Trimble

A Guide to Going Constructible

How to Implement Digital Transformation in Construction

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INTRODUCTION

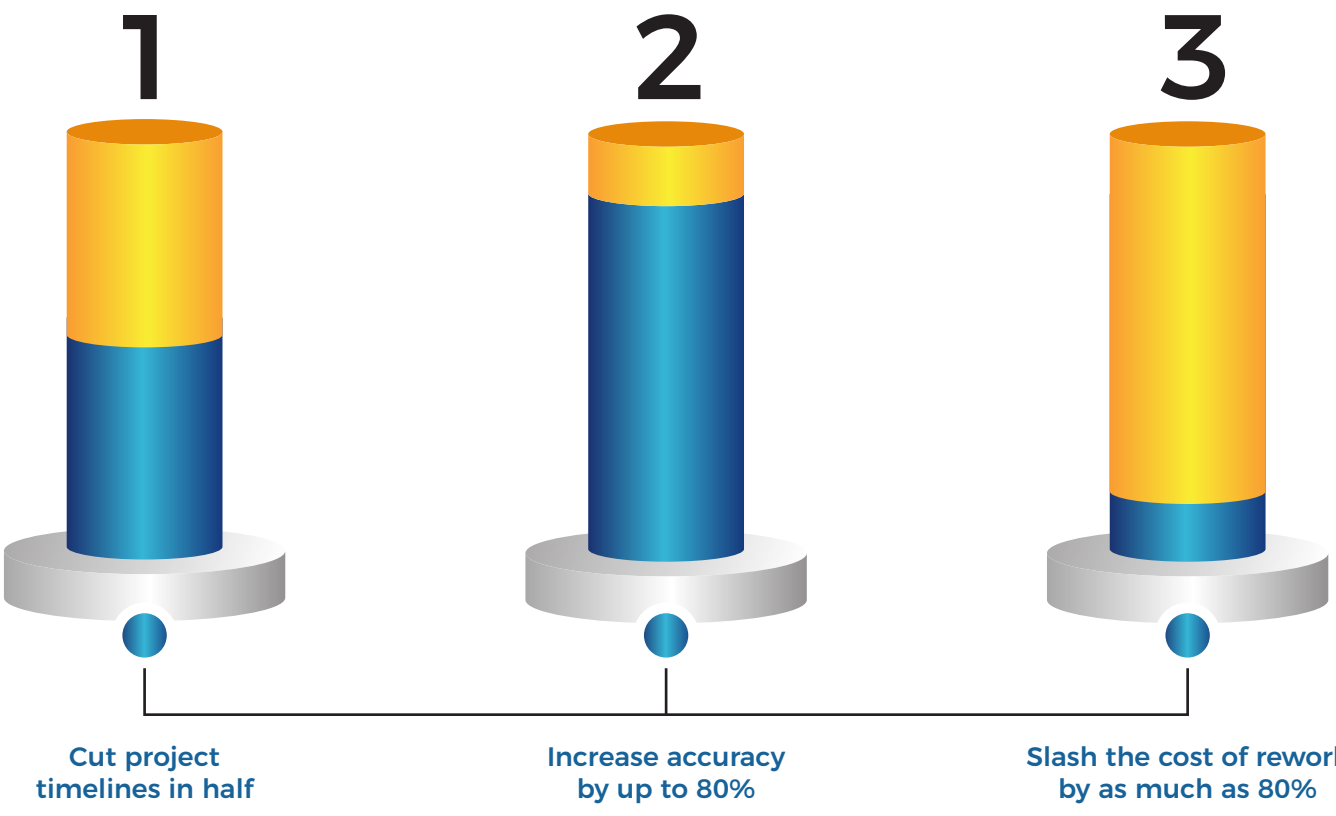
As a construction leader, you're under increasing pressure to improve processes, reduce waste, and increase efficiency and productivity. But the manual processes and disjointed single-purpose software tools the industry traditionally depends on make achieving those objectives nearly impossible.

That's why a growing number of industry leaders are embracing a new generation of interconnected, multi-function technologies to digitally transform their organizations and move beyond the limited 3D visualization capabilities of building information modeling (BIM) to actual production.

This transformation — the Constructible Process — provides the updated data and insights needed to create predictable plans and drive downstream efficiencies in the field and factory.

