
- ✓ Financial consolidation
- ✓ Program performance and strategy management
- ✓ Financial analytics
- ✓ Related reporting capabilities



These tools guide management strategy in the most effective and efficient directions with reliable insights, scenario modeling, and transparent and timely reporting.

Advanced analytics

Advanced analytics includes applications and technologies that leverage historical, current, and predictive data to help you make decisions that optimize operations. With advanced analytics you can discover subtle patterns and associations, and develop and deploy predictive models to optimize decision making. Risk management tools enable you to make risk-aware decisions and meet regulatory requirements with smarter risk management programs and methodologies.



Advanced analytics includes data mining, predictive modeling, “what if” simulation, statistics, risk management, and text analytics to identify meaningful patterns and correlations in data sets to predict future events and assess potential outcomes.

Assessing Data Challenges

Digital data is everywhere and continues to grow at a stunning pace. The expanding use of automated sensors, high-resolution cameras, Earth observation satellites, high-performance

technical computing applications, and monitoring of social media data (such as Twitter), contributes to much of this data growth in government. The majority of this data is unstructured, or “big,” data — data that isn’t stored in a database, including

- ✓ Unstructured text files
- ✓ Transit sensor information gathered from buses, subways, traffic signal cameras, toll booths, and others
- ✓ Demographic information, such as population
- ✓ Text “chatter” among suspected national security threats
- ✓ Electronic citizen interaction with various government agencies
- ✓ Social media chat

The data growth explosion, as well as the nature and increasing use (and users) of public sector information, are key factors driving the need for analytics in public sector agencies. The challenge for agencies is to not only manage all of this data but also to recognize the value — identify trends and risks — and types of data and its uses. Data mining and analysis for BI to improve decision making and outcomes are driving the need for business analytics in government.

However, a recent IBM survey, shown in Figure 1-1, found that decision makers were most confident in the reliability and integrity of operational and financial data and less confident in more subjective, difficult-to-define data.

With public demands for transparency and accountability, leaders in the public sector need to make better, fact-based decisions. They need to define and understand different types and uses of information in order to not only measure but also understand the changing world.

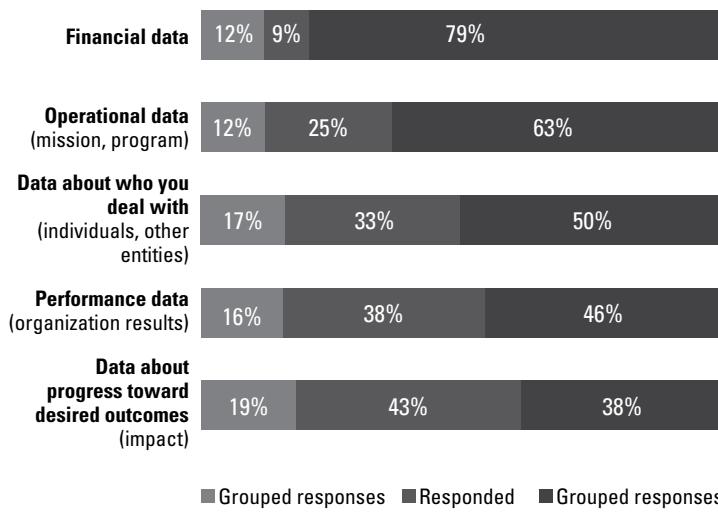


Figure 1-1: Decision makers' confidence levels in different data types.

Making the Case for Analytics in Government

The need for business analytics is clear. A majority of government leaders expect government to increase in complexity and reshape societies and governing over the next five years. And with that, only a small percentage of CFOs in government think they're effective in measuring and monitoring the performance of programs and services delivery.



Everyone wants open, results-based government. Government agencies and decision makers are increasingly turning to analytics to deliver smarter outcomes. With business analytics, government agencies gain advanced capabilities to do things like

- ✓ Grab the less than 5 percent of tweets that are of interest from more than 12 terabytes of tweets created everyday
- ✓ Predict power consumption using 350 billion meter readings from 20 million households annually
- ✓ Monitor traffic in real-time from millions of networked sensors to enable traffic pattern management and asset optimization

- ✓ Identify events of interest from hundreds of surveillance cameras
- ✓ Identify potential fraud in five million trade events per second
- ✓ Harvest insight from the 80 percent of new data growth coming from e-mail, documents, images, video, and audio

Aligning your strategies with global change

Leaders and decision makers in agencies at all levels of government must align their strategies with key drivers of global change. These drivers include

- ✓ **Accelerated globalization:** Countries and societies are becoming more economically interdependent across social and political boundaries.
- ✓ **Continued economic and budgetary pressures:** Today's tough economic conditions require everyone to do more with less — government agencies must deliver more services with ever shrinking budgets and revenues.
- ✓ **Rising environmental concerns:** Governments face pressure to address the effects of global climate change, develop alternative energy sources, and control rising energy costs.
- ✓ **Pressure for transparency and accountability:** The modern citizen has far greater access to public information than ever before and stringent regulatory requirements mandate complete accountability.
- ✓ **Expanding technology impact:** The Web is significantly transforming the way governments communicate with citizens, constituents, and one another.
- ✓ **Increased expectations to deliver on mission and services:** Today, government is expected to deliver results and value through secure, private services anywhere and everywhere.

Each of these drivers and their relation to government is shown in Figure 1-2.

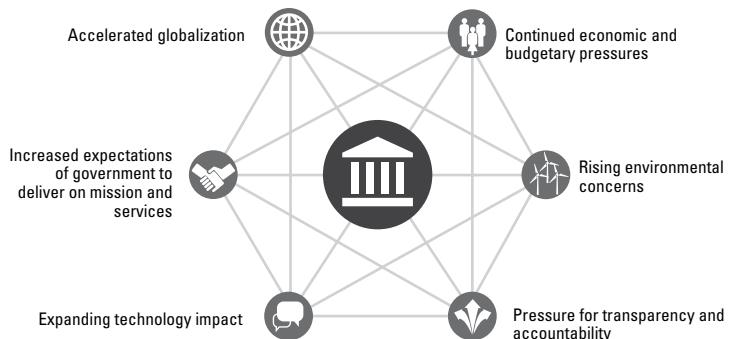


Figure 1-2: Governments must lead in the face of global challenges.

