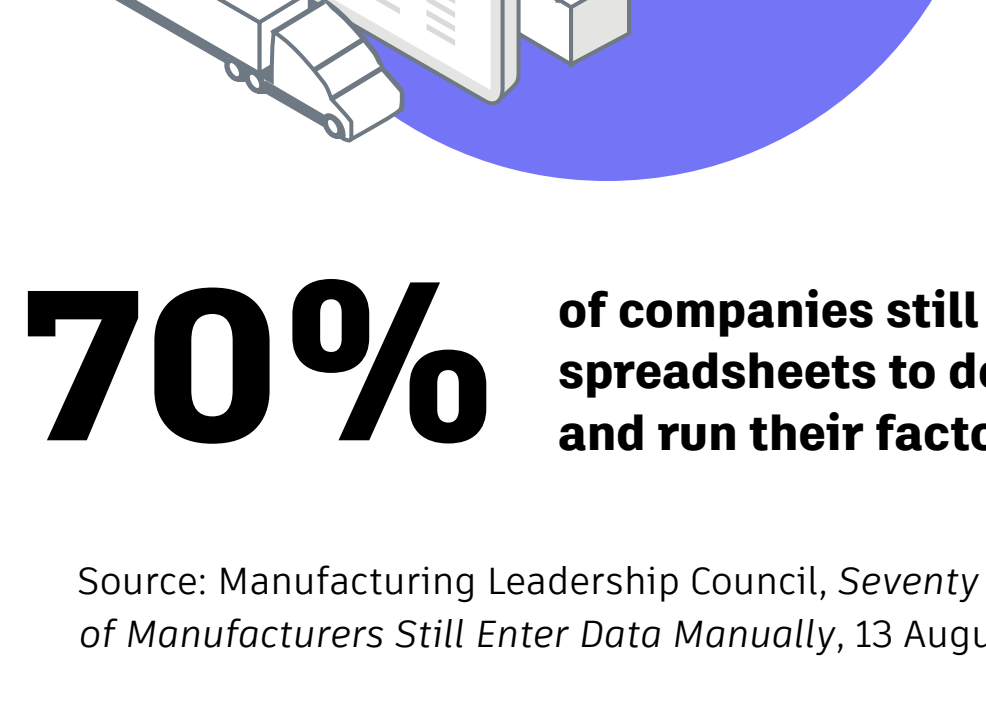


The digital factory: a data story

Whether it's completely new (greenfield) or a retrofit of an existing structure (brownfield), developing a new factory is probably the largest single investment your company can make. Which makes it all the more amazing that so many companies still plan, design, build, and operate their factories using processes that pre-date the Internet.

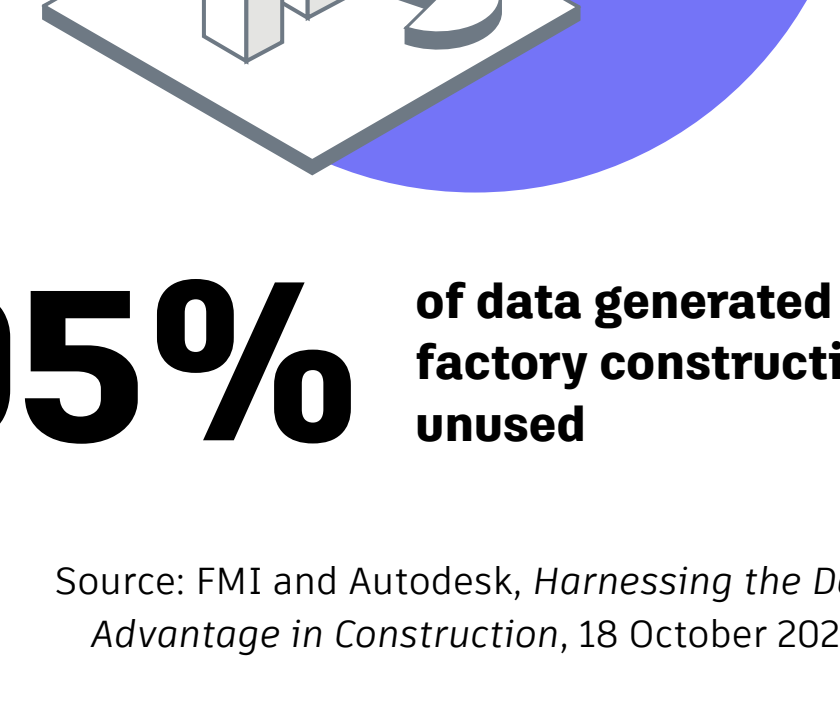
So what would a modern, start-to-finish factory process look like? It would be built on data. Highly collaborative, with predictable schedules and fewer surprises. And it would deliver more agility—with higher quality—at a much lower cost.

