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Laying Foundations: Building a Data-Driven Organization

The rapid expansion and evolution of data technologies has transformed how businesses operate and make decisions. Industries across the board are adopting new technologies to become more data-driven, and the construction industry is no exception.

As these advancements continue to impact the industry, construction companies should assess how they use collected data to inform and improve their decision-making processes to stay competitive.

Benefits of Becoming a Data-Driven Organization

Every company's data, and how they choose to use it, is unique. A tailored, intentional, and pragmatic approach to data strategy has the potential to bring significant and tangible advantages to any company, regardless of the information available.

Informed Decision-Making

Construction companies have various types of data (i.e., financial data, operational information, and HR-related data), some of which they may not realize is valuable. For example, location and geospatial data can be used to improve scheduling, staffing, project management, equipment maintenance, and other areas that have significant effects on job performance. By tracking these variables, companies can transform how they make decisions.

Managing subcontractors alone provides numerous opportunities to analyze data and better confront project challenges. This is especially true for larger projects, which may include 30-50 different subcontractors and their respective teams that are all performing different tasks. As an added benefit, when a company's data is properly collected, it can be vetted against industry-wide data such as CFMA's Construction Financial Benchmarker.

Clear Presentation

Dashboard software that presents and analyzes data can help improve an organization's decision-making process.

Dashboards allow companies to distill their most important information to discover and highlight trend lines, margin gaps, and/or problem-causing outliers.

Rather than combing through a spreadsheet of endless data – which could lead to mistakes, disengaged leadership, and difficult navigation – dashboards can help leadership easily visualize this information, helping to improve communication with stakeholders and board members, and increase the likelihood of receiving executive support on a request or idea.

When stakeholders have a chance to review dashboards before a meeting, they can explore the data in advance, saving time during the meeting. Additionally, if executives have questions about data sets during a presentation, then presenters can access multiple data sets in real time rather than needing to reexamine the data and reschedule the meeting. This allows for meetings and presentations to be focused on solutions and results instead of questions and symptoms.

Improved Margins & Productivity

According to the seminal book *Creating a Data-Driven Organization* by Carl Anderson, studies indicate that there is value gained from leveraging data in decision-making. Anderson states that one report "found that data-driven organizations had a 5-6% greater output and productivity than their less data-driven counterparts. They also had higher asset utilization, return on equity, and market value. Another report claims that analytics pays back $13 for every dollar spent. Being data-driven pays!"[1]

Historically, the construction industry hasn't leveraged the productivity gains experienced by other industries; construction still lags or implements changes that don't necessarily lead to efficiency gains. Increasing productivity is crucial as the industry's labor shortage continues, especially with 80% of contractors having difficulties hiring qualified craft workers, according to a 2018 report[2] by Autodesk and the Associated General Contractors of America (AGC). Because of the shortage, companies must tackle more work with fewer workers entering the industry.
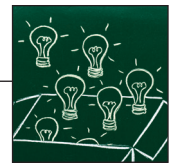
Implementing a thoughtful data strategy can empower data analysts to find areas that can bring simple solutions, allowing a company to complete processes faster, cheaper, and safer. Any changes that enhance productivity and improve the bottom line will grab leadership's attention and help a company stay competitive.

Data Opportunities for Contractors: A Case Study

While certain sets of data have the potential to shed light on areas that will directly impact a company's bottom line, becoming a data-driven organization is a constantly evolving process. More likely, data collection provides the opportunity to transform a company culture to improve processes and decision-making strategies.

For example, the Seattle-based commercial GC Schuchart has already seen significant results in the early stages of its focus on data and has used data analytics to strengthen its project approach.

Schuchart employs about 140 workers with approximately half of them operating in the field. Though the company didn't initially have a dedicated analytics team, they realized the importance of a data-driven culture. Starting with limited resources and a few passionate employees, the company's early successes proved insightful and helped drive additional data projects forward.

Here are several ways Schuchart has utilized its data analytics to restructure its data measurement and decision-making processes.

Safety Concerns

Back injuries are a major issue in the industry and, like many, Schuchart assumed these injuries were likely the top issue for its site workers. As is often the case when comparing assumptions against measurable data, a detailed analysis of on-the-job injuries revealed that, surprisingly, hand injuries were the most common and back injuries were the second-most common.

Uncovering this information allowed Schuchart to engage in new conversations about safety precautions and assess how to devote resources to avoid those injuries by both time and place rather than focusing on their presumed information. Schuchart went on to provide multiple pairs of gloves to those working in the field so they had greater access to hand protection. The company also provided education and training to field and project management teams to raise awareness around the types of activities that could lead to such injuries.

Project Bids

Reviewing project data allowed the company to dive deeper into its bidding information for projects both won and lost. Taking a big-picture approach to bids, they were able to better gauge why they won certain bids and lost others by analyzing differing categories of data, such as location or who put the bid forward.

