Emirates Global Aluminium: Leading the industry with AI-driven transformation

The opportunity

EGA saw a chance to gain a competitive advantage by embracing AI

One of the secrets of successful organizations is they never grow complacent. No matter how well they are performing, they are always looking to get better and are always fortifying themselves against the next disruption. Emirates Global Aluminium (EGA), based in the UAE, is a case in point. Although EGA makes the UAE the 5th largest aluminium producing nation globally and is biggest industrial company in the country outside the energy sector, EGA knew it could—and must—do better.

The company could see that technology and innovation were evolving exponentially, transforming industry after industry— and would one day soon come for the aluminium industry. As CDO Carlo Nizam put it, “Speed, agility, efficiency and technology mastery are now core attributes for the future.”

To secure its position in that future, EGA was determined to catapult itself forward and lead the coming disruption in aluminium production. It aspired to deliver improved financial results for stakeholders, a safer more engaging workplace and greater experiences for employees, and to help its region become a leader in digital technology and sustainability. Over time, EGA believed it could also push forward the development of its industry by making its digital platform available to the rest of the ecosystem.

EGA knew it needed to think big. Its ambitious goals demanded that. So did its operations. The company produces 4% of the world’s aluminium, employs more than 7000 people, and serves customers in more than 50 countries. Moreover, aluminium production is a heavy, energy intensive industry, with smelters that can be multiple kilometers in length. Nothing less than total transformation would have the kind of scale and impact EGA aspired to.

The solution

EGA used the latest in AI and digital to improve existing products and services and innovate new ones

EGA needed to embrace new technology to both improve existing ways of working, but more importantly, to create game-changing new products and services. A technology upgrade alone would not be enough. EGA also needed to transform its culture by fundamentally changing the mindset of its workforce, making the entire organization more agile, faster at innovation, and far more efficient.

To reach those goals and help guide it on its transformation journey, EGA partnered with QuantumBlack, AI by McKinsey, and hired Mr. Nizam, its first ever CDO. From the beginning, the transformation team took a dual track approach so that EGA could rapidly deliver business impact even as it lay the foundations to scale.

To show immediate financial gains, the team set up a digital factory that could quickly turn out use cases in quarterly waves. To date, the factory has delivered more than 80 customized use cases with a combined impact of >$123 million, meaning the transformation program has been self-funding from the start.

At the same time, EGA created an Industry 4.0 Center of Excellence that would build the digital foundations required to sustain and scale the transformation. First was a set of roadmaps of EGA’s digital ambition and potential improvements in each business unit. The second foundation laid out governance and ways of working, including a transition to agile-at-scale. Third was a focus on people and capabilities, including a digital academy that has upskilled more than 3000 employees, including EGA’s engineers and supervisors.

The impact

>$100M

Impact delivered by the change program.

170%

ROI earned over the first three years of the transformation.

+12%

Increase in product throughput.

+18%

Increase in labor productivity

On the shopfloor, EGA uses advanced AI/gen AI, computer vision technology and shopfloor mobile platforms that support more than 20 apps for 1500 users, providing managers with real-time visibility. Better process controls and video-based SOP compliance monitoring with real-time notifications to operators and control rooms have cut down on variability and reduced operator reaction time 92%, which is especially critical for safety related alerts and improved SOP compliance by 65%.

Beyond the plant, EGA's transformation has had impact across the value chain. For example, EGA was able to dramatically improve logistics, which are notoriously volatile, by using a simulation-based digital model of its operations to optimize ship deployment. As a result, inbound logistical delays have fallen by 50%. Its procurement teams are now enabled by gen Ai shifting 30% of time to value-adding activities.

The result of EGA's transformation is an agile manufacturing system able to adapt to volatility while producing a high-quality product. In 2024, EGA joined an elite group of 189 companies designated as the Global Lighthouse Network by the World Economic Forum (WEF). Lighthouse companies exemplify the transformation of manufacturing through the pioneering use of advanced technology.

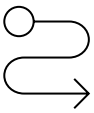
The final foundation was technology and infrastructure. EGA gathers granular data from across its operations. A new data platform democratizes that data, making it available to employees on separate self-service platforms. A new data and hybrid cloud architecture have helped EGA reduce its storage needs by 80% and increased processing speed by 35x. Its data centers use half as much power than previously, all of which runs on renewable power.

Lessons learned

Adoption and Scaling

Start small and aim for quick wins

EGA was determined that its transformation had to deliver immediate value. It started with quick, achievable goals to build momentum and credibility. The program was cash flow positive from day one, building confidence among stakeholders.



Strategic Roadmap

Build the foundations needed to scale

EGA took the time to understand the potential opportunities across the organization as well as the foundations needed to achieve them. By building the fundamental foundations, from infrastructure to talent, it is now in a position to scale quickly and cost-efficiently.

Talent

Scaling digital is about more than technology

Mr. Nizam estimates that technology accounts for only about 50% of a successful transformation. The rest depends on changing culture and behavior. The program should instill greater agility, an openness to innovation, and deliver value to the frontlines.

"Speed, agility, efficiency and technology mastery are now core attributes for the future."

– Carlo Nizam, Chief Digital Officer, Emirates Global Aluminium

"The work with McKinsey has opened a lot of opportunity for us to improve on the AI platform."

– Yousuf Ahli, Vice President Reduction, Emirates Global Aluminium