Vision, Leadership, and Innovation: Driving Excellence

Features:

Interview of the Honorable Robert M. Speer
Interview of the Honorable David L. Norquist

Leveraging Data Analytics as a Force Multiplier

by Ariane Whittemore, Paulette Freese and Andreas Lucido, CDFM, PMP

In today's fast-paced, results-driven world, traditional analysis and "gut" inspired intuition do not cut it in financial management, particularly in the high stakes environment in which many of us serve. Leaders and decision-makers demand a modern, flexible, and predictable approach to quickly gather and array disparate data in a manner that is easy to visualize and understand.

To that end, it is essential that financial managers comprehend the foundation of data and information management and the different types of analytic approaches an organization may leverage to set the conditions for advanced analysis as well as rapid and agile decision-making. Specifically, we need to understand how to use descriptive, diagnostic, predictive, and prescriptive analytics.

Why Should You Care?

OK, so why should you be interested in investing your scarce time and resources in data analytics in these times of fiscal uncertainty? If the mere existence of that unforgiving environment isn't enough, it is clear that investing even a modicum of effort in data analytics can provide you with access to information needed to make evidenced-based decisions that can set you and your organization on a path to success.

So how do you know if your organization needs to invest some resources in data analytics? Here are few characteristics of organizations that could benefit from a more robust approach to turning raw data into actionable information:

- Does your organization tend to make decisions based on what happened yesterday rather than what lies ahead?

- Do your analysts and leaders have difficulty uncovering novel courses of action that could be used to achieve desired outcomes and end states?

- Is it difficult to access and effectively integrate all the existing, organic information your organization produces?

- Are you uncertain about whether the information upon which you make decisions is missing or incomplete?

If the answer to any of these questions is "yes" then please read on.

It wasn't all that long ago (certainly within the career span of some readers) that the primary tools of budget and financial analysts were pad, pencil and the ubiquitous desk-top adding machine with which they prepared hand-written tables of information for briefings and multi-million dollar decisions. Data was scarce and information even scarcer. Just within the past couple of decades, we moved toward automated spreadsheets and briefings (anyone remember Harvard Graphics?) as we worked to provide requisite information to decision-makers to make the right choices... still without data clarity to most effectively inform decisions. As information technology and access proliferated, we began to suffer not from a dearth of data but from an overflow of it. Today, the information presented by those pad and pencil financial managers of bygone times simply wouldn't be good enough for contemporary decision-makers.

But what can analysts and leaders really gain by employing data analytics? Here are some of the most tangible benefits:

Data analytics capabilities are a critical, proven enabler to better informed decision making.

• Improves ability to make data driven decisions.

• Creates transparency for leadership and stakeholders.

• Integrates accountability and performance.

• Measures financial and business risk.

• Validates data and business rules.

• Provides basis for predictive analytic capability to drive future growth.

• Develops opportunity for process improvements and optimization.

• Acts as a "force multiplier" within an organization.

This is all about making better decisions in an increasingly complex world. If current trends continue, the federal financial management community will not grow substantially in the years ahead and may actually decline (particularly in light of pressure to reduce headquarters staff in DoD and other organizations). Moreover, the percentage of financial managers who are retirement eligible continues to rise. One certainly can't replace a seasoned financial manager, but we have to prepare for that eventuality by better leveraging available data. We need to establish business rules and use tools to enable us to make more informed decisions with less touch-labor. Data analytics is one powerful means of improving financial decisions that will chart a path to more efficient federal financial management processes and a more ready and capable force.

A Brief Primer on Decision Analytics

For almost every exercise in the military, we use the "crawl, walk, run" approach. This is similar to leading implementation practices for data analytics. The foundation of analytics begins with descriptive reporting and diagnostic analysis, which is more along the stages of "crawl and walk" in a military setting. As an organization matures its data analysis capabilities, predictive and prescriptive analytics becomes an advanced opportunity to enter the "run" stage and truly becomes a force multiplier for analysts and leadership *(see Figure 1)*.

Descriptive analytics is the method most commonly used across most federal government organizations and it is primarily used for reporting. It provides insight into "what happened." Imagine yourself as a comptroller looking to find ways to improve an invoicing process in Afghanistan. Descriptive analytics will provide insight into how many invoices need to be processed and the total value of funds outstanding.

