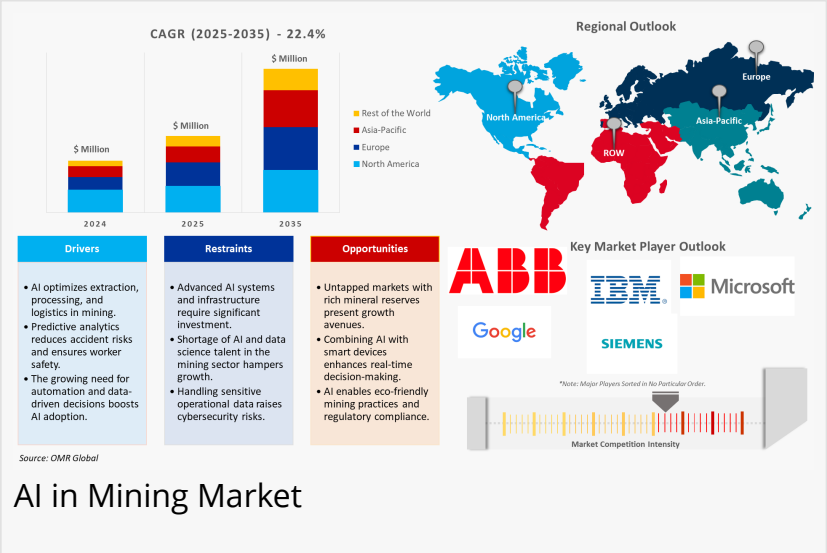
AI in Mining Market to Reach USD 4,181.0 Million in 2024, Growing at 22.4% CAGR 2025–2035

AI in mining market was valued at USD 4,181.0 million in 2024 and is projected to grow at a CAGR of 22.4% during the forecast period (2025-2035).



AI in Mining Market

INDORE, INDIA, May 7, 2025 /EINPresswire.com/ -- The mining industry's AI is witnessing dramatic growth owing to numerous technology adoption drivers within the industry. Rising demand for operational cost-effectiveness and reducing costs is inducing mining firms to deploy AI-led solutions. According to the World Economic Forum (WEF), in September 2024, AI algorithms can analyze geological data to predict the location of mineral deposits more accurately. Companies employing AI in exploration have reported a 20.0%-30.0% reduction in time and costs associated with mineral discovery. Enhanced data availability via digitalization and IoT inclusion has given significant soil for adopting AI. The increasing necessity for enhancing safety norms in unsafe mining conditions justifies automation and AI adoption. Competitive forces are inducing organisations to utilize the strength of AI for real-time decision-making and productivity. Cloud infrastructure expenditures and analytics platforms are facilitating the scalable deployment of AI into all mining operations. Governments and environmental regulations are also driving AI-based monitoring and resource scheduling solutions. Mining companies are teaming up with AI technology companies to create custom applications. Manpower shortages in remote mining sites further speed the use of AI-based systems. Finally, growing investor interest and government efforts for digital transformation are adding to the momentum of AI in the mining industry.

> AI in Mining to Hit $4.18B in 2024, CAGR 22.4% Through 2035”
>
> *Orion Market Research*

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Market Trends

Predictive Maintenance with AI

The mining industry's artificial intelligence market is growing at a very fast pace, owing to improvements in predictive maintenance technologies. Predictive maintenance technologies leverage real-time data to forecast equipment failure before it happens, lowering downtime and operating costs. These predictive maintenance solutions employ machine learning algorithms for the analysis of enormous amounts of sensor data strapped on mining equipment, such that maintenance schedules and resource allocation can be made by the operators in a well-informed manner. Artificial intelligence is used to enhance aggregate production by streamlining mining activities such as drilling, transportation, and ore processing. Through prevention of accidents precipitated by defective equipment, such a preventive process not only boosts mining production & security. Through the provision of capability for machines and robots to perform autonomously, AI in mining also drives innovation toward automation that eliminates human touch and attendant risks. Greater investment in AI technology will follow the increasing demand for sophisticated AI models as the market matures. An instance, a company that provides AI-driven products for the mining industry is Caterpillar Inc., providing AI-powered predictive maintenance and autonomous haulage for mining operations.

