How to Turn Big Data Into A Strategic Business Advantage

By Jay Snyder

We're now generating 2.5 quintillion bytes of new data every day, which means organizations around the world and across all industries are literally drowning in data. With 90% of the world's data created over the last two years—and with each "connected" person interacting with data every 18 seconds—IDC predicts that the global datasphere is on track to grow from 33 zettabytes in 2018 to 175 zettabytes by 2025. (Hint: One single zettabyte equals one trillion gigabytes.)

With individuals, companies and organizations worldwide generating a staggering volume of data right now—and with 30% of that data requiring real-time processing to be useful and actionable—the opportunity to turn data into a strategic business advantage remains largely untapped.

Consider this: Some of the largest infrastructure projects require 130 million emails, 55 million documents and 12 million workflows, on average. With such vast amounts of data being captured from so many sources, many firms don't know how to use or process this much information, which is why right now 95.5% of all data captured goes unused in the E&C industry.

All this to say that the article you're about to read may have been scribed several years ago, but it's still relevant in today's E&C environment, where companies continue to overlook the power of the big data that they're generating every day. Read on to learn how E&C firms can take their huge data sets and transform them into useable, actionable intelligence that improves competitive advantage, creates efficiencies and increases overall productivity.

How to Turn Big Data Into A Strategic Business Advantage

By Jay Snyder

How E&C firms can take their huge data sets and transform them into usable, actionable intelligence that improves competitive advantage, enhances efficiencies and supports high levels of productivity.

Our world is producing more data than ever—roughly 2.5 quintillion bytes of data every day, or just enough to fill 10 million blue ray discs (you remember those, right?).[1] With so much data being created and the use of data analytics starting to gain traction in engineering and construction (E&C), understanding what big data is and how your organization can leverage it to improve business processes is becoming an increasingly critical aspect of doing business.

In fact, some of the largest E&C infrastructure projects require an average of 130 million emails, 55 million documents and 12 million workflows.[2] With such vast amounts of data being captured from a multitude of sources, many firms can't manage and process this much information, which is why right now 95.5% of all data captured goes unused in the E&C industry.[3]

And while the challenges associated with managing and implementing big data processes are obvious, companies that don't embrace the new norm of data-driven operations could lose traction in the market and become obsolete in the future. In this article, we'll explain what big data is and why harnessing it is so difficult, as well as provide recommendations for E&C firms that want to leverage their huge data sets into actionable intelligence.

What Is Big Data?

Extremely large data sets that may be analyzed computationally to reveal patterns, trends and associations—especially relating to human behavior and interactions—big data in the E&C industry is collected by:

- Sensors
- Drones
- Wearables
- Global positioning systems
- Email
- Transactions
- Financials
- Design plans
- Weather data

[1] Watanabe-Crockett, Lee. "The Daily Data Diet: Information Creation in Numbers." Global Citizen. 2016.

[2] Famous, Gabriele. "Three Technology Trends Shaping the Future of Design and Construction in 2018." Aconex Group. 2018.

[3] Hill, Brian L. "Digging for the Big Data Gold in Today's Construction Projects. Xpera Group. 2017.

Often considered unwieldy and difficult to capture, review and process efficiently, big data can be analyzed to reveal patterns or insights about an organization's processes, effectiveness, productivity, financials and other operational areas. For example, leading E&C firms are already using data for early risk detection to track equipment and productivity measures, leverage predicative analytics, and manage software integration and real-time data reporting.

"Like it or not, every construction company—and solutions provider—is now also in the data business," says Jon Fingland, Trimble's general manager, Collaboration Solutions. "How well we help our customers transform that data into intelligence that drives better decisions to deliver projects more efficiently and more sustainably, with higher quality, lower costs and fewer risks is what defines the next frontier of construction management."

"Data is the key to improving the bottom line as well as protecting it," Fingland continues. "Our ability to break down data silos and transform raw data into action and intelligence is the crux to solving most challenges that rear their head in our industry."

Leveraging Big Data to Your Advantage

When it comes to leveraging big data to your advantage, Reggie Arichabala, co-founder of startup Riskcast, says, "It's critical that you begin with the right foundational data for the analytic problem at hand. Oftentimes, data builds upon itself, and so ensuring that you have the correct strategy for capturing that data, in the correct order, is critical to success."

Using big data to gain insights about your organization presents an interesting array of challenges that include, but aren't limited to:

- **It takes the right talent, tools and processes.** Big data presents unique challenges for the E&C industry, and many organizations are either unprepared for or overwhelmed by the magnitude of information. Understanding which data can be useful and how it translates into business intelligence, for example, requires strategic planning and a clear understanding of your organization's overall goals and vision. Once you have a clear direction of what you want and need from your data, then you can begin to extract meaningful insights to help guide your organization. And while a data analytics platform can greatly improve business performance, those results won't come overnight. By having a clear understanding of the time frame and rollout process, you can more easily manage expectations during this transition.

- **Collecting and analyzing it can be a challenging task, especially if you don't know your end goal.** Many firms struggle to understand how big data can be used to improve performance or processes. While getting the right tools may be as simple as buying a software program, finding the right people is a more difficult task. To successfully gain insights from your data, assemble a team that not only has a background working within the built environment and understands the life cycle of project work, but also has strong research and analytical skills to best leverage your data to improve business performance. Companies that don't invest in the right

people often experience disappointing failures and are slow to realize a return on their investment. One new role to explore within the E&C industry is the "construction technologist." This position combines industry knowledge with a background in research analytics to drive performance and generate strategic business insights.