Introducing the digital factory.



70% of companies still rely on spreadsheets to develop and run their factories

Source: Manufacturing Leadership Council, *Seventy Percent of Manufacturers Still Enter Data Manually*, 13 August 2024

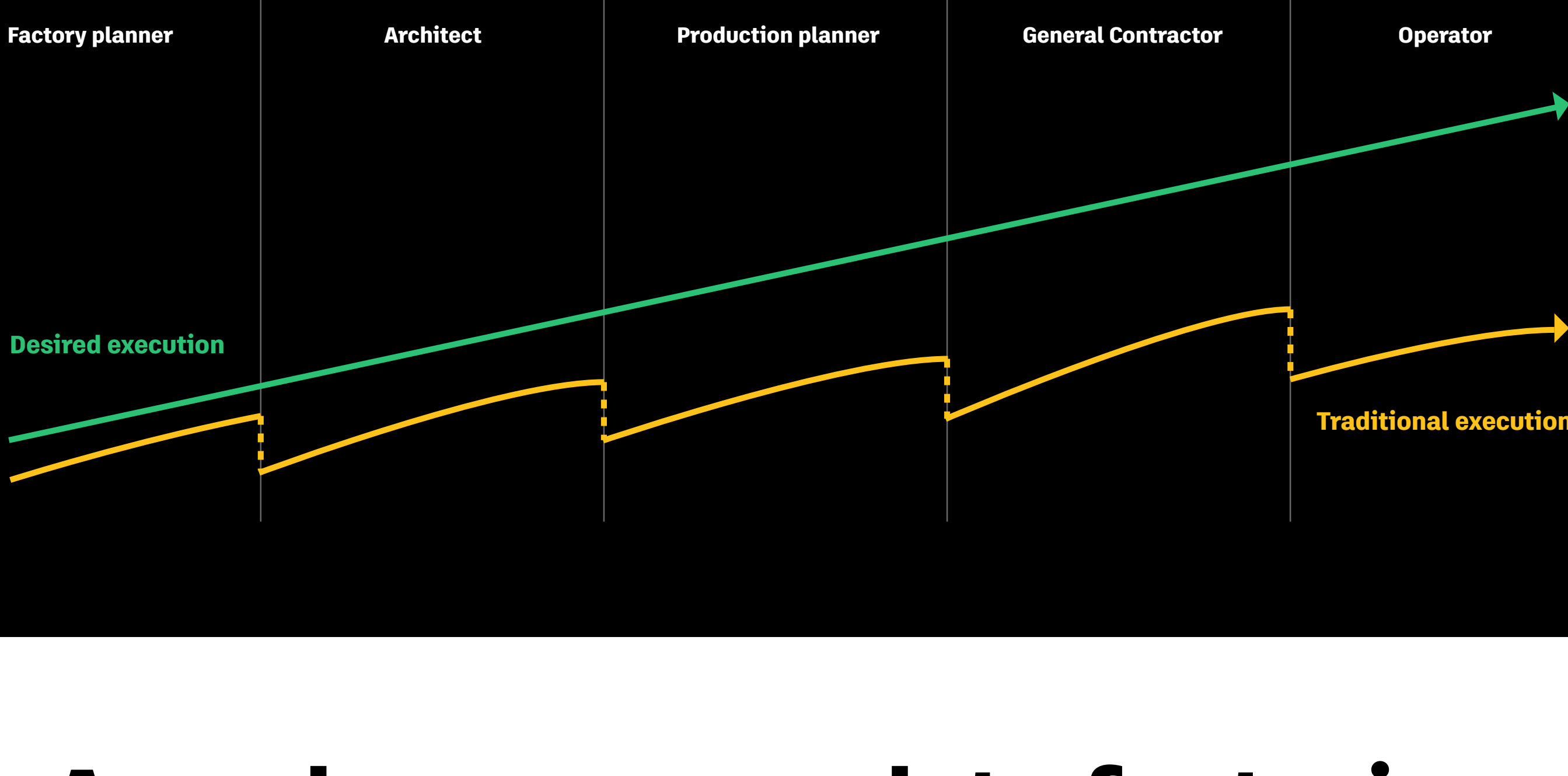


95% of data generated during factory construction goes unused

Source: FMI and Autodesk, *Harnessing the Data Advantage in Construction*, 18 October 2022