Aligning information: The government approach to analytics

The government approach to analytics is two-pronged with an internal (agency) focus and an external (citizen) focus and consists of mission goals, financial objectives, and operational requirements — all aligned, all with interconnected objectives. Take a look at Figure 1-3. In this diagram, you can see how the approach is broken down.

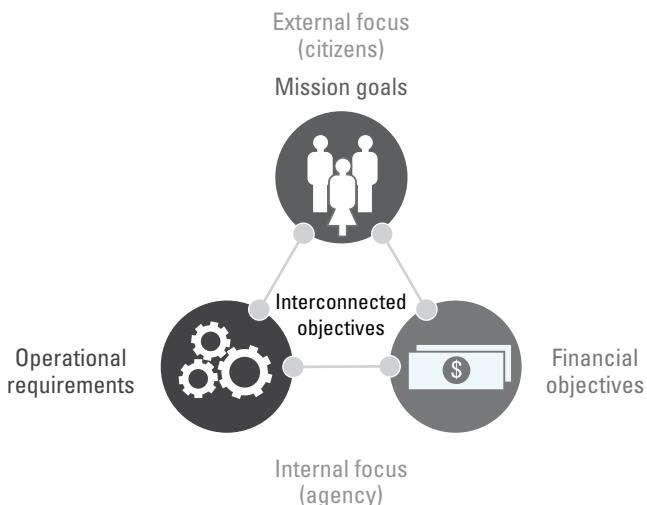


Figure 1-3: The governmental approach to analytics.

Mission goals are visible to citizens and directly impact the citizen (similar to customer service relationships in the private sector). Financial objectives and operational requirements are important because they drive mission goals, but traditionally the citizen typically doesn't have visibility into these elements. But that, like everything else in government, is changing.

Why is analytics important to government?

Unlike private sector companies, government agencies have no "shareholder value," a measure that they can readily point to that shows the legacy of how a government has performed year in and year out. But we do see measures that citizens and government agencies use to do the following:

- ✓ **Create a strong legacy of transformation.** All elected officials want to leave government better than they found it. That desire forms the foundation on which they run, and those campaign promises are translated into specific policy objectives. Those policy objectives become the goals of many government agencies. Analytics helps to measure the success and failure of programs and, ultimately, the success and failure of the political agenda.
- ✓ **Spend public funds responsibly.** No elected official or career civil servant wants to be identified with activities (real or not) that waste government funds. So spending wisely and responsibly is essential. Analytics helps to achieve that goal.
- ✓ **Drive smarter decision-making.** The pressure is on to work smarter and to make better decisions. Government agencies feel that pressure as well. Gut-reaction decisions are no longer defensible to citizens and other stakeholders. Analytics can help ensure that decision-making is based on reliable information, as well institutional expertise.
- ✓ **Drive transparency and accountability.** Open government isn't just a fad. Just look at initiatives everywhere in agencies large and small that are designed to throw open the windows of government to inspection and comment by citizens. Analytics helps to drive that transparency and accountability.

- ✓ **Realize results-based government.** In the end, it's the results that matter. Did government deliver against the stated goals and objectives or did it fail? Why did that happen? What could've been done differently? Analytics helps answer those questions to keep programs on track and on budget.
- ✓ **Achieve the best outcomes for everyone, from everyone.** This is the lynchpin of government: delivering the right services, to the citizens who need it, without interruption. It's the "public trust" of government, and it's what everyone inside and outside government strives to achieve. Analytics, as you will see, helps to achieve this ultimate goal.

Looking at the government imperatives

Some of the most important government imperatives and the uses and application of analytics are explored in greater detail throughout this book. To find out more detail on the government imperatives, check out the following chapters:

- ✓ Improving program performance (Chapter 3)
- ✓ Using analytics in defense agencies (Chapter 4)
- ✓ Strengthening public safety (Chapter 5)
- ✓ Managing resources effectively (Chapter 6)

Chapter 2

Measuring the Impact of Decisions

In This Chapter

- ▶ Starting your analytics journey
- ▶ Moving beyond scorecards and dashboards
- ▶ Discovering the Analytics Maturity Model

Business analytics offers strategic, user-friendly tools to help you measure the impact of decisions you've already made and the potential impact of decisions you make in the future. Much of the time, attention is paid to dashboarding instead of to the depth of analytics capabilities.

In this chapter, you discover how the practice of analytics has grown from the initial use of scorecards and dashboards into integrated solutions that help agencies make better decisions.

Understanding Scorecards and Dashboards

The first analytics tools that tend to be used by an agency are *scorecards* and *dashboards*. To start out, many agencies manage this information using spreadsheets. It's important to have an understanding of the basics prior to taking the next step because analytics isn't a destination; it's a journey.

Scorecards include a collection of your important metrics (each with an associated target) thresholds for good and poor

performance, and a clearly identified owner. *Dashboards* provide critical information in a single display, often in a single computer screen image.

You may be asking yourself “Why use scorecards and dashboards?” It’s for the same reason that car companies build cars with fuel gauges and speedometers. Scorecards and dashboards provide an easy-to-understand view of the performance metrics that matter most for making informed decisions that produce better outcomes.

Scorecarding software helps you align your teams and tactics with your agency’s strategy, communicate goals consistently, and monitor performance against targets. Scorecards allow managers to easily and quickly drill into supporting details in related reports or conduct additional analysis to determine why a metric is performing a certain way. Not all scorecards are alike. There are five types:

- ✓ **Strategy management:** This type of scorecard is used to manage strategic objectives, not individual metrics. An indicator is used to highlight the performance of each objective.
- ✓ **Business process performance management:** In this case, key performance indicators (KPIs) — a measure of performance of success factors — are used to measure core processes or value proposition(s). Less is more — the fewer the items, the more effectively they can be managed.
- ✓ **Performance monitoring:** A performance monitoring scorecard is used to track the larger number of metrics and ensure you can meet mandate requirements such as the Government Performance and Results Act (GPRA).
- ✓ **Red-yellow-green reporting (RYG):** RYG results when the scorecard environment becomes a repository for all the measures within an agency. Note, this is different than conditionally formatting reports.

