Creating a Balanced Portfolio of Information Technology Metrics

By Kevin C. Desouza

Given the growing dependence on information technology (IT) for service delivery and the accomplishment of mission objectives and the trend of increasing spending on IT, it is important that we have tools and techniques in place to develop a balanced portfolio of measures of IT performance, which include IT project management, IT operations management, and IT innovation.

This report investigates the state of the use of IT metrics in the public sector. The project reviewed literature across diverse fields such as management sciences, information systems, public administration and management, and operations management to examine the state-of-the-art approaches to the use of metrics for IT in the public sector. The project analyzed strategic plans from federal and state government IT offices to understand how metrics were captured in these formal plans.

The Need for Metrics

Information technologies (ITs) are critical assets in all aspects of the public sector. The criticality of designing, implementing, and maintaining IT assets in an effective and efficient manner cannot be underestimated. Over the last few years, spending on IT has increased across all three levels of government (federal, state, and local), and most observers expect this trend to continue.

Given this growth in spending and the critical connection of IT to the operations and success of public agencies, we hear a limited number of success stories on how IT has helped transform agencies, deliver service more optimally, save taxpayer resources, and even lead innovation efforts to address vexing social challenges. We are more likely to hear about IT projects that have "gone rogue" and failed to deliver on their promises.

One possible cause for these problematic IT projects is that the chief information officer (CIO) community has not done enough to invest in the creation of metrics that capture the performance of IT assets and their contribution to organizational performance. Building performance management processes and capabilities requires CIOs to invest time and effort to capture, validate, analyze, and share data on metrics. In the absence of credible information on IT performance, anecdotal evidence about IT failures is likely to dominate the discussion of IT performance in the public sector. With the availability of IT performance metrics, CIOs can both proactively manage performance and demonstrate mission results.

In light of very public IT failures at each level of government, the time now appears ripe for further improvement in the management of IT projects with the development of IT metrics. There are efforts underway to modernize policies and procedures when it comes to IT management and the role of the CIO. The challenge is that IT projects are highly complex, and government now is attempting to better manage that complexity. Part of the response to this has been the increased emphasis on developing metrics to measure current IT performance. As government deals with the challenge of IT and organizational complexity, its response has been to enact stronger performance management tools, such as metrics. Metrics should be used to measure current performance, as well as to signal opportunities for improvement.

Metrics identify organizational priorities and measure the performance of those priorities. Metrics should track performance and guide operational and strategic decisions. The Government Accountability Office (GAO) and the Office of Management and Budget (OMB) have extolled the need for quality IT metrics in government to measure and assess the effectiveness and viability of IT projects.

In a February 2015 audit of 20 Department of Defense (DoD) major automated information systems—which include communications, business, command, and control systems—GAO found that 12 out of 20 programs did not have cost and performance metrics in place within the first two years of the programs. GAO found that it took the DoD,

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on average, five years and two months, and $452 million, to establish baselines for life cycle cost, scheduling, and performance targets.

In spite of the challenges, complexity, and inconsistency, a focus on metrics is important. Metrics are needed to increase transparency of operations, track progress, spur innovation, and understand areas for improvement.

IT-Specific Performance Management and Metrics Programs in the Obama Administration

OMB plays a key role in the development and oversight of federal investments into IT by working with agencies to plan, justify, and determine how to manage their portfolios. OMB also assists agencies in developing business cases for potential IT investments and establishes management processes for monitoring investments. Through initiatives such as the IT Dashboard, TechStat, and PortfolioStat, OMB has focused its efforts on improving IT project management to prevent wasted resources. As explained below, these efforts are making strides toward improving performance management; however, most remain incomplete and need further development.

On July 25, 2013, David A. Powner, director of IT management issues at GAO, testified to Congress that:

"The federal government continued to spend billions of dollars on troubled IT investments and we identified billions of dollars' worth of failed and challenged IT projects."