Autonomous Mining Operations

The mining market for AI is growing rapidly, led by the development of autonomous mining. Artificial intelligence technologies are being adopted by integrating into most processes to enhance efficiency in operations, lowering costs, and enhancing safety. These include predictive maintenance, ore grade control, real-time data analytics, and autonomous haulage systems. AI facilitates decision-making to an optimal level using sophisticated machine learning algorithms and neural networks based on deep learning that interpret huge amounts of data from mining operations and machinery. AI minimizes dependence on human labor in dangerous conditions, thus enhancing the safety of workers. AI promotes environmental sustainability by maximizing resource use and reducing waste. The adaptability and scalability of AI-based solutions render them appropriate for both underground and open-pit mining operations. The adoption of AI is fueled by innovations in cloud computing, IoT, and edge analytics. Governments and regulatory agencies are also promoting digital transformation in the mining sector through policies. Consequently, the mining industry is growing more inclined towards adopting AI for innovation and competitiveness.

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Regional Outlook

Strong Presence of Key Market Players in Asia-Pacific

The Asia Pacific AI in Mining market is experiencing robust growth, driven by increasing investments in mining digitalization and automation activities. Rapid industrialization and urbanization in developing economies such as China, India, and Indonesia are increasing the demand for mineral resources, and mining firms are adopting AI-powered solutions to enhance productivity. Regional governments are encouraging technology uptake in mining with supportive policies and digital infrastructure building. The adoption of AI is facilitating real-time monitoring of mining activities, predictive maintenance of equipment, and enhanced safety procedures. AI is contributing significantly to optimizing ore grade control and optimizing supply chain logistics. Growing labor expenses and safety concerns are promoting the use of autonomous machinery and intelligent systems. Further, greater emphasis on green mining is encouraging operators to utilize AI for monitoring the environment and evaluating impacts. AI-driven solutions are helping companies reduce energy consumption and waste disposal. Increased partnership between technology vendors and mining houses is promoting innovation.

North America Holds Major Market Share

The North America AI in Mining industry is witnessing historic growth owing to the rising demand for automation and operational efficiency in mining operations. The advancement of artificial intelligence technologies such as machine learning and computer vision is helping mining companies optimize the extraction of resources, enhance safety, and lower their environmental footprint. AI is being driven by the need to process data in real-time and perform predictive maintenance, which improves equipment availability and operating expenses. In addition, the integration of AI with robotics and remote sensing technologies enhances the efficiency of exploration and drilling operations. According to the United States Environmental Protection Agency, in October 2024, the US Geological Service estimates there are over 11,000 active mines in the United States, ranging from sand & gravel pits to coal and gold mines. There are also thousands of inactive mines scattered across the country. Regulatory demands to ensure safer working environments for staff and reduced emissions are driving the adoption of AI. AI is being employed by companies to analyze geologic data and make mine planning decisions more effectively. The push to digitize the mining industry is creating the right environment for AI solutions. Komatsu Ltd., a company that delivers AI-driven predictive maintenance solutions through its SMARTCONSTRUCTION platform. The platform utilizes AI to gather and analyze data from heavy machinery, providing insights that help avoid breakdowns and optimize machine performance.

Market Segmentation and Growth Areas

Software Segment is Expected to Dominate the Market, Holding the Largest Share

The Artificial Intelligence (AI) in mining industry is growing rapidly, led mainly by the development

of software solutions that improve operational efficiency, safety, and productivity. AI-based software applications are being increasingly used for predictive maintenance, mineral exploration, ore grade estimation, and autonomous equipment operation. These technologies enable mining companies to process huge datasets in real-time, enhancing decision-making and minimizing operating risks. Combining AI with Geographic Information Systems (GIS) and Internet of Things (IoT) sensors has further enabled remote monitoring and data gathering to become convenient and streamlined. Machine learning-enabled software solutions can predict equipment breakdown well in advance, leading to decreased downtime and maintenance costs. In addition, AI is utilized to monitor the environment and adhere to safety standards. Pressure to meet demand for smart automation in mining is compelling software companies to develop scalable and versatile solutions. Stepping up investment by mining houses in digital transformation initiatives is driving growth in the AI in mining market.

The Equipment Maintenance Segment is Expected to Capture a Significant Share of the Market

The AI mining market is growing exponentially, owing to increased use of predictive maintenance in mining machinery. Mining operation depends heavily on the reliability and performance of heavy machinery, and unforeseen downtime can cause an enormous loss of money. Artificial Intelligence facilitates the recognition of possible failure at an initial stage through tracking and analyzing the performance data of equipment in real-time. It enhances operating safety and efficiency, along with reducing the cost of maintenance. Predictions of wear on parts are possible through machine learning models based on comparing history to determine trends and automating maintenance schedules. Consequently, mining companies increasingly utilize AI-based asset management solutions. The use of AI also enables remote operations, particularly beneficial in dangerous mining locations. Furthermore, the integration of AI with IoT devices improves the precision of information and decision-making. The focus on sustainability as well as saving costs further accelerates the adoption of AI in the mining sector.

