2018 TECHNOLOGY PREDICTIONS

Five key predictions for the development and adoption of technologies within the Civil Engineering and Construction market.

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As the new year begins, commercial contractors and subcontractors continue to face a labor shortage, rising cost of materials and commodities and increased pressure to move further into the design phase of construction projects. At the same time, the industry will see continued innovation and adoption of technology that will help ease these challenges facing construction business owners.

In civil engineering and construction, this will mean more construction technology options for small and mid-size contractors, as well as more options direct from the manufacturer. There will be a bigger push in 2018 to improve the integrity of 3-D models in the field, with models continuing to transition from mere visualization tools to information-rich building tools. There will also be an opportunity for greater application integration into machine control platforms, as well as advancements in mixed-reality/UAV data analysis.

FIVE KEY PREDICTIONS FOR THE CIVIL ENGINEERING AND CONSTRUCTION MARKET IN 2018

1. Direct From the Manufacturer Options and Greater Construction Technology Accessibility

There is a growing movement toward manufactures offering built-in machine control capabilities as standard or optional features on heavy equipment purchases, regardless of the size of budget or size of the machine. This progress will continue in 2018, which opens automated machine guidance systems to contractors of all sizes. With these factory-installed options, contractors can measure the ROI of these factory-installed options from day one. This might include getting to grade faster without pounding stakes, minimizing operator fatigue or eliminating the need to have an extra person on site to check grade.

Increased access to site positioning and machine control options may also provide opportunities for contractors to take on more projects or expand their services, without adding heavy equipment or staff. Owner/operators are investing in site positioning systems that reduce the need to hire professional surveyors to perform measurement tasks such as staking out or verifying elevations. Mobile, user-friendly site positioning equipment as well as more intuitive 'automatic' machine control options are also helping contractors close the skills gap by allowing inexperienced operators to get to centimeter-grade accuracy in a fraction of the time.

2. More Automatics Options for Specialized Machines

In 2018, there will continue to be increased adoption of positioning and 3-D machine guidance systems for specialized machines in the construction industry, such as curb and gutter machines. Steering and elevation control on a curb and gutter machine will save contractors tremendous time by delivering stringless operation at greater accuracy. These systems combine steering algorithms along with 3-D positioning guidance for smooth entrances and exits and tighter cornering for radii work. 2-D and 3-D automated machine control options for mini excavators and compact machine grading attachments will speed up tasks, such as trenching, slope-cutting and finishing work, helping small and mid-size contractors expand their services and improve utilization of their specialized and compact equipment and ensuring all operators meet accuracy requirements.

3. Expanded Application Integration

Today, automated machine guidance systems such as GPS solutions and handheld GNSS data collectors are often built on open operating systems like Android instead of on proprietary platforms. This makes the tools much easier to use and more in-line with personal technology everyone is familiar with. They include streamlined touch-screen displays, more intuitive menus and simplified navigation. Construction technology built on open platforms also means there is more flexibility to add other commercial or customized applications to the platform using APIs. Other applications loaded on the machine control platform may include timesheet applications, maps, apps that collect machine productivity data, or asset tracking programs. By leveraging the power and flexibility of the open platform, machine control systems will become the "centralized information center" where machines, data and people are always connected and in communication across the jobsite.

4. Data-rich, Constructible 3-D Models in the Field

There was a time when 3-D models were primarily used as visualization tools to show the "finished product"' before construction began. In 2018 and beyond, there will be a push for constructible 3-D BIM (Building Information Models) models to become more intelligent and data rich, making them much more useful to builders. By including more construction-ready data in the 3-D model, contractors can achieve significant gains and can continue to reduce costs during all stages of construction, from excavation, earthmoving and compacting and finishing, to piping and utilities and bridges. 3-D models that include construction-ready data can integrate several design processes together. This results in higher-quality designs, more quickly and at a lower cost. As contractors continue to look for ways to streamline collaboration, identify conflicts sooner and deliver greater accuracy, the trend of bringing information-rich 3-D models into the field will continue.

5. UAV Data/Mixed-reality Solutions Will Become More Mainstream

Today's civil engineering and construction contractors are finding new ways to use mixed-reality technology, UAVs (unmanned aerial vehicle) and data analysis to improve efficiency on complex building projects. This will continue to gain momentum as cost-effective cloud-based data analysis programs become more sophisticated and enable drone data to tie directly into existing workflows and industry design software. These data analysis services can normalize scanned drone data to see project progress and measure volume changes at a given project site over time. This might include commercial site measurement of stockpiles, square feet of roof left to put down or measurements of concrete left to pour.

At the same time, mixed reality (MR) applications will also pick up steam with advancements that improve positioning for augmented reality (AR) devices. MR reality technology blends real world objects with digital content in real time to help users better collaborate. As this technology develops and positioning improves, contractors will be able to load jobsite models into displays where it overlays the model onto real terrain.

In all, 2018 will be an exciting year for commercial contractors as the trend moves toward greater accessibility of more-intuitive, flexible machine control platforms. That coupled with the proliferation of data-rich 3-D models in the field and advancements in UAV data analysis and MR solutions will come together to help contractors maintain a laser focus on efficiency gains, improved collaboration and real-time information sharing. Look for these technologies to help contractors "stand out from the pack" in tackling increasingly complex projects while delivering the best possible product to customers.

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