McKinsey & Company

Private Equity & Principal Investors Practice

Rise of the platform era: The next chapter in construction technology

The construction technology ecosystem is shifting toward integrated software platforms that better serve customer needs. Significant opportunities exist for strategic and financial investors.

This article was a collaborative effort by Katy Bartlett, Jose Luis Blanco, Brendan Fitzgerald, Josh Johnson, Andrew L. Mullin, and Maria Joao Ribeirinho, representing views from McKinsey's Private Equity & Principal Investors and Engineering Construction & Building Materials practices.

October 2020

It's been a decade since construction players began embracing digital solutions. In the early- to mid-2010s, thousands of new market entrants offered point solutions that served existing use cases or, in some instances, created new ones. The first widely adopted construction point solutions addressed basic needs; for example, improving design capabilities or digitizing paper-based information. By the second half of the decade, industry players—spurred by end-customer feedback about their difficulty integrating point solutions—began expanding their product portfolios to create suites of integrated solutions.

While the construction technology industry is still filled with players offering point solutions or limited suites, our latest annual effort to map and understand the construction technology landscape reveals that the industry is moving toward platforms and predicts that a combination of multiple platforms will coexist in the space. As the global COVID-19 pandemic forces many construction players to digitize and use technology to ensure the safety of their workers and boost productivity, this dynamic will likely only continue to accelerate. There are significant opportunities to create value for both strategic and financial investors that are evaluating consolidation plays.

COVID-driven impacts

The continuing pandemic has also had an impact on the construction technology industry. As thousands of health professionals heroically battle the COVID-19 virus, construction industry leaders are also charting a path toward keeping their employees, contractors, and end users safe. Indeed, the bulk of short- and long-term pandemic-driven construction industry issues will be solved with technology.[1]

Top construction companies were already investing heavily in technology prepandemic. By necessity, contractors, architects, engineers, and suppliers have quickly shifted to working and collaborating digitally—from video-call site meetings to filling digital orders. While there has already been a rapid increase in collaboration technology uptake, the pandemic has also triggered a painful shakeout. Many contractors are seeing shrinking backlogs and more competitive bidding environments, which have analogously impacted the construction tech industry. Construction tech players have been forced to lay off employees and cut costs to manage cash flow. Continued uncertainty on recovery timelines and the risk of virus resurgence could drive an additional wave of bankruptcies among smaller players, further accelerating the trend toward industry consolidation.

Taking the good with the bad, we expect that the continuing COVID-19 pandemic will drive a net acceleration in the use of technology and the construction industry will continue its transformation from a highly complex, fragmented, and project-based industry to a more standardized, consolidated, and integrated one.[2]

