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CONSTRUCTION
CLOUD™

Construction Productivity 101:

A Practical Guide to Increase Productivity in 7 Easy Steps

Increasing productivity will help you complete projects faster, reduce costs, win more bids, and increase your profit.

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Introductions

According to a recent study of over 12,000 projects by the Independent Project Analysis Group, more than 35 percent of all construction projects will incur a major change.[1] What's more, almost any change in a project will have a negative impact on construction productivity resulting in inefficiencies.[2]

These percentages increase when you take into consideration megaprojects, 98 percent may "suffer costs of more than 30 percent." Indeed, a whopping 77 percent of megaprojects are at least 40 percent late.[3]

25%

of all project costs grow in the field by over

30%

25%

of projects slip by over

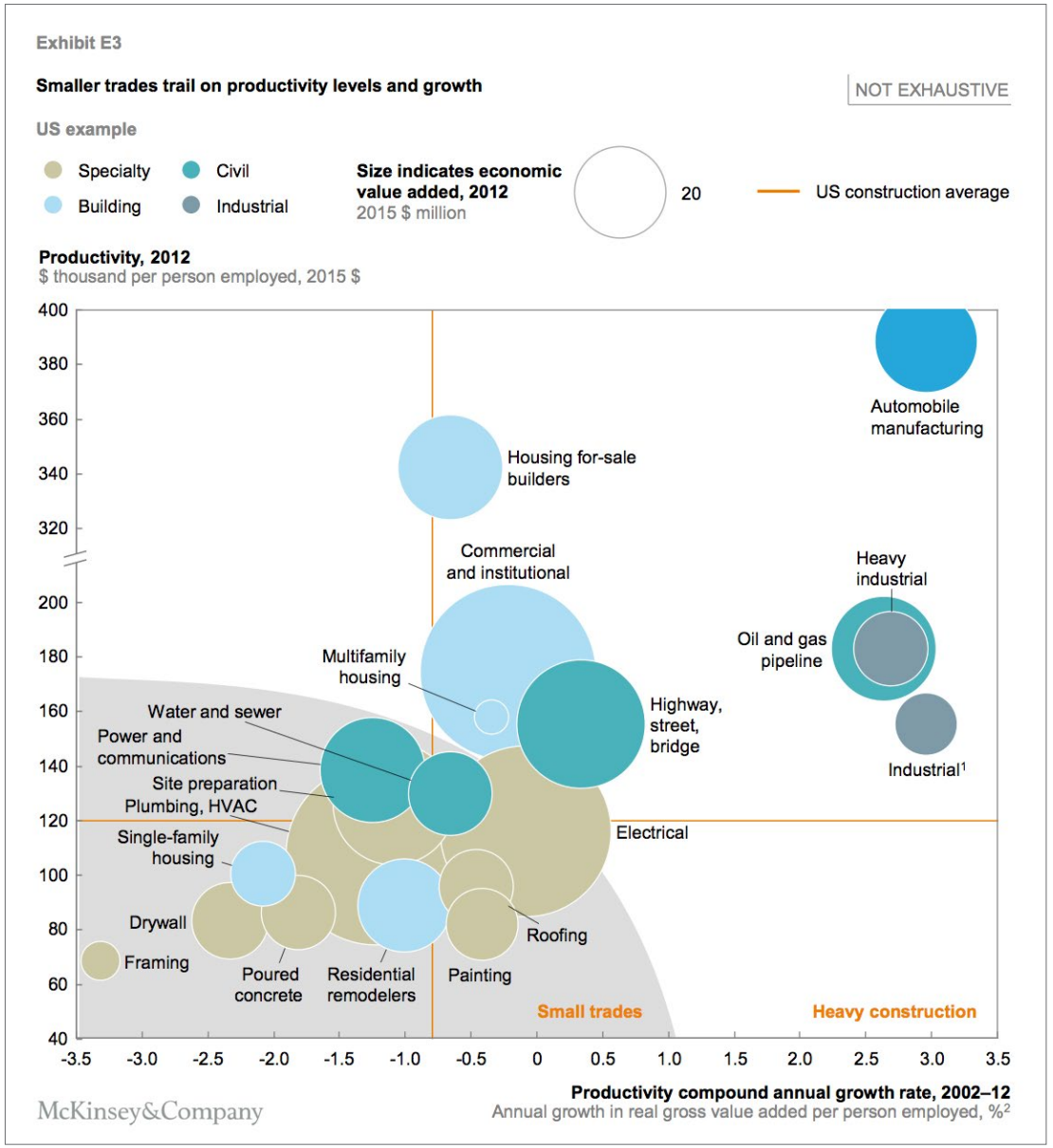
20%

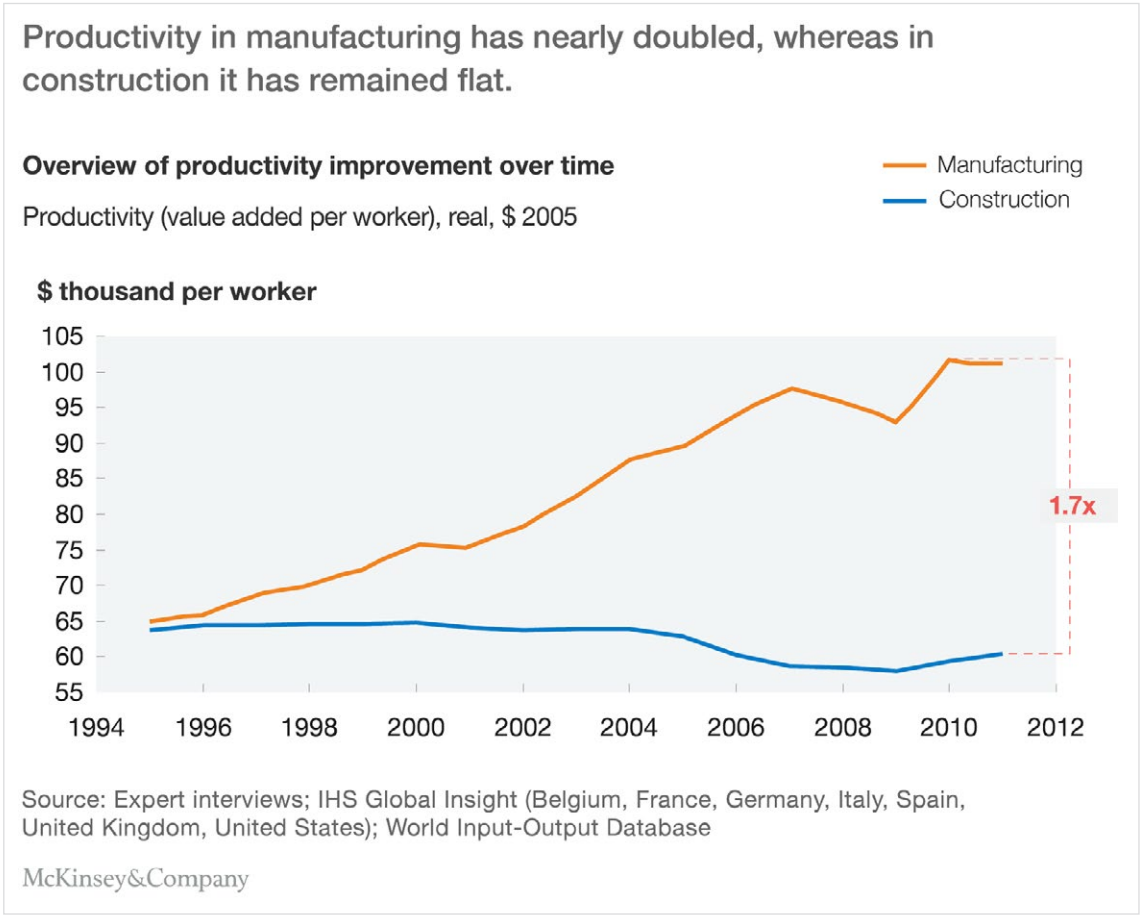
Megaprojects cost and schedule overruns

McKinsey Global Institute.
"The Construction Productivity Imperative." July 2015.

Inefficiencies, such as schedule slip and project growth, are the biggest contributors to job overrun, impacting schedules, budget, and labour productivity that can result in an average cost increase of 80% of original value on a construction project.

While many factors contribute to cost overruns, the primary factor is low productivity. “Productivity,” generally defined as the measure of the rate at which work is performed, has been historically neglected in construction. While other industries such as manufacturing have seen productivity double over the past two decades, construction has remained flat.





