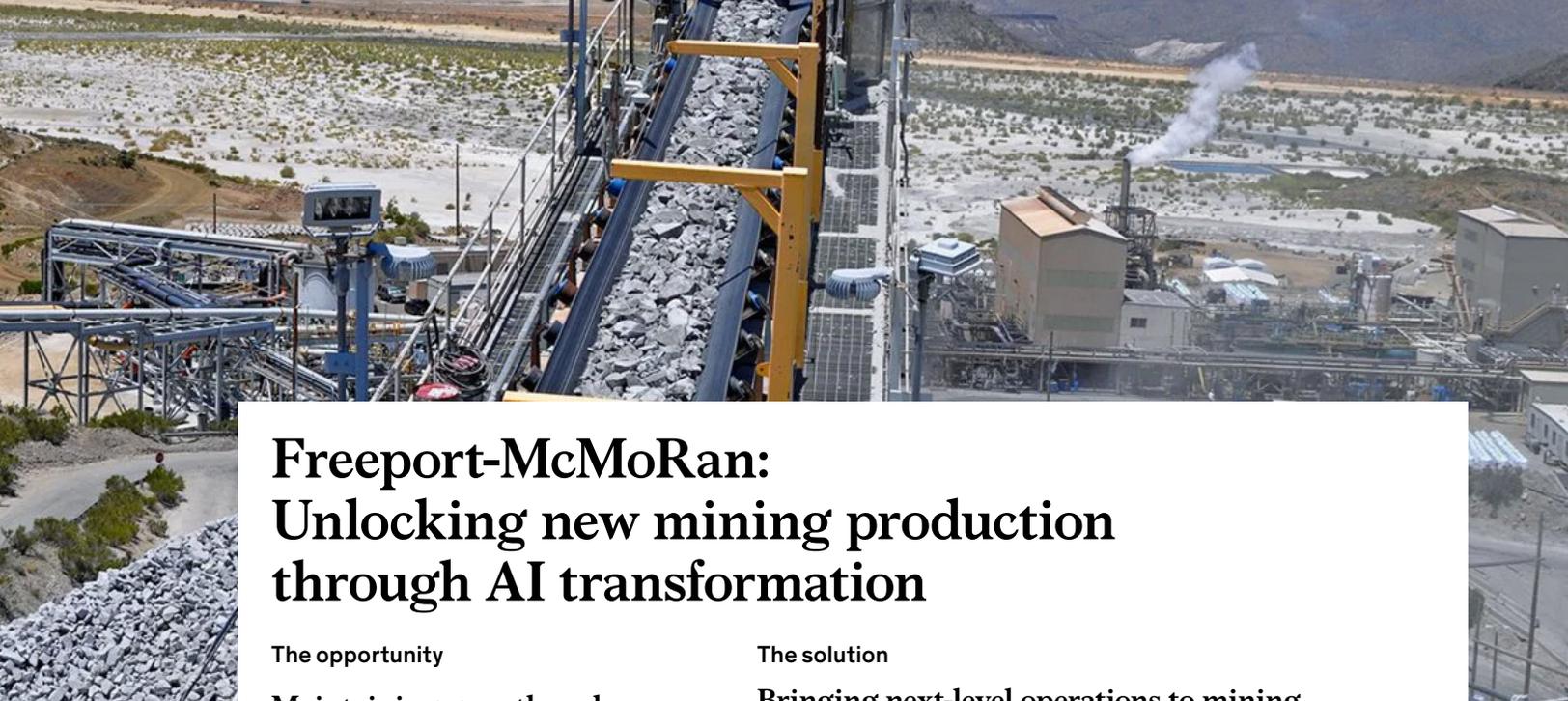


McKinsey
& Company



Rewired in Action

Real world examples of Digital and AI transformations
and how leading companies succeeded



Freeport-McMoRan: Unlocking new mining production through AI transformation

The opportunity

Maintaining growth and production despite rising costs

Freeport-McMoRan, one of the world's leading mining companies, faced a dilemma. To maintain growth in its Americas copper operations, it needed to increase production. But with a portfolio of mature mines and aging technology, it was looking at significant cash outlays and lengthy permitting to open new mines. The alternative was to increase copper production from the mines it had. Freeport believed the answer would lie in improving operations with advanced analytics, but it lacked the technology skills and capabilities to design and deploy AI at scale.