Using a scorecard to house all the measures and metrics of an agency isn’t a recommended practice. You aren’t going to set targets for all measures, and any attempt to do so may result in poorly defined targets, misdirected efforts, and a watering down of communicating what’s important to your agency.



- ✓ **Report cards:** These are reports similar to quarterly or annual reports. By definition they provide lagging indicators, which means they don't support proactive remediation. They explain what happened after the fact and have a diminished value in driving strategy.



Understanding your agency's goals and using an appropriate environment to manage them enables you to use analytics successfully. Mixing purposes causes confusion and can result in a very low — and declining — adoption rate.

Determining Drivers



Understanding how and when to measure the various elements of the agency is important. All information isn't equal. To understand the distinctions, keep the different measurement elements in mind:

- ✓ **Data:** These bits of information haven't been analyzed or tested. Publishing them only adds clutter and minimizes understanding of the items that matter.
- ✓ **Measure:** This is a numerical expression of a component of the agency. Measures have been tested and provide meaning through a number of dimensions — such as program, region, or time.
- ✓ **Metric:** This is a measure with a target. For example, metrics could represent the components of core processes. Defining metrics requires well thought-out targets.
- ✓ **Key performance indicator (KPI):** This is a high-level, strategic metric that defines productivity or efficiency. You may not set specific targets for a KPI, but you're looking for improvement or an indication that something has changed. KPIs are also used to track and compare progress.
- ✓ **Strategic objective:** This describes what the agency has to do to achieve its overall mission. It's not a quantitative measure. Strategic objectives may evolve over time, but they shouldn't change much from year to year.

If you don't understand the strategic importance of an objective, KPI, or metric, your natural reaction may be to look for just the "red" metrics in the "traffic light" scorecard model.



Avoid focusing on just traffic light scorecards because they may in fact have little impact. What's more, you could miss out seeing that a marginal metric (yellow) is actually having a greater effect on the program or agency. Most metrics feature a corresponding color scheme and trend arrow that indicates whether that performance is on, above, or below target and whether performance is trending up or down.



One of the ways around this pitfall is to understand the weight of each objective. This way, the KPIs and metrics that support it are seen in the right context and offer a clearer picture of how that objective is performing.



A scorecard helps you manage on a monthly basis while dashboards help you work on a more daily basis. With this in mind, it's important to build a platform that provides the correct information at the right time. Looking at a KPI or metric monthly versus a metric daily provides widely different levels of variance. It's this variance that you want to manage. Ideally, this should be in an application with real-time data.

Aligning Core Processes

When choosing KPIs and metrics, your goal is to align them with your agency's mission to ultimately deliver value.

Consider a social services agency. The customer wants a prompt and helpful service, so you should be measuring the process in terms of two key indicators: time (response time) and quality (resolution). What you don't want to measure are costs, employee productivity, and so on. These items could be included in an associated report, but they shouldn't be managed in the same way as time and quality.

A scorecard not only provides a tool to help manage performance, but also it's a communication vehicle. In the social services agency example, if you measure response time and resolution, you show employees what really matters to the agency. In this way, you enable employees to understand how each role impacts performance. In turn, you allow people to make decisions that enhance value and make the process even more efficient or effective.

Other business analytics tools can help. Dashboards and reports help users visualize objectives and provide important analysis and diagnostics. But keep the scorecard focused on the few items that really matter to the agency. Maintaining a consistent system where the scorecard and management process are interdependent helps to ensure long-term success.

Diving into Dashboards

Agencies are increasingly using dashboards to provide at-a-glance views of current performance and to facilitate rapid decision-making. When targets, forecasts, or resource allocations change in order to address performance issues, these changes are reflected in the tactical and operational dashboards — as well as their related forecasts and plans, and so on — throughout the organization.

Dashboards provide critical information in a single display. Therein lies their appeal and the reason why dashboards are often deployed as a “front door” to performance management initiatives, in concert with other management functions, such as analytics, reporting, budgeting, and forecasting.

Getting buy-in from senior management

Like any other strategic initiative, performance management initiatives and dashboards and scorecards are most successful when coupled with the strategic vision and endorsement from the senior executive team. With dashboards, managers can drill into or through related reports and other information to explore and understand the trends and issues affecting performance at a granular level.

A financial workbench, for example, helps controllers and CFOs understand how to better control costs by looking at plans, what-if scenarios, and actuals. The financial numbers roll up into a set of high-level KPIs giving them the tools to make better decisions and accurately measure results.

Choosing appropriate dashboard solutions

But not all dashboards are the same. Agencies must be careful to adopt dashboard strategies with built-in security that provide each user group/role/part with information that's appropriate, is updated on a schedule that meets their needs, and is shared consistently across the organization. A series of disconnected dashboards is of no value, so IT investments must accommodate these factors to ensure a successful deployment.

Moving beyond Scorecards and Dashboards

When agencies deploy business analytics, they embark on a journey that takes them far beyond spreadsheets and basic visualization techniques. For budget planning and resource allocation, what-if scenarios are used to predict threats and opportunities. Algorithms automate tasks ranging from mundane report development to complex data analysis. And a wide range of discrete business processes, such as automatic inventory replenishment or call center assignments, are optimized by embedded algorithms.



The optimal analytics solution will use a unified platform that works smoothly to deliver insight to your decision-makers. Key capabilities are tightly integrated and capabilities are built or added as needed.



The challenge is typically not in finding a use case; it's in identifying a starting point and creating a plan. To help agencies begin, this section gives you some suggestions.

