

VIEWPOINT

Artificial Intelligence

the arrival of AI brings caution for use

By William S. Thomas

Few technological advances have been as transformative or controversial as artificial intelligence (AI). These pioneering technologies, ranging from autonomous machinery to predictive algorithms, are revolutionizing society, not just the construction industry. AI promises a future of increased efficiency, enhanced safety, and unparalleled precision; but at what cost? Further, as these systems proliferate, they continue to learn, adapt, and make decisions directly impacting projects and people. Perhaps the greater risk awaits those who do not embrace the power of AI, left behind in a world no longer recognizable or navigable. Whether novice or early adapter, those using AI in the construction industry should do so with a sense of caution, not just wonder.

AI + CONSTRUCTION...

AI is a broad term that refers to the capability of machines or software to mimic human intelligence. This spans several technologies, including machine learning, where algorithms learn and improve from experience, to robotics, where machines carry out tasks traditionally performed by humans. In the construction industry, AI has found a variety of promising applications like automated equipment. Self-driving trucks, drones, and robotic arms are now capable of performing tasks ranging from land surveying to bricklaying, all with a level of

precision and efficiency that often surpasses human capabilities. In addition, AI has been integrated into project management and design. With machine learning, AI systems can analyze vast amounts of data from past projects to predict outcomes and make recommendations, thereby aiding in planning and decision-making.

Perhaps the most promising area for early adoption of AI is project safety. The construction industry remains one of the most dangerous in many countries, particularly in America, where it accounts for 21% of all deaths among U.S. workers and nearly 200,000 annual recorded injuries, according to 2021 data. The reality is these incidents are preventable. With the emergence of predictive AI, workers may realize an unprecedented sense of safety. Machine learning programs already exist which classify project sites according to their safety risk profile, and predict accident occurrence and severity. If implemented, these tools allow stakeholders the opportunity to predict project safety performance and provide preemptive inspections or interventions in a targeted manner.

Another effective application is AI's ability to remove data silos. Solutions exist which allow team managers to see real-time data on workers on a project site, to assess obstacles to labor productivity, track equipment utilization, and enhance safety. Potential

benefits could be better cost control, fewer delays and less waste, and a safer, more productive site. Welcome to the new "digitally measured mile!"

...EQUALS, WE ASSUME, RISK

As the integration of AI in the construction industry deepens, an area that will witness a significant shift in dynamics is legal and liability issues. The introduction of AI and automation into a field traditionally driven by human decision-making creates complex questions about responsibility and accountability. Determining liability in the event of a failure, accident or "bust" to the schedule or budget is a question yet unanswered. If an autonomous machine, operating based on an AI algorithm, causes a loss event, the scope of potential parties to the inevitable lawsuit could potentially include the company that owns or operates the machine, the machine's manufacturer, plus the programmers or creator of the algorithm, in addition to traditional parties to the claim. This ambiguity poses significant risk to all parties involved, as the law has yet to establish any clear precedent.

Furthermore, AI, especially machine learning, is known for its "black box" problem, or lack of transparency or understandability in how the AI system arrived at its decisions or predictions. If a problem occurs due to an AI's decision, it can be challenging to determine

why that decision was made and who should be held responsible. This lack of transparency poses significant challenges in construction, where decision-making processes often need to be open, clear, and justifiable, particularly in interactions with code officials, reviewers, and other stakeholders. If an AI system recommends a particular design modification, or a specific approach to a construction process, stakeholders need to understand why that recommendation was made, particularly if it contradicts human intuition or established practices.

The approach presented by AI has been called “techno-solutionism,” a view of AI as panacea as opposed to another tool in the toolbox. As we see AI advance, there is a temptation to adopt it as a universal solution. But technology often creates larger problems in the process of solving smaller ones. For example, ethical issues arise from AI’s displacement of human labor, issues of access and the potential for exclusion of smaller firms, concerns about data privacy and intellectual property rights. Further, if AI is used to automate decision-making processes, there is risk it could replicate and amplify existing biases, leading to discrimination against certain groups of workers or resulting in unfair treatment.

CLOSING THOUGHT

In the short term, there is a need for individual actors to adopt AI centered policies and procedures, which should urgently be elevated to an industry-wide oversight and advisory panel to prepare a stringent and exhaustive protocol for the industry as a whole. In situations involving critical decision-making, a hybrid model combining both AI and human judgment could be a pragmatic solution. While an AI system may provide recommendations, the final decision should rest with human professionals who can consider the AI’s input within the broader context of the needs of the project.

If AI systems can perform construction tasks more safely or efficiently than human workers, a contractor who opts not to use such technology could potentially be seen as negligent, not just behind the times. We cannot turn away or refuse to see the road

ahead; we can only begin to take those first steps forward. AI’s promise of a smarter, safer, and more efficient construction industry

is enticing, but we must always remember to proceed with caution, and consider the potential cost. ■

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