Three Ways Artificial Intelligence and Machine Learning are Transforming Construction

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EMPOWERING PROJECTS WITH INNNOVATIVE TECHNOLOGIES

Construction firms have increasingly been breaking free of the "way it's always been done" mentality by embracing new technology. And technologies such as artificial intelligence and machine learning bring unique opportunities to the construction industry – mainly because a sizeable amount of the work is manual, cumbersome, and repetitive. Taking advantage of automation, and artificial intelligence to help make decisions during that automation, stands to effectively transform our industry for the better.

In fact, these solutions have already made a noticeable impact as the construction industry continues to adopt technology – and the future of artificial intelligence in construction looks bright. Artificial intelligence spending in the construction industry has been forecast to reach over $4.5 billion by 2026, and has the potential to increase the construction industry's profits by 71% by 2035.

Artificial Intelligence vs. Machine Learning

Many people (and products) use the terms "artificial intelligence (AI)" and "machine learning (ML)" interchangeably, but there are a few key differentiators to note.

Artificial intelligence is technology that can understand data and act independently; it's able to evaluate data, use reason to make assumptions about that data, predict outcomes, and make decisions much like a human would. AI not only helps assist with real-time decision making but can also, as my colleague and vice president of product development at Autodesk Construction Solutions, Sameer Merchant, puts it, "help you see around the corner."

Machine learning, by comparison, is a technology that can scan and digest millions of data inputs in a short amount of time, detect trends within that data, help make predictions and provide insights on those specific trends. In short, machine learning helps you to continuously learn about something –

whereas artificial intelligence is understanding what all those data points and continuous learning means.

As the construction industry heads toward a technical revolution, these two technologies are already changing the game in the three ways. Read on for a review of their efficiencies and effects.

1. Increasing Accuracy & Reducing Rework

Data entry workflows in construction are cumbersome and time consuming. And whether anyone would like to admit it or not, human error is a reality that's simply part of the job. In fact, I co-created a company to help with this very problem in construction — my cofounder (then-project-manager at a large general contractor) came to me after being completely fed up with two outdated processes that are critical for maintaining contract compliance on construction projects: submittal log creation and document closeout. We utilized AI and ML to automate the most labor-intensive tasks — and thus the tasks most prone to human error — allowing teams to focus on higher-level tasks and strategy.

Increasing accuracy and minimizing errors can also reduce costly rework down the line caused by those oversights/errors. By utilizing these advanced automated processes teams can catch errors before they continue downstream and make their way into the field. And with rework costing the industry over $31 billion in 2018 alone, it's high time the industry began prioritizing accuracy.

2. Mitigating Risk, Both on Paper & On-Site

Risk is a big topic in construction, whether it's financial risk or physical risk causing bodily harm. Bringing automation, artificial intelligence and machine learning into the mix early can help reduce both.

In terms of financial risk — inaccuracies, human error, and miscalculations can lead to project delays and costly rework, which will ultimately put a dent in builders' bank accounts. AI and ML allow them to put certain tasks on autopilot — bringing a level of certainty to their projects and dramatically cutting down time spent on those manual tasks. Leveraging this technology will typically reduce hours of tedious, manual work into mere minutes — leaving the humans behind the computer with more time to review requirements, implement that work

and focus on more strategic tasks.

AI has progressed enough to mitigate physical risks in the field as well — flagging them before anyone even steps foot on site. Certain AI technologies can understand critical quality problems, provide visibility into high-risk areas and even take action to help mitigate those safety behaviors and hazards. This usually manifests itself as design risks, but can even go as far as to help predict the likelihood of falls on a jobsite.

3. Saving Time Frees Up Focus

AI helps us do people do their jobs better. But this doesn't mean that AI will be taking jobs from anyone — in fact, it's quite the opposite! AI needs human intelligence to be effective. Utilizing AI frees up massive amounts of time, allowing teams to focus on the more important, more strategic elements of their jobs. AI and machine learning act as tools, or more, secret weapons, to help us be our best selves.

My favorite analogy to use in this case is road laying machinery. Sure, you could lay a road using only human effort. You can perfectly sketch the road, lay it brick-by-brick, so to speak, but this would take years. That's why there are excavators to do the laborious task of laying a road. But again, that human element is still needed to smooth out the edges. And no matter how good your excavator is you're still going to need a human to operate the machine and check its work. Artificial intelligence is a mirror of this — it helps enhance the quality and speed of work, but it will never be a replacement for human intelligence.

Where Will AI Go From Here?

The construction industry has just begun to scratch the surface of AI applications, and it's exciting to be involved with the next wave of AI and machine learning solutions and applications. This technology is helping cut down on manual work, mitigating risk, reducing human error and freeing up time for more important tasks. And much like the invention of the printing press or the personal computer, this technology won't be taking jobs any time soon but, rather, serving as a complementary tool to your own human intelligence, empowering you to be the best builder you can be.

About the Author

Karuna Ammireddy is the senior director of research and development at Autodesk Construction Solutions, where he focuses on construction-related AI initiatives and product development. He joined Autodesk with the acquisition of Pype in 2020, where he served as chief technology officer and was responsible for overall product development, operations and technology growth for Pype products. Ammireddy has spent more than a decade building simple to complex software systems with teams of various sizes. Visit autodesk.com.

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