

## SPECIAL REPORT: ANALYTICS SUPPORTING NATIONAL SECURITY



# ADVANCED ANALYTICS STILL RICH WITH UNTAPPED POTENTIAL FOR NATIONAL SECURITY

Government and military organizations are just beginning to explore the potential for advanced analytics to transform decision-making

**THE CASE FOR ADVANCED ANALYTICS** supporting national security is beyond question. Whether dealing with mission readiness, situational awareness, acquisition, or intelligence issues, advanced analytics are already providing decision-makers with deep insight into a given challenge as well as foresight into the effectiveness of different decisions.

With that in mind, the 2018 National Defense Authorization Act (NDAA) makes data management a priority. The goal is to “promote defense management transformation through the better use of large amounts of data from across the department,” according to the Senate Armed Services Committee summary of the legislation.

NDAA also empowers the department’s chief management officer to coordinate the governance and use of data across the Department of Defense (DOD).

“Data is the foundation for whatever mission area you find yourself in,” says Mark Krzysko, Deputy Director for Enterprise Information in the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics/ Acquisition Resources and Analysis at DOD.

At the same time, there is a growing realization that organizations are just scratching the surface with advanced analytics—that there’s so much more that can be accomplished. It’s not just a matter of collecting more data. It’s about the utility of that data for smarter and better insights to shape their decision-making.

“We’ve been using data for decades, but it has been highly inefficient,” says Krzysko. “Sometimes it’s right. Sometimes it’s wrong. And taking that leap, changing the dialogue to a data dialogue, is fundamentally difficult.”

## AUGMENTED DECISION-MAKING

The relationship between advanced analytics and decision-making is more nuanced than many realize—especially when it comes to predictive and prescriptive analytic tools. On the one hand, these tools can provide military commanders and other leaders with actionable intelligence more quickly than a human analyst. The operative word is “actionable.”

However, the goal of analytic tools is not to circumvent human decision-making, but to augment that process with hard data, according to a recent report titled “Predictive Analytics Handbook for National Defense,” developed by Booz Allen Hamilton.

For example, analytic tools can help commanders understand the relationships between different silos of information, freeing them up to focus on higher-level issues, according to the report.

In short, these tools ensure commanders have more information—and more accurate information—upon which to base their decisions. “The data might be in the form of the mathematical probability that an event will occur, or a recommended action based on certain parameters,” the report states. “Commanders still need to use their experience, knowledge, and judgment to evaluate the analytic outputs.”

## A DIFFERENT WAY OF THINKING

Data experts say that advanced analytics requires a different way of thinking. That dialogue needs to shift from thinking about the tools themselves to thinking about what difference they can make.

“It’s not about the technology. It’s about understanding what questions you’re trying to answer, what problems you’re trying to solve,” says Kevin Garrison, Chief of Analytics in the Office of Special Assistant for Governance and Analytics at DOD. “If you don’t know what problem you’re trying to solve, it’s just a science project.”

Mark Tapper, Special Adviser to the Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance (ISR) for the U.S. Air Force, describes it in terms of a “mission effect change.”

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Defense and intelligence agencies have no shortage of data with which to work, with information streaming in from innumerable sources. The challenge is to make the leap from data collection and aggregation to actionable intelligence.

“How do you aggregate capabilities to create effects?” says Tapper. “How do I aggregate all data known to mankind, and then how do I make that aggregation useful? And how do I move the aggregated data-for-decision on timelines that matter? That’s really the mission effect chain.”

Actionable intelligence can come in different forms, depending on the questions being asked. Gartner has identified four stages of advanced analytics maturity, with each stage providing more value than the last:

- **Descriptive:** Focused on providing insight into a given situation.
- **Diagnostic:** Focused on explaining how that situation developed.
- **Predictive:** Focused on helping leaders anticipate the potential effect of a given action.
- **Prescriptive:** Focused on helping leaders determine how to chart a course to a desired effect.

Training is critical to helping people think about data in new ways. Part of that is training people to use the tools effectively; the other part is training people to ask the right questions.

“The most important part of the transformation is grooming our workforce to understand how data can help them do their job,” says Krzyzsko. “It’s a transformational leap.”

Case in point: Robert Cardillo, director of the National Geospatial-Intelligence Agency (NGA), recently finished an eight-week course in Python, an open-source programming language often used for data analytics.

“That’s to show—to demonstrate from the top—that this is really serious business now,” says Peter Highnam, director of research at NGA.

### GETTING FROM HERE TO THERE

But training is only part of the story. To get buy-in from key stakeholders—to help their agencies move up the maturity scale—data experts need to demonstrate the value of advanced analytics. In short, real change happens when analytics experts win people over by actually solving real problems.

That can be more difficult than it sounds, because real problems often defy quick fixes. “A lot of problems that need to be solved are not one-year or two-year problems—

## MAKING THE CASE

When it comes to getting buy-in for advanced analytics initiatives, it’s important to provide stakeholders with a compelling argument.

