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CONSTRUCTION TECHNOLOGY

THAT IS DISRUPTING THE COMMERCIAL REAL ESTATE INDUSTRY

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INTRODUCTION

Rather than thinking about technological advancements as a threat, separated disturbance of construction and commercial real estate, we should think about it in the context of a disruptive framework and how it can impact the construction environment. Being tactical and using research will be key in reviewing the demand for real estate, the influence of innovations, as well as prospective sources of disruption to how we build.

A MARKET FOCUSED ON HIGHER, FASTER AND SAFER

Commercial architects, engineers, developers and construction business have constantly pushed the limits. The world's first high-rise, the 10-story Home Insurance Building in Chicago was built in 1885, used the then innovative system of sustainability and safety. Currently, commercial construction companies are using sophisticated innovations such as 3D Modeling, Artificial Intelligence, Sensing, Machine-Learning and various other applications to design and create today's structures. The application of Robotics Automation and AI, called RAAI, continues to increase and drive innovation. New tools, consisting of Virtual Reality, Augmented Reality, AI, The Internet of Things (IoT), Digital Twin technology and other advancements are creating an extra efficient, economical, and safer building experience.

THE EFFECT

As technology becomes integral to businesses and their procedures, Construction Technology, or ConTech, has actually been raising considerable capital. This year will be a new record for the space, with ConTech financing up 60 percent from 2017. Since completion of June 2019, financial investments amounted to more than $4 billion into the ConTech sector, which is higher than 2018's total amount for the entire year. ConTech in the context of construction, is modern technology used to innovate the way we plan, design, construct, produce and set up structures. Modern technologies and digital tools are disrupting the planning and construction experience today and into the future as the main drivers for how we build.

Our future structures will be building themselves with the touch of a button and in some cases, will be doing so at breakneck speed, completing construction in just minutes. Instantaneous and comprehensive access to building plans, by means of real-time digital representation, called a Digital Twin, is now a reality. With building components easily stacked and connected, the Fourth Industrial Revolution (4IR) is upon us.

BUILDING PLANNING

Building design is being interrupted both virtually and physically. Increasingly, construction documents are being kept in the cloud while technological advancements are being implemented earlier in the process, during site selection process. Some industry participants are using digital user interfaces to access property information including zoning laws and proposals. An electronic app uncovers prospective risks as users examine parcels. Once the site is picked, electronic Building Information Modeling (BIM), especially if

incorporated with Virtual Reality, can develop a 4D modeling. This adds another dimension to 3D physical attributes and mockups of frameworks, enhances cooperation and as well as increase effectiveness, reducing losses when modifications cause multiple plan changes.

BIM incorporates various devices that assist in sustainable administration as well as enable building and system styles that simplify operations while raising property values. For example, Deloitte's Amsterdam headquarters which was finished in 2015, is considered among the "smartest" structures on the planet, used an ingenious design that consisted of orienting the structure to the north, while developing an effective floor plan that generates southern light to minimize cooling and heating expenses. Using data collected from a range of sensing units, an application organizes the interior electronically to make it possible for 1,000 work desks to accommodate an astounding 3,000 employees. Roughly 25 percent of the employees are at their work desks concurrently. The app can readjust temperature levels and light settings depending upon the number of people and their activities within the structure at any time. The latest connected structures like Amsterdam's app-enabled building are attuned to our habits, giving data-rich patterns that computers utilize to make better-informed choices. Already your thermostat, smartphone, lights as well as security system are beginning to communicate, as well as soon they will be restricted only by exactly how well they can play together.

CONSTRUCTION INNOVATION

New applications, materials and tools are enabling less inexpensive, more durable and safer construction. From one of the most basic tools to products and communications to independent robotics, technological advancement is moving towards Lean Construction, enhancing productivity, and reducing expenses. Possibly the best advantage these tools offer in the early construction process is precision. Laser scanners validate that structures meet specification, while electronic tape measures, including an app, render precise measurements. Virtual Reality goggles provide completely immersive walkthroughs, enabling all those involved in building and construction consisting of developers, engineers, contractors and designers to spot errors and problems early. Machine-learning and artificial intelligence make it possible for faster gathering and analysis of data, therefore creating a quicker, clearer picture of a jobsite. The outcome is greater