Assessing your analytics sophistication

How close is your reality to the vision of your agency transformed by analytics? Consider whether some functions are further along than others, and bring people together to share

aspirations and concerns as they relate to analytics. Explore the big challenges that can be addressed by analytics and evaluate together your agency's readiness to address them.

Improving your analytics competencies

Having assessed your path, focus on the capabilities to drive improvements. Analytics specialists may have advanced skills and tools, but agency specialists can best determine requirements and priorities. Real competence in this area requires a partnership between those who excel at analytics and those who understand agency implications. How can these partnerships be improved? Do the statisticians understand your mission or goals? Do leaders appreciate the value the specialists bring? Are skills transferred to local analysts to expand the capacity for future analytics efforts?

Questions to consider for improving analytics skills and tools include the following:

- ✓ How effective is your agency at attracting and developing the analytics skills it needs?
- ✓ What incentives are in place for analytical talent to mentor others?
- ✓ How prepared is your agency to integrate emerging analytical tools into the process?

Using an information agenda

Using an information agenda to connect your path to your competencies puts you in the best position to get started and maintain momentum by aligning information technology to analytics strategy. An information agenda provides the balancing mechanism for acquiring and developing capabilities. The information agenda contains four interconnected areas:

- ✓ Agency strategies and objectives
- ✓ Project roadmaps
- ✓ Information infrastructure
- ✓ Governance of data management and tools

The information agenda begins with the articulation of strategies and objectives to anchor all analytics initiatives in value. From these strategies, it's imperative to identify the most important projects and initiatives.

When developing information agendas, consider these questions:

- ✓ What are our most pressing priorities?
- ✓ How can analytics make a difference?
- ✓ What infrastructure is needed for analytics to be effective?
- ✓ How can our agency and culture make the most of our investments in analytics?

Studying the Analytics Maturity Model

Agencies grow in analytics maturity step by step. Many have some type of reporting or analytical technologies in place but then find that these technologies don't adequately address critical challenges. This realization moves the agency to take steps toward becoming more analytically mature. Business analytics software helps your agency better understand, anticipate, and shape business outcomes. When making decisions, business analytics software enables executives, managers, and staff to answer these crucial questions: How are we doing? Why? What should we be doing?

Many agencies have been steadily improving their ability to answer these questions. Put another way, they have been growing in analytics quotient, or *AQ*. *AQ* measures agencies' readiness, ability, and capacity to locate and apply insight and re-orient to make better decisions — decisions that deliver better outcomes.

Most agencies see growing in analytics maturity as a journey — something they achieve in stages. Not only are some agencies more mature than others in their adoption and use of analytics, but also it's common to find different levels of maturity within the same agency. For the purposes of the discussion in this book, we focus on four levels:

- ✓ **Novice:** At this level, individuals or teams analyze their own data, typically using spreadsheets or basic query tools. Knowledge workers have only a limited historical view into past performance and must rely in part on “gut feel” in making decisions. Some departments may still be using spreadsheets or other basic reporting tools to organize information about their activities. Others in the same agency, however, may be several steps ahead on the journey.
- ✓ **Builder:** The second stage is defined by broader collaboration across teams — typically within one department — using both historical and current views of data, as well as trending for past and future time periods. At this level, the agency’s decision makers may use dashboards or scorecards to get to complex information quickly.
- ✓ **Leader:** These agencies are typified by senior-level accountability with defined operational and financial metrics across more than one department. They can combine data from various systems to achieve a cohesive view of conditions. Integrated, driver-based planning aligns resources, and predictive models are used to understand future outcomes and behavior and determine the underlying factors that influence or cause such results.
- ✓ **Master:** These agencies set top-down goals and allocate resources based on strategic priorities and real-time insight into shifting dynamics. Everyone knows the objectives and how they can collaborate across the agency to achieve them. Decisions are aligned from strategy to operations and analytics are deployed throughout processes to optimize outcomes.



If you’d like to take a friendly quiz that will help you add up your AQ score, visit the IBM website at www-01.ibm.com/software/analytics/aq.

Chapter 3

Improving Program Performance

In This Chapter

- ▶ Recognizing challenges in program management
 - ▶ Using analytics to target the needs of citizens
 - ▶ Managing programs more effectively
-

Public sector civilian agencies make up the bulk of our nation's government, employing millions of Americans at the federal, state, and local levels. For these agencies, measuring and managing performance is a top priority. Integrating this performance info with budget and spending info is quickly becoming the number one goal of civilian agencies, particularly in light of increasing cost constraints.

Herein lies the challenge. Governments, like the private sector, are data rich but information poor. Disparate tools, manual paper-based processes, spreadsheet budgeting, and legacy systems provide limited visibility into program performance. In this chapter, you discover these challenges and how business analytics provides civilian agencies with better information for better results.

Recognizing Challenges in Program Management

Today, more than ever, decision makers need to understand and apply data patterns in order to perform their missions more effectively and produce better results. Agencies and

departments at all levels of government are under constant pressure to improve the services they provide to their constituents. Matching programs to demands, delivering uninterrupted services, and operating efficiently are objectives that agencies must satisfy in order to achieve the ultimate goal of the agency: to serve citizens in the best way possible. Whether your agency provides public utilities, transit and transport, social services, public education, or arts and culture among others, you face many of the same challenges.

Agencies need the ability to link strategy with execution and cost, while measuring detailed, indisputable performance results against targets — metrics, plans, and budgets. Additionally, agencies must make activity-based costing a reality. Civilian agencies must be able to leverage, analyze, and associate silos of information across different parts of the organization to get a single view of performance management.



Take a look at Figure 3-1 to see how these factors work together and how government can use this figure to serve people in better ways and overcome the following challenges:

- ✓ Siloed compliance initiatives and difficulty maintaining audit trails
- ✓ Disparate and inconsistent information across agencies and initiatives (makes it impossible to make informed tradeoffs during the budget cycle)
- ✓ Time lags and long queues hurt the credibility on more strategic problems
- ✓ Inability to link agencies' operational metrics to overall mission or strategic measures of success
- ✓ Lack of information to create an accurate citizen profile
- ✓ Lack of visibility into revenue and expense variances
- ✓ Pressure to demonstrate transparency and accountability back to citizens and national stakeholders on initiatives such as social services, education, and health

Agencies can improve citizen and business services through better prediction capabilities, visibility into performance, and data access for dynamic decision making. These capabilities enable programs to be appropriately matched to citizen demands and agencies to be operationally efficient while delivering uninterrupted and improved services.



