Looking Forward:

Innovations in Construction Technology

Staying up to date on the latest innovations and technological breakthroughs in any industry is, of course, an essential best practice. That said, the construction industry has historically earned a reputation as being cautious when it comes to embracing the latest in advancements, which is understandable given that a lot is at stake on a day-to-day basis. However, with industry-evolving technologies on the horizon (and some already arrived), it would be a missed opportunity to not stay abreast of the most current advances.

Bottom line? It's an exciting time to be a part of the construction trade.

Here is a look into some of the groundbreaking innovations currently percolating throughout the industry—as well as a glimpse toward the future.

3D Printing

People in the industry have already been impressed by the accuracy and precision of 3D printed materials. This is now being taken a step further.

A global race is afoot as architects hurry to be at the forefront of 3D printed houses. A potentially industry-changing technology, not only would it increase safety by eliminating hazardous tasks, such as falling objects and falls from great heights, but it would also cut back on wasted materials and reduce construction periods (a company in China has printed ten full size houses in a single day). Human error is also reduced due to the machines' precision and accuracy.

Looking forward, 3D printed houses have the potential to reduce homelessness, especially in refugee areas. At the moment, the printers work on sections at a time, but Professor Behrokh Khoshnevis at University of Southern California is developing a process he calls "contour crafting" in which a gigantic 3D printer would produce a home in a single run, all the way down to electrical and plumbing conduits. [1]

Drones

Unmanned aerial vehicles (UAVs), better known as drones, have the potential to be a major game changer—and in more ways than one.

Enhancing safety is a way drones have already begun to affect construction sites across the country. Using HD cameras, drones can survey sites and decrease the need for superintendents to walk around and risk unexpected injury. Additionally, they can give real time progress updates which can be inputted into BIM models. [2]

Now that professionals have begun to place laser scanners on drones, new opportunities in the field of land surveying have also grown exponentially. [3]

There's still some red tape to get past with the FAA (currently you need the agency's approval to fly an unmanned aircraft for commercial use), but the deadline for new regulations is sometime in 2015, so expect a range of industries to begin embracing this new technology.

Wearable technology

Wearable technology, such as smart glasses and watches, is becoming increasingly prevalent in everyday society. When put to use in the construction industry, the technology offers opportunities in increased on site safety.

Take DAQRI, a startup based out of L.A. The company has developed a smart helmet which utilizes augmented reality on top of a user interface with the use of cameras and sensors. It goes as far as spelling out instructions right onto the worker's visor customized to exact locations. Keep an eye out as BIM becomes integrated into this technology in a similar way to how it has been integrated into onsite mobile devices. [4]

Looking to the future...

3D Printing Drones

Imagine a swarm of bees working in tandem to build a hive. Now take this oversimplified metaphor and replace those bees with drones attached with 3D printers and the hive with a building. That's what London Architectural Association professor Robert Stuart-Smith has been working toward. Further, Stuart-Smith foresees the drones troubleshooting throughout the building process, making adjustments in real time. [5]

Solar Roads

In America there are roughly 31,240.86 square miles of roads. Now imagine if all of that real estate was comprised of structurally engineered solar tiles. As it stands, Scott and Julie Brusaw have been developing tiles that can currently handle loads up to 125 tons. While we're probably a ways off before this is actually feasible for the wear and tear of highway commuters, keep in mind parking lots, driveways, or sidewalks. These lesser trafficked paths may be the first to see this technology put into action. [6]

Nanotechnology

Nanotechnology is full of possibilities and may very well be prevalent within the industry in the near future. An exciting application for the technology is nano coatings, simply sprayed on anything from gear to construction parts, walls etc. Capable of self-healing, self-cleaning, and being scratch resistant, nano coatings promise to extend a building's lifespan. The coatings can also be made to be water, oil, and dirt resistant. As it stands, it is too expensive to be practical on most sites, but as the price point gradually falls, look for nanotechnology to be ubiquitous in the industry. [7]

In closing

Perhaps if there's one word which epitomizes the above, it would be: potential. By and large, these technologies are relatively young. As it stands, we can only speculate the directions these advances will grow and develop as they ultimately come to shape the industry's future. While there is merit in keeping a skeptic's eye, the value in staying up-to-date is immense. Now is the time to be vigilant.

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