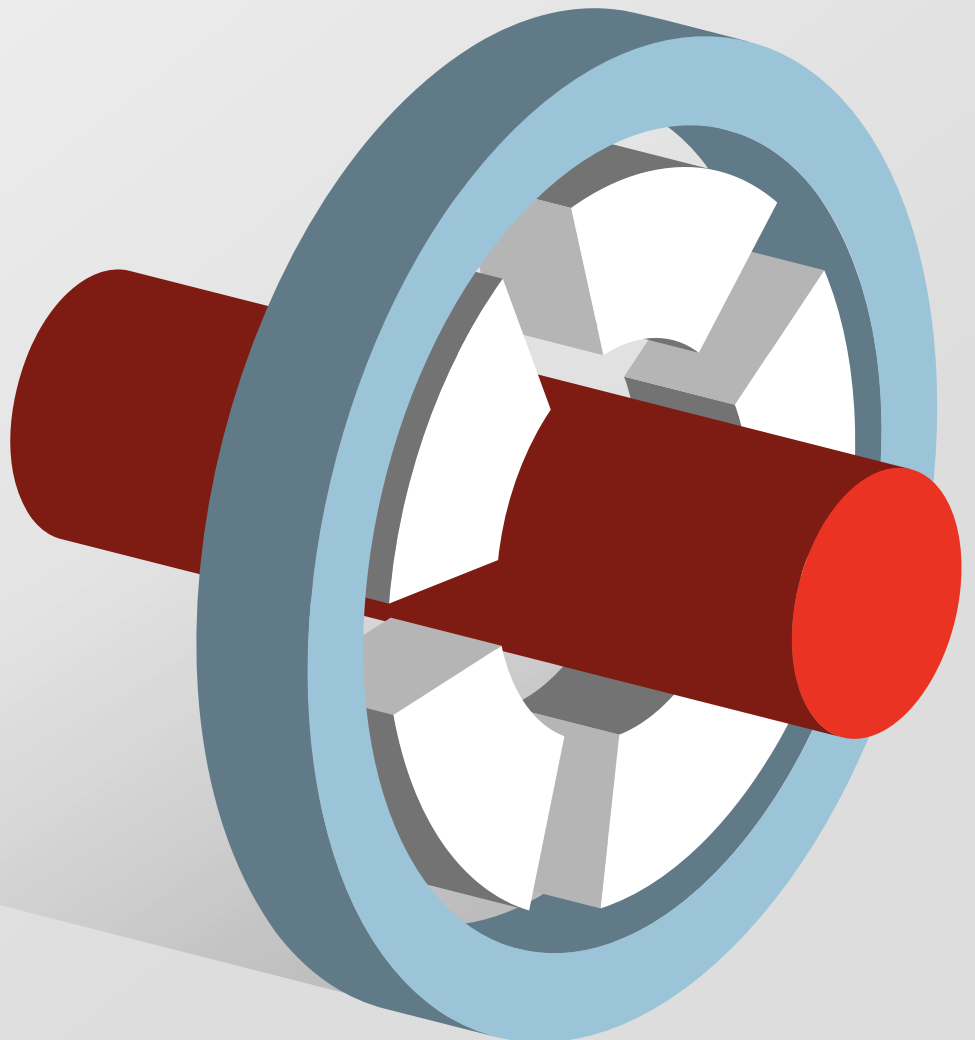




GUIDE

Five Ways to Advance Construction Quality



It's boomtime for construction in America. And with President Joe Biden's trillion dollar American Jobs Plan just passed, construction companies stand to gain even more from the largest public investment in infrastructure since the 1960s. A huge portion of that investment – \$550 billion – is earmarked for repair and expansion of roads, bridges, rail, airports, water and electrical systems and broadband networks, with major construction requirements in all areas.

If you're a construction firm, getting in on the action means demonstrating your company's capability to complete and deliver projects at the highest possible quality. Construction companies always need to deliver quality, but with competition so tight, margins so narrow, and federally-mandated Quality Control (QC) guidelines so stringent, industry leaders are forever thinking about ways to enhance and leverage QC processes to make them even more rigorous, efficient and productive. The best way to do that is by becoming a data-driven company.

Here are five things to consider when it comes to advancing QC through better data and digitization in today's construction market.



