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Using AI solutions

to unlock the benefits of 4IR in mining and manufacturing
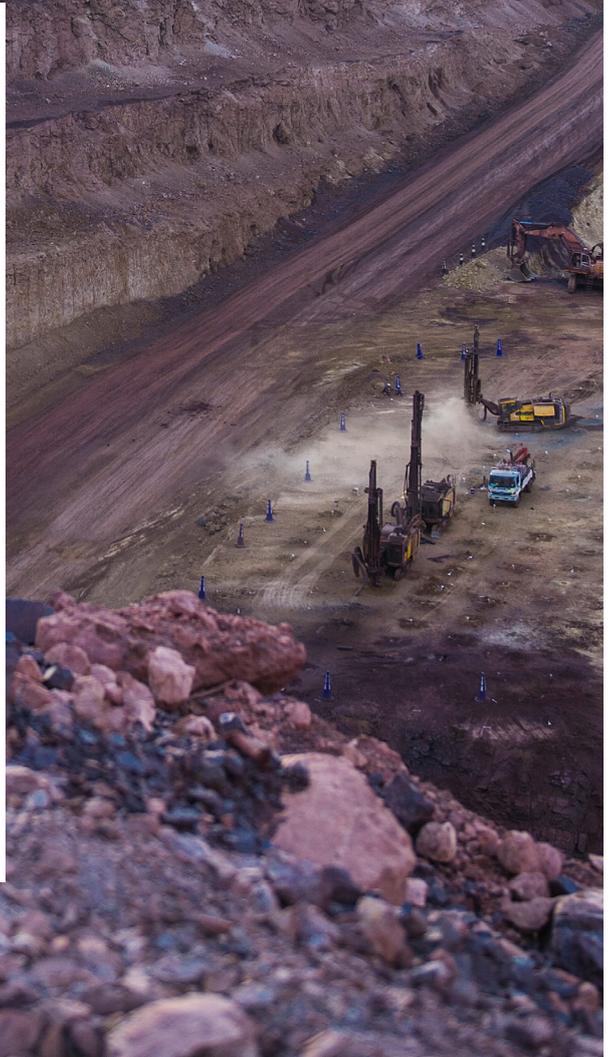
In a volatile market, industry is under pressure to innovate and improve efficiencies

COVID-19 has brought upheaval to the global mining and manufacturing industries, disrupting customer demand and work schedules throughout the pandemic. Companies in these sectors have faced many daunting challenges in this time of social distancing and lockdowns—among them breakdowns in global supply chains, reduced production and poor visibility into the future.

While the impacts vary depending on the sub-sector, there is no doubt that COVID-19 has upended operations and reframed expectations across the board. Some companies have needed to rapidly pivot to new industries or dramatically ramp up production to cater for surging demand in products such as cleaning chemicals, respirators and personal production equipment.

Others are wrestling with volatile commodity pricing. Many have seen demand plunge, resulting in liquidity concerns and stockpiles of inventory they cannot move. For most, the pandemic has created new operational challenges, including the need to implement new safety protocols and equipment as well as the need to ensure continued production while keeping people safe.

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Nine in 10 manufacturing executives in Fictiv's 2020 State of Manufacturing Report reported a direct business impact because of COVID-19, including lower sales, increased costs of materials and production, and cancelled or delayed product launches. Some 87% are making digital transformation a high priority.

The virus outbreak is also accelerating many of the disruptive trends mining and manufacturing companies were facing at the start of 2020—among them, the pressure to reduce carbon emissions,reconfiguration of global value chains, and the never-ending pressure to cut costs and optimiseefficiency.

This all unfolds along with the advent of the Fourth Industrial Revolution (4IR), which bridges the industrial and digital worlds with new technologies that enable mining and manufacturing companies to elevate automation to unprecedented levels. Among the key technologies driving 4IR are the Internet of Things, the cloud, big data and artificial intelligence (AI).

This creates significant opportunities for the mining and manufacturing companies that are able to put in place technology platforms that enable them to be more data-driven, agile, automated and efficient. In this environment, effective use of data and technology will set the leaders apart from the pack.

Forward-looking companies will be accelerating their digital transformation programs, with a view to get end-to-end perspectives of their value chain and ecosystem. Modernisation of their IT infrastructure via cloud platforms that can handle large volumes of real-time data and enable collaboration across the supply chain is just the beginning.

With the right platforms in place, companies will be able to leverage AI for applications as diverse as predictive maintenance, price forecasting, risk management and defect detection. They will also be able to use data to drive smarter decision-making. This will enable them to optimise production, increase resilience and enhance their performance.

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Unlocking the potential of big data
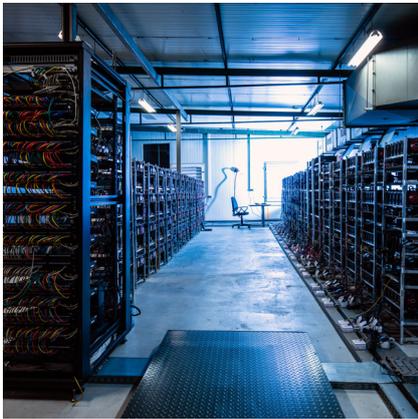
The pace of change in mining and manufacturing demands agile responses from companies, informed by up-to-the-second data. This comes at a time when organisations have access to more and richer data via robots, public databases, geographical information systems, wearables, partners' digital platforms, Internet of Things devices in plants, factories and mines, and more.

