



Hexagon's Drill Assist moves drill autonomy forward

Precision in practice: Drill Assist's human approach to automation

Mining automation is often discussed in terms of removing people from the process. For Hexagon's Curtis Stacy, senior product manager, autonomous drills, the real progress lies in keeping them involved.

Drill Assist, Hexagon's autonomous drilling solution, is built on the principle of augmentation, not replacement.

It delivers significant productivity gains by creating what Stacy calls a 'digital operator' – a technology layer that supports human decision-making rather than displacing it.

BUILDING A DIGITAL OPERATOR

From its earliest development, Drill Assist was designed to enhance

operator performance while maintaining control in human hands. The focus was on creating a simple, transparent system that would work seamlessly in day-to-day mining environments.

That simplicity has become a guiding principle. Operators can learn the system in minutes, reducing the training and support burden on site teams. Installation is equally straightforward, helping mines to scale automation quickly across fleets without complex integration.

This approach has had clear social and operational benefits. Rather than removing the operator, Drill Assist provides a consistent digital foundation that improves performance, safety and confidence. The result is

a system that feels more like an assistant than a replacement.

SIMPLICITY AS A DESIGN DISCIPLINE

Ease of use remains central to Drill Assist's success. The interface has been intentionally stripped back to its essentials, minimising distractions and allowing the system to manage routine processes automatically. Operators are alerted only when their input is genuinely required.

"The more information you show, the more chance there is to distract the operator," Stacy said.

By automating problem-solving in the background, Drill Assist enables users to focus on outcomes rather than inputs.

During initial testing, the operator described the experience simply: just as he was about to intervene, the system did exactly what he had planned to do. That combination of responsiveness and restraint has become a hallmark of the technology.

TRANSFORMING THE OPERATOR'S ROLE

A shortage of skilled drillers is one of the mining industry's most persistent challenges. Drill Assist addresses the issue by reducing the learning curve and allowing less experienced workers to perform to professional standards safely.

Stacy recalled one operation in the US where a truck driver became a

Drill Assist connects drilling data across the mining value chain, driving better blasting, loading, and processing outcomes



fully productive driller after just six hours of training. With the system guiding every step, he achieved the highest output on his shift.

That accessibility is changing how mines think about workforce development. Drill Assist captures best practice from experienced operators and embeds it into the system's logic, allowing new users to benefit from decades of cumulative expertise. Over time, the AI learns from both operator feedback and ground response, ensuring consistent results across shifts and conditions.

MEASURING THE IMPACT

Drill Assist's results have been notable across all major deployments.

Productivity improvements of around 30% are typical, with gains of up to 50% recorded in variable ground conditions. These increases stem from more precise control of feed pressure and rotation speed, as well as the system's ability to maintain optimal performance when ground hardness changes.

Where rock conditions limit penetration rates, results stabilise at parity with manual operation. But across most sites, the combination of consistency, reduced downtime and safer operation translates into strong business value.

Stacy said the team continues to refine the system's performance in down-the-hole hammer applications, which present more complex challenges for automation. Even there, however, improvements of around 18% are already being achieved, with scope for further optimisation.

INTEGRATION WITHIN THE HEXAGON ECOSYSTEM

Within Hexagon's broader technology suite, Drill Assist plays a central role in connecting operational data across the mining value chain. It provides accurate, consistent drilling informa-

tion that feeds directly into blasting, loading and processing analysis.

"The real value is downstream," Stacy said. "If you drill correctly, the data can improve blasting and fragmentation, which in turn improves loading, haulage, energy use and recovery."

Accurate drilling data allows mines to predict and control fragmentation more effectively, leading to smoother bench floors, faster loading and less energy use during crushing and milling. By combining Drill Assist with Hexagon's analytics and fragmentation tools, mines can make informed adjustments in real time, improving both efficiency and sustainability.

LEARNING FROM THE FIELD

Drill Assist's development continues to draw directly from the experience of operators. The AI logic was built through close collaboration with drillers, who shared how they responded to different ground conditions. Those insights were used to train the AI, resulting in a system that behaves like a skilled operator – i.e., consistent, calm and adaptive.