1. EMPOWERING NEW EMPLOYEES

When companies secure funding under the new infrastructure bill, they're going to need to jump into projects feet-first. This often means hiring people with less training and experience than ideal.

Companies need to arm their novice employees with tools designed to let them perform work safely and at top quality from day one. Digital apps on mobile devices, loaded with checklists and other resources, are easy to use and let new employees get up to speed immediately, whether they're maintaining or installing equipment or inspecting sites.

Digital checklists present employees with simple decision-trees that ask them specific questions about situations they're in and the work they're performing. Unlike paper, digital checklists respond in real-time to answers given, reconfiguring themselves on the fly to be relevant to the exact situation. For example, if the employee indicates they're performing bridge maintenance, the digital checklist can expand, prompting the employee through a series of QC checks for rust, meanwhile hiding irrelevant questions about electrical cable frays – or postponing those questions until the right time. Digital checklists ease cognitive load by simplifying and standardizing complex tasks, ensure the efficient use of employee time, and bring precision and rigor to QC processes.

Digital apps also put reference documentation directly into workers' hands. New workers and workers returning after furlough periods need more informational backup than veteran workers do, but it's unwieldy and impractical to bring paper-based manuals and guides to worksites or into the field. With just one tap of a digital app, novice workers can view whatever they need to perform their jobs, whether it's a wiring diagram, a series of lumber grade references, pictures of expected results from non-destructive testing, or examples of Contractor Quality Control Plans (CQCP) for comparative purposes. A series of "DO" and "DON'T" images on an app, in place of a bulky training guide – or, worse, no guide at all – is an incredibly simple and effective way of empowering new workers to perform quality work.

Empowering new employees with digital checklists and resources gets them quickly up to speed, ready to perform and respond effectively in all kinds of different situations. Digitizing routine workflows as part of a quality assurance strategy reduces errors by helping employees to do things right the first time, as well as discover problems early before they become costly and time-consuming to correct.

2. ACCOUNTING FOR SITUATIONAL VARIABILITY

Construction work is dynamic and varied, with teams moving from site to site and from project to project – one day a team might be inspecting poles for a broadband grid project, the next day it’s inspecting an electrical grid. The circumstances of the build or the engineering might change from project to project as well. One bridge, overpass, or grade separation is not like the next one, and teams might do work in multiple jurisdictions with different standards or regulations, time zones, geological features, or weather conditions in each.

Your QC workflow needs to account for all this situational variability. The problem is, standard checklists and forms are rigid and can’t adapt to varied or unexpected scenarios. To make do, mobile teams usually gather “extra” information in ad hoc ways, such as writing in the margins of paper, adding



extra columns to spreadsheets, or hijacking existing spreadsheet fields. These methods capture situational data, but make it difficult and time-consuming to consolidate and share QC data downstream.

To perform QC procedures effectively, employees need to be given convenient and straightforward tools that are flexible enough to handle this range of situations, yet rigorous to ensure the data is useful. Digital checklists and forms are adaptable to any scenario, and they centralize and regularize QA/QC data so it can be stored, shared, and analyzed. Data-driven QC makes all kinds of construction and inspection workflows more efficient and adds value to inspection data captured in the field.

Digital tools are also a must to maximize QC processes that are already future-forward. For instance, more construction companies are using drones for inspections, but the photos and data that the drones capture need to be easily transferable to the boots on the ground –the teams who will investigate issues further. For maximum effectiveness, your inspection teams need to be digitally equipped to work in tandem with your eyes in the sky, and obsolete, paper-based and makeshift methods just won't cut it.

3. ACHIEVING HIGHER PERFORMANCE

With the building boom making hiring difficult and margins in construction frustratingly tight, it's more crucial than ever that construction firms get as much performance from their existing workforce as possible. Work has to be performed to the highest possible quality to avoid error and duplication of work, lost time, loss or damage to equipment and work stoppages.

Again, digital tools maximize performance. Instead of wasting time searching for that wiring diagram or map that shows you where you need to stand, digital apps put those tools at employees' fingertips so they can get the job done faster. Having photo references and "DO/DON'T" images for comparison, for instance, lets newer workers make the right decisions on their own instead of stopping work to consult with other team members. When workers have all the information they need on company phones, tablets, or loaded on their personal devices, people do the right things faster.

