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Turn Your Workforce into a *Work Force*

Your Guide to Building
a Construction data hub

Workforce shortages continue to plague the construction industry and will for years to come. An aging workforce, lack of interest among younger generations, and competition from other industries have left the industry struggling to deliver projects on time, within budget, and and up to quality standards.

The sad reality is you can't control the job market or the flow of supplies or the demand for new projects. But you have complete control over the way your work gets done and how you manage your complex projects.

For most builders, that system has been an ongoing battle. Contractors and subcontractors across your projects work in their own systems, making it nearly impossible to know the status of anything at a given time. So, you rely on status check-ins via email that are outdated by the time they're reviewed. When it comes to reporting, it takes hours to dig through different applications to pull everything into a bloated, unwieldy spreadsheet that's missing updates by the time it's completed.

The only way to overcome the challenges plaguing construction companies today is to have a single source of truth for your complex projects. Making the most of your work force, ensuring the materials are on-site exactly when expected, keeping project teams scheduled properly, and more all are dependent on the most critical data being available anytime you need it.

You know you need a construction data hub, but where do you even start? Lucky for you, you're reading this guide! You're only a few pages away from understanding exactly how to build your own single source of truth for all your most complex projects and make the most of the workforce your business already employs.

In this eBook, we'll explore the practices, infrastructure, and tools that can provide both scale and flexibility for a source of truth.

Houston, do we have a source of truth problem?

Technology is essential for managing complex project portfolios–75% of organizations use at least six tools daily. But this complexity is causing a productivity crisis in construction, where the volume of construction data has doubled over the last 3 years according to research from Autodesk.

Programs in those industries often involve many systems, data sets, and teams, making it difficult for organizations to collect, manage, and use the information they need to be successful. Think of cross-functional supply chain management, developing telecom infrastructure, real estate portfolios that require collaboration, and construction projects that include multiple departments.

How are builders experiencing this "productivity crisis"? They're hampered by delays and costly rework. They're unable to respond to rapidly changing economic conditions or make informed decisions quickly. They're wasting resources and it's costing them money. Each of these problems makes it clear you have a breakdown in process and data in your organization. But a solution is possible with a clear, concise single source for all business-critical information.

With such complexity and scale, having all your information in one place is ideal but feels improbable. You need everyone to use the same correct data because mistakes snowball and are costly. But because so many people are involved, it's more likely they create and work with different versions of information
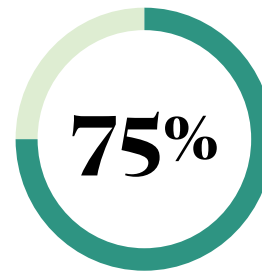
75% **of organizations use at least six tools daily.**

An ideal Single Source of Truth (SSOT) has all data stored and managed in one place. Mentions of the information in other locations are references only. When someone changes data in the SSOT, those changes reflect everywhere.

Ten questions to determine if your organization has a data problem:

1. Do teams know where to go when they need to look something up?

2. Are there well-defined processes, roles, and responsibilities for ensuring data accuracy?

3. Do executives and other stakeholders have easy access to up-to-date, relevant data for making decisions?

4. Are you able to track changes to data over time?

5. Can teams generate reports and applications autonomously?

6. Are recurring collection and reporting tasks automated?

7. Can people find information without interrupting their workflows?

8. Can people answer questions without interrupting colleagues?

9. Can teams access data without specialized training?

10. Does everyone see the same data?

If you answered "no" to any of these questions, you have a data problem.

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How to build a source of truth at scale, step-by-step

Building a source of truth at scale can feel daunting. But it's important to recognize that once you establish a plan and follow the right steps, your organizational processes can improve by leaps and bounds with a source of truth. Improvements also grow over time.

The collaborative process outlined below makes the process manageable, aligns stakeholders in your organization, and sets you up to be successful long-term.

You won't have to run this long race blindly; use the five steps below as the map that shows the way.