understanding into potential safety and security issues, scheduling delays and budgeting problems. Material production is also seeing a blend of traditional and new practices. One process in particular can now transform weaved fabrics into complicated molds and for concrete structures. This development allows faster manufacturing and building, less waste and lowered carbon imprint. Robot plants, with things linked to BIM through the internet, can create materials, much like 3D printers. With continued adaption, the 3D printing market might get to $33 billion by 2023, as systems and software programs improve. "Self-healing" concrete will help prevent costly repairs. Yet one product is a throwback to the past - wood. With sustainability a growing consideration, smaller high-rises are being built with wood, which is a better insulator in cold environments, and counterintuitively minimizes fire risk by charring as opposed to burning.

Virtual Reality as well as Augmented Reality innovations are being used to train building workers, enhance security, and software applications such as Spot-r, Fieldwire (monitoring software for building groups) and Katerra (which optimizes design and materials supplies) are guaranteeing that everyone who is part of a building project are literally on the same web page. Smart devices as well as wearable building innovations, as well as sensing units and on-site electronic cameras, can be tied right into building and construction management software programs, to provide a much clearer image of structure progress and real-time reporting. New devices help provide additional information to project supervisors, and eliminate the presence of human workers from unsafe conditions. Drones are now being used to inspect building and construction sites, minimizing worker safety issues, and even producing 3D designs that are reducing the time to determine quantities of soil or evaluate other critical construction issues.

Robotics are already alleviating busy work and integrating communications between man and equipment. Construction Robotics' SAM100, a mobile robotic arm, helps a human mason to automate the bricklaying process, thus speeding up operations. BURRO, also from Construction Robotics, lifts and places blocks as well as various other things on a job site. Just as vital, robots are now learning to operate in brand-new ways too. MIT designers have created a robotic that can assess visual details from its camera and responsive comments from sensors in its gripper and wrist cuff to learn and forecast the ideal way to carry out jobs. While the learning system has actually been evaluated through playing a video game of Jenga, future applications can consist of putting together building products. According to a new study from Science Robotics, construction of huge frameworks by smaller, autonomous robotics collaborating with each other is swiftly gaining momentum in the field of robotics research study, and can resolve an essential need for risk-free, inexpensive, lasting and automatic construction.

CONSTRUCTION TECHNOLOGY

TECHNOLOGY OUTLOOK

With technology, manufacturing and industrial automation disrupting nearly every aspect of life and industry, it is not surprising that the commercial real estate market will certainly follow suit in time. While fewer number of available workers along with skyrocketing building costs show no indications of diminishing, how we build will become even more important. The accelerated rate of innovation in ConTech will end up being a lot more disruptive with the onslaught of 5G, which is anticipated to let loose a huge Internet of Things community, and link billions of gadgets together. Robotics, automation and artificial intelligence will gain significant momentum in the future. All assumptions point to a bigger, much faster and more cutting-edge year than the last. Certainly, 2020 will be the year that organization historians will consider as the turning point in time. Businesses that deploy new technology, update their tools and resources and proactively engage with innovation will certainly be well placed to attain unimagined success in future. Those companies that invest in ConTech and embrace it, will be among the leaders in a digital revolution and construction companies that abide by traditional methods will see significantly diminished market share.

CONCLUSION

While the construction industry is often slow to change and adapt innovations, it is important to identify the top trends that are occurring. Smaller firms that can integrate some of these ideas and resources are poised for significant growth compared to their competitors. Increased productivity, reduced errors, lower expenses, and higher profits can all be experienced when construction companies implement new trends in the industry.

ABOUT CIVE®

CIVE® is an upscale Design-Build firm, specializing in top-down build process driven by value engineering – from state-of-the-art design, leading-edge engineering, high-quality construction, and elite project management.

Our strengths lie in a rich mix of talent, experience and ingenuity. Our clients can depend on us to anticipate industry changes and plan for the future, while providing most practical and cost-effective solutions. CIVE® devotes customized, individual service to all its clients, whether large or small.

Specialties: Residential, commercial & industrial design, civil engineering, structural engineering, mechanical engineering, electrical engineering, construction management & project management.

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