With digital tools, no one needs to haul around manuals, guides or file folders full of paper, or flip through printouts to get the information they need. Multimedia capabilities work in the other direction, too – instead of spending time describing a problem over the phone or in writing, workers can take pictures and send them instantly to whatever supervisor, contractor or regulatory body needs it. Confident employees work faster, and digital tools for training and support helps get them there.

When QC issues are communicated quickly, they can be addressed immediately and, where necessary, remediated faster. By avoiding duplicate or repair work, productivity remains high as you meet your quality objectives. The performance gains aren't just in the field, but benefit your administrative procedures as well. With traditional, paper-based media and spreadsheets,



reporting and downstream integration is piecemeal and inefficient, squandering precious administrative labor. However, when inspection data is captured digitally, it doesn't need to be transcribed, re-entered or reformatted to immediately generate reports or to incorporate into downstream processes – from QA and QC reporting, to analytics systems, to customer-contractor communications.

4. COMMUNICATING QUALITY

Construction businesses need to be able to take the data they're gathering and demonstrate the level of quality they're providing to all parties involved in a project – from end clients, to government funding agencies, and to general contractors and subcontractors. Being data-driven lets construction firms more easily track and demonstrate the value of their QC efforts quickly, efficiently, and comprehensively. For instance:

- **Digital checklist-based SOPs:** Employees can use digital tools to take pictures or video of the individual steps and the end result of any given task, confirming the quality of the work performance even before you send out a QC inspector.
- **Remote supervision and oversight:** With digital tools and digital quality inspections, experienced supervisors can review inspection results remotely and in real-time, giving novice or post-furloughed workers oversight without slowing them down. Supervisors operating remotely can provide quality assurance and control to larger teams than would be possible through individual site visits.
- **Consolidating quality-related data:** Rolling up data from your SOPs and inspections into a single view of your quality efforts and results shows stakeholders that quality is a key differentiator for your company, giving you a competitive edge and helping with retention. Partners know that your commitment to quality eliminates rework, keeps prices in line and ensures you get the job done right the first time.

Those QC efforts can also be easily communicated internally to demonstrate the quality and value of investments in employees and processes. Your company brass may be impressed by metrics showing how fast QC inspections can be done with digital tools, but they'll be even more interested in metrics that show how much faster they're done because data-driven methods have eliminated unnecessary rework. These kinds of gains translate to improved productivity, time and cost savings, and increased profitability over the long term. What's more, they demonstrate continued value in work process improvements.



5. BEING DATA-DRIVEN MEANS BEING QUALITY-ORIENTED

Quality control inspections can be done with paper-based media, but it's notoriously problematic. Paper checklists, spreadsheets, and maps are cumbersome and error-prone, while versioning glitches are rampant when work takes place with multiple teams across physical sites. With paper, there is no easy way for employees performing inspection activities to account for "extra" information or circumstances that just don't fit the mold. And even if you manage to address these difficulties with paper, you'll always face the problem of integration: data gathered on paper can't be collated, correlated or fed easily into other systems.

Today, becoming a quality-oriented construction firm means becoming data-driven on performance. This means asking how (and how well) does your company:


- Perform quality assurance and quality control activities?
- Measure quality?
- Communicate about quality, both externally, to your customers and partners, and internally, to the company itself?

To train and support employees to deliver, measure and communicate quality, companies need to adopt digital tools and data-driven approaches. Companies also need to capture comprehensive QC data, analyze it, and share it in a free-flowing way to provide evidence of quality to its partners, contractors, and executives. The best way to achieve these goals is through a digital platform and digital tools.

CONCLUSION:

Becoming data-driven in construction means ensuring quality across workflows – whether a business is building something from the ground up, modifying an existing site, or finishing up with a final inspection. What starts by empowering your workforce with digital apps and checklists develops into a seamless process of QA/QC data generation and analysis, in which data about QA/QC processes – how long inspections take, who performs them and how often—feeds back to improve QA/QC workflows, inform training decisions, enhance SOPS, and streamline and enhance internal and external communications related to quality.

To learn more about how becoming data-driven advances construction quality, contact Fulcrum.



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