How GIS Can Break Down Government Data Silos in the Digital Age

Logistics management is the backbone of how actions come to life for federal agencies, especially in situations where adversaries, major weather or disaster events can put a team's resources under extreme pressure. But with so many moving parts to account for, including the need to constantly update context, tools and support, managing logistics can easily become confused and ineffective.

So how can agencies work to better improve situational awareness and better manage the gauntlet of logistics? Many agencies have turned to tools powered by geographic information systems (GIS), a collection of tools that make it possible to visualize sets of data on regional maps. By tapping GIS tools, operators can tap new methods of storing, analyzing and implementing data to address critical and unique challenges along the supply chain.

The Defense Supply Center in Richmond, Virginia, for example, was able to improve the way it approached support for communication and management around construction activities by working with Esri and engineering design firm HDR, Inc. The center needed tools that could help communicate and support development goals, prioritize projects with funding in mind, and create living and interactive documents with live project-tracking updates all while keeping information applicable and engaging to those who need it, says Joel Griffin, a senior analyst at HDR, Inc.

The agency worked with Esri and HDR to create web-based story maps, which built project perspectives from any angle and helped layer on different scenarios for operators, enhancing navigation, streamlining data and updates on a single server, and ultimately giving decisionmakers a better view of day-to-day operations.

"Digital development plans consolidated large reports into short summaries to help executives get to the critical information they needed quickly," Griffin says. "The 3-D digital models give the people onsite the perspectives they are used to seeing from the ground to help them better visualize the potential projects in context to existing facilities."

As agencies and operators turn to potential avenues to digitally transform operations, GIS is more than a logistics management tool: It provides federal government and military with enhanced situational awareness powered by geospatial data to facilitate and further digital transformation initiatives.

GIS helps institutions collect, organize, distill and share avalanches of data to pinpoint room for innovation within an organization. Funneled and mapped data points offer context and insight on-the-go for government decision-makers and forward-deployed military personnel. These points serve to improve communications, simplify workflows and drive decision-making, ultimately injecting visibility into supply chain management tools.

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"There are a lot of people and a lot of data siloed in different departments," says Pratibha Basrao, director of Geospatial Solutions at HDR, Inc. "With this enterprise GIS platform, there is robust situational awareness for everyone. It used to take days and weeks to get information. Now, they can just login to this platform and answer their questions."

GIS Injects Visibility Into Federal Government and Military Operations

GIS tools' major advantage to military decision-makers is that they can boost visibility, which can, in turn, play a hand in facilitating operational improvements.

"The biggest challenge public sector decision-makers face is in their ability to make informed decisions," says Basrao, noting that with help from partners like Esri, government and defense agencies can tap GIS to create an insightful, data-derived roadmap for an organization's supply chain that will provide government and military leaders with the visibility necessary to make more informed decisions. This includes improving visibility into planning, inventory, production, location and transportation, all of which ultimately better prepare organizations and systems to respond to stressful situations and external pressures.

Oftentimes, finding the broken link in a supply chain can be like looking for a needle in a haystack. By providing a larger, more comprehensive picture to how datapoints work together, GIS helps managers and operators pinpoint the exact location of challenges and disruptions or note unusual activity. With mapping systems like ArcGIS, supply chain managers can log, communicate and act on analyzed data points in more efficient and effective ways. Moreover, the predictive capabilities of GIS in cases of impending weather or threats on the horizon gives a leg-up for supply chain managers when it comes to the planning stage.

Management devices that track tools, like military supplies, tanks and vehicles, paint a clear picture of successful response efforts, especially in times of emergency and response on the front lines. Teams can glean insight from these previously tracked events to then anticipate future patterns for more preparation ahead of major events.

Without this insight, there can be massive limitations and blind spots in agency supply chain management, cost-effectiveness and timely response, and limited innovation. "Work order equipment tracking using IoT and GIS is valuable because equipment tends to get misplaced and is difficult to locate, especially during emergencies," says Basrao. "A real time operations picture is invaluable."

Federal and Military Decision-Makers Tap GIS to Boost Digital Transformation

In many cases, GIS adoption also facilitates digital transformation. For example, the U.S. Army's Tactical Operations Center 3-D application integrates advanced GIS to create highly interactive 2D and 3D views of the battlespace. This interface interprets collected data while transforming the way that combat commanders communicate situational awareness across the organization. By tracking, visualizing and linking more than 1,700 units within one mission, the TOC application facilitates the logistical transportation of supplies and resources in sync with need, while predicting potential disruption to logistical supply chains in times of stress.

Along with TOC, other technologies, like the Intelligent Road/Rail Information Server, have worked to improve the military's view and tracking of infrastructure and mobile assets across the globe. Using GIS and location-based services, IRRS can facilitate tasks like tracking intermodal shipments via road, train and ocean, including updates from traffic and incident data. It can also create detailed infrastructure mapping from critical data on facilities such as hospitals and nuclear power plants.

"The warfighting readiness is a very small part," says Basrao, speaking to what it takes to prepare for and fulfill a mission. "It's the logistics that take up the bulk of the time and effort. That's the main focus, making sure the infrastructure is deployed and functioning."

Organizations are increasingly tapping GIS tools to address unique challenges. New, creative uses of GIS show versatility of geo-spatial data and mapping implementation, such as the Philadelphia's dive into understanding pro-growth policies and Mississippi's use of systems to manage river traffic flow. These uses showcase how simple it can be to integrate these maps into management processes, logistics and workflow, with minimal disruption and costs.

But seeing real transformative uses of GIS is not just about buying software, it's about knowing how to use it effectively. "Implementing the software the right way and getting users to adapt to change is very difficult," says Basrao.

This is where vendor partners can step in to help.

"You need partners that understand your business," says Basrao. "Change management during digital transformation is crucial to helping people adapt. It takes a convergence of solid technology, accurate use case identification or transformation, and insightful guidance for the situation at hand."

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About Esri

Esri, the global market leader in geographic information systems (GIS), offers the most powerful mapping and spatial analytics technology available. Since 1969, Esri has helped customers unlock the full potential of data to improve operational and business results. Today, Esri software is deployed in more than 350,000 organizations including the world's largest cities, most national governments, 75% of the Fortune 500, and more than 7,000 colleges and universities. Esri engineers the most advanced solutions for digital transformation, IoT, and location analytics to create the maps that run the world. Visit us at esri.com/news.