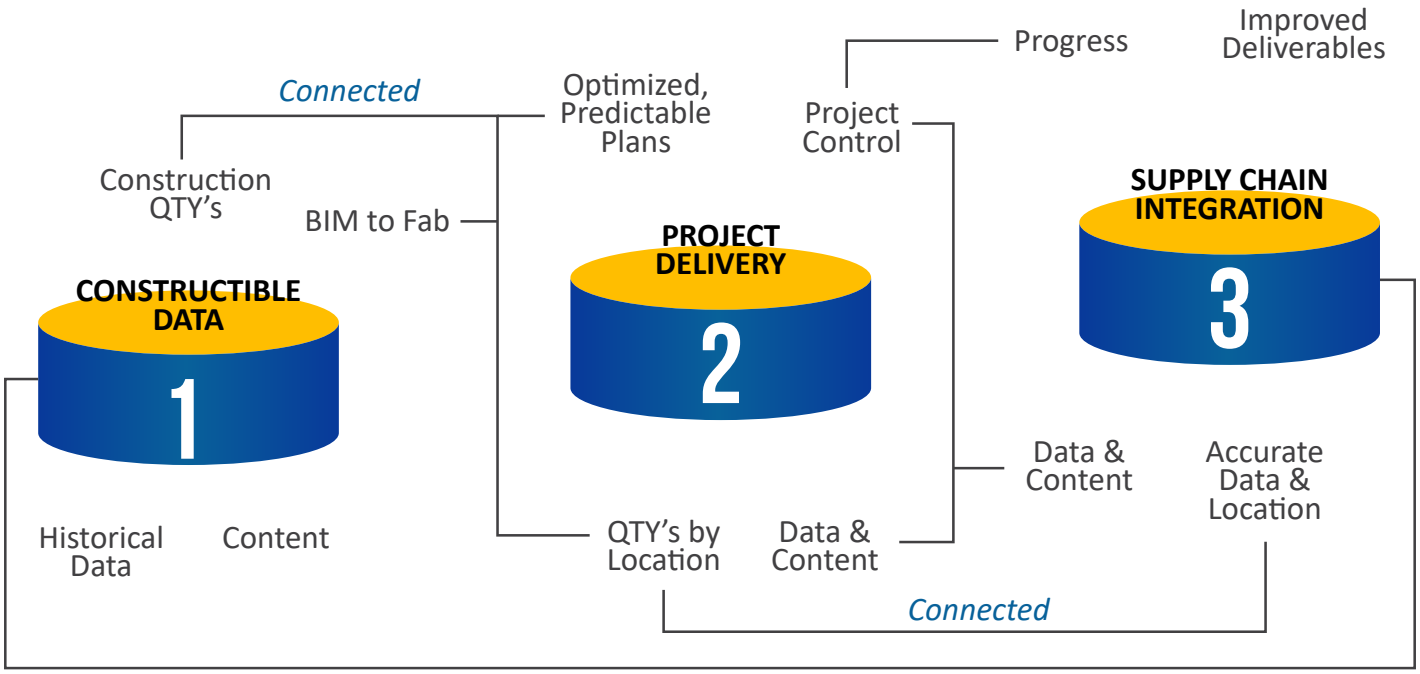
This guide will help you understand the Constructible Process and the initial steps to take to implement it in your own organization so you can:

- *Cut project timelines in half*
- *Increase accuracy by up to 80%*
- *Slash the cost of rework by as much as 80%*



DECONSTRUCTING THE CONSTRUCTIBLE PROCESS

The Constructible Process consists of four components that together form a closed-loop system to drive current and future business intelligence: constructible data, supply chain integration, prefabrication and modularization, and project delivery.



