Construction Today And In The Future

To understand the present and predict the future, one must have their anchors in the past. A more than ever need is to study the global construction practices dating back and present to build a better, practical and sustainable future for the humankind. The history of construction is endless such as it's rarely a part of the past but always a stepping stone in to the future.

We are witnessing a holistic shift in today's construction trends with active efforts in reducing carbon footprint as it accounts for some 40% of global emissions. Greener alternatives to traditional methods are gradually taking up the space. Renewed perspective towards new materials, additive manufacturing, robotics and next-gen synthetic brains; driving innovative 'construction work cells'—automated manufacturing ecosystems. A combination of these four forces will drive the construction industry through a multitude of changes, enabling smarter and more sustainably built cities.

The future depends on technology advancements keeping in mind the adversely affecting factors for the world's infrastructure like climate changes, scarcity of resources and rapidly changing urbanization.

Trends Shaping Future Construction

1. Bio-Concrete

A self-healing form of concrete designed to repair its own cracks. Developed by Dutch researcher and microbiologist Hendrik Jonkers using an extra ingredient acting as a healing agent and requires no human intervention to be repaired once placed which can bring down the millions spent on maintaining, repairing and restoring the infrastructure. This concrete gets healed when the water droplet falls into it through a crack and activates the bacteria component while it was mixed, and it eases the crack eventually.

2. Green Building Construction

Green building is a resource-efficient method of construction that produces healthier buildings which have less impact on the environment and cost less to maintain. This sustainable approach to construction accounts for a building's entire life cycle: siting, design, construction, operation, maintenance, renovation and demolition.

3. Building Information Modeling (BIM)

Building Information Modeling (BIM) is the foundation of digital transformation in the architecture, engineering, and construction (AEC) industry. It provides the clients with a graphical representation of a model that is going to be constructed with physical and functional characteristics that creates information flow on a shared cloud to everyone for easier communication.

4. AI & Machine Learning

To collect and analyze multiple streams of data from a digital workflow, AI and Machine learning is widely used by the construction firms. AI can faster categorize the data than humans that save time to get a clear picture of issues on the job site. Machine learning uses visual information from on-site cameras and uses AI to tag the information to prevent it from safety violations.

5. Predictive Analysis

Predictive analysis in the construction firms is associated with risk management that implies to the entire project levels-suppliers, plans, and the site. It integrates technology such as data mining, modeling, and machine learning to examine the data and predict future decisions.

Monumental and ceaseless innovations, dynamic market changes have paved the way for Future Ready – Digital Renaissance in the construction Industry. Keeping in mind the various construction industry scenarios, resulting from technological and socio-economic trends, we are looking forward to new data-driven business modules and a greater focus on sustainability.

CE&CR in conversation with the industry leaders gets in-depth views on the theme story and what they have to offer in the future world:

Bibhrajit Halder
Founder & CEO
SafeAI

> *"There are now 3 technological megatrends–automation, digitalization and electrification-working in confluence that will reshape the construction project cycle."*

CE&CR: How do you envision the future of construction and how will it be a game changer for the industry? Also, what new developments in the construction equipment sector can the industry foresee in the coming years?

Bibhrajit Halder: Historically, the construction industry has been rife with inefficiencies but there are now 3 technological megatrends–automation, digitalization and electrification–working in confluence that will reshape the construction project cycle.

First and foremost, autonomy will play a huge role in propelling the construction industry forward. We've already reached the inflection point for autonomous solutions as companies have now seen how this technology can provide safer working conditions and optimize job site productivity with which, workers will be taken out of dangerous conditions and elevated to new roles to manage the more efficient job sites. It will also make sites more productive, adding about a thousand hours of uptime per machine per year, which adds up to projects being completed 20% faster and at approx. 25% cost.

This shift to more productive job sites will be further supplemented as construction sites around the world become increasingly digitally connected. The result of this increasing digitalization will be a store of past learning and information that can improve operational efficiencies in the bidding and planning process, while streamlining supply chain management.

And finally, as more governments and companies make net-zero commitments and look to comply with stricter emissions regulations, construction sites will also move toward electrification as a solution. With reduce maintenance and lowered operating cost. As these sites become more sustainable, the rest of the construction supply chain will need to harness green solutions as well–making the whole process more sustainable.

CE&CR: With respect to transformational industry dynamics, what are your views about adaptive and innovative Next-Gen tools, integrated new workforce typology and new normal EPC models?

Bibhrajit Halder: It's easy to think of industries like construction as slow moving. With costly barriers to entry and important safety considerations, there has often been a steep adoption curve for new technologies. But with industry wide challenges–including dangerous working conditions, rampant operational inefficiencies, and project delays–construction is poised to benefit immensely from solutions such as autonomy. Which is why we're now seeing adoption of emerging technologies quickly pick up steam. Ultimately, construction as an industry is on the precipice of this transformation, as automation, digitalization and electrification address important gaps in productivity and safety.

CE&CR: The global trend is to achieve sustainable goals in all the sectors contributing to the economy; with respect to that; will green construction takeover traditional methods in the future? If so, how will it happen and how do you think the industry is taking strides in the process?

Bibhrajit Halder: For working towards the comprehensive net-zero goals, the construction industry will need to incorporate new, sustainable solutions. Improved electrification technology that can be retrofitted on new and existing construction equipment will make this transition to greater energy efficiency.

This transition will not only reduce carbon emissions it will also help push the entire value chain to be more sustainable, driving forward new technologies in everything. Electrification will deliver additional benefits to the construction industry, too, including quieter equipment that limits disruption to the general public, fewer unexpected maintenance issues and ultimately lower ownership and operating costs, as compared to traditional equipment.

CE&CR: Lastly, is there anything you would like to add to our story on 'Construction Today and in the Future'?

Bibhrajit Halder: Construction stands at an inflection point. companies are turning toward autonomous and electrification solutions in earnest; we're on the brink of a period of mass adoption for these proven technologies across these industries. Moving forward, the next challenge will be ensuring the successful integration of these technologies to fuel smarter, safer sites.