Data Analytics: Enabling Next Gen Construction
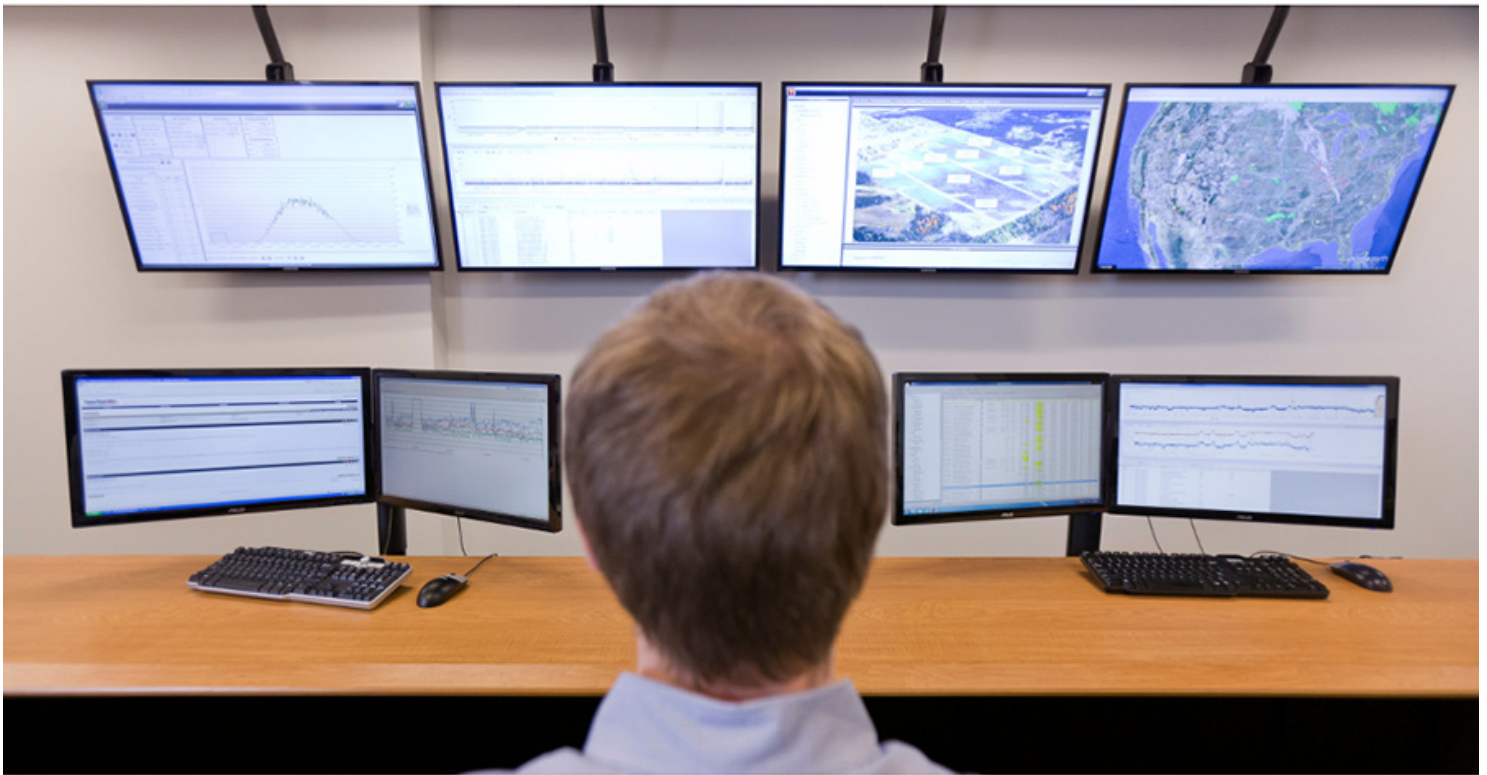
The next five to 10 years will see huge changes in how the construction industry operates. The world is rapidly becoming more connected, and arming the industry with data—and data analytics—literally at our fingertips—will open up worlds of opportunity.

Systems thinking, complexity management, and the embrace of change are key strategies that will offer clarity on what otherwise could be an overwhelming journey.

Today's construction projects have grown larger and more complex, exponentially increasing the amount of data flowing in and out. As information is collected from thousands of data points distributed across multiple locations, the amount of data available to construction professionals is almost unfathomable. How can we process and take action on it all?

Breaking Down Barriers with Data

As communities shift their focus to building "smarter cities" through integrated infrastructure, a huge opportunity exists. Nearly 40 percent of municipal leaders are prioritizing "smart buildings" as an area for future investment, according to Black & Veatch's 2017 Strategic Directions: Smart City/Smart Utility Report.

Advancements in data collection technology—the likes of which have only been seen in the world of science fiction—have enabled the rise of analytics platforms. As autonomous vehicles, virtual reality, drones, machine vision and location awareness and GIS applications become more prevalent on job sites, costs continue to decrease, further enabling the industry to evolve. Embeddable sensors, on-site laser scanning technology and "smart" features fitted with RFID tags are already much more accessible, having reduced in price significantly.

Data analytics platforms will help the construction industry better manage, visualize and act on what is becoming a staggering amount of data. These systems break down barriers by integrating various flows of information—such as field data, drawings, schedules, budgets, resources and quality metrics—from multiple applications and devices into a single, centralized dashboard. This arms project managers with the actionable information necessary for targeted decision-making and better day-to-day operations.

These systems apply the latest processes—increased visualization, building information modeling (BIM) and geographic information systems (GIS)—to offer the most effective solutions to date. GIS and 4D modeling are playing a major role in the design-build process by allowing project teams to build dynamic maps and animations, allowing them to quickly view past, present and future scenarios.

Expect to see an even greater shift towards cloud-based systems, as mobile data becomes ever more important. Today's world is connected by 50 billion connected devices, a number that is expected to grow to 200 billion by 2020. Mobile data will be a huge focus moving forward.

Embracing the Cloud

There is a sea change in how companies view real-time, cloud-based systems. As cloud applications become more prevalent and woven into daily life, the industry exhibits less skepticism and becomes more receptive.

Housing data in the cloud puts that information in everyone's hands. From procurement teams to constructions crews to the back office, data is accessed at the swipe of a fingertip. Real-time reporting offers a direct view into a project's status and performance, while advancing data mobility allows this information to be accessed from most mobile devices, allowing for 24-7 information sharing.

This access offers a new synergy between the field and back office, elevating the level of situational awareness, encouraging transparency and collaboration, and driving informed decision-making. For example, enabling a team to have instant knowledge of an environmental impact like a changing weather pattern allows managers to redirect crews on the fly.

Although data analytics may appear to be the magic bullet, the technology doesn't come without challenges. The nexus of data transference and security will continue to be a major concern as it relates to user accessibility. How will firms ensure user accessibility while still maintaining control, governance, traceability and accountability?

Forward-looking companies need to embrace methodologies that account for the possibility that all things that can be connected, will be. The implications of this converged state are far-reaching, and can offer insight when viewed from the evolving perspective of how new players and technology innovators will interact.

A future-forward methodology may best be developed when accounting for those three paradigms of systems thinking, complexity management, and the embrace of innovation.

This view will foster a comprehensive understanding of the entire system—physically, spatially and virtually—by providing the physical attributes and location of assets, and by promoting awareness of the extensive communications systems that connect these assets, including the attributes that ensure reliability, resiliency and security. Black & Veatch has found this deserves a specific project management and execution platform that allows for a system-wide view of all of our projects to ensure optimum control and analytical insight into a system ripe and primed for innovation.

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