◈ Steps

1. Know what you're solving: Define your objectives

2. Audit your data collection & work processes

3. Adopt a customizable no-code solution

4. Automate what you can with guardrails & governance

5. Establish data governance & communicate

1 Know what you're solving: Define your objectives

Anyone starting this initiative should first ask:

- What problem do we want to solve?
- What information do we need to know to solve that problem?
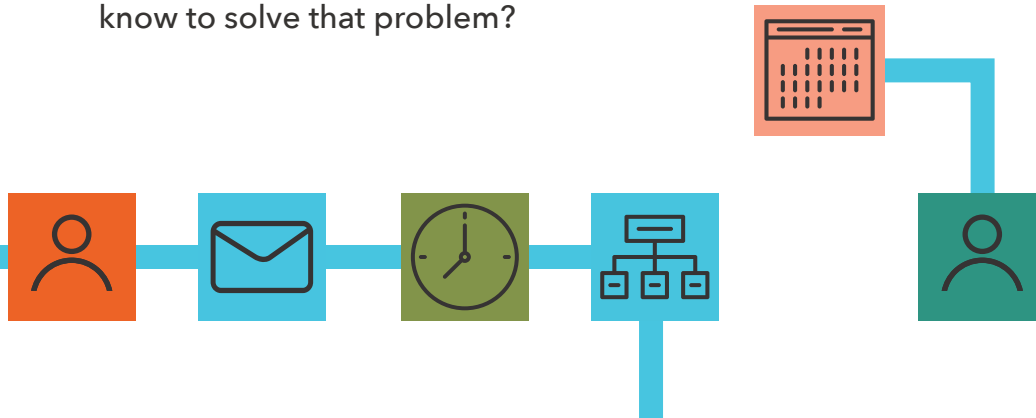
> "
>
> *How folks want to structure databases and use fancy new technologies and graph networks and all that kind of stuff, that often doesn't translate into what the business needs. So we need to let the business drive the technology.*
>
> Brian Hinshaw, Principal Business Manager at AT&T

Companies usually have good reasons for building, maintaining, or improving a source of truth. For example, Operations leaders may want to make warehouse logistics more efficient but get conflicting reports from teams in those locations.

People from the business and tech sides of the organization must work together to answer these questions.

Business usually has a problem ("warehouse logistics aren't efficient, and we get conflicting reports from teams on the ground"). Tech then looks at the current data setup and potential causes of the problem; their findings inform the scope of the project. ("Nobody collects any of the required information" is a different beast from "Two datasets don't sync, and we should add a new pipeline.")

After completing the initial problem statement and fact-finding, people from business and tech together formulate a goal for the source of truth project.

It is critical that objectives are defined by a collaborative group. Involve tech folks early so they can start thinking about the infrastructure and technical needs for your system.

2 Audit your data collection and work processes

"The quality of data is based on the processes that happened before the data is collected," says Brian Hinshaw, Principal Business Manager, AT&T. Once you understand the problem you're solving, find the processes to collect the data you need and ensure those work.

"You wouldn't believe the number of different ways we get a customer name or an address, and that trickles down into the later processes and systems and just causes all kinds of problems."

To avoid such issues, run through these steps:

- List the processes and platforms where you gather data for your source of truth.

- Check whether data gets collected correctly for your purposes.

- Identify data with a high business impact that needs attention.

- Find data collection gaps.

Classify existing data sets as bronze, silver, or gold. Gold usually indicates the most complete and accurate set. Sometimes the golden label is aspirational, signaling information with a high business impact that should achieve that level of accuracy but isn't there yet.

Prioritize the processes and datasets you need to create or improve, then get to finding your solution.

Sometimes, creating a missing data collection process is most urgent; in other cases, fixing problems with the data you're already gathering is more important. Brian says: "Oftentimes, we end up so much trying to fix what happened after the data was collected that we forget we really need to go back up to the front of the process…If we take a little bit of time today and fix way up at the front of the process, we'll have a better source of truth at the end."

Another way to decide what to focus on is by finding manual processes—often recognizable by the involvement of Excel—that you can automate. Doing things by hand is most prone to mistakes and delays, so such activities are a great starting place for building or improving your source of truth.

3 Adopt a customized no-code solution

Once your ideal process and structure is established, find a flexible solution that allows your teams to connect the most critical data easily without disrupting existing data and process. The right no-code application will also give your organization the ability to grow and evolve as new processes become more important and the scope of work changes.

Quickbase offers the end user flexibility while preserving the integrity of your work hub. Our solution provides data integration pipelines and the capability to build no-code apps in one platform.

Brian gives the example of a customer with five Quickbase apps. Each app provides a different view of the same data tailored to each stakeholder.

