



## 2019 engineering and construction industry outlook

My take: Michelle Meisels



As we move into the final year of a decade that has seen its share of peaks and valleys, there is no doubt that our industry is an active participant in building the future of the modern world.

Overall growth in 2018 for the US engineering and construction industry is projected to be around 5 percent and is likely to accelerate further going into 2019.<sup>1</sup> Mergers and acquisitions are positioned for a strong 2019, following an active year, which to date has seen 344 deals with a total value of more than \$20 billion.<sup>2</sup> Driving this activity are the proliferation of mega projects infused with advanced technologies, a focus on smart cities, and the promises of a data-driven world.

The engineering and construction industry is facing considerable hurdles—finding and retaining talent, responding to material price volatility due to tariffs and other trade-related headwinds, and absorbing the rapid pace of technology development pervading our personal and business lives. However, there is reason to be optimistic. Digital is transforming the industry itself and helping us imagine, create, and build the spaces, structures, and cities of tomorrow. Engineering, design, and construction firms have a unique opportunity to leave a mark on the smart cities of the future, using advanced technologies to design and build them today. These same technologies hold the promise to help firms achieve operational efficiencies, thereby reducing costs while improving margins. Those firms that embrace the projects of tomorrow and invest in digital transformation are expected to be the winners here.

As we enter 2019, here are some observations and signposts for our industry.

# Upgrading infrastructure and digitizing the smart cities of tomorrow

The cities we live in today are the growth engines of our economy and society.

However, in the United States, the infrastructure that supports these urban centers is crumbling. Reports from the American Society of Civil Engineers give the country a D+ rating, indicating the current infrastructure's poor conditions and deteriorating levels.<sup>3</sup> The essential underpinnings—roads, bridges, transit, and water—all received a C+ or lower rating with no single infrastructure segment rated as A, or exceptional and fit for the future.<sup>4</sup> Given the population growth in cities, there is a startling gap between the rising growth of urban dwellers and the infrastructure to support them. Recent pledges from the US government to support public works projects may spur an increase in projects for domestic engineering and construction companies in the year ahead, which could present significant opportunities.

At the same time that existing infrastructure needs desperate upgrades, the march of progression toward Smart City 1.0 continues to accelerate, as cities around the world invest in the “connected infrastructure” that will enable better management of urban assets such as public transit, wastewater systems, and roads.<sup>5</sup> IDC forecasts that smart cities spending will reach \$158 billion globally by 2022,<sup>6</sup> an opportunity for the entire spectrum of firms in our industry to help cities execute on their visions. Engineering and construction firms are key enablers of this powerful vision for upgrading infrastructure to incorporate sensing technology and data analytics that could improve the lives of the people who move within and between cities. Collectively these companies are building the roads and highways, designing the smart residential and office buildings, and creating digital touchpoints of connectivity between people and their vehicles, homes, and workplaces.

What would help these cities is a clearly articulated strategy for leveraging advanced technologies like the Internet of Things (IoT), analytics, and artificial intelligence (AI) along with the scale to respond to the influx of digital transformation projects in smart cities worldwide. From a funding perspective, the strategy may include plans for public-private partnerships, as the cost of many

of these projects could be cost-prohibitive for a city to undertake. Private funding in cooperation with government entities is one avenue to fund these major projects. From a delivery perspective, the more complete the solution a firm can bring to the table, the greater the positive outcome. The recently announced strategic alliance<sup>7</sup> between one of the leading global infrastructure firms and an electronics innovation company to work together building smart cities is one example of how to marry scale with digital. In the coming year, we expect to see design, engineering, and construction firms further augment their portfolios with digital and connected technology assets in an effort to capture a larger share of this market.



# Connected construction provides a 360-degree approach

Not only is digital transforming cities, it is also transforming the way engineering and construction companies run their businesses.