The benefits of analytics for citizen services include

- ✓ Predicting and targeting the needs of citizens more accurately
- ✓ Matching programs and resources to meet highest-priority citizen needs
- ✓ Positioning resources to focus on high-priority service areas
- ✓ Automating processes for more efficient and effective service delivery
- ✓ Scaling to serve the needs of national, regional, and municipal governments and specific agency requirements

With integrated plans, business intelligence, and performance metrics, you can improve your understanding of the current state of your operation, which enables you to make timely, informed decisions in line with your operational goals.

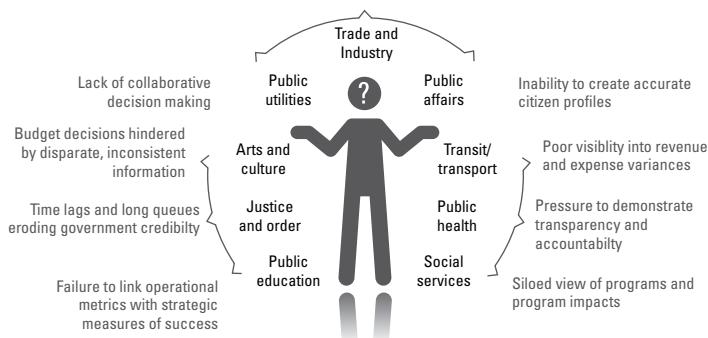


Figure 3-1: Improving citizen and business services.

Advancing Program Performance

Program managers are also under constant pressure to perform. If a program doesn't consistently deliver the expected results or is plagued by cost overruns, it faces the prospect of cancellation or defunding.

Alameda County Social Services Agency uses BI to improve service delivery

The state of California, in an effort to reduce costs and improve the performance of state social programs, challenged its counties to achieve a welfare recipient work participation rate (WPR) of 50 percent. Lower WPR indicates potential fraud and waste. At the time, Alameda County's WPR was 12 percent — last among California's 58 counties and well below the state average of 22 percent. Alameda also needed daily performance metrics proving program effectiveness to respond to state flexible funding provisions and private donors.

A new solution called *Social Services Integrated Reporting System* (SSIRS) was implemented to improve efficiency and customer service. SSIRS extracts client information from a series of department-specific systems, enabling agency staff and management to view case performance from the global agency level down to the worker and to all

levels in between. Business intelligence (BI) and automated alerts empower caseworkers to proactively manage their client base and enable the agency as a whole to coordinate the delivery of social services. Significant benefits include

- ✓ Realized \$11 million in direct savings through fraud and waste reduction
- ✓ Real-time understanding of case and program status to find the best assistance programs for each situation
- ✓ Reduced waste, fraud, and redundancy
- ✓ Reports in minutes instead of weeks or months

To check out the full case study, go to www.ibm.com/business-analytics/alameda and view the PDF.



Program performance analytics enables agencies to

- ✓ Gain a strategic view of programs and budgets from the top level of government to the agency staff level
- ✓ Achieve critical insights, leading to better decision making and the best results
- ✓ Facilitate improved financial and operational governance, reduced risk, and compliance with reporting requirements
- ✓ Take advantage of scalability from an executive level to an agency and agency staff level

Chapter 4

Using Analytics in Defense Agencies

In This Chapter

- ▶ Improving mission readiness
- ▶ Enhancing supply chain management

The U.S. Department of Defense (DoD), with more than 1.3 million men and women on active duty and another 1.1 million serving in the National Guard and Reserve forces, is tasked with defending the nation.

Sharing and leveraging information from disparate sources within and among these mammoth organizations is crucial to ensuring success in their missions. In this chapter, you discover how the DoD and intelligence agencies use business analytics to strengthen national security and defense.

Defending Our National Security

To fight and win our Nation's wars, the DoD must ensure our soldiers, sailors, marines, and airmen are well-trained, well-equipped, and adequately funded to support their mission end-to-end. Accomplishing this mission requires effective information sharing across the full range of military operations and institutional organizations.

Sharing information across this institutional and operational breadth is a mammoth undertaking that requires accessing large volumes of disparate data, all of which are collected and managed by different organizations. Training, equipment,

and medical care, for example, are three separate disciplines handled within different commands.

To ensure successful operations, individual organizations — whether a squad on the ground, a task force at sea, or a regional medical command back home — must be able to share information with and leverage information from other parts of the larger organization.

Business analytics software delivers comprehensive solutions that enable a seamless, integrated exchange of decision-quality information among all levels of government. By providing decision makers with consistent, accurate, and trusted information, business analytics allows immediate insights into mission, financial, and operational performance; deeper analysis of trends and patterns; and clear foresight for planning and allocating resources.

The U.S. Army, for example, is currently putting business analytics technology to work by using online analytical processing (OLAP) to determine which units they'll send in response to requests for Army forces around the globe. This process enables them to quickly wade through vast amounts of data residing in multiple systems, thereby reducing the cycle time between a request and the decision about which unit to send from weeks to hours.

Additionally, the Army uses business analytics reporting and analysis to

- ✓ Manage personnel skills requirements and inventories to effectively deploy resources, identify critical skills gaps, and anticipate when to acquire outsourced services
- ✓ Provide timely reports on the status of all troops and assets
- ✓ Maintain accountability reports to track what decisions have been made and when

Improving Mission Readiness

Readiness. The number one goal of the DoD and one of its greatest challenges. Readiness across the operational breadth of the DoD means war fighters are well-trained, well-equipped,

and have the funds to support their mission end-to-end. Readiness demands operational efficiency throughout the entire organization and means being able to link operational efficiency to budget efficiency.