The State of IT Metrics Today: Challenges and Findings from Interviews

Twenty-seven chief information officers (CIOs) and/or IT directors were interviewed on their use of metrics to manage IT departments, personnel, infrastructure, projects, and innovation. The interviews identified four challenges:

Challenge One: Many IT metrics will depend on other organizational units meeting their performance targets.

Challenge Two: IT metrics require a focus on long-term planning.

Challenge Three: CIOs will need to coordinate efforts to integrate metrics and develop standards for comparison.

Challenge Four: IT departments must have the ability to collect real-time data on IT operations.

Findings
Based on our interviews with CIOs at the federal, state, and local levels, we had five key findings:

1. CIOs recognize the value of metrics.

2. CIOs are adept at managing through metrics for outsourced contracts.

3. CIOs are participating in agency strategic planning processes.

4. CIOs use metrics for benchmarking, but with caution.

5. CIOs need to carefully manage IT metrics around cost.

The report notes that CIOs recognize and understand the value of metrics. CIOs have created programs to support the collection, analysis, and communication of data on IT programs, but they are challenged to find the time and resources to implement comprehensive performance management programs within their departments.

Recommendations

Based on our interviews, the report now sets forth a series of recommendations on the development of metrics for use by CIOs in measuring IT performance. The recommendations are organized into a process framework of designing, implementing, and evaluation.

Designing an IT Metrics Program
Recommendation 1: Set clear goals before selecting metrics—A common misstep in metric use is deciding which metrics to use before clear goals and objectives have been

identified and established. The CIO should look first at what the organization wants to accomplish and then decide on the appropriate metrics.

Recommendation 2: Develop a strategic IT plan linked to agency strategic goals—CIOs should work quickly and diligently to create detailed, thorough strategic plans. A CIO

should start with the agency's strategic plan to assess the areas where technology can enhance the agency's capacity and likelihood of reaching the goals.

Recommendation 3: Engage internal and external stakeholders in the development of metrics—Stakeholders should be engaged in the selection, definition, and collection of metrics.

The Federal Information Technology Acquisition Reform Act: A Stronger Role for Federal CIOs Can Enhance IT Performance Metrics

The Federal Information Technology Acquisition Reform Act (FITARA), passed in 2014, enacted changes to the governing and management of information technology (IT) in the federal government. Amid significant challenges with IT procurement strategies and project execution, FITARA was developed to increase efficiencies, provide cost savings, provide better services to citizens, and limit the number of IT project failures. The most significant changes FITARA made to IT governance were strong mandates for chief information officers (CIOs) and the clarification of their role within their organization, their power, and responsibilities.

New authorities that FITARA vests in the CIO are significantly increased responsibility and authority over IT functions within the agency. Prior to the law, many CIOs did not have clear authority within their organization to manage IT. Authority and responsibility were often split, making IT management a tangled web that frequently reduced responsibility and clear accountability for project failures. Today, authority for hiring IT personnel, approving IT budgets, and signing IT contracts is now subject to the CIO's approval.

To establish clear lines of authorities and government-wide IT management controls, agencies now are required to set a common baseline for roles, responsibilities, and authorities. This baseline will come from a self-assessment and implementation plan that each agency will conduct and submit to the Office of Management and Budget (OMB). This baseline will become a basic set of requirements that explains how CIOs will interact with agency chief acquisition officers (CAOs) and chief financial officers (CFOs). It also outlines CIO mandates such as the CIO's inclusion in IT program planning at the agency component level, in final project approval, and on boards that use IT resources as well as the agency's Investment Review Board.

The baseline also designates that the CIO will define development processes, milestones, policies for capital planning, and IT resource reporting. This ensures that CIOs are creating processes that certify and review IT resources. Additionally, recognizing that placing too much responsibility on the agency CIO could create bottlenecks, FITARA added delegation responsibilities. CIOs will, however, still have the ultimate responsibility for IT functions within the agency. This keeps expectations of accountability and responsibility realistic, while creating new methods for governing IT projects within agencies and keeping the CIO as a strategic player across the organization.

