

AI Technology in the Construction Industry and its Potential Impact on Jobs

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One of the fastest-growing trends in the construction industry is the use of artificial intelligence (AI). AI combines computing power, large amounts of data, and human guidance to enable problem solving. Recent advancements in technology allow users to leverage AI in ever-expanding ways. When deployed effectively, AI has the potential to increase efficiency in data analysis, provide new insights, and make predictions about future outcomes. Because of these recent advancements, industry professionals are interested in the future potential of AI to bring efficiency and automation to their systems.

OVERALL BENEFITS OF AI IN THE CONSTRUCTION INDUSTRY

Using data to predict the lifecycle of assets allows companies to gather information in an expedited time frame. When it comes to project controls, it's all about quality data. It is critical that we are 'in the know' about AI tools. AI can expedite the data collection process, improve reaction time, and put us in a better position to help our clients deliver successful projects. It is a tool that can be leveraged to improve construction and will continue to impact the industry exponentially.

My work as a member of the Professional Development Advisory Council of the Professional Women in Construction's NY Chapter (PWC NY) underscores my belief that networking opportunities such as conferences and industry events are key to staying informed. I recently attended a few panel discussions about AI technology, where we discussed the many advantages



and ways to incorporate AI and predictive data analytics in the construction industry. These include:

Project management: AI can help with scheduling, ensuring projects are planned and monitored with more accuracy to help with delivering the projects on time. With tools like virtual reality (VR) and predictive analytics, AEC (Architecture, Engineering, and Construction) professionals can offer real-time design, risk assessment, and project progress updates to clients, which helps to minimize and avoid costly delays.

Quality control: AI-powered systems and sensors can detect problems and identify defects during the construction process.

Supplies and equipment: AI can monitor construction equipment maintenance requirements for increased efficiency. It can also aid in inventory management, helping streamline supply chain issues.

Safety: By looking at data to discover possible dangers, AI can help to prevent worksite accidents and maintain compliance with safety standards.

Estimating: AI estimating can automate the take-off process and help speedup cost development.

Scheduling: AI schedule optimizer takes the project schedule and develops multiple scenarios on how quickly or cost effectively a project can be built based on the project needs and/or resource limitations.

Contract management: AI contract analysis can assist with aggregating contract requirements that will one day help project management teams manage requests for information (RFIs), contract changes, payment requisition, claims, etc. There's lots more to be done in this area, but the future looks bright.

ROBOTICS FOR THE CONSTRUCTION INDUSTRY

With the current workforce shortage, companies are turning to AI-embedded robotics technology to streamline workflows and maximize project productivity. Several innovations in AI robotics have significantly improved the safety and efficiency of various construction processes, including drywall, layout, data collection, and overhead drilling.

Here are some examples:

Drywall Finishing Robot: A robotic arm attached to a scissor lift delivers a Level 5+ finish on walls, reducing a process that typically takes three to five days down to just two days. The operator controls the robot from a safe distance of about 10 to 15 feet away, enhancing the safety benefit of using the robot.

Field Printer: Utilizing building information modeling (BIM) or CAD files, this device semi-automatically prints digital building models directly onto the construction site floor. It transcribes wall layouts by spraying chalk. Field printers are 10 times faster and have greater accuracy than traditional methods.

Agile Mobile Robot: Equipped with a 360-degree camera, this quadruped robot navigates construction sites to report project progress, creates a digital project twin, and compare as-builts to the BIM model. This helps speed up schedules, generate quantities for payment applications, and measure work quality.

Construction Robot: Leveraging semi-automated drilling

technology, this robot enhances productivity in the mechanical, engineering, and plumbing (MEP) and interior finishing installation projects. It takes over the installation process while allowing project managers to track progress and status through data, which relieves field crews from this task.

These advancements in robotics are transforming the construction industry by improving efficiency, safety, and overall project management.

AI IN THE TRANSPORTATION SECTOR

The firm HNTB – where I am a program manager – works alongside transportation agencies across the United States, offering a broad range of services to meet its clients' needs. This includes a digital transformation solutions team that works with clients interested in analyzing AI adoption and implementation to help them learn to use AI predictive analytics and machine learning for asset management and assessment processes. The team, which supports AI in the infrastructure and architecture design processes, is investigating and coordinating with software vendors on how AI is being implemented for project control applications such as risk management, schedule development, submittals, data analysis (KPI performance dashboards), and reporting. Clients are beta testing technologies such as AI bots to address the speed and efficiency of various construction processes.

Although many applications of AI are still being tested, some transportation agencies have already turned to these capabilities for impactful solutions that are making a real difference in their work today. These agencies are using tools such as intelligence signaling for traffic control, image recognition for tolling purposes, and various monitoring devices for tracking asset health and traffic flow. Along the way, AI is absorbing large amounts of data generated by infrastructure, vehicles, and other sources to better understand, report, monitor, or identify potential issues. Transportation departments in states across the country are using AI to predict and analyze data such as pedestrian and bicycle traffic, congestion, accidents, traffic patterns, weather conditions, and more.


AI is particularly significant right now, as transportation agencies benefit from one of the biggest federal infrastructure investments in decades: the Bipartisan Infrastructure Law, as

enacted in the Infrastructure Investment and Jobs Act, which authorizes up to \$108 billion for public transportation. It is the largest federal investment in public transportation in the nation's history. As funding is allocated and new projects take shape, agencies can look for ways to enhance their operations through improved workflows and automation with AI emerging as a potential tool in this transformative process.

THE FUTURE OF AI AND JOBS FOR WOMEN IN CONSTRUCTION

There is no denying that AI is already embedded in the construction industry, and it will continue to change the construction workflow rapidly in the next few years.

There has been a lot of discussion about whether AI will replace jobs. I believe jobs that are considered administrative and/or repetitive tasks will most likely be replaced with AI. But I think the use of AI will also help to upskill the current workforce allowing everyone to work more efficiently and productively. The workforce can be reutilized from data entry to data analysis, where they can become the experts who will ensure the result generated by AI is quality information.

Some research shows that women are more likely to lose their jobs across many industries due to AI. But in the AEC industry, I believe the AI transformation will help women with upward mobility in the workforce in many ways. For instance, the use of AI in modular construction, VR, 3D printing, and process automation will allow more women in the different areas of the industry. Having AI as a tool within our industry will help level the playing field and create opportunities for women in many areas, such as project management, construction management, site superintendent roles, construction technology, and more leadership roles. The growth and development of women in all areas and positions in construction can help reduce the worker shortage we are seeing now for the "human" jobs that cannot be done by AI alone. 



About the Author

Sharnette Tucker is a program manager at [HNTB](#) with more than 17 years of experience in construction management, environmental awareness, project management, contract administration, and project information system implementation. Sharnette is always exploring the newest ways to improve efficiency, safety, and productivity, and she specializes in using technology tools and innovative processes to provide lean project monitoring support that helps successfully deliver projects for her clients.

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