



TECHNOLOGY

Machine learning in construction: turning data into automation

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SUMMARY

Explore how machine learning transforms construction project management through data-driven insights and automation.

Transforming how projects are built and managed to increase efficiency and profits

We've all heard the buzz words by now, but just what is machine learning in construction?

While it may sound like something out of a sci-fi movie, machine learning is already part of our daily lives. If you've used Google Maps, binge watched a "recommended for you" show on Netflix, asked Alexa to recommend a restaurant or song, or received a call from your credit card company about fraudulent activity, you've benefited from machine learning.

Machine learning is the common denominator in making all of these activities work—and it's estimated that machine learning is used in more than half of today's mobile apps.





AI has the potential to increase the construction industry's profits by 71% by 2035.

— Accenture |

Identifying data patterns to create automated intelligence

Simply put, machine learning uses computer algorithms to detect patterns in large data sets and predict outcomes.

In some machine learning applications, computers are initially programmed to learn how to solve problems, but can change and improve algorithms on their own—making faster, more accurate predictions. It essentially helps to find the needle in a haystack of data, taking in large quantities of complex data and identifying patterns to provide reliable, effective and repeatable results.

For example, according to the Google Research Blog, the company introduced machine learning to Google Maps, improving the usability of the service. The algorithms help the app extract street names and house numbers from photos taken by Google's "Street View" cars and increase the accuracy of search results. With over 80 billion high-resolution photos collected by Street View cars, analyzing these images manually would have been impossible; instead, Google's finely-tuned machine learning algorithms automatically extract information from geo-located images.



While machine learning and artificial intelligence (AI) are sometimes used interchangeably, they are different.

Machine learning is the technique that has most successfully made its way out of labs into the real world, while AI is a broad field covering areas such as robotics and natural language processing. Machine learning is also commonly mistaken as simply using averages or statistics. Instead, it entails a complex process of understanding and preparing the data that is analyzed, developing algorithms that produce valuable predictions and outcomes, and testing and refining the algorithms to ensure accuracy.

Free guide

[5 Reasons and 25+ stats on the benefits of a construction data and workflow transformation.](#)

The practical applications of machine learning in construction

Data is driving better decisions in all industries, including construction. As more manual forms of tracking project data are replaced with automated, streamlined

solutions, the amount of data captured in each job grows exponentially.

For instance, industry research has found that larger infrastructure projects create an average of 130 million emails, 55 million documents, and 12 million workflows. That's just one project, imagine gathering and analyzing your whole company's content? But that's often what will move the needle—being able to assess large amounts of data.



As the volume of data increases, machine learning is gaining traction in construction —providing the tools with that necessary ability to analyze the data, make decisions and make predictions that can reduce occurrences of project delays, boost productivity and quality, improve safety and retain laborers.

This technology enables more automation in construction, removing monotonous duties and helping simplify design and planning processes. This allows the humans on the team to spend their time honing their expertise and creativity. Beyond that, machine learning can help teams and companies make informed predictions for a more streamlined business and workflows.

Machine learning in construction: what's on the horizon?

One of the truly amazing things about machine learning in construction is that it can look at terabytes of data and figure out project risks before they happen.

A machine learning model could learn from historical patterns in thousands to millions of similar jobs to assess patterns and flag poor outcomes, such as margin drawdowns, project delays, project rework. This helps humans identify risks and figure out how to prevent problems from arising.

And the utility of machine learning doesn't end at predicting bad results; it can be used to:

- Find sources of productivity or new growth.
- Optimize future bidding processes through historical modeling, leading to a higher likelihood of bid acceptance.
- Identify risks and rewards, measure their impact and use predictive analytics to help you act on them by reducing sources of risk or capitalizing on sources of growth.

Here are a few additional examples of machine learning in construction, as noted in this example from the McKinsey & Company report, [Artificial Intelligence: Construction technology's next frontier](#):

In the meantime, [connect with Trimble Viewpoint](#) today to see first-hand some of the data-driven technologies we've developed with [Viewpoint Analytics](#), and learn why our [Trimble Construction One suite](#) of connected, cloud-based construction solutions is ripe for machine learning opportunities.

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