To achieve the targeted changes of FITARA, agencies will have to implement transparency and review methods. CIOs will work with other program managers to outline strategic objectives and create IT performance metrics. Monthly reports that include updates via performance metrics and activity data for major IT investments will be submitted to OMB. If data reported is not timely or deemed unreliable by the CIO, the CIO must notify OMB and develop a plan to find and resolve the problem.

FITARA offers the opportunity for federal agencies to enhance the use of metrics in developing more evidence-based approaches to managing IT. Efforts such as baselining and sharing data will prove useful toward the creation of metrics. In addition, metrics focused on costs for services, acquisition, and maintenance of systems will become useful tools to streamline the management of IT in the public sector. Analytics, such as the identification of spending patterns, vendor-specific analysis for performance on contracts, and more rigorous project analysis can result if data on key metrics are captured and analyzed rigorously.

Stakeholders need to personally buy into the metrics, and understand the value behind participating in metrics programs.

Recommendation 4: Collect baseline data on performance—Collecting baseline data is important because it allows the CIO to accurately and reasonably measure performance. Baseline data are the foundation of performance management.

Recommendation 5: Avoid "watermelon" metrics—While CIOs are developing metrics, they should avoid creating index measures that combine multiple metrics, which can become "watermelon" metrics. Watermelon metrics are what one interviewee and his department use to describe results that appear "green" (reflecting success) on the outside but reveal a "red" (reflecting failure) core when split apart.

Recommendation 6: Select fewer and less-complex metrics—The old adage of "less is more" can be applied to metrics in the public sector. Quantity does not necessarily equal quality, and CIOs must understand this to find true value from their metrics.

Recommendation 7: Design and build dashboards that capture metrics—Metrics do not matter if we cannot make good use of the data they produce. Dashboards help us use data in a way that is easy to visualize and manipulate to meet our needs.

Recommendation 8: Do not focus exclusively on IT infrastructure metrics—CIOs need to have a balanced portfolio that looks at metrics around people, projects, and even innovation.

Implementing an IT Metrics Program

Recommendation 9: Communicate regularly and often with key stakeholders about metrics—Maintaining dialogue with stakeholders allows the CIO to develop and reassess metrics that are up-to-date, useful, and goal-oriented. This can be done by establishing regular meetings with stakeholders that ensure changes—or possible disruptions—do not go unnoticed.

Recommendation 10: Keep metrics updated—CIOs emphasized the need to keep up-to-date and timely metrics. If the CIO has a metric, then ensure that the IT department is capturing data on it, analyzing it, and reporting the current status of it.

Recommendation 11: Use metrics to set targets—CIOs can use metrics to establish targets within each of the categories

discussed earlier (project management, operations management, and innovation).

Recommendation 12: Keep an eye out for people gaming the metrics—Metrics are only as good as their utilization, so managers must make sure that they are used as intended. There is ample evidence of the negative outcomes that can happen when employees attempt to game the system and work toward a certain metric output instead of working to actually improve performance.

Evaluating an IT Metrics Program

Recommendation 13: Revise metrics periodically—We were told by several CIOs that, in order to get the right metrics, one must continually reassess. This requires CIOs to take a critical look at what they're measuring, things that have changed, possible threats, and opportunities.

Recommendation 14: Seek continued renewal and improvement—Metric optimization must take place to enhance performance management. Optimization is continuous renewal and improvement; specifically, it requires organizations to mine metrics and use the information to drive continuous improvement.

As evidenced by this report, government IT leaders need now to be part of a new era of government performance management that is data-driven, constantly evolving, and optimized. ◘

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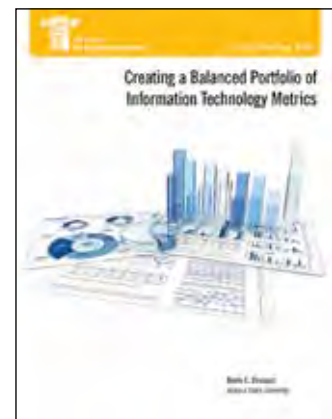
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