“One of the key things that McKinsey brought to the table was developing the model with the users in the room, so that they’re building ownership and conviction right from the very get-go. This helped with the acceptance and the adoption, creating co-ownership across the team”

- Cory Stevens, President, Mining Services

The solution

Bringing next-level operations to mining with data and AI

Data engineers, metallurgists, and mining engineers from Freeport collaborated with McKinsey's data scientists and experts to improve operations at a single aging mine in Bagdad, Arizona. The goal was to create a digital solution that could improve every aspect of operations, prove its value, and be easily scalable to all Freeport's mines. This was the start of agile and analytics journey for Freeport.

McKinsey helped Freeport create a digital roadmap using AI, advanced analytics, and agile work methods to increase productivity at every step of Freeport's processes. The new approach favored minimum viable products that could be continuously improved, rather than the traditional goal of “perfecting” a solution before it was deployed. To entrench this capability, McKinsey brought in agile coaches to train teams to operate faster and better.

Freeport had a big leg up for its AI transformation because it had built a central cloud-based data architecture. A key component was a data warehouse to store the data collected from sensors installed on the company's trucks, shovels and stationary machines, allowing Freeport to capture second-by-second performance readings. It used that data to train an AI model custom-designed and built by McKinsey to find operational improvements that could increase output at lower cost. Instead of running the plant at a single setting all day, Freeport could now adjust settings every hour to maximize production from a given type of ore, quickly boosting production by 5-10%. The amount of additional copper production Freeport is projected to unlock over five years is equivalent to one new processing facility without the eight to ten year wait to bring a new facility online. Once the AI models were built in a modular way, Freeport was able to easily adapt and scale throughout its mines in the Americas.

The Impact

200 million

Increase in pounds in annual copper production across mines

\$350-500M

EBITDA improvement by scaling AI

\$1.5-2B

The cost of a new processing facility that was avoided

Lessons learned



Strategic Roadmap

Drive the transformation from the top

Leaders at Freeport played a crucial role in cultivating a culture of experimentation and an openness to change. They encouraged teams to take bold leaps when creating innovative solutions, paving the way for new ideas and new approaches to problem solving.



Talent

Harness your talent's full potential through cross-functional collaboration

Through adoption of an agile mindset with cross-functional teams, Freeport transformed its operating model. This shift allowed it to tap into more of its talent and encouraged individuals to approach problem-solving in new ways and fostered collaboration throughout the organization.



Technology

Design for scalability

Freeport was able to scale faster with modularized tools and a common platform. Sixty percent of the core code could be easily reused. While the rest had to be customized for each site, the centralized code base simplified the process, enabling faster adoption.



“Modern mining is a complex and technical undertaking. Technologies such as cloud, centralized data warehouse, wireless mesh networks, and IoT sensing, allowed us to bring the data closer to the field and learn from past experiences”

– Bertrand Odinet, Chief Information Officer and Chief Innovation Officer

“We put in the recommended AI engine and saw 10% improvement in production. And we thought if we do the implementation at all seven of our sites right, it's almost like having a brand-new plant without having to go through permitting process and disturbing a new area. It's in the billions of dollars that we're offsetting by going through the transformation.”

– Cory Stevens, President, Mining Services

“We learned things we'd have never predicted. The project taught us to be more receptive to what the data was telling us. And it gave us the confidence to try more complicated analyses.”

– Bertrand Odinet, Chief Information Officer and Chief Innovation Officer

Video link and case story

<https://mckinsey.com/rewired-in-action-freeport-mcmoran>