While slower to adopt digital than other industries, the construction industry is moving quickly to incorporate game-changing technologies into operations to increase safety, reduce operational costs, provide innovative solutions to customers, and find competitive advantages with real-time insights that can change project outcomes.<sup>8</sup>

Internally, digital technologies like robotic process automation (RPA) have the ability to make significant impacts on back-office operations for engineering and construction firms. Engineering and construction firms generally experience prolonged cash-conversion cycles and financial constraints, including longer average days sales outstanding of 82 days—more than all other industries.<sup>9</sup> These operational areas have many processes that can be significantly improved through RPA.<sup>10</sup> In addition, building information modeling (BIM) systems that allow contractors to create 3D models and make immediate changes to designs today are evolving quickly. With the inclusion of cost and project scheduling to add two more dimensions, 5D BIM systems can help bring projects in on time and on budget, ensuring no overruns—a key to driving operational efficiencies with large construction projects. Look for potential further maturity of BIM in the coming months into offerings that incorporate 7D, adding energy efficiency and facility management for comprehensive life cycle project management.

Digital is also driving “connected construction” adoption. Drones, wearables, augmented reality (AR), and GPS tracking services are revolutionizing job sites, streamlining surveying, improving worker safety, and capturing valuable data. In the year ahead, digital control towers for construction sites could evolve, tying together all the data captured through connected construction assets to deliver a true 360-degree view of an in-process project.





# Analytics and data are the core for future growth, productivity, and efficiency

Data is quickly becoming the core for future success in the construction industry.

It moves business decisions from reactive to predictive and could enable engineering and construction firms to outpace their competition. For this reason, it is likely to be a priority on the growth agenda of CIOs in the coming year. A data and analytics strategy can fuel the ability to deliver smart buildings and smart cities projects, identify and address diminishing margins, and manage increasing project size and complexity.<sup>11</sup> It can help identify not only what went wrong but also prevent it from happening in the future.

Data related to engineering and construction projects exists in a multitude of sources, many of them outside traditional enterprise resource planning (ERP) systems. Therefore, companies should devise a framework for collecting the data from all of these sources, using tools and models to analyze that data, and providing the insights gleaned to the right people in the right moment to make an impact on the business.

Data and analytics also provide companies the ability to refine operations and tackle business goals like reducing costs or providing next-generation client services. Companies can use a data-driven approach to unlock smart decision making, identify the optimal location for their project, and source the best materials to use, all through an interface that enables decision makers to ask questions and work through scenarios. And as we have seen in other industries, data can even be packaged as a value-added service to clients. Engineering and construction companies should continue making investments in data and analytics in the coming year to ensure they are keeping pace with the rapid developments in this area.



# Talent remains a challenge

A pervasive challenge that could hamper the industry's growth and momentum in the coming year is the tight labor market.

The US construction industry has been consistently adding workforce, and in fact, employs around 7.2 million professionals, the highest levels since the Great Recession of 2008.<sup>12</sup> All the while, US construction industry unemployment levels have dropped to an 18-year low.<sup>13</sup> In fact, the latest job openings data from Bureau of Labor Statistics suggests that since 2014, while the number of jobs openings have almost doubled, the number of hires over the same period has just increased by 14 percent.<sup>14</sup> Labor shortages are reaching crisis proportions and are expected to continue through 2019 as well.

The impact of not filling job openings and not having the right skill set in the workforce can negatively impact engineering and construction companies in various ways, including not being able to respond to market needs, losing project bids, and failing to innovate. With the influx in expected projects in 2019, engineering and construction companies should consider innovative approaches to attract, recruit, and retain talent. Engaging with the open talent ecosystem, tapping the resources of the retirement-age experienced workforce, and developing in-house training programs are all part of long-term strategies that companies should adopt.

Today, winning the talent war includes projecting a positive brand for your company out to the market—one that reflects the advanced technologies that are part of the connected construction site. And to appeal to new generations entering the workforce, it also showcases the sustainability initiatives that many firms have adopted. Additionally, sourcing talent through apprenticeship programs and technical schools can identify prospective employees with the right skills. And considering the rise of digital, it is also important to understand how skills are changing and then design a talent management strategy that reflects this.



# Let's talk



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She specializes in cloud ERP, project controls, supply chain management, and analytics technologies. While she has served clients across many industries, her primary focus has been serving engineering and construction companies. Michelle was born and raised in Southern California and graduated from UCLA.

## Endnotes

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