Herein lies the challenge. Agencies must be able to track war fighters while managing suppliers, material, and distribution. Defense must unite this information to get a complete picture of operational performance — operational efficiency tracked to budget efficiency — to ensure readiness.

Business analytics provides an integrated, best practices software platform for operational performance management. With integrated plans, business intelligence (BI), and performance metrics, you can dramatically improve your understanding of the current state of your agency and improve your ability to make timely, informed decisions in all areas: operations, budgets, personnel, and logistics.

Managing a critical parts supply chain with analytics

The U.S. Coast Guard Aviation Logistics Center (ALC) recently expanded its logistics management IT system to include naval operations. This expansion created a need to consolidate its reporting and modernize its overall IT infrastructure to be more agile and responsive to support the transformation of the organization.

The ALC deployed an integrated IBM Cognos BI solution that produced financial reports and managed procurement, contractors, aviation, and naval station and depot supplies. The solution also supported data driven management of operations for

aviation and naval asset maintenance. Significant benefits included the following:

- The creation of one cohesive data system for supply chain and logistics management
- Savings of \$500,000 in the first year due to improved visibility into the status of part orders
- Enhanced ability to readily build and distribute reports over the Web without overtaxing IT

To read a complete white paper on this subject, go to www.ibm.com/business-analytics/USCG.

Defense agencies use analytics solutions to

- ✓ Help military and defense organizations improve operational effectiveness while reducing costs and waste
- ✓ Measure, monitor, and analyze service-level assets
- ✓ Gain a holistic view of joint operations, capabilities, and task organizations
- ✓ Monitor performance for real-time decision support
- ✓ Locate and track required material and arms for timely delivery
- ✓ Link people, equipment, supplies, training, and weaponry together to support effective national defense

Chapter 5

Strengthening Public Safety



In This Chapter

- ▶ Keeping citizens safe
 - ▶ Improving methods of predicting and preventing crimes
 - ▶ Securing our borders
- 

Public safety is one of the most basic and important functions of government. Keeping citizens safe requires a wealth of information about a virtually infinite number of risks and threats. Whether it's DHS (Department of Homeland Security) countering terrorist threats, FEMA (Federal Emergency Management Agency) responding to natural disasters, CBP (Customs and Border Protection) defending our borders, or the FBI and local law enforcement agencies fighting crimes of all types, data analytics holds the key to more effective public safety programs.

In this chapter, you discover the data challenges for law enforcement and other public safety agencies and how business analytics helps them address these challenges.

Predicting and Preventing Crime

Protecting citizens from criminal threats is a primary mandate for governments and one that often has limited resources. Deploying these limited resources in a manner that maximizes their effectiveness is critical to preventing crime and protecting citizens. Business analytics provides a powerful tool to help law enforcement not only predict and prevent crimes but also solve them.

Using predictive analytics to prevent crime

Residents of Memphis, Tennessee, can sleep a little easier knowing that a new weapon has been deployed to combat crime on the streets: statistical data. With traditional policing tactics unable to thwart a rising rate of criminal activity and budgets tight, the Memphis Police Department (MPD) teamed up with the University of Memphis and Project Safe Neighborhoods and pioneered a way to focus its patrol resources more intelligently. Operation Blue CRUSH (Crime Reduction Utilizing Statistical History) tapped the power of IBM SPSS software and geographic information systems to zero in on where and when crimes were occurring — and likely to hit next.

By recognizing crime trends as they're happening, the MPD's predictive enforcement tool gives

precinct commanders the ability to change their tactics and redirect their patrol resources in a way that both thwarts crimes before they happen and catches more criminals in the act. Significant results include

- ✓ A reduction in serious crime by 30 percent overall, including a 36.8 percent reduction in crime in one targeted area
- ✓ A reduction in violent crime by 15 percent
- ✓ An increased share of cases solved in the MPD's Felony Assault Unit (FAU) by four times, from 16 percent to nearly 70 percent

To check out the full case study, go to www.ibm.com/business-analytics/MemphisPolice and view the PDF.

The last thing criminals want to be is predictable. Yet crime can be as foreseeable as an afternoon thunderstorm. Using predictive analytics to forecast when and where crimes are likely to occur, law enforcement resources can be deployed to expected hot spots. Complex statistical models can be applied to a database of crime reports, arrest records, and 911 calls that produce a color-coded, geographic map that anticipates criminal activity across a metropolitan area. This forecast then acts as a guide for crime-fighting strategies. Additionally, law enforcement agencies and civil authorities can gain surprising and valuable insights into the nature of crimes. For example, analysis may reveal that a large proportion of property-related crimes could be attributed to careless owners. In response, a public education campaign may be undertaken to encourage people to pay attention, follow basic safety and security tips, and avoid becoming a victim altogether.



Analytics for crime prevention helps law enforcement agencies

- ✓ Preempt crimes with more effective deployment of law enforcement resources
- ✓ Monitor crime activity and deploy law enforcement officials using real-time dashboards
- ✓ Improve information transparency across departments
- ✓ Monitor the effect of cross-agency decisions on future crime rates
- ✓ Accurately position new infrastructure investments for delivery of public safety agendas

The goal of local and regional law enforcement, national security, and public safety agencies is to keep our citizens safe. They achieve this mission by reducing crime rates, protecting our borders, and ensuring the right resources are in the right place at the right time.



But through this process, law enforcement still faces many challenges:

- ✓ Manual, inefficient data consolidation and analysis using spreadsheets, and other non-integrated or scalable analytic tools
- ✓ Inability to distill unstructured, “big” data from numerous sources including traffic and patrol cameras, high-resolution imagery, and other disparate sources into actionable insight
- ✓ Difficulty analyzing and revealing important patterns in data
- ✓ No access to real time actionable intelligence about potential and quickly developing security threats
- ✓ Siloed, fragmented crime incident data without “big picture” views of crime patterns or predictive models to guide proactive deployment of resources to counter these threats
- ✓ Need to manage and protect multiple points of vulnerability against an array of risks and threats
- ✓ Inability to share data between different agencies at various levels of government to make informed, time-critical decisions

Bolstering Homeland Security

From deterring and preventing terrorist attacks and safeguarding national borders, to responding to major emergencies and disasters, unifying national security efforts and garnering citizen confidence requires strong, cohesive performance management strategies. Like many government agencies today, DHS is focused on using business analytics solutions to address some of its greatest challenges — a pervasive lack of cross departmental, decision-quality data, continuing budget pressures, and the public's stringent demands for transparency and accountability.