In fact, construction is actually one of the few industries that is less productive now than it was 60 years ago. A report from McKinsey Global Institute goes so far as to refer to lagging construction productivity as an "intractable productivity problem."[4] One need only examine the lag in digitisation, a primary drain on productivity, to see exactly why this is the case—the 10-trillion-dollar construction industry has been outpaced by every sector, including mining, gas and oil industries, spending less than 1% of revenue on information technology.[5]

But the construction industry is starting to make productivity a priority as costs from inefficiency continue to soar. Even minor inefficiencies can result in staggering costs. Take rework due to poor document control as an example. An independent study revealed that such rework can cost as much as $4.2 billion a year in the U.S. alone.[6] Low construction productivity as a whole costs the U.S. global economy 1.6 trillion dollars a year.[7] It's safe to say that deceptively small gaps in productivity add up to exorbitant costs, which have become simply too high to ignore any longer.

The Benefits of Increasing Construction Productivity

While most construction professionals are starting to become aware of the costs of ignoring low productivity, few realise that when construction productivity increases, everyone benefits, especially owners and contractors:

- **Projects are completed faster** – 90% of project costs occur in the field not the office, and most can be attributed to time waste or delays. By increasing productivity, contractors can reduce, and in some cases, eliminate common construction waste, such as unnecessary time delays that cause cost overruns. For example, McKinsey Global Institute recently reported that a construction company completed installation 43% faster by increasing efficiency.[8]
- **Project costs are reduced** – the phrase "time is money" takes on new meaning in the construction industry, where even small project delays can result in massive budget overruns. By working more productively, contractors can dramatically reduce costs and save money.
- **Contractors can bid more competitively** – while it's tempting to assume that the way to bid more competitively is to track costs so you can make more accurate estimates, in reality the way to improve bidding strategy is to increase overall productivity. By improving your construction productivity, firms can reduce their costs to help win more bids.
- **Projects are more profitable** – when projects are completed faster, costs are reduced so contractors can bid more competitively. By bidding more competitively, contractors can win more bids while protecting their profit margins.

43%
faster by increasing efficiency

The good news is that if minor inefficiencies can result in massive costs, then even incremental improvements to productivity on the construction site can save contractors a lot of time and money.

7 Steps to Success

With this in mind, we've reviewed some of the most innovative research on construction productivity and highlighted the seven best ways to boost productivity to help your organisation to complete projects faster, reduce costs, and increase your profit:

1 Bring Technology on Board:

When it comes to increasing productivity, adopting new technology is proven to deliver big payoffs. New technology such as onsite productivity software, project management software, and building information modelling(BIM) software can all but eliminate waiting times and reduce costly rework.

PlanGrid

Adopting construction productivity software is the fastest path to construction productivity. Sometimes getting the boots on the ground to adopt technology can be the biggest hurdle, but PlanGrid was built especially for field use, making it easy for those who aren't tech-savvy to adopt it. PlanGrid's construction productivity software allows teams to collect, manage, and collaborate in real-time on drawings, submittals, markups, photos, issues, and RFIs. The innovative cloud software can help improve productivity in enumerable ways, from reducing time-consuming trips to the office to allowing teams to complete accurate takeoffs electronically, instead of manual surveying or using other means to track issues and tasks.

kahua

Kahua is reinventing how companies manage and collaborate on projects by solving the problems with legacy project management tools. As an added benefit, Kahua allows teams to synchronise their drawings and markups between Kahua and PlanGrid to drive office and field collaboration. kahua.com

RedTeam Software

RedTeam offers a comprehensive, cloud solution for construction project management and accounting. With RedTeam, drawings can be shared in the field from RedTeam to PlanGrid, and RFIs can be easily accessed from PlanGrid back to the office via RedTeam. redteamsoftware.com

eSUB

Built for subcontractors, eSUB's mobile and cloud project management software connects the field and office in real-time. Coupled with PlanGrid, construction teams can save snapshots of drawings and annotations to eSUB documents for a complete record of what happens on the job site. esub.com

How to Transition to a Paperless Construction Company: Your Blueprint to Digital Transformation

Poor document control is a primary cause of rework which negatively impacts construction productivity and the bottom line. By making the switch to a digital construction solution, construction professionals will be able to:

- Save time
- Eliminate rework
- Reduce paper and printing costs

No matter which solution you choose, going digital will help reduce risk, increase ROI, and boost productivity.

