

# On-Site

## Construction hits the AI era

By On-Site Staff March 4, 2024

Webinar panel shares insights into how artificial intelligence is driving change in the construction sector.

Much as such technologies as computers, email and smartphones have transformed business, Artificial Intelligence (AI) is quickly emerging as a generational game-changer, and a game-changer that is already in play in the construction industry.



AI is not new. In fact, the concept was considered by scientists and authors more than 70 years ago. In the ensuing decades, the pursuit of machines and programming that could mimic human-like decision making has made considerable headway, but the speed at which computers could analyze potential outcomes and apply decisions was always a limiting factor.

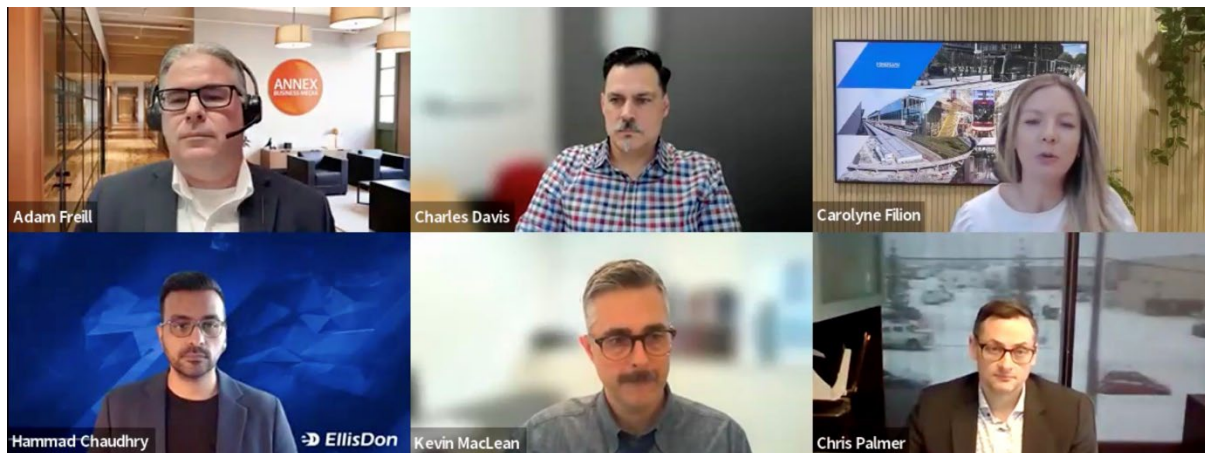
As computer technology has evolved, so too has AI, however, and the latest generation of the technology, which includes large language model-based programs like ChatGPT, is now making AI viable, and available to the masses.

While most agree that AI can be a game changer, it is not without its pitfalls, and many in Canada's construction industry are wrestling with the practical applications of AI, and what it can and cannot do for the world of construction.

To assess the impact that this technology is currently having on Canada's construction sector, as well as the potential it holds, this past January, On-Site Magazine hosted a webinar featuring experts from five of the nation's foremost contracting and engineering companies.

The panel discussion, which was sponsored by Buildots, whose technology uses artificial intelligence and computer vision to improve efficiency on construction projects, and American Global – Canada, one of North America’s largest privately held insurance and surety brokerage firms specializing in all aspects of construction risk management, featured Hammad Chaudhry, vice-president of innovation and construction technology at EllisDon Corp., Charles Davis, director of data and analytics at Modern Niagara Group, Carlyne Filion, director of innovation, research and development at Pomerleau, [Kevin MacLean](#), principal at [RJC Engineers](#), and Chris Palmer, director, enterprise intelligence and security at PCL Business Technology.

## AI IN THE FIELD



As he opened the discussion, On-Site editor Adam Freill asked the panel where AI is having an impact on the industry. They were quick to point out several current uses, as well as uses that are emerging and evolving as existing and start-up technology companies find industry pain points that they can address with various AI-based apps and technology platforms.

“If you look at BIM and VDC, you can use AI to help do things like automated clash detection that we couldn’t do before without draining a lot of resources,” said Chaudhry. “And then there’s a predictive side of things.”

As an example, he pointed at the ability of machine learning to analyze large amounts of data relatively quickly to do such things as assess risks on a project, explaining that risk mitigation is driving considerable interest in AI growth.

“The way we’ve been considering AI, as specialty trades contractors, is how can we use the tool set to eliminate or reduce the repetitive and mundane,” added Davis. “We see there’s some real value in that as a tool in the toolkit to help us become much more effective, and to free up time for people to really lean into their specific skills.”

He also listed a variety of opportunities where AI can be harnessed, from the drawing stages to estimation, pointing to the jobsite issue of on-site logistics as a prime opportunity that will benefit his company.

“A lot of these sites where we’re working, you’ve got multiple trades working there, you have limited set-down areas to keep things in, so having tools that can help with the logistics – with the coordination – could reduce the time and effort that really is a lot of manual chasing.”

Filion, added that “safety, efficiency and the decision-making process” were core construction concepts where AI holds considerable promise.

## **EVOLVING QUICKLY**

While some companies are already making use of AI through a variety of technologies on their sites, developments are moving quickly, which Davis said can make it difficult for many company owners and management staff to sort out the hype from the practical uses and applications.

“At this point, there’s a lot of tire kicking going on, and trying to work your way through what is real and what is marketing,” he explained, adding that costs associated with some of the customizable AI platforms can make access to their use prohibitive for smaller construction and contracting firms.

