Data Analytics:
Leveraging Information to Drive Your Mission

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Executive Summary

Operating in an increasingly connected world is a double-edged sword for federal agencies. On one hand, data is readily available from more sources than ever. On the other, this information explosion makes understanding the data and using it to drive mission objectives harder than ever.

Data analytics provides organizations with the lightbulb moment they need. It allows agencies to glean important insights from massive amounts of data in real time and apply them across fields including cybersecurity, drug diversion prevention, finance, health and more.

But fully implementing data analytics can be arduous and time-consuming. For agencies to move from simply collecting information to doing data analysis, they need automated solutions that can

harness, organize, protect and synthesize big data. They also need data visualization and anomaly detection capabilities to acquire insights not normally detected by traditional analytics tools, and they need for these solutions to work in concert.

To learn more about automated tools that enable agencies to use their data to drive better decision-making, GovLoop partnered with AlphaSix Corporation, an IT solutions and services provider specializing in big data and cybersecurity, to produce this report. In the following pages we highlight the top barriers to effective data analytics, what agencies need to fully leverage analytics and three case studies of analytics in action. We also share insights from Mark Hughes, Vice President of Strategic Programs, and Stephen Moore, Vice President of Engineering at AlphaSix.

Navigating Information Overload

Gathering data is not a challenge for government agencies today. The number of data sources is expanding exponentially, giving organizations either more chances to gain new insights or more challenges — depending on their approach.

A September 2018 Government Accountability Office (GAO) report found that governmentwide, agency managers rated their agencies' use of performance data an average of 3.39 on a five-point scale during the previous year. These results marked a drop from GAO's last report in 2013, when the average was 3.41. These results suggest federal leaders are growing less confident in their agencies' data strategies over time.

"Every application, networking device and operating system is spitting out data nowadays," said Stephen Moore, Vice President of Engineering at AlphaSix. "Operationalizing that data and turning it into knowledge is the real challenge for government."

This information overload is further compounded by the need for communication across agencies and legacy systems. These disparate data sources must be brought together to provide analysts with full visibility of the data they're examining before they can draw actionable conclusions.

"We're at a unique time when government has the ability to look at data from multiple places to see the big picture," Moore said. "It's cross-correlating between data sources. That wasn't necessarily possible in the past."

This flood of information shows no signs of slowing down, meaning agencies must use analytics to find, interpret and communicate significant patterns in data. Agencies that don't build a scalable big data framework now will end up making costly improvements to their infrastructure later.

In the next section, we explain in greater detail how data analytics can benefit your agency.

Data Analytics Lights Your Way

Data analytics offers agencies drowning in information a life raft. Federal analysts previously overwhelmed by the volume of data facing them can use analytics to find order amid chaos. Analysts can collect and visualize information using data analytics, helping them notice anomalies that previously remained unseen.

"You have to have analytics because there's no silver bullet way of either finding bad guys in cybersecurity data or fraud in financial transactions or pharmaceutical data," Moore said. "You use analytics to maximize the value of the analyst's time by showing them what they should look at first.'"

Automation takes data analytics to the next level by boosting the speed at which analysts can generate insights. This frees up employees by removing the process of manually imputing data and letting them focus on other tasks. As the amount of information grows, so does automation's usefulness for managing it.

"It's just impossible for a human or a group of humans to go through and make sense of that data without some sort of automation," Moore said.

Cybersecurity also becomes increasingly important the more information agencies handle. The larger the amount of data, the larger the risk of it getting compromised.

Moore said that cybersecurity is sometimes viewed as a hindrance to data analytics because integrating the two is challenging. The combination is possible, however, with a robust data analytics platform.

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To protect their data, agencies need an analytics platform that incorporates the following security best practices:

DATA GOVERNANCE

Data governance ensures the highest quality of data exists within an agency. Agencies govern the availability, consistency and integrity of their data based on what's best for their needs. They also manage who can use their information, and how secure it is from both external and internal threats.