Traditional approaches lead to lost data

Taking a factory from a plan to operational requires many different stakeholders—experts who often work in their own siloes. And that can lead to astonishing losses of data as the project unfolds. But what if you could capture all that data and use it throughout your factory lifecycle?



A modern approach to factories

Plan 1% of lifetime cost

How can a phase with such a small budget have such a large impact on the success of your factory project? Traditional approaches are heavily design-bid-build focused, with emphasis on concerns like existing conditions, MEP requirements, contractor management, and code compliance—essentially the building envelope.

But what if you could move beyond mere concepts and feasibility studies, integrating production and manufacturing engineering input more seamlessly into the planning process? What if you could apply all of the operational insights from your last factory directly into your next one? What if you could connect the outside of your factory to the inside—planning for operational agility, asset commissioning, maintenance cycles—right from the start? **With the digital factory, you can.**

- ↑ Predictive maintenance efficiency
- ↑ Improve time to market
- ↓ Reduction in errors and re-work

The value of digital twins

A digital twin is a virtual representation of a physical object, system, or environment. With up-to-date data bundled in one place, a digital twin evolves with the flow of information from sensors, building information models, production line machinery, and more. In short, anything you can model on a computer.

But it requires good data, and lots of it.

In manufacturing, digital twins can be used to test the quality and performance of parts and assemblies, manage supply chains, automate fabrication processes, and ensure

factories operate safely and efficiently—all of which contribute to better, more collaborative decision making, fewer errors and bottlenecks, and increased return on investment.

The more data you put into your twin from the beginning, the more you can get out of it throughout the operational lifespan of your factory. More insight into the impact of production line changes before you make them. Faster product development processes. And longer equipment lifespans. Digital twins can unlock it all.