Peter Highnam, Director of Research for the National Geospatial-Intelligence Agency, suggests using the “Heilmeier Catechism,” a series of questions developed by George Heilmeier (Director of the Defense Advanced Research Projects Agency from 1975-1977) to help the agency evaluate research proposals:

1. What are you trying to do? Articulate your objectives using no jargon.
2. How is it done today, and what are the limits of current practice?
3. What is new in your approach and why do you think it will be successful?
4. Who cares? If you succeed, what difference will it make?
5. What are the risks?
6. How much will it cost?
7. How long will it take?
8. What are the mid-term and final “exams” to check for success?

they are three-, four- or five-year problems,” says Garrison.

On the other hand, the idea is not necessarily to start with the most difficult problems.

“There are some critical challenges out there, but [it makes sense] to start small, understanding where your pain-points are and what kind of urgent problems you might be able to tackle,” says Graham Gilmer, a senior associate and leader in Data Science and Machine Intelligence within Booz Allen Hamilton’s Strategic Innovation Group.

In a way, it’s not that different from how agencies approach the workforce, says Scott Jachimski, a principal and director of Analytics, Data Science and Machine Intelligence for National Agencies in Booz Allen’s Defense & Intelligence business. When hiring a new employee, an organization does not expect that person to fit in perfectly from day one. Instead, there’s a learning curve, both for the employee and the organization.

It works the same way with advanced analytic tools, says Jachimski. A new tool “might be intimidating now because it’s not 100 percent accurate. But if you can learn to embrace it and try to teach it and help it, in five or ten years it’s ready—and you’re ready along with it.”

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# SESSION HIGHLIGHTS

FCW, Defense Systems and technical partner Booz Allen Hamilton, recently convened an event to explore and examine the evolving role of analytics in national security. Here are some highlights and takeaways:

### KEYNOTE

#### MARK KRZYSKO

Deputy Director for Enterprise Information Office of the Under Secretary of Defense for Acquisition, Technology & Logistics/ Acquisition Resources and Analysis, Department of Defense

*"If you don't understand how [advanced analytics] is fitting into your mission area, you may go awry. You may have product without success."*

#### TAKEAWAYS:

- When sharing data across organizational boundaries, it is important to come to terms on data semantics.
- Data sharing initiatives also must address sensitivity classifications.
- Context matters: When sharing data, organizations must document the relevant use cases and business rules associated with that data.

### PANEL DISCUSSION

#### KEVIN GARRISON

Chief of Analytics, Office of Special Assistant for Governance and Analytics, Department of Defense

*"It's not about the technology. It's about understanding what question you're trying to answer, what problem you're trying to solve."*

#### TAKEAWAYS:

- Advancing to predictive or prescriptive analytics is more about culture than technology.
- Technology for advanced data analytics is a critical component, but it's not the most important factor.
- Advanced analytics succeeds only when it shapes how people make decisions.

#### SCOTT JACHIMSKI

Principal and Director of Analytics, Data Science and Machine Intelligence for National Agencies, Defense & Intelligence Group, Booz Allen Hamilton

*"It's really about, what things can we solve? What things can we work on today? And what are the things that maybe might take a little longer, but that we want to start working now?"*

#### TAKEAWAYS:

- To develop a more mature analytics approach, it is essential to address barriers to data access.
- Often those barriers are less about technology and more about policies and culture.
- When selecting a problem to tackle, narrow the focus as much as possible.

#### MARK TAPPER

Special Adviser to the Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance, Headquarters U.S. Air Force

*"Whatever the tools, whatever the analytics, they have to be intuitive, and they have to be specific to particular problems."*

#### TAKEAWAYS:

- Think in terms of data-for-a-purpose: What do you need to know? When do you need to know it? And how will you use the information once you get it?
- To win support, advanced analytic tools must be intuitive and not require extensive training.
- When it comes to adopting a new solution, look for people who want to make it happen, not the people who want to say that it can't be done.

#### GRAHAM GILMER

Senior Associate, Data Science and Machine Intelligence, Strategic Innovation Group, Booz Allen Hamilton

*"The ability to be agile and responsive to these new capabilities is critical for us to be able to keep up."*

#### TAKEAWAYS:

- The move toward predictive analytics is being aided by advances in computational power and machine learning.
- Predictive and prescriptive analytics are important, but there is still real value in more traditional descriptive analytics.
- In DOD, the adoption of open data architectures is supporting the use of advanced analytics.

#### DR. PETER HIGHNAM

Director, Research, National Geospatial-Intelligence Agency

*"Even when there's huge demand for new tools and technologies ... to make that change, you have to be confident that your decisions and recommendations are going to be as good as or better than they were before."*

#### TAKEAWAYS:

- Data experts often insist on having a fully developed ontology before beginning a project; but sometimes it's better to start something before that is fully defined.
- The goal of automation is not to replace an analyst but to augment their analysis.
- More often than not, you will need to go outside your organization to find the expertise required to leverage new technology.

**For more information, including video highlights and recommended resources, please visit: [FCW.com/Analytics](https://www.fcw.com/Analytics)**