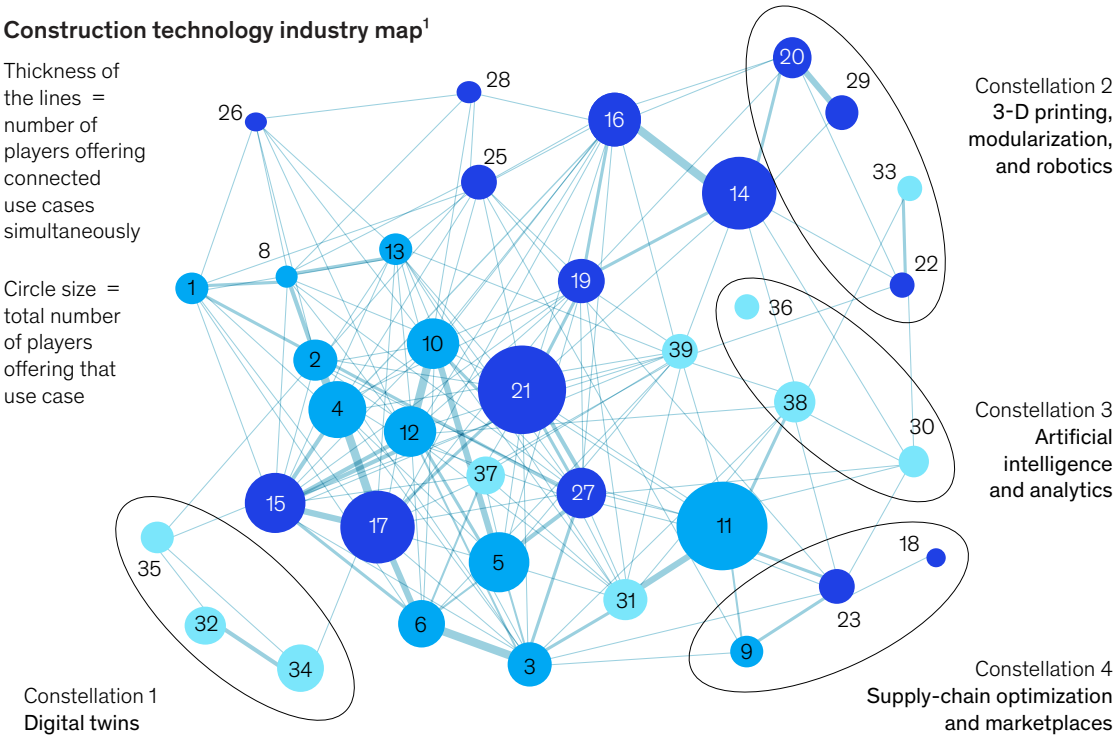
Construction tech in the platform era

In 2018, we first assembled multiple data sets and employed advanced analytics to map the global construction technology industry ecosystem. We recently refreshed our analysis and found that the largest clusters of use cases include 3-D printing, modularization, and robotics; digital-twin technology; artificial intelligence (AI) and analytics; and supply-chain optimization and marketplaces (Exhibit 1).

[1] Jonas Biörck, Jose Luis Blanco, Jan Mischke, Maria João Ribeirinho, David Rockhill, Erik Sjödin, and Gernot Strube, "How construction can emerge stronger after coronavirus," May 8, 2020, McKinsey.com.
[2] Timmy Andersson, Jonas Biörck, Jose Luis Blanco, Jan Mischke, Rob Palter, Maria João Ribeirinho, David Rockhill, and, Erik Sjödin, "The next normal in construction: How disruption is shaping the world's largest ecosystem," June 4, 2020, McKinsey.com.

Exhibit 1

The largest construction industry clusters of use cases include 3-D printing, modularization, and robotics.



Digital collaboration

1 Capital financing
2 Customer relationship management
3 Equipment management
4 Estimating
5 Manpower optimization
6 Materials management
7 Planning
8 Portfolio planning and management
9 Predictive assessment performance
10 Project scheduling
11 Real-time monitoring and control
12 Resource planning
13 Risk management

Back office

14 3-D modeling
15 Bidding process
16 Building-information modeling
17 Contract management
18 Deep learning
19 Design management
20 Design simulation
21 Document management
22 Laser scanning
23 Machine learning
24 Management
25 Process simulation
26 Productivity management
27 Progress tracking and performance dashboards
28 Value engineering
29 Virtual learning

On-site execution

30 3-D printing
31 Compliance
32 Construction materials marketplace
33 Drone-enabled yard inspection
34 Equipment marketplace
35 Labor and professional marketplace
36 Off-site fabrication
37 Quality control
38 Robotics/automation
39 Testing and training
40 Yard inspection

[1]All project life-cycle phases ~2,400 firms. Mapping during 2018 was focused on the full project life cycle vs construction phase in 2017.
Source: Pitchbook; Preqin; McKinsey analysis

The industry has continued to grow briskly with venture-capital (VC) activity rising to several billion dollars at the end of 2019 from low levels a decade ago (Exhibit 2). VC investment in construction tech outpaced the overall VC industry 15-fold through 2019, with clear indicators for continued momentum.

