Voices of the Industry

In the following, industry developers and visionaries outline the tools and technologies they believe will have the most influence on the industry in 2017, as well as what tools are ready today but are not used enough to improve efficiency and productivity.

Q: What new advancement will make the most difference in the next year and why?

John Voeller, Former Senior Vice President, Black & Veatch: I believe we'll start to see real value from artificial intelligence (AI). This is a more than 30-year-old collection of technologies that still requires education. While the acceleration in AI came along with computer gaming and animated movies, the applicability to commercial solutions is straightforward and growing rapidly. For instance, Fiatech is hosting an initiative that will apply AI to capture project data and knowledge around capital facility projects, project safety and work packages.

Dustin Parkman, Vice President, Product Development, Bentley Systems: The reality context model. A reality context is the aggregation of all data from terrestrial surveys and laser scans to data captured by drones and smartphone images. It's a model that is able to draw data directly from design and construction apps—and open the door for real-time visual project management. A reality context model provides a visual index to all the information that is relevant to the design, construction, maintenance or operation of a structure. The capability is here and ready for prime time.

Marcel Broekmaat, Market Manager, GC/CM Division, Trimble: We expect to see a significant increase in the adoption of augmented reality (AR). With AR, information that has been in the domain of designers and engineers becomes available for project managers and workers in the field by providing easy access to sophisticated project information sources, such as building information modeling (BIM).

Dr. Jochen Teizer, Director, RAPIDS Construction Safety and Technology Laboratory: Automated and wearable technologies that empower the workforce and improve its skillset while at work will undoubtedly change the way we work and communicate to deliver projects safely, on budget, on time and at high quality. Personal data collectors and proactive feedback devices bundled with smart data mining algorithms that solve interface issues and connect to open information models will predict and prevent any risk automatically before work actually starts. Build digitally first, of course, but also collect, analyze and report actual performance data.

Q: Where does more emphasis need to be focused to make visible improvement in processes?

Teizer: In principle, most of the technology we need in the field already exist. Around the world, it is the people that we are missing, those who can implement into organizations and processes. Attracting the brightest minds to construction happens only when a much higher priority is put on supporting the next generations of engineers and workforce. Unlike other industries, most leaders in the risk-averse construction industry have been waiting for decades to engage in much more serious collaboration with strategic partners at universities. This will hurt everyone's competitiveness if no change occurs soon.

Parkman: Cloud services offer huge opportunities for organizations to make big changes that go well beyond saving on IT costs. We have to get past the traditional means of extraction and import of data files. An open and live cloud infrastructure will allow us to make exponential improvements in work processes for the infrastructure community.

Broekmaat: BIM collaboration. As the industry moves to adopt building information models to capture design and engineering intent, we've yet to solve methods of information exchange.

Voeller: Building a robot with the vision and agility to negotiate a busy construction site with people and other robots requires recognition and situational awareness building that is decades beyond where we are. However, ifwe were to use simple high-speed RFID tags on everyone and everything, current robotic systems could navigate, recognize, sense motion, etc. rather easily, and also do action planning in near real time as well as activity learning. This is exactly what Xerox PARC did in its pioneering efforts decades ago—it created what it called Tabs and Pads, which were object and people identity tags that allowed people and things to connect and know the type and capabilities of every object. Standards are being developed, but interorganizational teams continue to produce deliverables in isolation, resulting in higher cost of information exchange due to the larger data sets that have to be coordinated. ■