DOWNLOAD GUIDE

7 Steps to Success (cont.)

2 Improve Planning with More Data

It goes without saying that improving planning will improve productivity. You can start by analysing the entire construction process from end-to-end on previous jobs to locate and determine productivity weaknesses and strengths. If problems or changes arise during construction, then re-planning is advised. Improving data use is imperative to help increase productivity.
In particular, for teams using BIM, by enabling each member to input their information into one model it can be evaluated as a team from the beginning of a project. This will deliver huge gains in productivity by dramatically decreasing building process waste. But it's not enough to use more data in current planning processes. Contractors should also strive to analyse data from previous projects to identify and eliminate barriers to productivity.

Make sure to review and keep track of your previous bids/projects by spreadsheet. Keep note of specific details of the projects (type of project, location, scope, subcontractors, unforeseen circumstances) to facilitate access to more accurate bids with historical company data. By developing metrics to determine how accurate current planning processes are, contractors can set realistic benchmarks to ensure improvement.

3 Improve Productivity Training and Enable Improved Site Experience

Have you been providing enough training for your construction supervisors? Supervisors have the ability to make or break a job, and contractors that invest in training their employees will reap huge dividends. While the industry traditionally focuses on training employees to facilitate project completion—e.g., how to operate a new piece of equipment—few contractors actually train their supervisors on how to increase productivity or be mindful of it.

Supervisors need to be trained not to look at a job on a day-to-day basis, but on how to increase the odds of on-time completion. Does the project have milestones? If so, is the project on pace to meet those milestones, on schedule and within budget? In addition, the industry as a whole can benefit from inviting design students to complete internships on job sites to help reduce conflict between designers and contractors and help designers create more "constructable" designs.

7 Steps to Success (cont.)

4 Increase Use of Prefabrication

Repetition is a fact of life with large projects, and by now, most construction professionals know that when a project calls for repetitive elements, those elements can be prefabricated in a factory rather than built from scratch on site. However, most are unaware that using prefabricated elements not only decreases costs, but also increases quality.

As prefabrication is completed off-site in a controlled environment, manufacturing processes are streamlined via pre-planning and quality control.

In fact, according to Civil and Environmental Engineer Emeritus, Paul Teicholz, "If you can put the proper design content for prefabrication into the design from the beginning, you can achieve a very significant improvement."[9] In short, prefabrication increases efficiency, allowing construction professionals to maximise value, minimise risk, and control costs.

5 Move Toward Shorter, Team-Friendly Contracts

"Draconian" contracts continue to impede productivity and impact the bottom line of projects. When each party seeks to provide as much legal insulation as possible, it makes it more difficult for team members to engage directly with each other, increasing the likelihood of errors and discrepancies that lead to inefficiency.

Rather than increasing your legal team, modern construction negotiations would do well to follow the lead of Japan and Korea, where shorter contracts require less legal mediation and more direct engagement from team members. In this scenario, problems and solutions are discussed fully and openly and compensation is agreed upon with reduced legal involvement. All of this serves to improve overall productivity of a construction project.

7 Steps to Success (cont.)

6 Improve and Increase Safety Training

Accidents can be a primary cause of project delays and cost overruns. Contractors need to offer comprehensive safety training to make employees more aware of hazards and risks in their environment as well as encouraging them to adopt new safety methodologies. Many outdated safety practices have been proven ineffective, so contractors need to continually incorporate new methodologies into daily operations to reduce risks and liabilities.

Raising awareness about safety and providing more awareness curriculum will also help to improve safety while increasing productivity. In general, don't just provide safety training—make sure it's up-to-date!

7 Communicate Better

It goes without saying that productivity impacts everyone on the construction site, but contractors can really shift the dynamic on their projects by communicating the importance of productivity to the entire team. Moreover, the construction company should explicitly solicit suggestions from workers on how to improve productivity and incentivise them to do so.