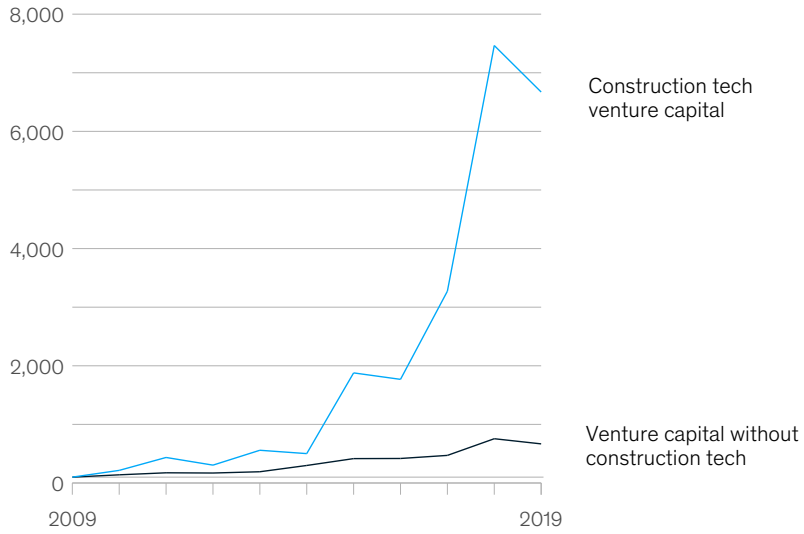
Despite this continuing influx of VC-funded participants, the industry has seen significant consolidation over the past five years. From 2014 to 2019, investors poured $25 billion into engineering and construction (E&C) technology, up from $8 billion over the previous five years. Of this $25 billion however, $17 billion in transactions involved either M&A activity or private equity (PE) investment (Exhibit 3).

These investment trends, coupled with end users' frustration with integrating the proverbial sea of point solutions, have driven a clear shift toward the development and launch of integrated platforms rather than point solutions. We define platforms as technologies that enable visibility into management of business or operations processes through native capabilities and seamless integration with other technologies to aggregate data and process control in a single place. Currently, 20 percent of companies offer solution suites addressing more than five use cases, compared with just 13 percent in 2017.

Exhibit 2

Venture-capital investment growth in construction tech has far outpaced the overall venture-capital space.

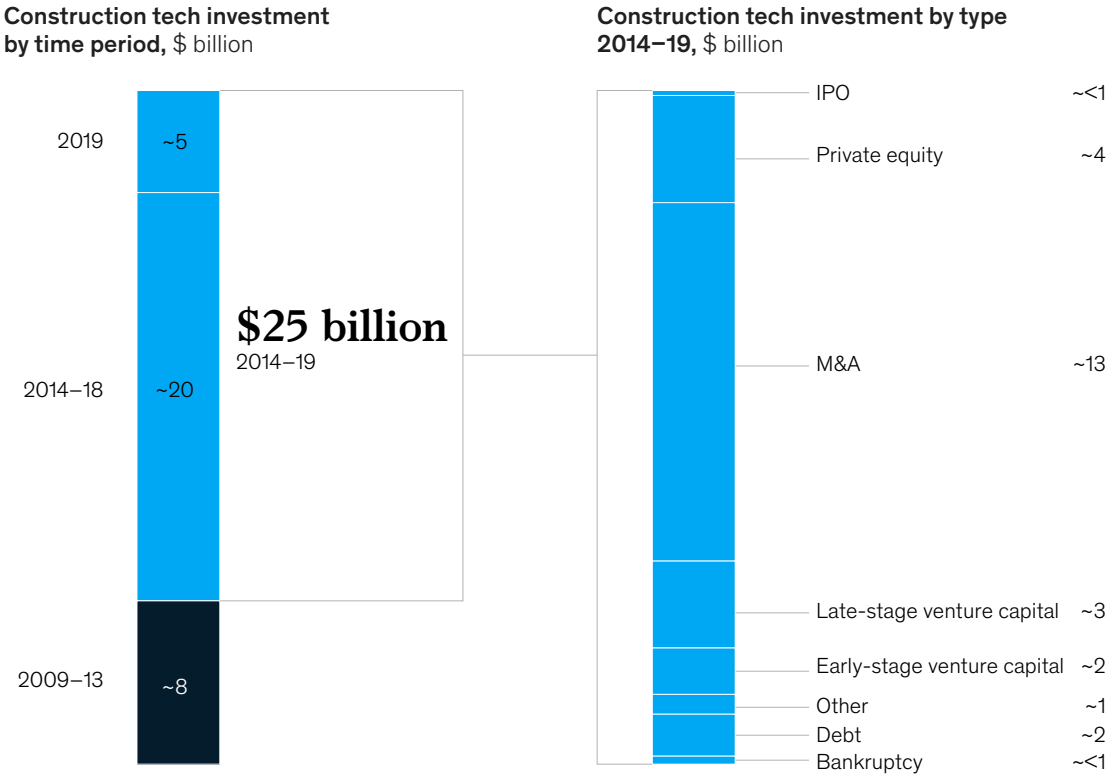
Venture-capital yearly volume, index (100 = 2009)



Source: McKinsey analysis

Exhibit 3

Investment in construction tech has more than doubled over the past decade.