CONSTRUCTIBLE DATA

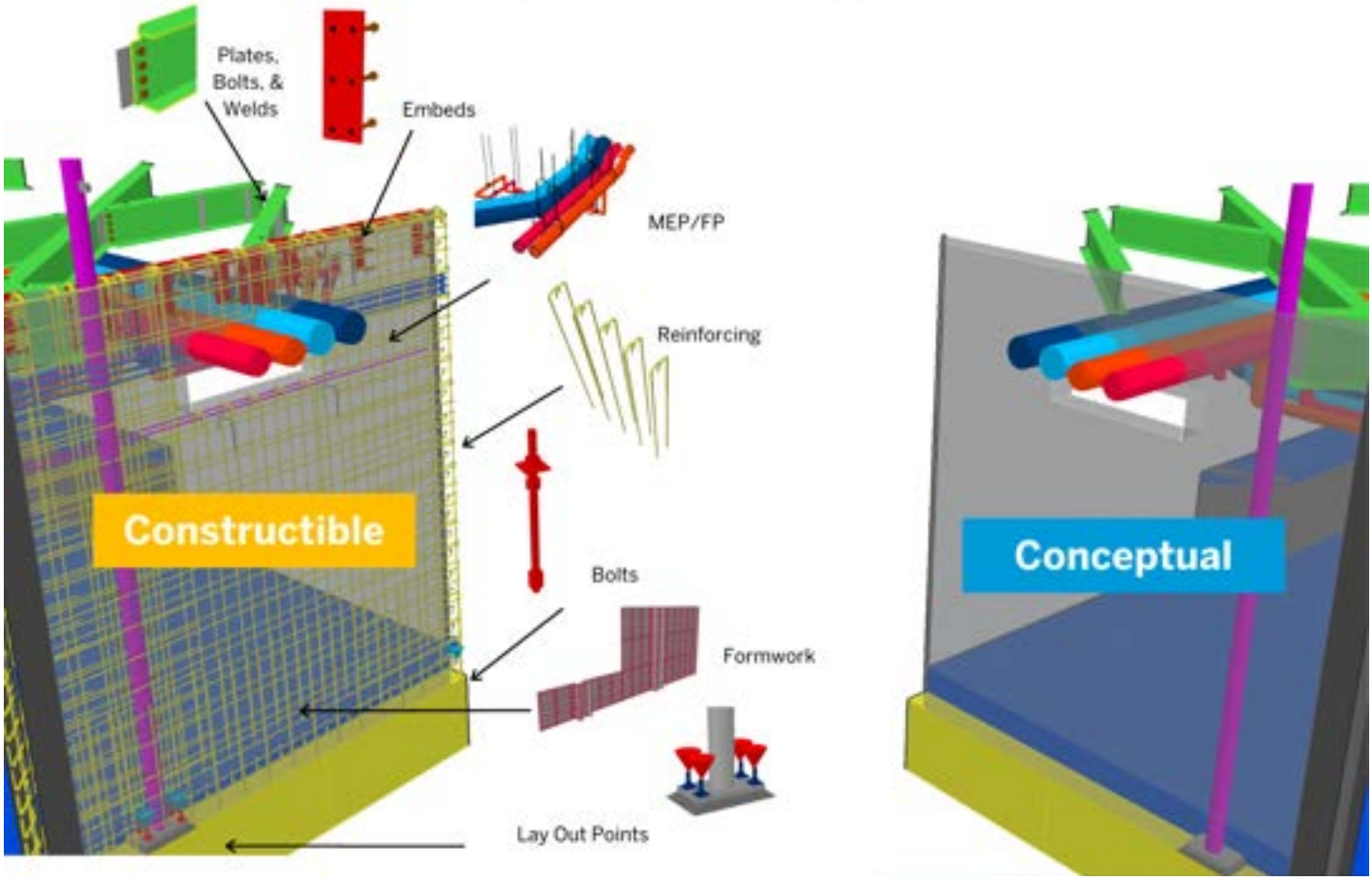
What it is:

Constructible data is building system information that bridges the gaps between office, field, and factory, enabling greater collaboration and connection among teams. While 3D BIM data is the backbone of a constructible process, constructible data also includes financial, procurement, logistical, geospatial, and part- and material-based information to create a comprehensive and current view of a construction project.

Why it's important:

Data integration is central to the modernization of construction processes, and it's critical to the design, specification, and delivery of building systems and construction work. The goal is to get constructible data early in the project—at the same cost or at a lower cost than traditional processes—to build confidence in it among your teams and drive downstream value and efficiencies.

Constructible data includes part- and material-based information, as well as geospatial, financial, procurement, and logistical information.



Benefits of constructible data:

- *Reduce duplicated effort and rework*
- *Increase planning accuracy and control*
- *Decrease cost and timelines*
- *Increase fabrication productivity (manufactured in situ, off site, and on site)*

Key technologies:

- *Purpose-built design and detailing solutions*
- *Access to reliable digital content*
- *Reality capture*
- *Coordination and collaboration systems to house the data*

Questions to ask when evaluating your data

- *How granular or detailed is your data?*
- *Is your data historical, predictive, or both?*
- *How many systems currently house important data?*
- *How is your data currently being leveraged to decrease operation and maintenance costs?*
- *How fast can your company go from design intent to LOD 3+?*

SUPPLY CHAIN INTEGRATION

WHAT IT IS:

Supply chain integration focuses on where the work is done, by whom, and when. It relies on constructible data to plan, coordinate, and optimize labor, equipment, logistics, production automation, and usage of materials.