Design

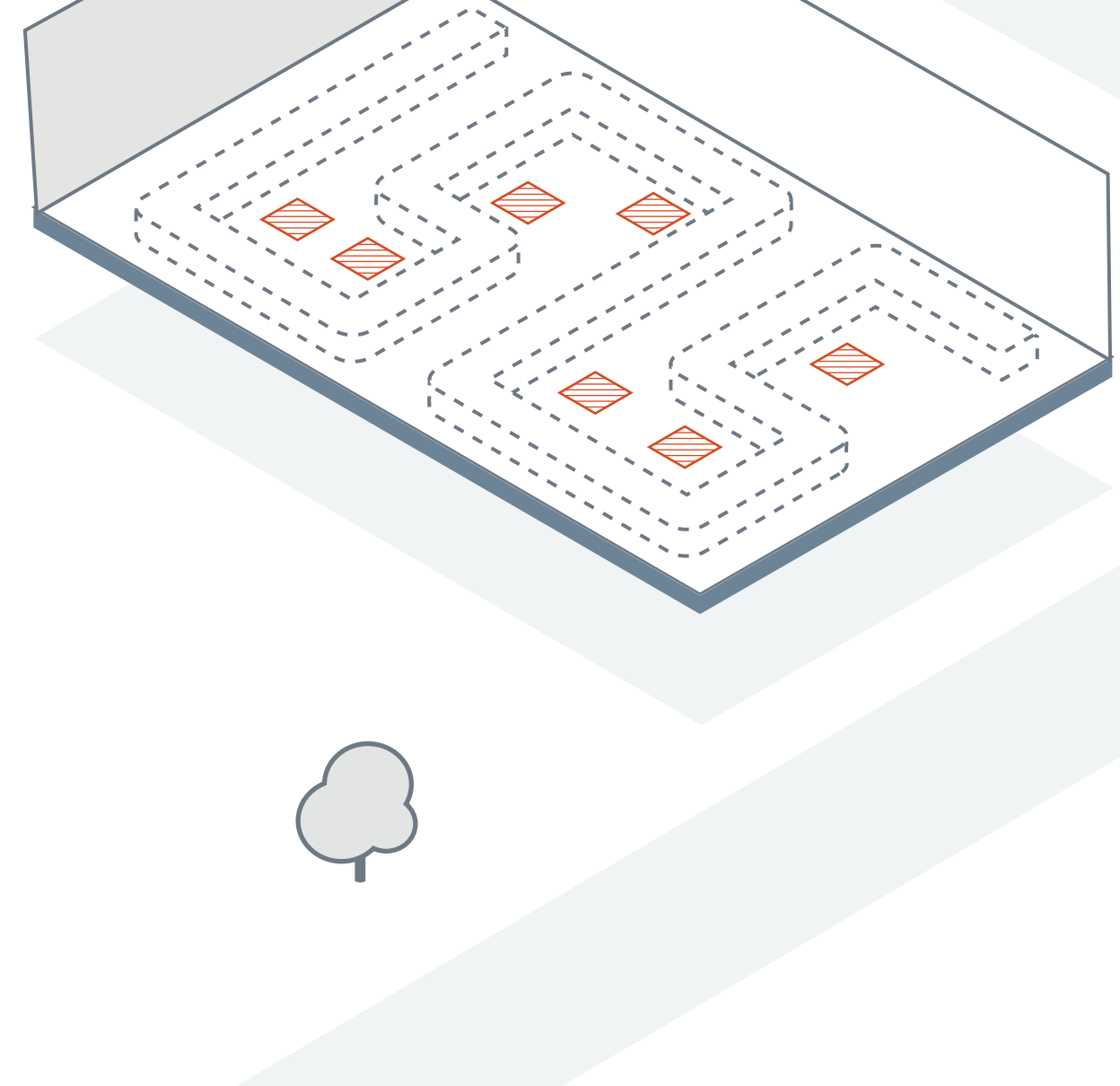
4% of lifetime cost

Even today, factory designers and engineers still operate in siloes—the architects don't know what the production line will look like, the manufacturing engineers have no idea if their machines will fit through the door, and no one is talking to the construction team.

And that assumes that any of the decisions made by any of these stakeholders—and others—won't change next week. (Hint they will.)

But what if architects could see and interact with the manufacturing machines as they're being sourced? What if production engineers could flag areas in the building design that might negatively impact the production line? What if construction could adjust the build timeline as decisions evolve? And what if they could do it all in real time? **With the digital factory, they can.**

- ↑ Optimized factory design
- ↑ Cost predictability & control
- ↑ Improved construction quality