Analytics solutions for national security enable DHS to accomplish the following:

- ✓ Improve border safety by using predictive models to target passenger and vehicle searches
- ✓ Position infrastructure and resources for greater effect on public safety and security
- ✓ Improve transparency and cooperation across departments and among different levels of government
- ✓ Improve threat prediction and prevention
- ✓ Expedite the legal flow of people and goods across borders while intercepting dangerous people and illicit or hazardous items

Chapter 6

Managing Resources Effectively

In This Chapter

- ▶ Controlling expenditures for maximum effectiveness
- ▶ Supervising deficits and improving revenue collection

Financial and operational decision making is a complex process that requires high performance across all levels of government. Analysts are often challenged with managing large volumes of data (both numbers and textual information) through spreadsheets. Too often, these spreadsheets result in stranded silos of disparate and inaccurate data that can't be centrally managed.

In this chapter, you find out how business analytics helps agencies, departments, and programs develop the best course of action for better results and to get the right information to the right people, in the form they need, to make timely, informed decisions.

Getting a Handle on Your Budgets

Agencies at all levels of government are under tremendous pressure to manage resources more effectively — resources like balancing budgets, reducing costs, and preventing fraud and abuse. This management process is outlined in Figure 6-1. In order to meet the goal of doing more with less, agencies with various missions including labor, tax and revenue, energy and public works, public health, and others, must drive efficiencies

for lower-cost service delivery, reduce risk and prevent fraud, and ensure the right resources are in the right place at the right time.

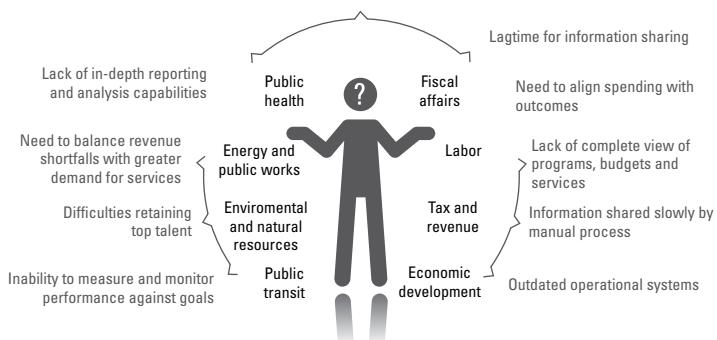


Figure 6-1: Challenges faced by numerous agencies across government.



Challenges to managing resources effectively include

- ✓ Difficulty obtaining shared real-time information, often exacerbated by manual processes
- ✓ Inability to align and correlate spending with outcomes
- ✓ Incomplete view of programs, budgets, and services
- ✓ Outdated operational systems that do not integrate with other modern systems
- ✓ Inability to measure, monitor, and communicate program performance against stated goals and objectives
- ✓ Difficulty retaining well-trained, experienced, and motivated staff
- ✓ Doing “more with less” — revenue shortfalls are common and the demand for services is constant
- ✓ Lack of a complete view or “big picture;” no in-depth data analysis and reporting capabilities

Business analytics solutions typically include enterprise planning, budgeting, and consolidation capabilities that let the entire organization contribute to the planning process and connect strategy to plans, targets, and operational objectives. Flexible planning allows realignment as external conditions change. Predictable planning eliminates “best-guess” project milestones, accelerates cycles, and improves communication.

Analytics helps agencies effectively manage budgets so they can do the following:

- ✓ Gain a strategic view of revenue streams, budgets, costs, and expenses government-wide or at the agency and departmental level
- ✓ Leverage collaborative budget preparation and execution
- ✓ More effectively measure and monitor financial performance across agencies
- ✓ Use robust financial reporting capabilities to support compliance with internal and external requirements
- ✓ Achieve a transparent budgeting process

When used for managing operations, analytics can

- ✓ Predict and help prevent outages in key public services
- ✓ Gain critical insights into management of operational resources
- ✓ Help reduce operational costs related to handling of fraudulent activities
- ✓ Lower operational costs for program execution
- ✓ Manage supply chains for more cost-effective procurement of goods
- ✓ Retain top performers by identifying predictors related to employee satisfaction

Watching over Revenues

The other side of the budget coin is revenue. Agencies must manage revenues to ensure that the funds allocated to their programs and services are actually available. With constant pressure to limit tax increases and public scrutiny of growing deficits, managing revenues is every bit as important as controlling costs.

Countering fraud, waste, and abuse is an ever-important mandate for all agencies in government. Whether it occurs within an agency, among suppliers, or at the constituent level (for example, recipients of social services), fraud, waste, and abuse is a blight that drains limited resources and must be identified and prevented to maintain the public trust.

Using preventive maintenance to reduce customer calls

Facing an aging infrastructure and numerous customer complaints, the District of Columbia Water and Sewer Authority (DC Water) needed to improve asset reliability and lifespan and streamline its business processes. DC Water also wanted to get ahead of maintenance and repair the infrastructure before it failed.

DC Water worked with IBM to implement business analytics and information management technology to modernize infrastructure management and gain greater visibility into critical operations. The partnership yielded the following results:

- ✓ Reduced customer calls by 36 percent through increased preventive maintenance and implementation of automated meter readings
- ✓ Increased percentage of emergency investigations dispatched within 10 minutes from 49 percent to 93 percent
- ✓ Gained the ability to generate reports for regulatory compliance and management review in seconds versus days

To check out the full case study, go to www.ibm.com/business-analytics/DCWater and view the PDF.