Many organizations across government are already using descriptive analytic capabilities, and visualization tools such as *Tableau, Qlik,* and *Microsoft Power Business Intelligence* (BI). Each visualization software has benefits and drawbacks. However, many organizations struggle deciding which is the right visualization software for them; the answer to this is, of course, that it depends.
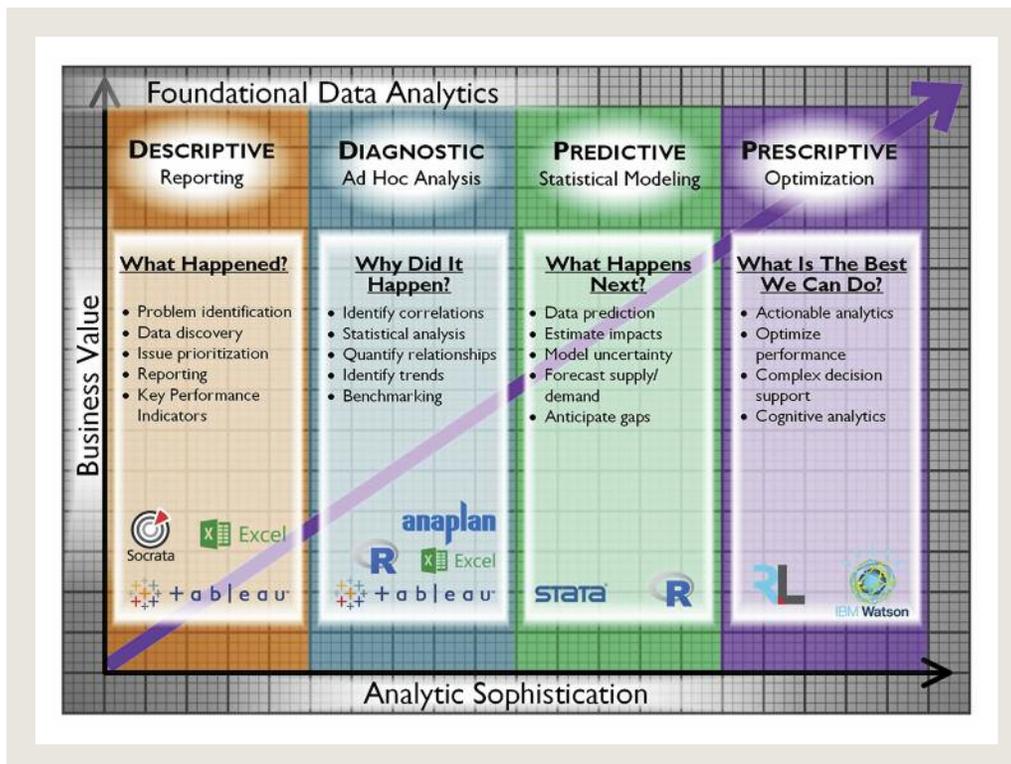

Figure 1: *Foundational Data Analytics*

Figure 2: Visualization Software Examples

Practitioners of data analytics are generally software agnostic, but the complexity of the business environment, number of IT systems, and sheer volume of data is a good place to start to focus on a particular offering. Another key consideration is an environmental assessment to understand which data analytics tools are currently being used within your organization or your parent organization. For example, a budget officer or non-commissioned officer within the Army financial management community may consider Tableau more strongly, knowing Army Program Analysis and Evaluation has already purchased Tableau Server and will provide access to those interested in using it. Or, a contract analyst at Army Contracting Command may consider using Qlik knowing that is what the command purchased and it is important to integrate analytical products for leadership. Or, maybe you are a lone finance officer at that fund center in Kandahar and you choose to use Power BI, knowing it has already been purchased with the Army's Microsoft package. Regardless of the ultimate choice, it is important to purposefully make a reasoned decision.

Before an organization jumps into more advanced data analysis approaches, it is useful to start with basic "blocking and tackling" through descriptive analytics. This on its own can rapidly advance insights, create efficiencies, and reduce workload to provide more opportunity to analyze rather than just report.

Diagnostic analytics is more analysis based. It provides additional detail on "why" something happened. In the same example as above, diagnostic analytics would be able to provide you, as the comptroller, with the reason(s) why so many invoices are outstanding. This could be attributed to the volume of invoices located at one fund center or forward operating base and the available contract and financial analysts onsite to process them. Or, it could be an issue with the complexity of certain invoices, where contracts with multiple line items take a longer period of time to process than standard service or material contracts.

Predictive analytics provide the next step by leveraging statistical modeling. It provides an indication of "what will happen next." Returning to the invoicing process in Afghanistan, you as the comptroller will know that there will be a backlog of invoices in Kandahar due to the limited resources and complexity of contracts at that location. In setting performance measures for all your fund centers and preparing for major briefings with your leadership, you will know in advance there will be a future backlog of invoices at that location.

Finally, *prescriptive analytics* is a means to optimize a process. Referencing the same invoicing example, prescriptive analytics would provide the ability to predict the backlog of invoices of a certain type and identify the action needed to execute the payment of funds. For example, you as the comptroller could institute an automated action to reduce the backlog of invoices by routing complex invoices to Bagram (instead of Kandahar) where there are financial and contract analysts with deep expertise in managing multiple line item contracts. Similarly, you could create an automated action to route invoices to another location based on the volume completed and outstanding, as measured at all your fund centers in Afghanistan.