Source: McKinsey analysis

Platforms are attractive because of their ability to increase customer stickiness compared with point solutions. The more features and interfaces with other tools offered, the higher the likelihood the platform will become critical to day-to-day operations for customers' businesses, increasing switching costs and boosting profitability through both reduced churn and increased pricing leverage. From an industry perspective, the growth in platforms implies that large companies will need to continue to scale to remain competitive, while smaller companies offering point solutions will need to simultaneously consider their integration with the broader ecosystem in addition to the core value proposition of their technology. Failure to account for these trends could adversely affect revenue growth and, more broadly, competitive positioning in the market.

There is compelling economic logic for platforms, and we see many other industries moving in this direction. This does not, however, signal the end of point solutions. Even among platform competitors, there remains space for multiple winners in the broader construction technology market. Most of the existing platforms have grown from a core foothold in a given customer segment such as general contractors and architects, or a project phase such as construction execution or design and engineering. As winners emerge in each of these focus areas, other competitors looking for growth will either need to cross segments and compete

against a different incumbent platform on that incumbent's "home turf" or create the capability to easily integrate across multiple platforms. Given that the most successful incumbent platforms are owned by some of the industry's largest and most well-capitalized technology firms, we believe the most likely outcome will be the continued growth of multiple, interconnected platforms in the future.

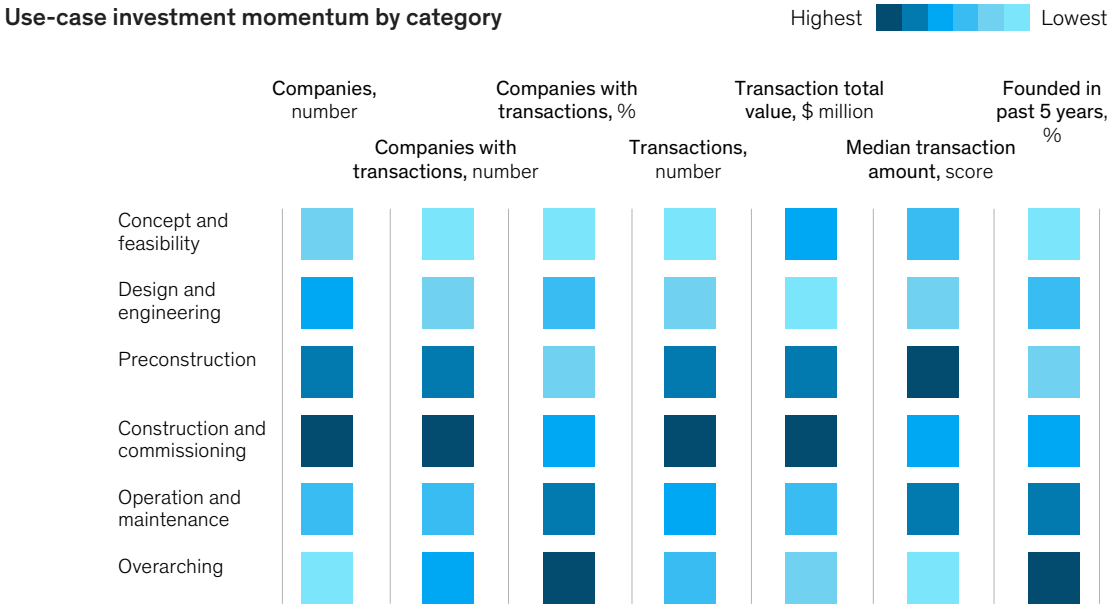
Consolidation opportunities

Construction technology is still a heavily fragmented, point-solutions-driven market with ample opportunity for integration plays that create either new platforms or attractive component acquisition targets for growing incumbent platforms. This fragmentation is more evident when analyzing construction tech offerings across the project life cycle. The construction and commissioning phase continues to be the most active, with twice the investment activity and more active players than other phases (Exhibit 4). Preconstruction and "overarching technologies," which include advanced technological applications such as AI, robotics, and advanced visualization, were the next largest.