DATA ENCRYPTION

Data encryption strengthens agencies' cybersecurity by encoding data so that only privileged users can access it. Information becomes unintelligible to those who lack access, leaving it with people on a need-to-know basis.

USER INFORMATION ACCESS

Determining which users can access data and how they do so also improves cybersecurity. User information access lets agencies control who reaches their information and when, how and why they do it.

Lastly, Moore said that agencies must adopt a platform that ensures data is shared in a way that makes policy owners and leaders in their organizations comfortable that it's safe to share.

How AlphaSix Helps

AlphaSix specializes in designing, implementing and supporting big data analytics for federal agencies. It also assists organizations with cybersecurity services and solutions.

"We see ourselves as a one-stop shop giving you everything you need to do big data analytics," Hughes said. "We're able to provide agencies with the platforms, software and services to enable analysts to look at their data and turn it into knowledge."

Tools like AlphaSix's patented anomaly detection engine technology, Qato, assist analysts by letting them customize how they visualize data, helping them probe it for revelations. Qato detects anomalies using data analytics, bringing clarity to large amounts of information. It centralizes data for simpler, faster insights, letting analysts hunt for patterns uninterrupted while cybersecurity remains intact.

"It's the ability to quickly distill a bunch of information, drill into it, go from chart to graph and then on to the next step," Moore said. "It's exploration and discovery, finding things that you don't necessarily have to program the system to look for beforehand."

Instruments like Qato utilize data analytics without sacrificing security to external or internal threats. Algorithms help collect behavior patterns in machines, pointing analysts to unusual incidents faster and saving them time. Visualization tools then let analysts turn seemingly indecipherable data into charts, graphs and other images that help them recognize patterns quicker and share insights with the organization in an easy-to-consume format.

Agencies must swiftly adapt their data analytics strategies to an expanding array of sources, relationships and patterns. Qato evolves alongside these organizations, keeping pace with information ingestion, processing and presentation. It can be scaled for analyzing any amount of data, reducing costs and time wasted on rebuilding data architectures.

In the next section, we highlight real-world examples of how analytics produced actionable insights across diverse government interests, such as finance, health and drug prevention.
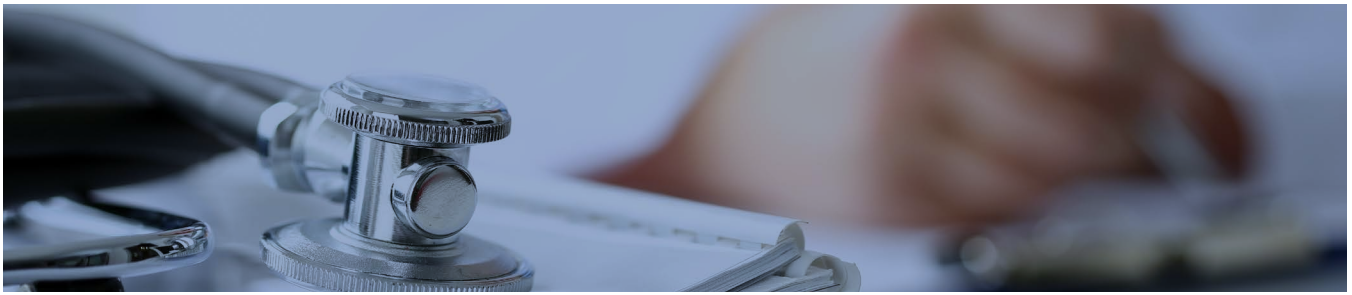
Discovering Health & Safety Insights

One federal healthcare agency wanted better insights into occupational health and safety issues. The agency already had a wealth of data on those topics, but it all existed in siloes. The organization struggled to consolidate, catalog and publish data from its various labs that had their own data storage methods.

"Not having access to data can really be detrimental to the overall mission of government," Moore said. "It's always a challenge of making the data appropriately available to the people that need to access it but then keeping people that don't need access from being able to see it."

AlphaSix created a data warehouse for the agency that allows users to access data, previously not available, in a collaborative environment.