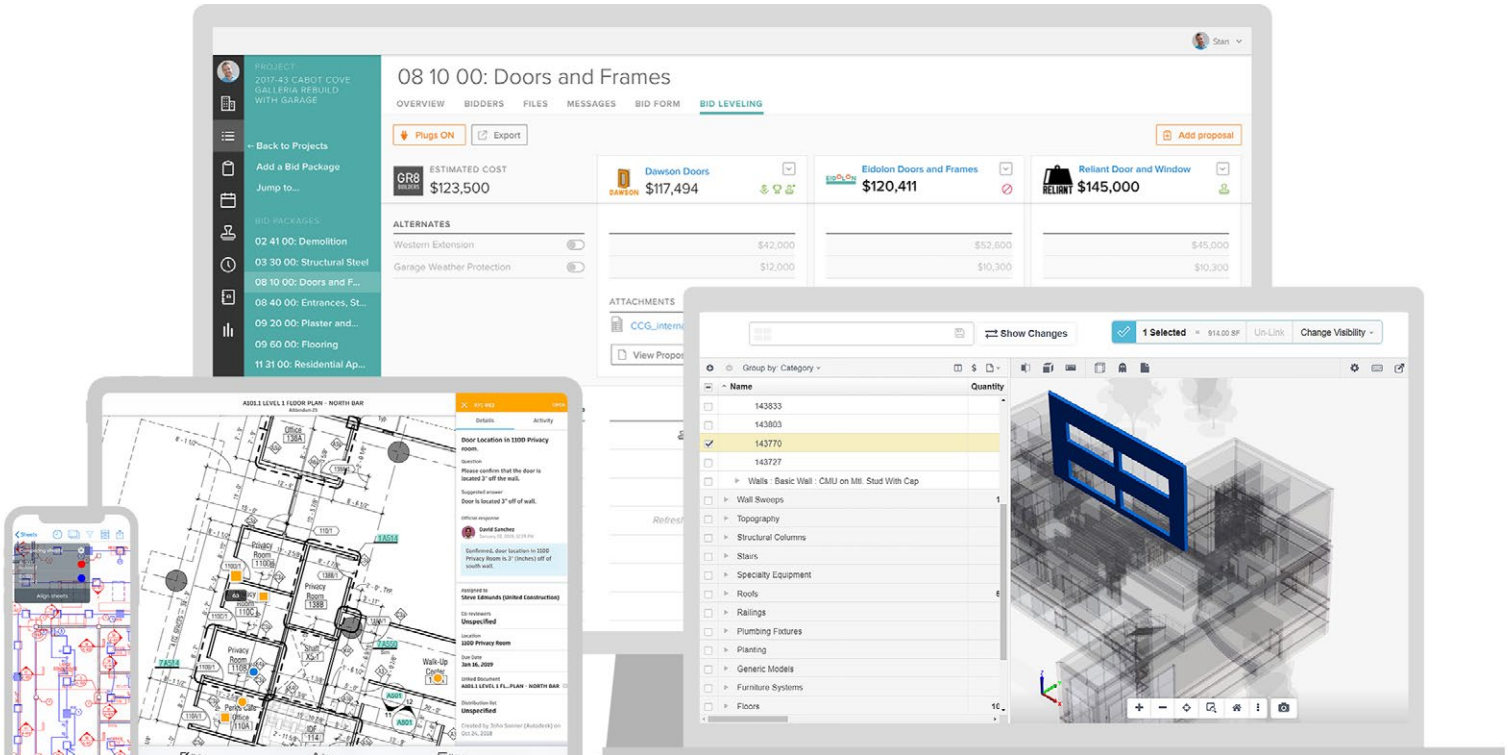
But firms can also go beyond traditional methods of communication and leverage construction collaboration and/or productivity software to improve collaboration across all your teams. Using such software can allow a worker to immediately communicate a change or error to managers which otherwise could lead to frustrating project delays or lower cost performance.

See the Future of Connected Construction

construction.autodesk.com

In 2018, Autodesk announced that construction would be a key focus area to help our customers on their design and make journey. To capitalize on the opportunity, Construction became its own CEO-staff level organization, Autodesk Construction Solutions. This unique structure is comprised of product development, customer success, marketing, and field operations. The organization is designed to move at the speed of the market and serve customers on a level playing field with other solution providers. Autodesk Construction Solutions offers products that cover the entire construction lifecycle, from design through plan to build and operate, including the Autodesk Construction Cloud which brings together our cloud-based solutions Assemble, BIM 360, BuildingConnected and PlanGrid.

Our vision is to create a vibrant construction industry where predictability and productivity are exponentially increased, while jobsite waste is proportionately reduced. The time has come for platform that will empower an industry transformation. Our mission is to help construction teams meet the world's rapidly expanding building and infrastructure needs, while making construction more predictable, safe and sustainable.