Digging deeper to use cases within these project phases reveals a significant focus on field productivity, engineering-design tools, planning and scheduling, and facility management and improvement-focused solutions (Exhibit 5). Interestingly, however, 49 percent of companies addressing these use cases were involved in a transaction between 2014 and 2019, and roughly 14 percent of companies were founded in the past five years. Use cases based on AI and advanced analytics experienced the highest proportionate share of activity, with nearly 80 percent of companies involved in investment or transaction activity. This segment also has the highest portion of new companies, a trend that we anticipate will develop and continue. Given the current shift toward platforms and the large population of young companies, multiple opportunities exist for either strategic or financial investors to build value through roll-ups and other integration plays.

Exhibit 4

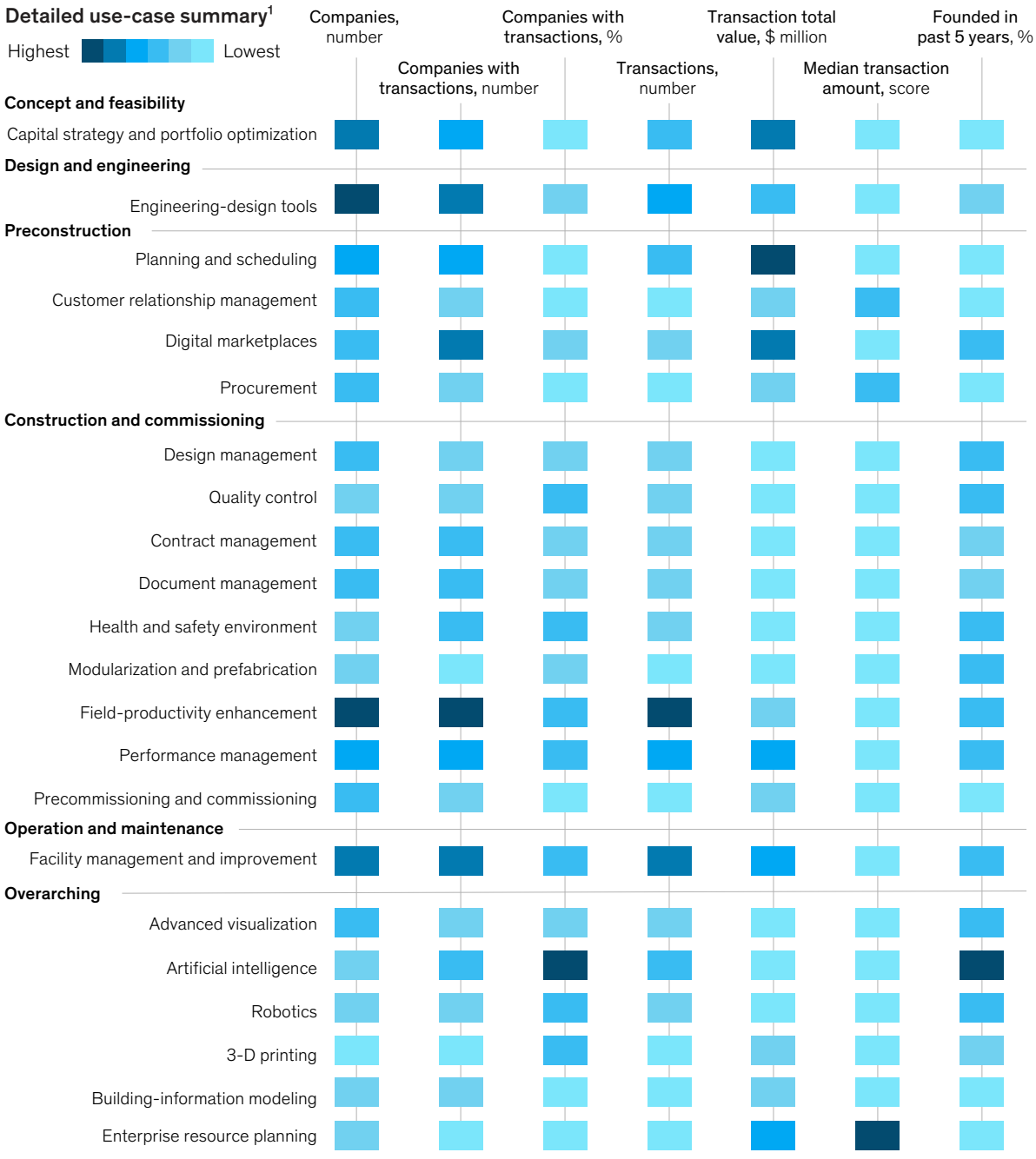
The construction and commissioning phase has twice the investment activity and more active players.