Implementing Decision Analytics

Each type of analytics approach provides unique benefits to act as a force multiplier. However, just like the admonishment of "crawl, walk, run" in military exercises, an organization needs to master each analytics step in turn; it is extremely difficult to leap straight into predictive or prescriptive analytics. Analytic capability should mature over phases and be sequenced based on the needs of the organization. Overall, successful organizations tend to follow an iterative process to continuously refine and improve analytic efforts.

> *"We've used data analytics to support both information sharing and decision making. When the GAO audit team requested financial information on income from our overseas operations, our consulting partners identified data analytics that provided the specific data requested, as well as trend analysis over a number of years. They also introduced us to a software solution which gives us the ability to sort and view data and create visualizations that tell the story in a snapshot, and can be tailored to the audience and the topic being discussed."*
>
> **Paulette Freese,**
> Office of the Deputy Assistant Secretary of Defense for Military Community & Family Policy

During the first phase of data analytics implementation, an organization should define its business challenges, identify process owners, understand key business drivers, and define the desired end state. A recent example of a successful descriptive analytics implementation is at U.S. Army Central (ARCENT), where the Resource Management (G8) directorate

migrated ARCENT's Performance Metrics program from a 50 chart PowerPoint briefing to eight dynamic dashboards in Tableau. Using Tableau data visualization software, ARCENT created a suite of interactive reports and dashboards which increased its analytical capabilities through mapping, drill-down functionality, and dynamic filtering to provide actionable financial information for both financial managers and senior leaders.

In the second phase of implementation, ARCENT was able to develop a strategy for integrating data sets across various legacy financial, logistics, and travel systems. ARCENT was then able to combine not previously linked data sets, to reveal trends, patterns, and causal relationships, to improve overall data quality. Based on the previous phases, ARCENT has developed a summary scorecard for 22 metrics across 10 financial centers and created seven supplemental dashboards to support deep dive analytics, trend and root cause analysis against open commitments, spend plan execution, and campaign lines of efforts. These dashboards were presented during the final phase in a financial management forum to Army financial management leadership and ARCENT's global fund centers.

Similar efforts have been completed in the office of Military Community and Family Policy (MC&FP) within the office of the Undersecretary of Defense for Personnel and Readiness. Through data analytics implementation, MC&FP developed a data repository to centrally collect and integrate data across the military Services' disparate data systems to analyze, assess, and report Nonappropriated Fund Morale, Welfare, and Recreation program financial performance. MC&FP was able to transition from inaccessible archival data to an online analytics environment, allowing instantaneous multi-year reporting and analysis. Data analytics also enabled MC&FP to turn data into information. This information has been used numerous times by senior leaders to make more informed program and budget decisions. Next, MC&FP will evaluate additional data to incorporate into the data repository, which will enrich the understanding of DoD's nonappropriated fund activities' costs and program performance.

Conclusion

In assessing opportunities to implement data analytics, federal financial managers should conduct the same due diligence as they would when assessing other business improvement opportunities – one size certainly does not fit all. Organizations should evaluate the type and relevance of proposed software to the business environment, clearly understand each step in the implementation process, and embrace iterative opportunities to enhance and accelerate decision-making information for leaders. There is no time like the present for DoD and other federal financial managers to implement novel approaches and leverage advancing technologies to increase productivity and insight at all levels.

Ariane Whittemore

Ariane Whittemore is a Director in the Security & Defense Business Unit of Grant Thornton's Public Sector. Before joining Grant Thornton in 2015, Ms. Whittemore served 35 years in the Department of Defense financial management community, the last 20 as a member of the Senior Executive Service. She culminated her career as the Assistant Deputy Commandant of the Marine Corps for Programs and Resources. She is a former President of the ASMC Washington Chapter and leads Grant Thornton's ASMC sponsorship.

Paulette Freese

Paulette Freese is the Assistant Director of Nonappropriated Fund Policy in the Morale, Welfare, and Recreation (MWR) and Resale Policy Directorate in the Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy, Office of the Under Secretary of Defense for Personnel and Readiness. Her team provides policy, advocacy, and oversight for nearly $20 billion in programs that deliver critical community support and quality of life benefits to service members and their families, as well as commissaries, military exchanges, and other activities supported by nonappropriated funds.

Andreas Lucido, CDFM, PMP

Andreas Lucido is a Senior Manager in the Security & Defense Business Unit of Grant Thornton's Public Sector. Mr. Lucido is a former Army officer who served in multiple joint task forces and commands. He has more than ten years of experience in program management leading various financial management and data analytic engagements across the Army and federal government.