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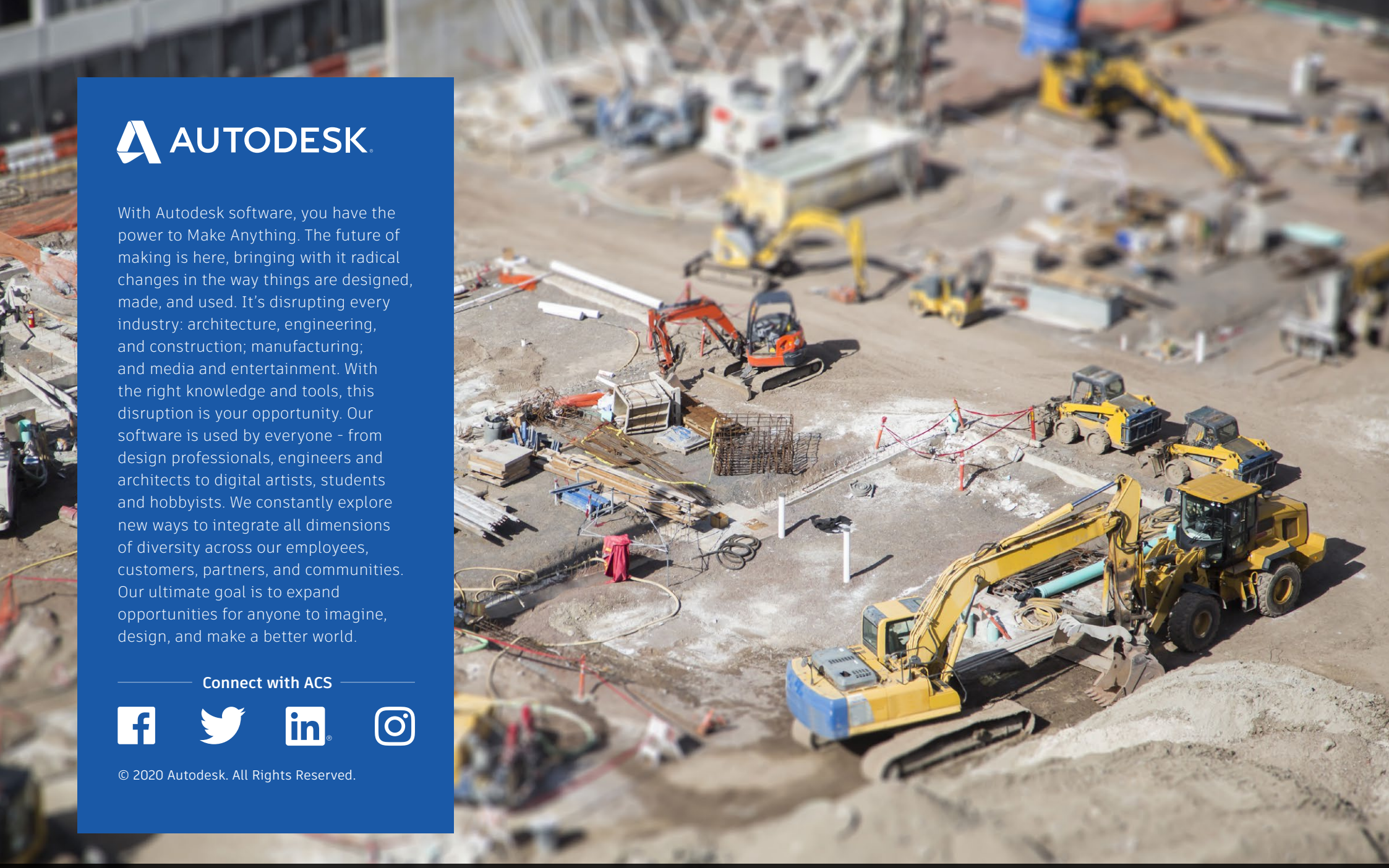

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With Autodesk software, you have the power to Make Anything. The future of making is here, bringing with it radical changes in the way things are designed, made, and used. It's disrupting every industry: architecture, engineering, and construction; manufacturing; and media and entertainment. With the right knowledge and tools, this disruption is your opportunity. Our software is used by everyone - from design professionals, engineers and architects to digital artists, students and hobbyists. We constantly explore new ways to integrate all dimensions of diversity across our employees, customers, partners, and communities. Our ultimate goal is to expand opportunities for anyone to imagine, design, and make a better world.

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