

 **Shaping the Future of the Construction Industry with Technology**

*by Michael McLin, Maxim Consulting Group*

 **There's Nothing to Fear But Fear Itself in 2018**

*by Tyler Riddell, eSUB*

 **Digital Construction**

*by Carol Hagen, Hagen Business Systems Inc.*

 **Electronic Signatures Are Enforceable—If You're Careful**

*by Joseph Kanfer, Woolford Kanfer Law, P.C.*

 **How to Minimize Risks for Successful BIM-Powered Projects**

*by Tara M. O'Hanlon, Miller Nash Graham & Dunn, LLP*

 **HR & Technology**

*Jamie Hasty, SESCO Management Consultants*

 **LEGALLY SPEAKING: Innovative Legal Procurement Models Decentralizing Data in Construction**

*by James L. Salmon, Esq., Benjamin, Yocum & Heather*



# Embracing Technology

# Shaping the Future of the Construction Industry with Technology

by Michael McLin, Maxim Consulting Group

Savvy construction industry professionals confess that acceptance of technology is the future. A good number resist committing their time and resources while hoping to see results by using tech for sake of tech. Tech innovations are sweeping the industry to the point that even the standard issue hard hat is changing, in addition to new advances that benefit every area of the industry—for those that embrace the future. Technology is making construction safer and more efficient. Implementation beyond the design and construction process is required if technology is to become mainstream and part of tomorrow's strategic platform.

Popular software, technologies and devices have proven themselves when deployed on larger-scale buildings and infrastructure projects. "Wherever the new technologies have properly permeated this fragmented industry, the outlook is an almost 20 percent reduction in total life cycle costs of a project, as well as substantial improvements in completion time, quality and safety," according to the World Economic Forum.

The following technologies are driving a more connected future.

## Wearable Technology and Smartphone Use

The smartphone is the single technology that is changing the construction worker's day-to-day activity. Workers can stay more connected with the apps on their phones that combine tools such as a calculator, time, to-do list, GPS, a level and communication tools. Smartphones serve to sync construction plans and share project documents. Without this technology, communication and management is much harder and projects will take longer and companies might not generate the same revenues throughout the year.

Increasingly, wearable tech apparel and personal protective equipment are common on construction sites including hard hats, gloves, safety vests and work boots. Construction wearables are being outfitted with biometrics and environmental sensors, GPS and location trackers, Wi-Fi, voltage detectors and other sensors to monitor workers' movements, repetitive motions, posture and slips and falls.

However controversial, the promise of improving two long-standing issues is highly incentivizing for the industry. The options of viable solutions that will increase both worker productivity and safety, the construction industry is looking to be heavily impacted by wearable technology.

## Autonomous Trucks: Driverless Solutions

From bulldozers to freightliners, trucking is becoming increasingly "smart." A mining company in Australia is currently deploying autonomous dump trucks with GPS to transport its loads. The trucks are controlled remotely by a single operator, which amounts to a more efficient use of resources and provides for a safer work environment for employees. These "smart trucks" get loads to their destination with fewer delays and less fuel usage than trucks with human drivers.

We're probably still years away from it being commonplace to see self-driving equipment on the jobsite. But the benefits of increased safety, higher productivity, greater fuel efficiency, and being able to hire fewer operators/controllers who can depend on equipment automation are viable enough for major equipment manufacturers to explore what's possible.

## Customer Relationship Management

The concept of customer relationship management, or CRM, is not new. CRM helps businesses manage every interaction with customers. CRM is relatively new to the construction industry. Many industries, such as marketing, use CRM to manage hundreds, or thousands, of customers. In the construction industry, a mid-size contractor may have just 15 clients they have active bids with and an additional 20 they know about. The proper implementation of a CRM program can help them manage their clients efficiently and result in greater productivity.

## Building Information Modeling

Building Information Modeling, or BIM, has changed the way contractors operate. BIM is centered on utilizing digital tools "to efficiently produce information" in order to allow assets to be constructed, operated and maintained, according to the Institution of Structural Engineers. It enables architects, project managers, and contractors to design, plan, and construct buildings. BIM is a single program that lays the framework for how projects will unfold.

By viewing projects digitally during preconstruction, you can immediately see that there may be an air duct running straight into a concrete column or other design issues. Pre BIM, this scenario would have unfolded at the expense of additional cost and time—not to mention a disgruntled client. BIM allows construction professionals to see these errors before they occur. BIM is also used for practical cases, such as staging a job site. A tight and well-managed construction job site in an urban environment requires thoughtful planning and preparation.

The benefits of BIM don't end once the project is complete. A detailed model can be handed over to the facilities

management department. There's no need to unroll old and possibly modified drawings the next time someone needs to reference the structure.

### Project Management Software

Efficiency is key. An increase in the availability of project management software that will handle all aspects from bidding, scheduling, and specs to drawings, photos and even meetings has been one of the critical advantages of project management software. Gone are the days when you had to fax questions and responses back and forth. Now, everything is in a single system, creating a single record for everyone's collaboration and reference.

### Drones

Officially called Unmanned Aerial Vehicles, or UAVs, drones equipped with cameras have been in use the past number of years to collect information and visuals in locations that are difficult to access. Captured images can support site assessment and inspections, as

well as augment a project team's understanding of progress and as-built conditions. Drones also can be utilized to monitor logistics, deliveries, and the workforce. A number of progressive companies are taking drone footage and converting it into 3-D pictures that can be compared to architectural plans. Future improvements are focused on advanced cameras and lenses that can capture high-definition images, as well as enhanced communication, in real time, between drones and software on the receiving end. There is also the potential to utilize sensors for greater monitoring of the jobsite. And, of course, one low-tech issue is critical: rules, regulations and controls (currently under the purview of the Federal Aviation Administration) must balance the needs of the industry with the safety of the public.

While more tools are being developed every year for the industry, construction is still perceived as one of the least tech savvy fields in the world. Mines, drilling rigs, and other remote worksites aren't

exactly known for their Wi-Fi connectivity. However, many industry experts are optimistic about the future. Technology is transforming the way the construction industry operates. It's not just about delivering a finished building. It's increasingly about how that building is going to be operated and maintained for the next 30, 40, 50, 100 years or more.

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