Artificial intelligence in operational technology

Sector focus: Construction and infrastructure

The construction and infrastructure sectors, incorporating steel, construction and utilities, are central to the development of green infrastructure and industrial strategy. As carbon-intensive industries, they face environmental challenges even as they play a key role in building next-generation infrastructure.

The steel, construction and utilities industries are interdependent and face many of the same challenges in the move away from carbon-intensive production. Steel is a key input for construction, while utilities are essential for both steel production and construction projects. Governments often target the sectors together in stimulus packages, green infrastructure plans, and industrial strategy.

Meeting challenges with AI in OT

While many of the challenges they face are different, all these sectors are looking to AI in OT to optimize their operations, improve safety and meet regulatory requirements around decarbonization. Increasing the resilience of production is vital in all industries, and AI can reduce unplanned downtime and mitigate the impact of any supply chain disruption.

The first step in bringing AI into the OT environment is to integrate IT and OT systems. This is already happening widely. In our manufacturing survey carried out by GlobalData, construction and infrastructure executives reported high levels of IT/OT integration, with 84% of respondents having made significant progress with full or partial integration.

Rapid progress in AI/GenAI

Our survey also found that AI/ML is already deployed in construction and infrastructure OT environments by 30% of our respondents, with a further 52% reporting pilot projects or plans to deploy the technology within the next 12 months. Utilities are particularly late adopters of AI in OT, with just 15% having extensively deployed it.

In addition, around 39% of construction and infrastructure companies have deployed or are piloting GenAI in OT, with 9% of respondents having no GenAI plans.

This push towards AI in OT is generally backed by the construction and infrastructure C-suite, with 56% executives saying it is either “essential” or “very important”. Like most other sectors, this initiative is being led by the IT department, as part of an IT/OT convergence strategy.

AI in OT benefits

In terms of identified AI benefits, the top three chosen by construction and infrastructure executives in our survey are improved product quality, improved productivity and improved supply chain logistics.

AI in OT use cases

The construction and infrastructure industry is deploying a wide range of AI and GenAI use cases across the board in OT. We look at three of the most popular: predictive maintenance, supply chain monitoring and safety management.

Predictive maintenance

Avoiding outages is a priority for utilities as supply failures create widespread disruption and financial losses. To help prevent them, EY and Eversource created an AI solution that integrates diverse data sources such as weather patterns, geographical features, SCADA, geographic information system (GIS), and other data sets[1]. It uses machine learning to analyze historical outage data and predict the likelihood of outages, and the correlations that cause them. This approach allows utilities to shift from reactive to proactive grid management, by predicting where and when maintenance is required. For example, if it detects a pattern of voltage dips, it can trigger targeted inspections to prevent future outages. The company says that the solution helped prevent 40,000 customer outages in just two months.

Supply chain management

A leading North American steel manufacturer partnered with C3 AI to transform its supply chain across three core units: raw materials, steel making, and steel products[2]. Facing challenges like inaccurate demand forecasts, manual scheduling, and labor-intensive detailing, the company deployed four AI-driven applications. For demand forecasting, it unified 15 data sources and improved forecast accuracy by 13%, enhancing inventory planning for $200 million in raw materials. It used historical data and 50+ parameters to optimize raw material sourcing to identify a 1% cost reduction in material sourcing. In steel making, it used AI to automate caster scheduling, cutting planning time by 98% and boosting yield by 0.6%. And finally, it streamlined the steel product design process, reducing manual effort with over 87% accuracy. Collectively, these solutions delivered over $50 million in economic value, significantly improving agility, efficiency, and responsiveness across the supply chain.

Safety management

The construction industry is one of the most dangerous workplaces worldwide, accounting for 19% of all US workplace deaths[3]. Construction companies are increasingly looking to AI to help identify risks across building sites to help reduce this danger. For example, US firm Consigli Construction is using data collected from fixed cameras and drone footage to undertake AI safety analysis[4]. It tested DroneDeploy's Safety AI platform, which identifies potential workspace hazards by collecting data from a site walk through[5]. The platform uses AI to produce a report detailing safety risks linked to specific OSHA safety standards. It requires no specific training, making deploying on site easy.

Overcoming AI challenges

Construction and infrastructure executives have identified several challenges holding back the broader adoption of AI within the OT environment. The top three were a lack of AI skills, concerns over the accuracy of findings, and complexity when integrating with existing systems. Utilities highlighted the difficulties around integrating AI with existing systems.

Many construction and infrastructure executives are turning to third-party assistance to help them overcome issues around skills. The survey found that help was sought across the board, with the three most popular requests for assistance being improving data management, responsible AI practices, and better understanding the regulatory environment.

Focus on digital infrastructure

Digital infrastructure plays a key role in enabling AI in OT projects, with foundational technologies such as networks, cloud and security helping drive the convergence of IT and OT. Our survey found that 87% of construction and infrastructure respondents said they had the requisite IT infrastructure fully or partially in place for deploying AI in OT. Concerns over cybersecurity and cloud connectivity dominated among those who didn't.

These worries are shared with many other industries. Industrial companies are increasingly the target of cyberattacks, which can shut down operations or steal business-critical information. Downtime is so damaging to business that ensuring resilience is essential, particularly in utilities where disrupting water or power supplies can have a far-reaching impact. As such, upgrading OT security is an investment priority for 63% of construction and infrastructure respondents as part of the push to AI on OT.

Connectivity is vital for the success of AI in OT because the processing of data is largely carried out in the cloud. However, construction and infrastructure companies are increasingly looking to edge computing to bring processing closer to their sites, with 77% of respondents either using it or planning to use it within 12 months as part of their IT/OT strategy.

Why Orange Business

Orange Business can help you take advantage of these AI opportunities and support you in your data quality, integration, and infrastructure requirements.

We have a unique skill set as a global integrator, communications operator, and service provider and genuine industrial experience. Our individual approach is designed to make your business outcomes a reality. Our consultants have extensive construction and infrastructure industry experience and are supported by best-in-class partner ecosystems.

We can answer your transformation challenges at every stage of the data journey using a secure, scalable, flexible approach. With our business approach, methodology, and skills, we will work closely with you to outline business goals, organize efficient and secure data sharing, and accelerate innovation.

Connect with Orange Business sales teams: Contact us

Take a personalized Operational Experience maturity assessment: Click here

1. https://www.ey.com/en_us/insights/power-utilities/ai-can-help-utilities predict-grid-outages
2. https://c3.ai/wp-content/uploads/2025/05/C3-AI-Case-Study-Steel Manufacturer-Value-Chain.pdf
3. https://www.oshapractice.com/blog/construction-safety-statistics/
4. https://www.constructiondive.com/news/ai-safety-construction-data/752094/
5. https://www.dronedeploy.com/product/safety-ai

orange™ Business