- **Within the E&C industry, many data sources are heavily siloed or stored in disparate places.** Recent research showed that 30% of companies are using applications that don't integrate with one another.[4] This happens when data is stored on different systems, including desktops, phones, tablets, servers, hard drives and in the cloud. Unstructured data can also be captured from materials such as blueprints, timecards, emails and PDFs, leaving 49% of firms to transfer data between applications manually. A recent construction technology report indicated that over 83% of construction workers rate mobile capabilities, such as the use of phones and tablets, as important. This suggests that as technological capabilities advance in the E&C industry, we'll continue to see greater implementation of various data sources from devices such as wearables, augmented or virtual reality, or new software applications.

Data as a Strategic Business Advantage

Developing a good data strategy helps you get the most out of your data by laying the necessary groundwork and putting all the

pieces in place, ensuring that the information is both available and usable. Dustin Devan, CEO of Building Connected, explains, "With 10,000 projects a month going through BuildingConnected, we are amassing data about the construction market at an incredible rate. Our data intelligence gives us deep insight into developments in the construction market and economy. This helps inform product decisions and strategic vision for the company. Additionally, our quickly growing data set ensures we can build one-of-a-kind machine learning solutions that separate ourselves from the competition."

[4] "2017 Construction Technology Report." JB Knowledge. 2017.

Similarly, contractors and other stakeholders in the E&C industry should consider the value that their data can provide not only to better run their businesses, but also to improve project outcomes. Information is held within your technology solutions; developing a plan for managing that data leads to harvesting that information and developing associated actions and initiatives. As you leverage data as a strategic advantage, consider the following steps:

1. **Determine what it is you are trying to achieve.** Articulate your data strategy goals and explain the envisioned future state. Take the time to determine what key performance indicators or metrics and insights you would like to have in order to meet business objectives.

2. **Identify various information sources in the business and on projects.** Sometimes these sources are within a company's technology stack, and sometimes they are external sources. This may uncover limitations or challenges related to data ownership and intellectual property (IP). In such instances, be careful not to violate IP laws. One way to do this is to include a data sharing agreement in all your contracts.

3. **After you identify the various information sources, assess data fidelity and data accuracy as well as consistency of data flow.** In other words, you want to ensure that the data captured is the correct type of information and that it meets a stipulated level of accuracy. Consistency of data flow means that the frequency and size of data are significant enough to be part of your analytics.

4. **Consider developing data protocols and adopting solutions to aggregate, restructure and securely store your data** to create the proverbial "single source" of truth. This single source summarizes the most technically challenging aspects of your data strategy.

5. **Continue by creating data integrations** that allow unidirectional, bidirectional or omnidirectional data flow to feed into systems across the data stack.

6. **Establish corporate governance and business rules** for interacting with information systems and the data itself.

7. After all this, you have created a significant competitive advantage by reducing multiple instances of data entry (thus improving data accuracy and access to information that is more reliable and current than that of your competitors). **Through intentional management of your information systems and data, you'll be able to more easily pursue business intelligence tools and advanced technology solutions.**

8. Lastly, **accept that this is a living data model that requires ongoing nurturing to manage technical integrations and data management.** The plan also requires continuous effort and adjustment to ensure that it keeps meeting your business's needs.

Breaking Through the Barriers

Intimidating for many companies—and especially those that are just beginning to wake up to its value—big data can't be ignored any longer. Cumulatively, we're generating roughly 2.5 quintillion bytes of data every day—a number that's on track to grow over the coming years. The organizations that take the time to gather the data, analyze it and turn it into actionable insights will gain a competitive advantage. The ones that bury their heads in the sand and hope it goes away will be quickly left behind.

Using the recommendations in this article, E&C companies can more effectively leverage their big data without having to make a big investment in labor, equipment or devices. Its use is becoming commonplace among organizations that want to outperform their peers and rise to the top in their industries. In most industries, existing competitors and new entrants alike will use the strategies resulting from the analyzed data to compete, innovate and capture value. Finally, big data helps E&C organizations ferret out new growth opportunities, leverage new resources and optimize processes in unprecedented ways.

For the complete white paper on big data, please see "Big Data = Big Questions for the Engineering and Construction Industry."

Jay Snyder is the technology practice leader with FMI. Jay has been in the engineering and construction industry throughout his entire career. He has industry experience as a construction project executive; corporate director of planning, design and construction for a health care system; founder and managing partner of a risk management tech startup company; and as a valued business consultant. He can be reached via email at ***jsnyder@fminet.com.***

for the Built Environment

Denver
210 University Boulevard
Suite 800
Denver, CO 80206
303.377.4740

Edmonton
Edmonton, AB
204.232.1373

Houston
1301 McKinney Street
Suite 2000
Houston, TX 77010
713.936.5400

Phoenix
7639 East Pinnacle Peak Road
Suite 100
Scottsdale, AZ 85255
602.381.8108

Raleigh (headquarters)
223 S. West Street
Suite 1200
Raleigh, NC 27603
919.787.8400

Tampa
4300 W. Cypress Street
Suite 950
Tampa, FL 33607
813.636.1364

WWW.FMINET.COM