Build

15% of lifetime cost

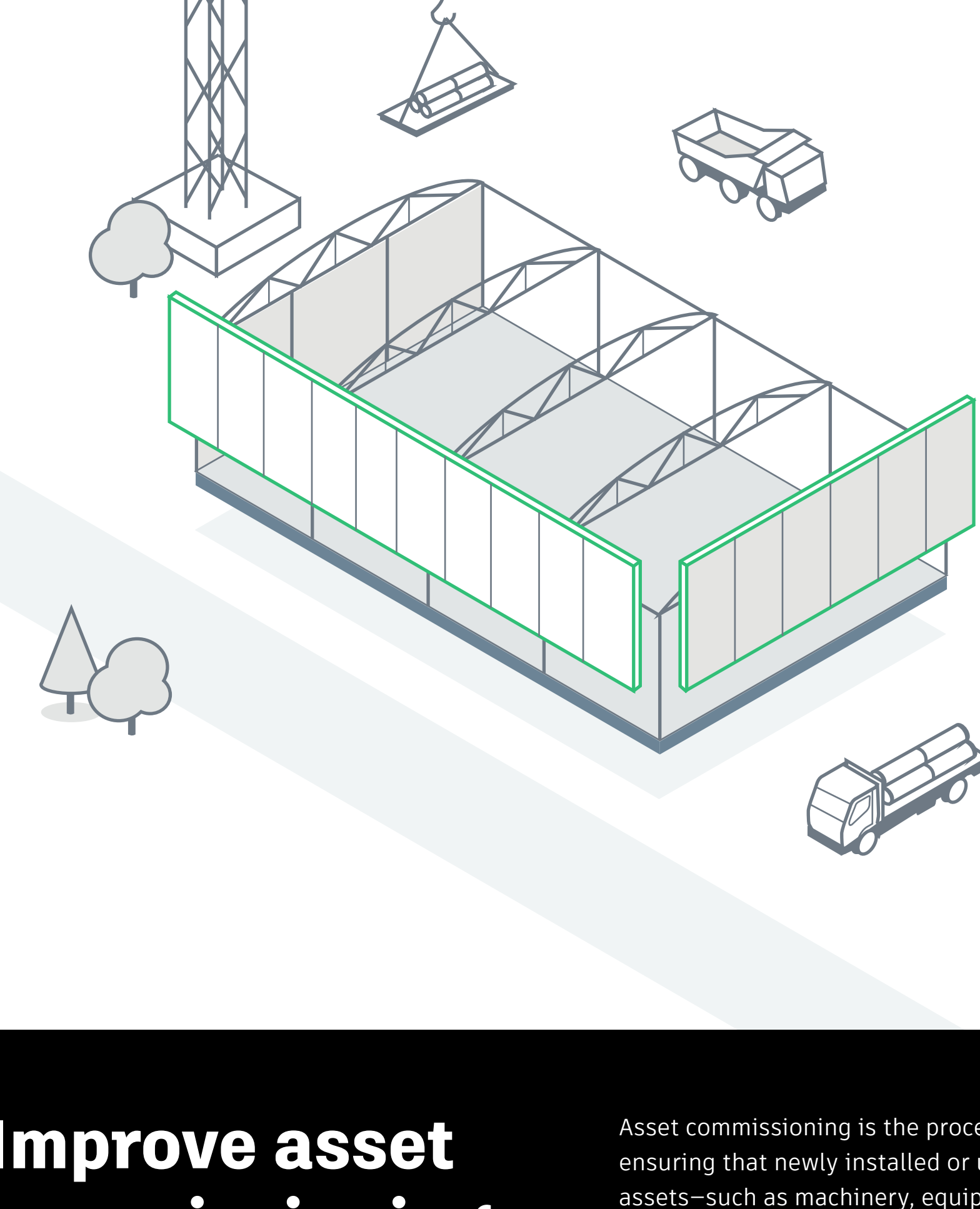
Does this sound familiar? The foundation is poured, the building envelope is up, and the first manufacturing machinery is being delivered—only to discover that a column intrudes two feet into the production line.

Now there's a three-month delay while the team attempts to fix the problem.

Unfortunately, such scenarios are all-too-common in traditional factory construction.

But what if the construction team caught this clash (and any others) in the design phase? What if the machinery specs had been connected from the architect's planning engineer's drawings to the manufacturer's drawings? What if you could be sure every machine was installed correctly? And that last-minute production line changes would update everyone's data, everywhere, automatically? **It can with the digital factory.**

- ↓ Reduction in operational costs
- ↓ Reduced carbon footprint
- ↑ Improved resource planning



Improve asset commissioning

Asset commissioning is the process of ensuring that newly installed or upgraded assets—such as machinery, equipment, or production systems—are properly installed, integrated, and tested to meet desired performance and operational requirements. It typically includes activities such as installation, functional testing, performance verification, training, and documentation.

The data from your digital twin—and the entire digital factory process—can radically improve this process by helping you bring your factory online, reduce defects at that handover, minimize product defects and non-conformities, and accelerate time to market.

