

Case Studies 3 Min Read

From mines to metrics: Inside Vedanta's AI playbook

Inside the metals-to-minerals group's push to turn AI into a lever for safety, sustainability, and serious ROI.



Ramarko Sengupta ETEnterpriseAI

Updated On Jul 24, 2025 at 09:56 AM IST



At Vedanta, AI isn't a side project. It's the new operating system.

Across its mines, smelters, and control rooms, the group is embedding artificial intelligence not as a tool, but as infrastructure—reshaping how India's largest diversified natural resources company operates, trains, monitors, and scales.

“Our vision is clear,” says Akarsh Hebbar, President, Vedanta Ltd. “To make Vedanta an AI-first company across productivity, safety, and sustainability, with measurable impact on EBITDA and ESG performance.”

AI that watches, predicts, and preempts

At Vedanta’s Jamkhani coal mine, drones powered by AI and LiDAR (Light Detection and Ranging) tech now monitor blast zones and restricted areas in real time. Manual inspection teams have been cut by 60–70 per cent. The shift to autonomous monitoring has reduced inspection lag from hours to minutes, and helped bring down unsafe zone entry incidents by 40 per cent. “Before automation, inspection routines relied on 6–8 personnel performing manual checks twice a day,” Hebbar highlights.

Smart helmets, fatigue detection systems, and AI camera networks have added another layer of site safety. Alerts are integrated into command dashboards, pushing early warnings to supervisors. Across pilot sites, near-miss events have

Downtime hurts margins, and that’s why Vedanta is betting big on predictive maintenance. At its aluminium smelters, GE’s Digital Smelter platform monitors pot health continuously, improving pot life by 10-12 per cent and boosting current efficiency. In the zinc business, 1,700+ sensors across 370 rotating assets help detect anomalies early, reducing unplanned downtime by up to 20 per cent. “The benefit is twofold: it improves equipment life and optimises manpower deployment, while reducing maintenance costs,” notes Hebbar.

Proof of the pudding

Through its Spark innovation platform, Vedanta has partnered with 150+ startups and deployed 100+ AI/IoT solutions. These aren’t just pilots, they’re working products.

Cooling helmets by Jarsh Safety have improved productivity by 15 per cent in high-heat environments. Facial analytics-based fatigue detection has reduced operator-related incidents by 30 per cent. VR-based training for underground mining has halved training-related incidents.

At Vedanta AI isn't just improving operations. It's reshaping and reducing risk. Traffic safety interventions have reduced incident rates by 60 percent at Jharsuguda and Lanjigarh sites. AI-driven reporting has helped eliminate 100+ critical risks and mitigate over 140,000 unsafe traffic situations. In over 30 use cases, risk-prone manual tasks have been entirely removed.

Behind the scenes is a hybrid AI governance model. There's a centralised group AI office, supported by federated Centres of Excellence (CoEs) inside each business. Model lifecycles are tracked, ROI is benchmarked, and data governance is non-negotiable.

every AI deployment with business KPIs," says Hebbar.

ESG, emissions, and AI at scale

With a \$5 billion sustainability investment, Vedanta is scaling AI for carbon monitoring, emissions forecasting, and supply chain optimisation.

The group is moving to decarbonise 100 percent of its light vehicle fleet by 2030, and 75 per cent of its mining fleet by 2035. Renewable energy, smarter resource planning, and AI-led forecasting will play a key role.

Vedanta's ambition is clear: build a digitally enabled, environmentally responsible enterprise that doesn't just extract value, but engineers it.

"We are transforming the way traditional mining companies operate," says Hebbar. "By partnering with global tech leaders and startup ecosystems, we're welcoming a new way of doing business."