"It allows each entity in their business process to do what they need to do without trying to force everybody into the same, 'You've got to follow the same' model."

Another example is a large enterprise with customer advocates. They produce reports on product and service performance for their clients on metrics like the number of orders, closed support tickets, or repair time.

Teams can quickly and easily customize apps to their specific needs without coding. Possible use cases include:

- Estimation and bidding processes
- Vendor and subcontractor management
- Material and equipment delivery and installation tracking
- EHS and OSHA checklists
- Punch lists
- Project management

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In the past, these advocates would go to a dozen different places to collect data, generate a report, import the info into Excel, adjust the layout, and convert everything into a format suitable for the customer—a process that often took hours.

The team now quickly completes all these tasks within one app. The data they require is already connected to the app. They can choose from various standardized reports, click to generate one, and send it over to their customer.

In large organizations, you want to have a service desk that helps with things like:

- Training to help people understand what's possible and how the platform works.

- Planning to advise teams on how to best get started building a first version of their app or source of truth that solves a small problem, then iterating from there.

- Data collection to assist people in figuring out if the data they need for their app is available and, if not, how to start collecting it.

- Data governance to educate people on standardization and answer questions about ownership, connecting to and using specific data sets, etc. (A topic we'll look at in more detail shortly.)

- Enhancement to guide people in how they can improve and expand their apps, for example, with new Quickbase features that become available all the time.

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We've got to make it [support] like going to McDonald's and saying, 'I want a Big Mac and some fries.' It's got to be that simple.

Brian Hinshaw, Principal Business Manager at AT&T

4 Automate what you can with guardrails & governance

You can automate many tasks related to creating and maintaining your overall work platform, most importantly, collecting data. But cleaning, standardizing, and validating information can be automated, too.

When you set up automation, it's critical to add guardrails. An automated process is more efficient than a manual one—also at amplifying mistakes when something goes wrong.

Every process that affects the business should have an automated check for accuracy or quality. For example, you can automatically generate and send a report to Finance for any invoices more than 30 days overdue.

When stakes are higher, you also want manual reviews of specific data points in an automated process, either through spot checks or on all the records.

Another automated check you can add is sending notifications when someone manually changes critical data, like when someone marks a previously completed task as in-progress again.

Data processes and practices you should consider automating:

Collection: Getting information from multiple sources

Standardization: Removing duplicates, fixing errors, and enforcing formats

Validation: Checking that incoming information is correct and compliant with privacy and other applicable regulations

Synchronization: Moving and referencing information between different datasets

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5   Establish data governance & communicate

Creating a reliable source of truth is usually as much about communication as it is about technology. You need to make clear definitions and agreements about your data practices, and communicate those constantly across the organization.

Data governance are the decisions you make about standards, practices, and ownership of information handled by your organization. Problems with sources of truth—and data management in general—often arise when no one makes such decisions, or when each department makes them independently.

The solution to all these problems is a platform like Quickbase, where governance is baked into the data infrastructure and pipeline layer of the system (e.g., who can make changes, how metrics are calculated), but end users still get lots of flexibility to do almost anything they want with that data using no-code apps.

Without such a solution, you need to enforce governance "manually" through policing, auditing, and lots of documentation.

Another advantage of Quickbase is that you can allow most or all users to see where data is coming from, how numbers are calculated, and which datasets connect to each other. This way, people can build their own understanding of what a number or element in a report or app means, without needing to guess or ask help from someone else.

Common mistakes that happen with datasets when there's no clear data governance approach:

Misalignment on times and dates.
Teams record times in their local timezones; people enter dates in different formats.

Missing field definitions.
Classic example: do first and last names get their own fields, or is there one field with "name" that covers both?

Varying calculation methods.
One team calculates a revenue result with tax, the other without, but they think they're calculating the same metric.

Uncoordinated data synchronization.
For example, shipping orders get pulled once a day at midnight from a dataset that also syncs once a day at 9 pm—orders between 9 pm and midnight will needlessly be synced a day later.

Undefined decision rights on data.
Often either too few people can make changes to data or too many; both situations lead to unreliable data. With too few people, folks start making copies of datasets and find other workarounds that quickly undermine any semblance of a source of truth. When too many people can make changes, the information becomes equally unreliable.

sources of truth success stories

You can overcome the thorniest construction problems with an effective source of truth built with Quickbase;

here are three examples from building project leaders who found their single source of truth.