Today’s iterations of AI are making it easier for those companies who have made the jump, however.

“In the past, AI was difficult to integrate, when data was unstructured,” shared Filion. “Thanks to the evolution of AI, I’ll say that today unstructured data is no longer as much of an issue as it once was. Of course, the more structured and organized data that you have, the easier the technology will be integrated in your practice.”

MacLean said that for many in the engineering community, their first steps into the use of AI have been going after the low hanging fruit of debugging code and models.

## **AUGMENTING THE DETAILS**

He explained that engineering and professional services firms appear to be focused on using AI technology to automate repeatable details, to add depth and additional data into the files they create.

“There is a lot of data that exists, but often, it’s not in a form that you can use to draw conclusions,” said MacLean. “So, we are looking towards automating the creation of databases using drawings and interpreting annotations and visual representations of our work because, ultimately, our product is an image that represents a three-dimensional building.”

He used the example of rebar, since most models are not so detailed to include each piece in the drawings, however an AI platform has the potential to automatically add in each piece, which makes for a richer 3D rendering, with data that can be further used to add efficiency to the project.

“From a structural engineering perspective, the engineer doesn’t draw every piece of rebar on the drawing, they don’t detail every connection on the drawings, a lot of that’s indicative, and there’s an opportunity to translate that sort of common expectation about what those annotations mean, into something that’s a bit more tangible,” he explained.

## **DYNAMIC DECISION MAKING**

Beyond fleshing out the model, Filion is excited about how fluid changes can be worked into the management of projects.

“Integrating AI with other technologies, such as IoT sensors or the BIM model, can enable a dynamic and responsive approach to construction project management, where decisions are based on current data rather than a static plan,” she said, adding that data gathered from current projects adds to the machine learning algorithms, which can help to optimize future projects. “This is really the strength to

be exploited from AI; to learn about the past and improve the future," she explained.

"The Holy Grail is the true optimization of the building, and that's running through and having an algorithm make design decisions," said MacLean. "But I think that's a long way down the road."

"We're really at the beginning of this technology and what it's going to do," added Palmer. "The initial benefit that we're going to get is probably driving basic efficiencies. And then as we continue to develop the technology within our toolset and within our processes, we're going to see the real enhancements come down the road."

For now, Palmer says the technology can help site personnel juggle the numerous, and often repetitive, tasks that are a necessary process of managing a project.

"We have so many intelligent people that, through experience, understand the nuances of what goes into building a structure," he said. "How do we free up these knowledgeable people to focus on critical tasks and make them more effective? That's where I see AI being a tool they can use; to help automate more mundane tasks."

## **SECURITY AND CHATGPT**

The panel was somewhat split on whether the use of ChatGPT was a positive or a negative for industry professionals. The risk of losing proprietary data into the cloud is a major concern, and a concern with merit – Chaudhry pointed to a recent issue experienced by Samsung, where its staff accidentally leaked some of the company's source code via an open AI platform.

"In general, it's a yea to ChatGPT, but doing it in a safe manner," said Palmer. "There are guidelines that people should follow... They will bypass your technical controls and those sorts of things. You'd be in a far better position to educate."

"I think, personally, it's a phenomenal tool for practical applications and creative things," said Chaudhry. "From the scare side of a business, whether you're a small specialty contractor, large design firm, or anything in between, we all probably heard about the Samsung story... You need to educate, but I think blocking access,

potentially, and providing a different tool, if you have the resources to... so you don't expose yourself to unnecessary risk."

"If you haven't already been having a discussion internally around creating guidance for your folks about 'How do I safely use generative AI tools or AI tools in general?', 'What are the telltale signs of where you can safely bring data versus when and where you can't?' and making sure people understand and have examples of what is an acceptable use and what is an unacceptable use, [you should initiate that discussion] because then you are arming them to use it safely and to use it without putting your organization, your data, or your clients at risk," explained Palmer.

"You've got to have good methods and tool sets around prioritizing your data security, access controls, secure authentication, and encryption. These are table stakes that you really have to put in there, particularly since the services are all cloud-based services," added Davis. "You need to do regular security audits, and compliance with data protection laws and data protection practices is essential. Depending on your client base, you may have data residency requirements that you have to consider."

Those details may not be part of the marketing pitch from a vendor offering to create an AI program that integrates into a construction company's procedures, so the panel advised digging deeper into such matters, rather than risking data loss, and to ensure that contractual requirements, which may include an integrity of data clause, are met.

## **LOOKING AHEAD**

One thing that all panellists could agree upon is that the age of AI is upon us.

"Winston Churchill said, 'We shape our buildings; thereafter, they shape us.' I think it's apt to consider a modern twist, given AI in our digital age," said Chaudhry. "We create our data, and thereafter it shapes us. So, the linchpin to all these technologies, whether it's construction or anything else, is data. And that's what AI is unlocking."

"AI is becoming integral in Canadian construction, we see that there's an opportunity for the tool sets to enhance efficiency, enhance sustainability and the work that we're doing; to augment the workforce to help us free people for their highest and best use," said Davis. "The success lies in balancing the technology with human insight and continuous learning, and considering AI as a tool."

“AI has a really big role to play on the future of our industry,” concluded Fillion. “But you’ll get more impact if you link AI also with other technologies, such as robotics, IoT sensor, and BIM models.”

To watch the full webinar on On-Site’s YouTube channel, click or scan the QR Code.

