ACCENTURE METALS
PROCESS REIMAGINED

Together, people and AI are reinventing business processes from the ground up.

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ISOLATED POOLS OF INNOVATION HERALD AN AI-ENABLED FUTURE FOR METALS

In 2017, one of the world's most advanced steelmaking facilities opened in Europe. The fully automated plant has a rolling line that exceeds 500 meters and is controlled by an innovative monitoring system with thousands of data acquisition sensors.

The new plant underlines the potential to transform metals manufacturing processes through "Industry X.O," which involves harnessing advanced technologies including artificial intelligence (AI) and the Industrial Internet of Things (IIoT). But the fact that the plant is also one of the first new specialist steelworks to open in western Europe for several decades underlines something else: that much of the metals industry is still operating with aging assets that make it difficult to harness new technologies.

THE SMART MACHINE REVOLUTION GATHERS PACE

Yet applying technological innovation is something metals companies must do if they're to remain competitive, attract vital skills and retain the knowledge of an aging workforce. And the importance of innovation is further underlined by the rapid change now underway across organizations of all types, as the rising usage of AI and machine learning drives a complete reinvention of the way work is done.

Across the world, organizations are using these technologies to speed up processes, reduce costs and relieve employees of repetitive tasks. But this is only part of the story. By implementing AI solely to save time and money, organizations risk driving away the very people they need to guide and work with these machines to achieve breakthrough results in the future.

A handful of forward-thinking organizations across all industries have spotted this risk and are acting to address it, by creating self-adapting, self-optimizing "living" processes that use machine learning algorithms and real-time data to continuously improve. In Accenture's view, this reinvention and reimagination of processes represents a massive leap forward that will unlock entirely new roles and new ways for humans and machines to work together.

TAKING THE TEMPERATURE OF AI IN METALS

What does it mean for metals companies? Some are already making significant use of smart technologies like AI and machine learning: alongside the new European plant already mentioned, some leading Asian steelmakers are using the IoT and AI to run their manufacturing processes and leveraging highly-tuned wearable technologies to ensure workplace safety. But looking across the industry globally, such bright spots of innovation currently stand out as the exception rather than the norm.

To establish whether this situation is changing, we conducted cross-industry research[1] among more than 1,000 process professionals that are early adopters of AI. Zeroing in on the findings from metals companies, we see that they're using AI to varying degrees throughout the value chain, with 71 percent using it in at least one business process, and over 40 percent using it to develop and manage products and services.
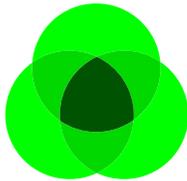
THREE OVERLAPPING LENSES

As explained further in the book *Human + Machine: Reimagining Work in the Age of AI* written by Accenture's Paul Daugherty and H. James Wilson, our research also reveals that leaders and visionaries in this space across all industries—metals included—are harnessing three interrelated dimensions of AI. They:

Reinvent processes: applying AI to manage process change, rethinking standardized processes as continuously adaptive and using AI across multiple processes.

Utilize data: making use of AI and data to solve previously unsolved problems and reveal hidden patterns.

Rethink human-machine collaboration: shifting toward an AI-enabled culture and reskilling employees to work in alliance with machines.

Currently, only a relatively select group of metals companies—just 5 percent of those interviewed, half of the proportion found across all industries—are doing all three of these systematically. A closer look shows metals companies are developing capabilities in the three areas at different speeds:

19 percent are systematically applying AI to reimagine processes and process change.

31 percent are harnessing data plus AI to capture exponential improvements in agility and KPIs.

**37 percent** are rethinking how humans and machines work together.

Looking globally, there are good examples of metals companies pursuing all three dimensions. In terms of reimagining processes, one company is working with SAP to develop solutions in areas including process analysis, machine learning, predictive analytics and production planning. In harnessing data plus AI, another organization is using machine learning and analysis of chemical composition and production data to optimize the consumption of materials during steel production. And in rethinking the workforce and AI, yet another company has created an analytics center of excellence to help embrace data-driven decision-making across the business.

BARRIERS TO OVERCOME...