Source: McKinsey analysis

Exhibit 5

Project phases reveal a focus on field productivity, engineering-design tools, planning and scheduling, and facility management and improvement solutions.



Note: Early-stage venture capital, late-stage venture capital, M&A, and private equity transactions included in analysis.
Source: McKinsey analysis

Financial and strategic investors continue to fuel a rapid expansion of the construction technology industry. The pandemic has only served to provide additional urgency.

Looking toward the future

While the trend toward consolidation and platform development is clear, there are still opportunities for strategic and financial investors to create value. We have identified a number of potential paths that an investor might take, focusing either on distinctive point solutions or investments that help build or scale the adoption of construction tech platforms.

Distinctive point solutions

— *Capitalize on continued growth and penetration of mature solutions.* Technologies such as building-information modeling (BIM) and electronic document management are nearly ubiquitous among major firms. But there are still opportunities to tailor solutions and build scale with smaller subcontractors and other market players, such as those in building materials–delivery tracking. The growth of platforms is not likely to reduce the need for these foundational technologies.

— *Scale early major disruptive solutions such as robotics.* There are major opportunities for the tech industry in cutting edge robotics apps for repetitive construction tasks such as brick laying, road paving, lumber cutting to standardized dimensions, and 3-D printing of building materials. These apps enable onsite fabrication and more complex assemblies.

— *Scale the underlying tech infrastructure.* As hardware and software volume and diversity continue to increase on job sites, there will be a corresponding need for supporting solutions. Construction-drone and electric-vehicle docking, wireless-internet backbone connectivity to support Internet of Things–enabled devices, information security, data-quality management, and data architecture are all examples of where investments in IT infrastructure can help capture opportunities from these technologies.

— *Digitize payments.* The vast majority of construction industry payments are made by paper ticket. Offerings that increase technology penetration in the payments space, particularly with small- to medium-size businesses, will become increasingly critical to enable the full digitization of the construction industry value chain. Tools for processes, such as quote-to-cash and procure-to-pay, will enable broader data visibility across the value chain and free up working capital for contractors, suppliers, and owners alike.

Platform solutions

— *Scale platforms with a specific angle.* While the generalist technology platform companies are well established, other companies have opportunities to build platforms that cater to specific industry subsegments or value providers. For example, an incumbent construction-materials company recently announced the launch and scaling of a platform solution targeting the bulk-materials supply chain and producers operating in that space.

— *Develop solutions enabling broader connection in the built environment.* Integrative technologies will be needed to better connect tech solutions and the physical built environment. The near-real-time collection of project data coupled with the integration of design, project management, and scheduling tools will further unlock the promise of platform solutions as companies strive for truly end-to-end digital projects.

— *Invest in building a data-analytics engine.* The construction industry has few, if any, truly predictive analytics solutions at the project or industry scale. Furthermore, many descriptive analytics tools are limited to trade-association surveys or dashboards built from mined company data and suffer from low update frequencies or low granularity. Both investors and the industry overall can create significant value by developing analytics and insights platforms that leverage the growing pool of inter- and intra-company data. These platforms will enable more proactive, data-driven management of both individual projects and companies overall.

The mandate for change and technological adoption in construction has never been stronger, and financial and strategic investors continue to fuel a rapid expansion of the construction technology industry. The COVID-19 pandemic has only served to provide additional urgency to the preexisting productivity and data-visibility issues facing construction companies. While this next phase of platform growth and adoption will better equip construction industry leaders to effectively plan and manage projects, construction technology is still a rapidly growing, highly dynamic space. Further efficiencies will be unlocked with deeper integration of technology solutions directly on the job site and with predictive analytics leveraging data from connected teams and equipment. In the end, the "platform era" will simply create the platform upon which these emerging technologies are built.

Katy Bartlett is a consultant in McKinsey's Denver office, **Jose Luis Blanco** is a partner in the Philadelphia office, **Brendan Fitzgerald** is an associate partner in the New York office, **Josh Johnson** is an expert in the Philadelphia office, **Andrew Mullin** is a senior partner in the Toronto office, and **Maria Joao Ribeirinho** is a partner in the Madrid office.

Designed by McKinsey Global Publishing