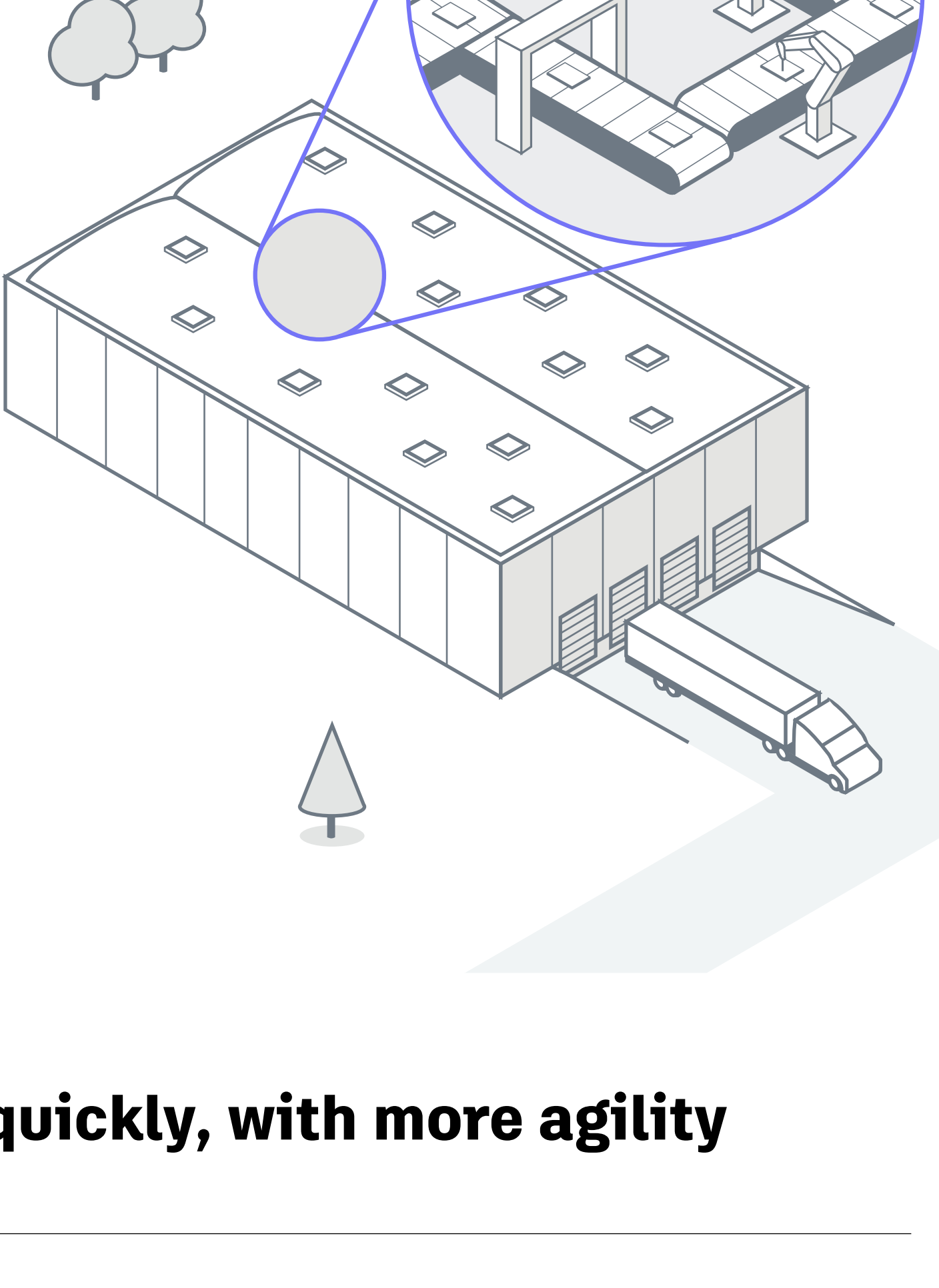
Operate

80% of lifetime cost

The longest, most expensive part of factories is always in its operation. But the sad truth is, by the time most companies get their factories up and running, they've locked away critical information and decisions in paper files—or lost it entirely.

But what if you could use all of the data from planning through build to improve decision-making in operations? What if you could continue to connect departments—product designers, engineers, sales, even customers—to bring more agility to your production line through flexible manufacturing? What if you could reduce mistakes and rework? Or bring more efficiency from the factory production line with real-time data? What if you could reduce unplanned downtime? Or react to an unstable supply chain? **A digital factory can make it all possible.**

- ↑ Increased production agility
- ↓ Minimized unplanned downtime
- ↑ Increased throughput



Get operational more quickly, with more agility

50% reduction in unplanned downtime with digital factory processes

30% increase in throughput with improved digital factory workflows

Source: McKinsey & Company, *Capturing the true value of Industry 4.0*, 13 April 2022



“In the model, all designers, planners, and suppliers speak the same language—it's like a kind of symphony where people meet and everything comes together.”

Till Moczarski, Project Manager for Digital Planning, Porsche

Introducing the Autodesk Design and Make Platform

Three industry clouds to help you manage your digital factory workflows, and get operational more quickly, with more agility.

Go further