By learning from human experience rather than replacing it, Drill Assist preserves the knowledge and judgement that are central to safe, effective mining. The technology acts as an amplifier for skill, ensuring that expertise is embedded and repeated across the operation.

GETTING IT RIGHT FROM THE START

For Hexagon, the significance of Drill Assist extends beyond the drill itself. Accurate, consistent data at the start of the value chain has a multiplying effect across every downstream process. Poor data at the drilling stage leads to inefficiencies in blasting, loading and recovery, whereas high-quality data can unlock measurable gains at every level.



"Collecting data when you're drilling with the wrong parameters produces nothing but erroneous data. Getting it right upfront is the key to transforming the mine," Stacy explained.

A PRACTICAL STEP TOWARDS AUTONOMOUS MINING

Drill Assist is a pragmatic response to the challenges of automation in mining. It offers immediate performance benefits while laying the groundwork for future autonomy. Its design prioritises simplicity, safety and human integration, qualities that make it as much a workforce tool as a technical one.

By focusing on how automation supports people rather than replaces them, Hexagon has positioned Drill Assist as a bridge between current operations and the intelligent, data-driven mines of the future. It is automation with a human touch: practical, precise and designed to deliver lasting value across every bench and every shift.

Mines adopting Hexagon Drill Assist report productivity gains of up to 50% and measurable reductions in re-work



Drill Assist: In depth

Advancing precision, sustainability and safety in drill automation

By integrating Drill Assist data with blast design systems for custom-blast loading, Hexagon aims to deliver an innovation that could significantly reduce energy consumption and emissions

Hexagon Drill Assist is redefining blasthole drilling through the power of artificial intelligence. The award-winning, OEM-agnostic automation solution sits as an intelligent layer above existing control systems, harnessing onboard rig sensors and an AI algorithm to optimise drilling with remarkable precision.

The result: dramatic increases in productivity, lower energy use and emissions, and enhanced safety, consistency and operator confidence.

In an industry under pressure to improve efficiency and sustainability while addressing workforce shortages, Drill Assist has emerged as a proven value driver. By automating the fine, compounding decisions traditionally reliant on operator skill, it delivers a step-change in productivity and accuracy across the drill-and-blast cycle.

AI-POWERED PRECISION FOR MEASURABLE GAINS

Drill Assist continually analyses real-time drilling data to optimise penetration rates and downhole quality. Its algorithm eliminates the need for manually entered parameters, reducing operator input while improving repeatability and hole consistency.

Mines adopting Drill Assist report productivity increases of up to 60% and measurable reductions in re-work. By drilling more efficiently and with greater precision, mines reduce ore dilution, improve fragmentation and lower their carbon footprint. One



major miner is even exploring the option to park one of four drills thanks to efficiency gains.

FROM NOVICE TO EXPERT IN MINUTES

In an environment where skilled drillers are scarce, the system's intuitive interface can transform a new recruit into an expert operator within minutes.

"The ability to train an operator in 15 minutes and instantly increase their productivity can transform an entire workforce in days, not years," said Curtis Stacy, senior product manager at Hexagon.

The system integrates seamlessly with existing rigs and can be disengaged instantly, returning full control to the operator. "Your drill remains just as you purchased it, but with increased productivity," Stacy said.

PROVEN PERFORMANCE IN THE FIELD

At Capstone Copper's Pinto Valley mine in Arizona, senior mine coordinator Joe Kalkus described Drill

Assist as "the best drilling programme I've seen in my career." Drill operator Robin Toot added: "Every hole I've drilled with it has been a nice, clean, good hole. The training time was really quick, basically one button to push."

BUILDING TOWARDS AUTONOMOUS DRILLING

Drill Assist represents a major step towards full rig autonomy. Enhanced with support for down-the-hole hammer and multi-pass drilling, it uses existing sensors to track rod depth without extra hardware.

Hexagon plans to integrate Drill Assist data with blast design systems for custom blast loading, an innovation that could further cut energy use and emissions. Ultimately, Hexagon envisions a future where users load a drill pattern, and Drill Assist executes the plan autonomously: minimal human interaction, maximum precision and a safer, cleaner, more productive mine.

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