For example, they could determine that while one project manager (PM) consistently won many projects worth hundreds-of-thousands of dollars, they often didn't win the million-dollar projects for which the company aimed. Additionally, one employee put out an aggressively large number of bids, so, based on sheer volume alone, they were likely to win at least a few, although not necessarily of high value.

By analyzing this data and having it lead to these procedural insights, the company was able to determine its strongest bidders and reassess where to focus bidding efforts. This allowed PMs to shift from a more-is-better mindset and instead focus on strategic bids that could deliver larger payoffs and other benefits aligned with the company's goals.

Project Profit by Hour

In the process of becoming more data-driven, the company adapted the concept of "wins above replacement," which is popularized by general managers in baseball and made famous by the book *Moneyball*. The strategy aims to identify workers who consistently perform above average.

In this case, the approach was employed to analyze PM performance and determine their profit-by-hour. For example, one PM had a good reputation and backing jobsite reports that praised their work. However, when considering this PM's wins above replacement rating – which is calculated for the specific project using projected financial profit combined with nonfinancial data, such as safety results, outstanding change requests, and number of RFIs – the performance was shown to be less than stellar. The project's financial results hadn't yet been adjusted for all of the issues present on the project, which only came to light through the data.

The ability to track data from jobsites in real time is still evolving but, in the areas available, it provides opportunities to verify the accuracy of jobsite information as it's happening.

With the right recording devices in place, site problems can be managed by alerts allowing companies to establish thresholds, provide early warnings, and redirect project focus.

Permit Tracking

In aiming to find new opportunities for potential jobs, Schuchart partnered with an outside organization to examine local permitting information and looked for companies or individuals that had applied for specific building permits. While this information was all public, gathering it into a data-driven dashboard and then filtering permits by important characteristics, such as location or project type, allowed leadership to better analyze potential leads.

This approach helped Schuchart visualize all of the various projects they could pursue over a two- to three-year period. It also allowed them to track projects by developer and determine which projects had developers with whom Schuchart had relationships. Rather than cold-calling developers to ask them for business, they were able to contact the developer with a specific project in mind. Even if requests didn't lead to jobs, they often sparked valuable engagement between the parties that could lead to future opportunities.

Steps to Become a Data-Driven Organization

Evolving into a data-driven organization takes time and resources, and may not deliver immediate results. Simply taking the first steps to start the process, however, can ignite momentum that can prove the long-term benefits.

Understand Your Current State

The pace at which an organization adopts a data-driven approach depends on many factors. While there's always room to become more data-driven, assessing where your operations currently stand in relation to the use of data will determine the necessary first steps.

Operations

Determine which company data systems, if any, are currently being used and which are communicating with each other in an integrated manner. For companies not effectively utilizing data, standard data pulls are typically improvised without an end goal and can require significant manual preparation before data can be used.

It's important to assess if different departments in your organization are interacting with data and if gaining access will be cumbersome due to data silos or arbitrary gatekeeping.

Companies that aren't heavily invested in data are likely preparing or updating key reports manually using ad hoc and potentially inconsistent processes. In contrast, data-driven organizations can validate that key measures, key performance indicators (KPIs), and analytics are reported in real time (or almost in real time), in consistent, well-defined, and automated mediums.

Company Culture

It's important to find a champion at the executive leadership level early in the process. Determine the level of interest that leadership demonstrates in creating a data-driven culture as well as the prevalence of decision-making based on gut instincts. Emphasizing the opportunity for transparency can be helpful. Leadership is often interested in supporting a culture of transparency so they can have more insight and knowledge of all aspects of the business. Disclosing data itself can be viewed as a form of transparency.

Finance teams are often the most prepared to collect data as they're already tracking and maintaining large amounts of financial information, so it can be helpful to engage finance leaders early in the process. While it may not appear a natural fit for them to champion initiatives around safety or operational efficiencies, these areas eventually can impact the company's finances. Without financial team buy-in, data initiatives are likely to stall.

If leadership is engaged, then assess the organization's available budget for implementing new data-driven processes.

Complete & Accurate Information

It's crucial that all departments and business units have a common understanding of data points and that their definitions are universal across the organization. Inconsistent nomenclature can create significant governance problems.

If data isn't universally defined, similar measures in different data sets can lead to contrasting results among departments. When this is the case, analysts and data users may spend more time preparing and validating data than actually analyzing and acting on it.

Data Warehouses

Once data is universally defined and labeled, it must be maintained in a centralized repository like a data warehouse, data store, or data lake. These environments contain vetted data that is easily accessible for approved users.