"We provided storage to each of these groups where data will become centralized and we can add governance, security and auditing," he said. "You know who's putting data in, who's doing what with it and then there's a better framework for bringing more advanced analytics to bear," Moore said.

With all that information in one place, users across the agency can apply extensive analytics to deliver safer work environments for citizens.

"The more data from different sources that you have, the better the picture you're going to have and the better information that you're going to be capable of deriving from it," he said.

Fighting Cyberthreats, Fraud

In response to previous cyberattacks, one federal financial agency worked with AlphaSix to implement a cybersecurity data warehouse. By enhancing its previous toolset to provide more advanced analytics options, the agency can more easily detect cyberattacks, insider threats and financial fraud. This saves the federal government large sums of money that were previously spent on deceptive claims.

Now, data from multiple sources is collected in one centralized location, where analysts can compare, contrast and organize it for faster insights. This reduces the burden on analysts, helping them spot anomalies and earn wins against potential cyberthreats.

Analysts previously spent more time on organizing data than understanding it. But the new data visualization tools streamline information so they can identify actionable insights, rather than culling through spreadsheets.

Overcoming Opioid Abuse

The national scope of the opioid crisis requires cooperation between federal, state and local governments. AlphaSix recently worked with pharmaceutical diversion experts on an application combining pharmaceutical manufacturing data with prescription drug-monitoring programs (PDMPs). The federally regulated drug database can be paired with state PDMPs to examine opioid diversion nationwide. The initiative helps inform government officials how to best fight opioids in communities across the U.S.

The application uses data analytics to detect anomalies that can help curb opioid abuse, like unusual doctor behavior or unexplained distribution chains involving the drug.

"If you've got a doctor who lives in a town with a population of 10,000 people that's writing more prescriptions for opioids than a doctor in an area with the population of Manhattan, maybe that's suspicious," Moore said.

Opioid abuse is a national epidemic, plaguing communities across America with related criminal, financial and health woes. Drug diversion is the transfer of any legally prescribed controlled substance from the individual it was prescribed for to another person who uses it illegally. Data analytics map drug diversion patterns, stopping the spread of opioids and other controlled substances.

Mapping drug diversion patterns requires cooperation between first responders, government employees, law enforcement officers and public health officials. Centralizing and organizing data from each of these sources helps all parties understand how drugs are being diverted in their jurisdictions.

Data analytics helps governments see opioid abuse patterns and how they drive related addiction, health and criminal struggles. Solving these issues protects the public and frees resources for improvements elsewhere.

Conclusion

Strong data analytics requires well-connected sources, centralized data collection, robust cybersecurity, user access control and vigilant anomaly detection. The pressure is on agencies that have not modernized their data infrastructures to obtain these capabilities and catch up.

"You need to make sure that you're building a framework that allows for multiple types of analytics and future-proofs you," Moore said. "You can't lock all your data in a black box that has only one way of doing analytics on it."

Organizations that adopt versatile data analytics platforms today can immediately provide their constituents higher-quality services. From there, the potential for more successes is limited only by an organization's ability to focus and scale its data analytics to address new obstacles.

ABOUT ALPHASIX

AlphaSix Corporation is an IT solutions and services provider specializing in Big Data and Cyber Security. Additionally, we design, support and maintain Secure Managed Print Services projects. AlphaSix works with Federal agencies, often in highly secure environments, to harness, manage, monitor and protect the vast amount of data being generated today. Big Data and Cyber Security are not just buzz words, at AlphaSix they are our core competencies. Our current projects span Federal Law Enforcement, Financials, Healthcare and Education.

ABOUT HPE SECURITY

Hewlett Packard Enterprise (HPE) Security helps organizations detect and respond to cyber threats while safeguarding continuity and compliance to effectively mitigate risk and incident impact. Delivering an integrated suite of market-leading products, services, threat intelligence and security research, HPE Security helps customers proactively protect the interactions among users, applications and data, regardless of location or device.

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GovLoop's mission is to "connect government to improve government."We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 270,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to connect and improve government.

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