Construction

Consigli uses Quickbase to manage complex projects with a source of truth

Consigli Construction is one of the largest employee-owned construction companies in the Northeast and Mid-Atlantic. To deliver their complex projects on time and under budget, they need a source of truth that gives their teams real-time access to information.

Quickbase gives Consigli such a central source of information, consolidating data from across systems into a single view for the entire organization. The platform's flexibility and no-code apps enable teams to modify their workflows quickly.

For example, when Consigli needed a comprehensive safety app to track and share safety information for the entire organization in one place, they created one in less than a month—an impossible timeline without a no-code solution.

Read more about Consigli and Quickbase's use in the construction industry in our eBook Innovate Your Growing Business.

Construction

Lighthouse Electric innovates their prefabrication process

Lighthouse Electric, one of the largest electrical contractors on the east coast that serves major corporations like Facebook and GM, was working to adopt a cutting edge planning and prefabrication building process but struggled due to reliance on outdated software and spreadsheets.

With Quickbase, Lighthouse Electric was able to build an application e application to track prefabrication kits from the opportunity stage to installation in the field. The application includes an easy-to-use mobile form that only takes three clicks to get started—lightyears ahead of the previous process. The application has become the central source-of-truth for this initiative and neatly connects their critical systems in one hub, where every employee can quickly find the information they need within 3 clicks.

With the help of Quickbase, Lighthouse Electric has expanded their prefab options and delivered over 3,000 kits in just 2.5 years since starting the Planning and Prefabrication division. With their applications, they can measure KPIs for requested, budget and actual prefabrication hours. Lighthouse Electric can now provide more accurate estimates for the planning and prefabrication process.

Read the entire case study:
[Lighthouse Electric Innovates their Prefabrication Process](#)

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Construction

Vertical-One saves hours on project management

While maybe unfamiliar to the average consumer, Vertical-One occupies a crucial niche in the construction industry. The builder partners with the largest names in telecom to maintain strong wireless connections via tower construction, modifications, upgrades, and maintenance.

Prior to adopting Quickbase, Vertical-One was using another construction management software, but it was too inflexible and poorly suited for their project pace. This lack of a collaborative platform created challenges for the financial and project management teams because of a lack of access to project statuses.

With Quickbase, Vertical One built an operations app that serves as a single source of truth—a complete project management solution that contains all the information necessary to bring a tower project from planning to final inspection. All data big and small—from the tower owner's information to contracts, permits, calendar schedules, expense reports, revenue forecasts, purchase order forms, and invoice requests—can be found here. This empowers Vertical-One to streamline the construction process for every ongoing project and bolsters the company's ability to take on more builds while maintaining efficiency and quality.

Thanks to Quickbase, Vertical-One is finding time savings throughout their critical processes. This includes saving the field teams at least 10 minutes every time they set foot on site thanks to automated hazard analysis processes and reducing time spent running financial operations from hours to 15 minutes each time.


Check the complete case study: Vertical-One Streamlines Project Management

A checklist for building your scalable source of truth

Use this checklist to ensure you build a scalable source without missing any essential steps:

☐   Define your objectives with collaborative group

☐   Audit your data collection and work processes.

☐   Classify existing datasets as bronze, silver, or gold

☐   Prioritize dataset and process improvements based on objectives

☐   Layout your ideal structure for how data and teams connect with each other to get work done