WHY IT'S IMPORTANT:

Supply chain integration is crucial for selecting construction partners like subcontractors, materials suppliers, and fabricators, as well as coordinating effectively with them. It gives you the ability to take on greater segments of the design-build-operate process and to capitalize on new business opportunities, such as producing and delivering "turnkey" buildings to owners and end-occupant organizations.

Benefits of supply chain integration:

- *Increase utilization of resources and assets*
- *Reduce schedule delays by using the right people, equipment, and materials at the right time*
- *Deliver accurate, real-time progress reports*
- *Enable proactive adjustment of plans to satisfy project demands*

Key technologies:

- *Sensors and telematics*
- *Labor, equipment, and materials (LEM) dispatch and tracking*
- *Work order management*
- *Fabrication automation*
- *Reality capture*
- *Automated/assisted installation*
- *Site BIM services*
- *Manufacturer and supplier content*

PREFABRICATION AND MODULARIZATION

WHAT IT IS:

Prefabricated construction is a growing trend in building delivery. Until recently, most building systems were fabricated from raw materials on site. Today, an increasing number of building systems are being pre-manufactured off site and shipped as completed, often as integrated assemblies. These include panelized structural and enclosure systems, interior ceiling assemblies, and bathroom pods, to name just a few examples.

WHY IT'S IMPORTANT:

Prefabrication and modularization allow you to better plan production workflows and optimize production space in dedicated facilities away from the project site. Through high-quality equipment and proprietary automated processes, manufacturers can safely and efficiently fabricate finished assemblies faster, with more consistent quality, and usually at a lower cost.

Benefits of prefabrication and modularization:

- *Create greater efficiency and consistency among similar projects*
- *Drive increased quality and productivity*
- *Continuously improve processes and capabilities*
- *Improve safety*

Key technologies:

- *Managed content library*
- *Integrated 3D scanning solutions*
- *Robotic total stations*

Questions to consider about prefab/modularization

- *What quality issues are you trying to address with prefabrication?*
- *How easily can project images and specs be shared?*
- *What improvements in operating efficiency and cost management do you want to achieve?*

PROJECT DELIVERY

WHAT IT IS:

Think of project delivery as the conductor of the construction orchestra. It's a strategy for integrating stakeholders, systems, and project and planning through office-to-field connectivity, giving you a 360-degree perspective of a project and your available resources.

While the traditional design-bid-build project delivery model still dominates, other options like integrated project delivery (IPD) and construction manager at risk (CMR) are also becoming increasingly popular in both residential and commercial markets because they offer the flexibility to change your approach based on your specific business needs and available resources.

WHY IT'S IMPORTANT:

Implementing a project delivery methodology helps you use the constructible data to optimize plans and drive predictability. It's key for both cost and production planning that allows your company to coordinate better internally as well as with third-party stakeholders throughout the supply chain so you can reduce rework across functional areas such as estimating, scheduling, and project management.

Benefits of project delivery:

- *Increase predictability and visibility*
- *Reduce duplicate entry*
- *Decrease office and field rework*
- *Increase efficiency and productivity*

Key technologies:

- *Project management*
- *Field and mobile technology*
- *Enterprise resource planning (ERP)*
- *Collaboration system*
- *Estimating*
- *Site BIM services*
- *Planning and production control*

Questions for assessing project delivery readiness

- *Has your company implemented standard project management best practices?*
- *Are your office and field teams connected?*
- *How efficient are your communications with external stakeholders?*
- *Is the initiative organizationally supported?*
- *Do you have the appropriate technologies and organizational reporting structures in place?*

HOW ALIGNMENT ENABLES ORGANIZATIONAL CHANGE

Change is hard and uncomfortable. Utilizing key principles of organizational change management can help ensure your transition to a constructible process is successful, smooth, and relatively pain-free. Here's what to consider:

1 **GOALS:** *Organizational, team, and personal goals will impact every aspect of your operation. Whether they're aspirational (improving building aesthetics) or practical (reducing operating costs and improving profitability), organizational goals are the driving force behind why you do what you do and should be the lone reference point for all decisions moving forward.*

2 **PEOPLE:** *Your company's goals both influence and are influenced by your people. What your company is trying to do dictates who your company hires. And who your company hires controls whether your company is able to achieve its goals.*

3 **PROCESS:** *Your company's processes orchestrate your people to achieve your goals. As a result, your processes must be designed with people and goals in mind. At the same time, your processes both constrain and are constrained by the data transacted along the way.*

4 **DATA:** *Your company's data can enable or inhibit your processes. A BIM model can be a productivity gain if it's used throughout the supply chain, or a drag on project performance if it goes unused.*

5 **TOOLS:** *Also called "work sources," your tools are the base of the value chain and produce the data that enables your processes. There's little immediate value in a constructible model if your entire supply chain is using paper drawings and last-minute coordination habits.*

5 STEPS TO GET STARTED WITH CONSTRUCTIBLE

The Constructible Process requires a shift in both culture and mentality, as well as a change in the tools and technologies used. Changing one of these elements in isolation without evaluating the impact on the others could end up hurting your performance and decreasing efficiency—not the results you're seeking.

