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Dawn of a new era: Digital and advanced technologies are reshaping the E&C sector

Technology is having an unprecedented impact on the E&C industry—from robots to connected job sites, the industry is seeing an incredible array of digital technologies that are transforming how E&C firms operate. These inherently disruptive digital and advanced technologies have the potential to provide greater efficiency, productivity, as well as safety breakthroughs the industry has sought for decades.

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From planning to design to construction—digital is everywhere

On the engineering side, digital capabilities surrounding predictive design, digital building twins, building information modeling (BIM), and the use of augmented and virtual reality (AR/VR) during the project planning stage can eliminate the cost and schedule overruns. For instance, BIM models allow stakeholders to see how a building is expected to look like after completion as well as the current stage of an under-construction structure.

On the construction side, connected job sites are using cloud-based technology to make information about almost every aspect of a project, available to all the relevant stakeholders located anywhere in the world. Digital technologies can also enhance ecosystem relationships, as E&C companies can easily collaborate on projects. These alliances can drive the future of connected construction, creating systems that link physical and digital assets beyond individual construction sites. Many contractors and builders are adopting these technologies to help them build more efficiently, but they are also driven by the need of the owner, who can more easily operate the facility with the use of tools like digital twins and other readily available data about the asset.

Improving productivity and safety – digital technologies – the key enabler

E&C companies are gradually moving toward using automation and robotics for highly repetitive tasks as well as for site inspections. This could result in significantly improving productivity while creating a safer work environment and helping to address the industry's labor deficit. While mechanical arms are automating repetitive

tasks such as brick-laying, drones are also set to become increasingly common in construction projects, primarily to perform inspections that would be otherwise dangerous for workers.

Beyond simple robotics and automation, the rise of artificial intelligence (AI) is also making its mark on the engineering and construction industry. For instance, AI and machine learning related software could help in optimizing supply chain logistics and reducing safety hazards.

E&C companies are gradually moving toward using automation and robotics

Although there is tremendous interest and desire amongst E&C firms to transform their organizations via digital, the adoption rate is still low, and the industry continues to lag other industries. One of the main challenges for E&C companies is being able to demonstrate the ROI. These investments are significant and with constant pressure on margins, E&C companies are struggling to see how the benefits of digital can help improve the bottom line.

Building a digital-ready workforce to be future-ready

However, the growing popularity of digital capabilities requires new skills and could eventually change engineering and construction jobs—redefining the roles that humans perform on job sites. Hence, the E&C industry needs to be prepared to invest in upskilling the existing workforce to build a digital-ready workforce and effectively implement digital transformation within their organization. Moreover, developing a human and robot talent management strategy that accompanies the move toward digital is expected to be an essential ingredient for success for E&C companies.



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