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Market Limitations and Challenges

•Data Availability and Quality Constraints : The performance of AI-based solutions in mine operations significantly relies on the quality and availability of real-time, high-quality data from different sensors and systems. Most mine sites, especially those located remotely or in developing countries, are deprived of adequate digital infrastructure or have outdated machinery that is incompatible with complete data capture. This undermines the ability of AI algorithms to make accurate predictive analysis and process optimization.

•Resistance to Technology Adoption and Workforce Readiness : Implementation of AI technology in traditional mines is typically met with organizational resistance, owing to cultural resistance and fear of job lossThere exists an enormous gap in current skill sets to work with, analyze, and

maintain AI-driven systems. A substantial amount of money needs to be spent on training and change management, stretching the timescales of roll-out and lowering the return on investment.

Market Players Outlook

The major companies operating in the global AI in mining market include ABB Ltd., Google LLC, IBM Corp., Microsoft Corp., and Siemens AG among others. Market players are leveraging partnerships, collaborations, mergers, and acquisition strategies for business expansion and innovative product development to maintain their market positioning. For instance, Hexagon AB offers a portfolio of AI-driven mining solutions that improve safety, operational efficiency, and productivity. The principal products comprise HxGN MineProtect, HxGN MineOperate, and HxGN MinePlan.

Recent Developments

•In February 2025, Researchers from the Fraunhofer Institute for Laser Technology ILT have teamed up with project partners to develop an AI module to help with laser material deposition. This technique is used to repair worn bucket teeth and other tools used in mining. The partners of this project are Canadian companies and research centers. There is a tremendous amount of wear and tear on mining machines. Typically, worn or dull rock crushers and rock chisels are melted and new buckets are used in place of them. Lastly, that is expensive and wasteful.

•In February 2025, Sandvik AB offers WearApp is a new AI tool for the mining and construction industry. It enables customers to make unprecedented maintenance decisions and significantly improve operational efficiency. The WearApp app has been developed by Sandvik to give its mining and construction customers unparalleled maintenance information about the screening media on their rock processing equipment. Enabled by AI, it accurately predicts wear rates and remaining lifespans.

•In September 2024, Hexagon's AI-powered Blast Movement Intelligence is set to transform blasting outcomes in mining. In partnership with Augment Technologies and through the integration of an AI-driven blast movement engine, Hexagon BMI has been proven in real mining conditions. Boosting blasting efficiency and providing high visibility into ore dilution for informed ore and waste delineation post-blast, it safely produces an accurate block model of the muckpile and ultimately maximizes yield.

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Some of the Key Companies in the AI in Mining Market Include-
- Accenture PLC
- Autonomous Solutions, Inc. (ASI)
- Caterpillar Inc.

- Cortex Logic
- Dassault Systèmes S.E.
- General Electronic Co.
- GoldSpot Discoveries, Inc.
- Hexagon AB
- Hitachi Construction Machinery Co., Ltd.
- Infosys, Ltd.
- Komatsu Corp.
- Metso Corp.
- MICROMINE
- Minerva Intelligence, Inc.
- Motion Metrics International Corp.
- Newtrax Technologies, Inc.
- Petra Data Science
- Rio Tinto Group
- Sandvik AB
- SAP SE
- Schneider Electric SE
- Tenova S.p.A.
- Wipro Ltd.

AI in Mining Market Segmentation Analysis

Global AI in Mining Market by Component
- Hardware
- Software
- Service

Global AI in Mining Market by Technology
- Machine Learning
- Computer Vision
- Natural Language Processing
- Robotics
- Data Analytics

Global AI in Mining Market by Application
- Exploration
- Geology
- Ore Sorting
- Equipment Maintenance
- Safety And Risk Management
- Autonomous Drilling
- Hauling

Regional Analysis
- North America
  - United States
  - Canada
- Europe
  - UK
  - Germany
  - Italy
  - Spain
  - France
  - Rest of Europe
- Asia-Pacific
  - China
  - India
  - Japan
  - South Korea
  - ASEAN Economies (Singapore, Thailand, Vietnam, Indonesia, and Other)
  - Australia and New Zealand
  - Rest of Asia-Pacific
- Rest of the World
  - Latin America
  - Middle East and Africa

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