Navigating Change: The Transformative Power of AI in Construction

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As an industry, construction is at a crossroads. Generational shifts in the labor market, changing risk profiles, dynamic build environments, and increasing project complexity mean that companies are under immense pressure to get the best out of their most valuable asset — their people.

Technology is a key lever that construction executives can pull to drive growth and maximize their workforce's potential in today's evolving landscape. At the forefront of this tech revolution is artificial intelligence (AI), a game-changing technology that has the potential to reshape the way construction projects are planned, executed, and managed. With implications reaching every corner of the industry, from design and planning to project management and safety, AI is an ongoing reality for our industry to take advantage of.

Several types of AI are increasingly used in construction. First, there's machine learning, which is typically used to predict project outcomes, helping to foresee potential issues and optimize planning. Then, there is robotics, which generally involves augmenting field tasks that would otherwise take significantly more time and effort, enhancing efficiency and precision.

Computer vision is another key technology, with a lot of focus on progress tracking, providing real-time updates and insights on the project's status. Natural language processing is often used to extract contract details or summarize reports, making it easier to handle large volumes of textual data.

Lastly, generative AI, the newest addition, can generate monthly summaries from daily logs or create schedules from specifications, highlighting its potential to streamline various cumbersome tasks.

AI ROADMAP: A JOURNEY THAT NEEDS TO START WITH DATA

As organizations consider how to utilize AI effectively, the first question to ask is about the availability of clean, consistent, and reliable data.

This process starts with how data is captured, collected, and imported. A sufficient volume of data that's highly accurate will lead to higher-quality AI outputs like better cost estimates and improved risk assessments. On the other end of this spectrum is data utilization, which is how effectively the collected data is used.

Data is plentiful in construction today but often isn't accessible, clean, or fully utilized. Data maturity is a concept used to measure an organization's capability to manage and utilize data. It's a journey from basic data collection to transforming data into a strategic asset.

As organizations think about AI they need to first better understand where they lie on the data maturity scale and find ways to make progress. With a strong foundation of high-quality, well-managed data, organizations can be well positioned to experience the compounded benefits that AI can bring across the various phases of a construction project.

EXPEDITING PRECONSTRUCTION PROCESS

AI is revolutionizing the initial stages of construction. It enables the automatic generation and optimization of designs based on predefined criteria, helping reduce the time taken to create and finalize construction plans. AI also aids in project planning by predicting the likely outcomes of different strategies, allowing for better decision-making and risk mitigation.

SUPPORTING DECISION-MAKING DURING THE COURSE OF CONSTRUCTION

In project management, AI shines in its ability to process vast amounts of data to generate actionable insights and speed decision-making. In an industry survey of over 1,000 professionals, on an average 18% of the total time on a project is spent looking for data or information. In the same survey, 43% of respondents felt they would make better decisions if they had greater access to real-time and historical information on project performance.

These are all areas where AI can have a big impact. It can expedite the speed of decision-making by putting critical information at the fingertips of decision makers. It can also analyze project timelines, resource allocation, and performance data to provide recommendations for efficiency improvements. AI can even forecast potential project delays or cost overruns, enabling preventive measures to be taken. AI will play a huge role in reducing risk by helping stakeholders make data driven decisions.

AI also holds significant promise in improving construction safety. AI-powered drones and robots can be used to monitor sites for safety hazards, while data from wearables can be analyzed to detect signs of worker fatigue or stress. AI can allow us to often see what can not be seen in real time by a human to help prevent accidents and improve overall site safety.

HELPING REDUCE FINANCIAL RISKS

AI is becoming an instrumental tool in financial management within the construction industry, particularly in helping to mitigate risk, minimize cost overruns, and enhance forecasting accuracy. AI technologies can enable a more in-depth understanding of resource usage and project spending, which can lead to cost savings through informed decision-making and resource allocation.

In terms of risk management, AI assists in the identification, evaluation, and mitigation of various project threats, helping to avoid costly delays and create safer construction environments. Furthermore, AI's predictive capabilities can help improve forecasting accuracy, allowing for better budgeting and cost control.

THE FUTURE OF AI IN CONSTRUCTION

The future of AI in construction is promising for both automation and improved decision-making. We can expect to see improved productivity due to the automation of complex tasks throughout the project lifecycle. And as various AI technologies become more sophisticated and are trained more specifically in our industry, their ability to analyze complex situations and provide insightful recommendations will only improve.

As companies start recognizing the value of investing in data maturity and the quality of inputs, these AI technologies will also improve. This will lead to AI becoming more and more ingrained in workflows and decision-making throughout the construction lifecycle. There is a good chance that companies that wait to understand or embrace this technology could be left behind in an increasingly competitive industry.

About the Author

Kris Lengieza is the Vice President of Global Partnerships & Alliances at Procore Technologies. With over 15 years in construction and extensive experience in partnerships and alliances, Kris has had the privilege of working at the intersection of innovation and practical application — helping teams unlock the full potential of technology to transform the construction industry.

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