Technologies such as data mining can help an agency ask certain pointed questions of the data it has already collected. Analytics provides the ability to slice-and-dice information in different ways and help uncover otherwise hidden fraud. Predictive modeling capabilities can help agencies assign a “risk score” to entities suspected of abusing the system, and monitoring and tracking capabilities help agencies see exactly how government funds are being spent.

Agencies can use analytics for revenue management to do the following:

- ✓ Automate and fast-track the processing of tax returns
- ✓ Help reduce tax and revenue deficits resulting from fraud
- ✓ Better predict who'll pay their taxes
- ✓ Help prevent social services waste fraud and abuse
- ✓ Guard against improper payments
- ✓ Help prevent improper payments for services and goods with deeper insight into supply chain

Chapter 7

Ten Ways to Apply Analytics in Your Agency

In This Chapter

- ▶ Getting the most out of data analytics for your agency
 - ▶ Sharing tricks of the trade
-

In today's climate of ever increasing citizen needs, shrinking budgets, and intense public scrutiny, agencies at all levels of government must improve and communicate program performance and effectiveness. Applying analytics to data consolidated across agencies and departments can provide trusted, accurate, and timely information needed to make the right decisions, enable achievement of ambitious goals across multiple functions, and track progress against strategy — at both a high level and down to the detailed results of individual functions.

In this chapter, you'll learn ten (okay, nine) great ways to apply analytics in your agency or department.

Align Activities to Your Agency's Mission

Government organizations need to tie their goals to strategy and translate those goals into specific objectives and measurements of success for an agency, program, or department. This tie-in helps employees better understand how their day-to-day activities help achieve their departments' strategic goals and that they're utilizing all available resources.

Establish Performance Measurements That Support Strategic Goals

When organizations can tie the goals of political leadership to strategy and translate those goals into specific objectives for an agency, program, or department, employees are better able to understand their individual roles in advancing the overall strategy. Agencies can staff appropriately and ensure the resources in place have the necessary skills to execute against strategic goals.

Unite Silos across Agency Lines

Sharing and consolidating data across agencies, programs, departments, and even systems — as well as between different levels of government — helps decision-makers in public sector organizations see the big picture and how their decisions potentially impact other parts of their organization or multiple agencies. With information silos eliminated, relevant information can be easily accessed, analyzed, and shared with other agencies, business users, and citizens by those who need to (and have the security to) see it.

Manage Budgets and Connect with Results

Budgets are a key management tool in both the private and public sector. But in the public sector, budgets are typically established by referendum or mandate, which means spending limits can be much more rigid and the demand for results against diminishing budgets can be stronger.

Closer tracking of spending to budget helps officials plan programming and expenditures, identify critical unbudgeted amounts, and deliver results against budget goals. In order to demonstrate results, program successes must be clearly linked to budget allocation, spending, revenues, and resources.

Measure and Improve Service Levels

By improving visibility into and across agencies, aligning resources with goals, and measuring success against spending targets, public sector organizations can become more responsive and transparent. Public officials and employees can monitor a program's progress against goals, measure service levels, and find inefficiencies to be fixed, in order to achieve better outcomes. Decision makers can better analyze risks, quickly identify critical issues, and rapidly correct problems to minimize waste and avoid embarrassing and costly public disclosures.

Predict Possible Outcomes

Many public sector organizations are utilizing predictive tools to help them better plan future activities in areas such as personnel management, crime prevention, social service requirements, economic development, and tax revenue forecasting. Such advanced analytics can provide powerful foresight into what should be done to improve effectiveness and outcomes.

Create a Culture of Analytics

As the tools become simpler to use and less expensive and as confidence in data grows, a culture of analysis forms, encouraging staff to ask questions and think critically about how operations and processes, incentive structures, and so on affect outcomes delivered. Giving people the info needed to make fact-based decisions gives them more responsibility and accountability — factors that contribute to better performance.

Demonstrate Good Governance

Government agencies, departments, and programs are accountable for results and face increasing regulatory compliance requirements and intense public scrutiny. When appropriate employees at any level can access centralized data on program outcomes and budgets, organizations can improve efficiency and better manage risk.

Implement Best Practices

Agencies that have implemented analytics solutions have discovered a number of factors that lead to success including the following:

- ✓ **Start small and grow.** Select a single, critical issue, such as budgeting, and focus on this project initially. After it's up and running, expand to other areas, carrying the experience and knowledge earned with the first project.
- ✓ **Get executive support.** When an executive sponsors the project, many barriers are removed and buy in/adoption is more certain. After employees understand the benefits of the technology, use will spread rapidly.
- ✓ **Enable analytic self-service.** Besides removing the reporting burden from IT, self-service puts strategic information in the hands of decision-makers at all levels. Self-reliance contributes to the culture of analysis that in turn supports performance improvements. Users can answer initial questions on their own, and then have enough detail to ask deeper, more detailed questions among colleagues.
- ✓ **Set up a committee or competency center.** Having the technology is one thing. Knowing what kinds of reports are needed, evaluating how the current ones can be improved, and knowing how best to deliver them to various users is quite another. A group of cross-disciplinary, cross-departmental staff focused on these questions is essential. Make sure to get your business and IT folks together in the early stages of the process to ensure the right info is delivered.

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Get access to reliable, timely information that drives better decisions

Government Analytics For Dummies, IBM U.S. Limited Edition, helps you understand how business analytics drives results in government for federal, state, and local agencies. These results show better prediction capabilities, visibility into performance, and data access for dynamic decision-making. If you're a mid-to senior-level military officer or government official, this book is for you. Flip open the pages and get started on your journey to understanding government analytics.

- ***Understand the challenges involved — know the challenges and improve citizen and business services***
- ***Manage your resources — control expenditures for maximum effectiveness***
- ***Turn to analytics — deliver smarter results***
- ***Align your strategies with global change — be a leader in your industry***



Open the book and find:

- Why analytics is important to government
- The government imperatives
- How to measure your success
- Ten ways to apply analytics in your agency

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