Data Teams

In addition to setting up the infrastructure for a data warehouse or similar repository, it's important to identify a business unit or functional team that will be responsible for maintaining the repository and acting as data stewards. This functional team could present itself in multiple ways, such

as a formal center of excellence or a steering committee with executive sponsorship. Regardless of the formalities around identifying and organizing this functional team, one of its core responsibilities will be to ensure data management matures with the data efforts of the business.

Forming a core team will help the organization develop a self-service analytics environment. Eventually, departments and employees should be able to access data on their own, use it for whatever exploratory options they deem important, and prepare reports through a self-service portal. Empowering employees with self-service data allows them to save time and increase efficiency by leveraging data infrastructure and curated information to automate time-consuming, repeatable tasks.

It's important to set a road map and milestones for tracking the growth and maturity of your data-driven organization as you execute your long-term data strategy. In a fully mature data-driven organization, dashboards and enhanced spreadsheet models should be capable of multivariable predictive analytics and forecasting. In these mature data-driven organizations, a dedicated team can devote time and attention to fine-tuning and defining KPIs and analytics.

Identify Opportunities

Pragmatic implementation of a data-driven approach can help increase a company's return on investment (ROI), so it's best to assess your company's current state to understand its logical next steps.

Early Victories

Results drive adoption, so when first working on data-driven projects or trying to convince leadership of data's necessity, it helps to gather input from stakeholders to determine exploratory areas that will have the most impact and deliver a strong ROI.

Identifying data opportunities that are easily implemented and deliver high value to the business can help. For example, Schuchart first chose to look at safety because it is an organization-wide concern with strong supporting data that could be easily accessed and analyzed. If a finance-specific problem was addressed first, then it may have only appealed to executive leaders.

By finding new and intriguing data on a universally important issue, employees throughout the company became engaged and willing to invest to see data analytics adopted in additional areas.

Research

There are many data tools, software, and applications available with similar functions, but it's important to research several to determine which best suits your company's needs. This is an important and often overlooked step in the assessment phase of implementing a data-driven organization strategy. It's important to remember that once a tool (or suite of tools) has been selected and the implementation process has begun, it can be expensive and time-consuming to change course.

Create & Execute a Plan

Once early opportunities are identified, lay out a plan and begin employing it. The implementation rate completely depends on the unique characteristics of your company, but there are implementation aspects that all companies should consider.

Prioritization

Prioritize opportunities that will enable additional opportunities. By identifying low-hanging fruit early, a critical path forward may emerge that will lead the organization toward its first few data-driven initiatives.

Don't just set goals for the company. Instead, establish a steering committee or a center of excellence responsible for overseeing data and holding stakeholders and executors accountable for goals. By integrating measurable success metrics into your organizational data strategy, your company can monitor progress and circumnavigate unanticipated roadblocks.

These measurable metrics should also be highlighted when strong progress is demonstrated. Metrics that tie tangible benefits – or even financial incentives – to those involved with the strategy implementation are effective drivers of continued strong performance.

Outside Advisors

While an organization may be committed to immersing itself in analytics, it can be a difficult process to start, especially for smaller companies or those without a large budget. Even the data-dedicated employees who are spearheading projects have other full-time responsibilities and are likely to relegate data-specific activities to after-hours or when time allows.

Timing

Contracting an outside advisor to establish initial data operations can help streamline the process. A third-party company that specializes in data analytics could potentially set up infrastructure for your company within three or four months, while it could take significantly longer for a firm to do so on its own with existing staff and competing priorities.

Most companies will likely need to contemplate the investment required to fast-track implementation with assistance from third-party specialists. However, by having infrastructure in place early on, companies are able to hit the ground running as they begin data-driven projects.

Momentum

Consultants or implementation specialists can help drive early success. For companies that choose to implement data initiatives on their own, there's a risk that leadership may not continue to fully support long-term data initiatives if efforts stall due to lack of resources.

Future Considerations

As data-driven efforts become even more valuable, many construction companies will likely begin to hire their own in-house data scientists and build out their innovation teams in the coming years. Eventually, contractors that focus on data will have a competitive advantage over those that don't. ∎

Endnotes

1. Anderson, Carl & Li, Michael. "Five Building Blocks of a Data-Driven Culture." *Tech Crunch*. June 23, 2017. *techcrunch.com/2017/06/23/five-building-blocks-of-a-data-driven-culture*.

2. "Eighty Percent of Contractors Report Difficulty Finding Qualified Craft Workers to Hire as Association Calls for Measures to Rebuild Workforce." AGC. August 29, 2018. *www.agc.org/news/2018/08/29/eighty-percent-contractors-report-difficulty-finding-qualified-craft-workers-hire-0*.

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Over the last 10 years, Matt has led teams that design, build, and implement advanced data analysis platforms that leverage data visualization tools. These tools have helped clients further unlock the value of their data by enabling them to quickly monitor trends and risks as well as identify and correct gaps and errors within their underlying data platform.

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