☐   Adopt a customizable no-code solution

☐   Set up a service desk to lead training, planning, and support requests

☐   Automate manual processes but create checks on high-stakes data

☐   Outline data governance and organize training
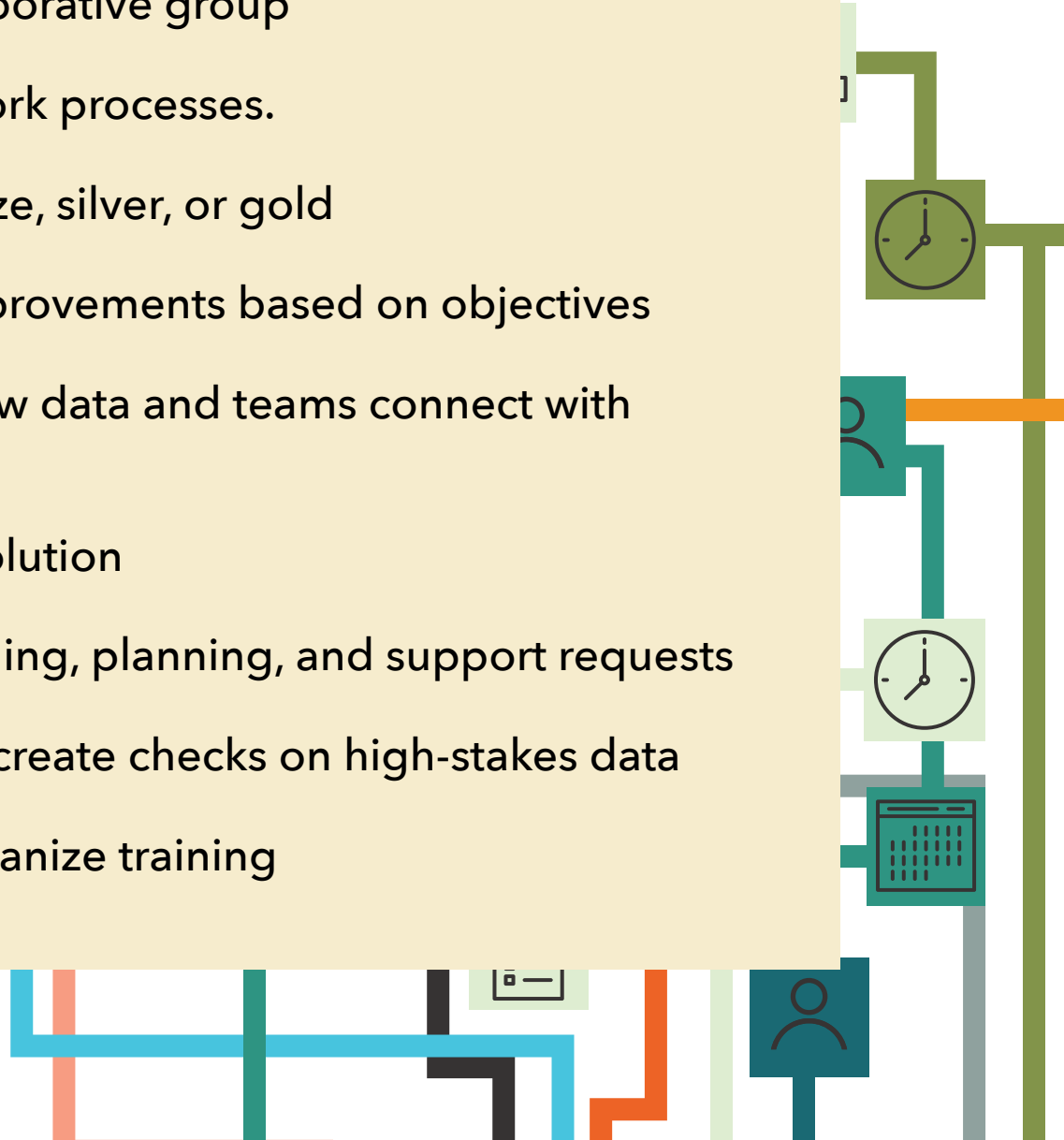
A construction source of truth is never one and done

By now, it's unlikely you still think a source of truth at scale is a one-time project. It's an ongoing effort that requires constant work and attention.

While a one-and-done fix might be an illusion, a flexible and scalable solution isn't. The steps outlined in this guide will help you create a holistic work platform at scale that is reliable, secure, and adaptive.

Having a source of truth ensures builders are able to keep an eye on project timelines, material status, and subcontractor work in an actionable, flexible place. It keeps projects on track and the effort wasted on a minimum.

Perhaps most importantly, you'll make the most of your existing workforce by eliminating rework and nonvalue add activities just by equipping all project stakeholders with the most-up-to-date information.

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A single source of truth is a dynamic organism… The business is going to change. The orgs are going to change. It's not a one and done scenario. You've got to keep adjusting it to the business and the organization so that it stays current and fresh.

Brian Hinshaw, Principal Business Manager at AT&T

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See for yourself how Quickbase creates seamless connections across your systems.