However, our finding that only 5 percent of metals companies are pursuing breakthroughs simultaneously in all three areas reflects the scale of the barriers to progress. Two factors in particular are impeding metals companies' advance towards greater AI enablement.

The first is that the metals industry is still widely perceived as heavy, dirty and not environmentally-friendly, making it hard to attract innovative young talent. It's also seen as being low-tech, which is a misconception. In reality, the metals and steel industries are highly complex, highly automated industries where precision is paramount. But this message isn't getting across, especially to younger people.

The other—related—barrier is the industry's aging workforce. Many people with the most valuable knowledge, learning and experience in their heads are around 50 to 60 years old. So, a big challenge for the industry is how to capture and retain these employees' learning and knowledge before they retire and take it with them.
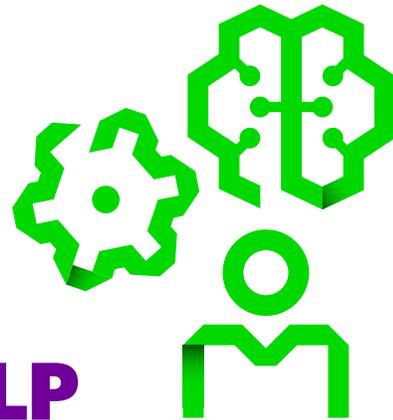
...AND AI CAN HELP

Applying AI and machine learning can help the industry surmount both of these barriers. In the book, _Human + Machine_, the authors highlight the opportunity for companies to empower people and machines to work together in new ways in the "missing middle"—the spectrum of human/ machine alliances and collaboration where each enhances and augments the capabilities of the other.

By getting experienced workers to teach smart machines, companies can capture their knowledge forever, and then apply it to help improve processes. Also, as well as humans augmenting machines, the missing middle offers scope for machines to augment humans— and here AI can help make metals a safer and more fulfilling industry to work in, by taking the strain of physically hazardous and repetitive tasks. Advances such as these will enable the industry to overcome today's barriers and accelerate AI enablement still further.

OPPORTUNITIES ACROSS THE BUSINESS

Looking forward, as adoption gathers pace, we believe the focus of AI in metals will differ from other manufacturing industries like automotive. Why? Because automotive is essentially a discreet, short-lifecycle industry based on assembling components, its use of AI is mainly targeted at customizing the end-product to customer needs by applying robotics and automation.

In contrast, the metals industry is more process based, using raw materials to produce batches that are then sent on to assembly-focused industries like automotive. This means asset availability is critical, and the biggest risk is variability of production. So, the core focus of AI in metals will be on managing continuous production processes to ensure consistently high product quality and equipment reliability. This means using AI in areas like tracking, predicting and managing quality throughout the production process, and eliminating variability by learning from historical data.

The opportunities for AI also extend into customer service. The current processes for handling cases where customers report damaged or substandard product are often slow and cumbersome. AI brings the potential to completely reimagine these processes, for example by videoing the defect remotely and using intelligent machines to identify the problem through a combination of human learning and technical data. AI could also transform industry R&D for new products by using data, logic and learning to understand aspects such as chemical compositions, accelerate testing and analysis, and shorten time-to-market.

Finally, "firefighting" has become a key skill in the metals industry. AI could reduce the need for crisis management by capturing and combining data and decades of experience to help humans make better decisions more quickly, based on reliable facts and predictions on product quality, equipment reliability, upcoming maintenance and more.

THE DIRECTION OF TRAVEL IS CLEAR

As our research underlines, the metals industry is currently lagging behind other sectors in harnessing the power of AI. But it's clear that the momentum of industry innovation is growing and that intelligent, self-learning technologies will play an increasing role. If they haven't done so already, metals companies should take urgent steps to identify where and how AI can generate the greatest value for their business. Those that fail to do this will be left behind—and could face an unwinnable race to catch up in years to come.

References

1   Daugherty, Paul and H. James Wilson. "Process Reimagined: Together people and AI are reinventing business processes from the ground up," Accenture, 2018, www.accenture.com/processreimagined.

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