To successfully initiate the Constructible Process, follow these five steps:

01

Prepare Your Company for the Constructible Process

Successfully transforming your existing business model isn't simple or risk-free. Any new business model that hasn't been put to the test is, by definition, disruptive. And disruption can pose a threat to sales, delivery, and other entrenched interests in your company—especially to those that are your biggest revenue drivers.

To make the adoption and implementation of the Constructible Process evolutionary rather than revolutionary, you first need a thoughtful approach to change. That begins with clearly communicating what the changes will be and gaining buy-in from across the organization. Make sure to thoroughly explain why the changes are occurring and how those changes may affect the daily responsibilities of everyone from project estimators all the way to the Executive Suite.

02

Understand and Specify Your Goals

Goal setting is one of the most important steps in going Constructible since it brings critical clarity and transparency to all stakeholders as you move forward. It helps you understand if and why the Constructible Process is strategically important to your company and how it can help you achieve desirable business outcomes. For example, your company's goal could be to increase operational efficiency, develop new services, or overcome workforce skills gaps.

Going Constructible isn't just about implementing new technology, though. It's about advancing people, processes, and technology together so that the constructible process becomes a key element in your company's culture, focus, and execution.

03

Assess Your Organization's Readiness

While setting clear goals is vital, success will only come if your organization can execute on them. Going Constructible isn't a matter of just flipping a switch. It's a transformation that must be strategically developed and implemented so your teams can successfully adopt it.

In this step, it's vital to understand the potential gaps in your company's readiness. Evaluate the current knowledge and skills from across the organization to identify any talent gaps or skill deficiencies that could derail your transformation efforts.

Make sure to investigate and codify which benchmarks you'll use to measure success across specific functions and throughout projects at large, as well as how you'll shift teams and technologies to avoid further fragmenting and siloing your operations in a way that may fuel destructive "them versus us" or "new versus old" conflicts within departments.

04

Capitalize on Existing Data

Data is your company's intellectual property and it's essential to your success. You can use your existing institutional data to optimize performance, improve planning, and drive predictability and automation for greater efficiency. You can also use it to differentiate from the competition and create new services in the marketplace. When you inventory the data you already have, or could be capturing, you can then determine what value the data provides.

It's also important to build a company culture that values data as a core asset. Revisit your data governance policies to make sure everyone understands your company's standard practices for effectively capturing, curating, sharing, and operationalizing your data.

05

Choose the Right Implementation Strategy

There are three main ways you can implement the Constructible Process in your company:

One deliverable at a time

There are plenty of third-party resources that can help your company create a constructible deliverable without making the upfront technology investment or process change. This could include outsourcing the development of a 3D model to create construction quantities, optimizing a schedule using location-based techniques, or performing periodic reality capture for comparison against a plan. This method has a low cost to entry and helps generate the business case for wider adoption.

One process or technology at a time

If your company is implementing a single process or technology, part of your evaluation needs to be how the single process or tool will support the overall Constructible Process. For example, will the tool support constructible data, leverage content, and contribute to a connected construction process? Will it help drive the desired evolution while meeting the demands of today's projects?

Specific business outcomes

Your company can engage experienced business consultants to help plan a constructible roadmap. For example, determining a mid- to longer-term strategy will help drive specific business outcomes such as increased margin or market share.

TRANSFORM YOUR BUSINESS WITH THE CONSTRUCTIBLE PROCESS

The Constructible Process helps you keep up with a changing construction industry. By ensuring every person, process, and tool is connected and working together, you can optimize the entire design, build, and operate lifecycle.

Taking a data-driven and integrated approach allows you to rethink and improve your company's supply chain, prefabrication and modularization needs, and project delivery model. With each project, you gain the data and accuracy you need to create greater predictability, repeatability, and efficiency—in the office, field, and factory.

With the Constructible Process, you're able to:

- *Increase efficiency and productivity*
- *Create repeatable processes for scalable production*
- *Continuously improve processes and deliverables*
- *Deliver projects with greater confidence*

Contact us today to learn more about how Trimble's software and construction expertise can help you reinvent your construction business.

CONTACT US

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