Yet many enterprises face major barriers to using today's abundance of structured and unstructured data to drive big data analytics, AI systems and new value chain models. They are wrestling with manual processes, organisational silos and poorly integrated systems—resulting in multiple sources of the truth, inadequate data security and governance, and trapped value.

They also face significant challenges in managing the high velocity and large volumes of data coming into their business. What's more, sharing of data with other members of the value chain is complicated by legacy technology and a lack of standards in the market. Data is often inconsistent and of poor quality, making it difficult to rely on it for insights.

75% of global mining executives agree that COVID-19 has had a significant impact on mining operations, while 65% say they expect fundamental changes to their operational model.

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To use information to make timelier decisions, streamline operations, improve quality, sharpen risk management and respond with more agility to volatile demand, miners and manufacturers need to put in place platforms and processes that enable them to:

Organise and manage data so that it's accessible to people who need it, but secure from everyone else.

Integrate data from multiple sources to provide a single, comprehensive, contextual set of operational knowledge— for instance, applying smart analytics and AI to better predict demand and adapt operations to meet it.

Leverage analytics to gain insights into assets, financials and operational workflows.

DotModus provides AI-powered and cloud solutions that help mining and manufacturing companies to reduce costs and optimise performance across their business. The Google Cloud gives mining and manufacturing companies a flexible framework that enables them to build at a pace that matches the speed of industry change and scale up efficiently.

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Google Cloud

Google Cloud's technology can help any mining or manufacturing firm to better organise its information and make it accessible and useful to those within the organisation and outside it who need it. Google Cloud Platform uses open standards to help enable data sharing and interactive collaboration, while also providing a secure platform.

Data analytics and engineering

As a trusted Google Premier Partner for Data Analytics, DotModus helps miners and manufacturers to use end-to-end big data processing and low-cost data warehousing solutions to uncover actionable insight from just about any data source. We can help organisations to configure a data pipeline that automatically organises data from in-house systems and third-party platforms.

DotModus has partnered with Looker— today part of the Google Cloud platform—to offer enterprises a tool that can be tailored to their workflow and quickly adapt to changes. With Looker, companies can drive a multitude of data experiences, from modern business intelligence and embedded analytics to workflow integrations and custom data apps.

The platform offers a unified interface to access the truest, most up-to-date version of a company's data, even when this data is scattered across multiple business systems that do not talk to each other. With Looker, decision-makers across the organisation get a centralised view of all data and real-time information.

CASE STUDY:

**Anglo American
To streamline data capture and minimise the time it takes to respond to mine risks, Anglo American wanted to automate the processing of the safety checklists each miner hands to their supervisor for approval. DotModus used Google Cloud to build a machine learning powered document scanning solution that does not rely on the availability of tablets or other electronic equipment in the field.**

The automated solution brings attention to risks sooner, streamlines the work allocation process. Improves data capture accuracy and helps Anglo American keep mineworkers out of harm's way. There are more than 60,000 different possible permutations of checklists that can be completed and scanned into the application. The solution can gather and process thousands of forms a day and is now implemented at Anglo American mines in multiple countries.

AngloAmerican

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Predictive maintenance can reduce maintenance costs by 25-30%, eliminate 70-75% of breakdowns, cut downtime by 35-45% and increase production by 20-25%. – The U.S. Department of Energy's Operations & Maintenance Best Practices – A Guide to Achieving Operational Efficiency

https://www.pnnl.gov/main/publications/
external/technical_reports/PNNL-19634.pdf

AI and machine learning

Machine learning algorithms enable mining and manufacturing organisations to identify patterns in vast streams of data that would otherwise be difficult to identify. Companies can elevate automation by feeding machine learning insights into an AI solution that has been empowered to make smart decisions against given criteria.

We help organisations to use machine learning to build cognitive systems that help them to optimise back office, operational, and customer-facing activities. Our machine learning solutions reliably.

learn from the data that they process and improve on their mistakes to ensure outputs and actions that are consistently accurate and relevant.

Some of the use cases include:

▬ Demand and capacity planning —using algorithms to predict customer demand for production scheduling and inventory planning.

▬ Predictive maintenance— continuously monitoring machines using sensors, and then using the data to predict failures and performance maintenance at the optimal time. This helps to reduce unscheduled downtime.

▬ Yield optimisation and quality testing— using AI and machine vision to identify defects (like poor ore grade quality or manufacturing defects) earlier and at a lower cost. This, in turn, helps to reduce yield losses and refine the production process.

▬ Back-office automation— using cognitive intelligence, optical character recognition and machine learning to transform unstructured data (invoices, photographs, forms and so on) into structured data.

▬ Support— AI-powered chatbots and other sophisticated self-service solutions.

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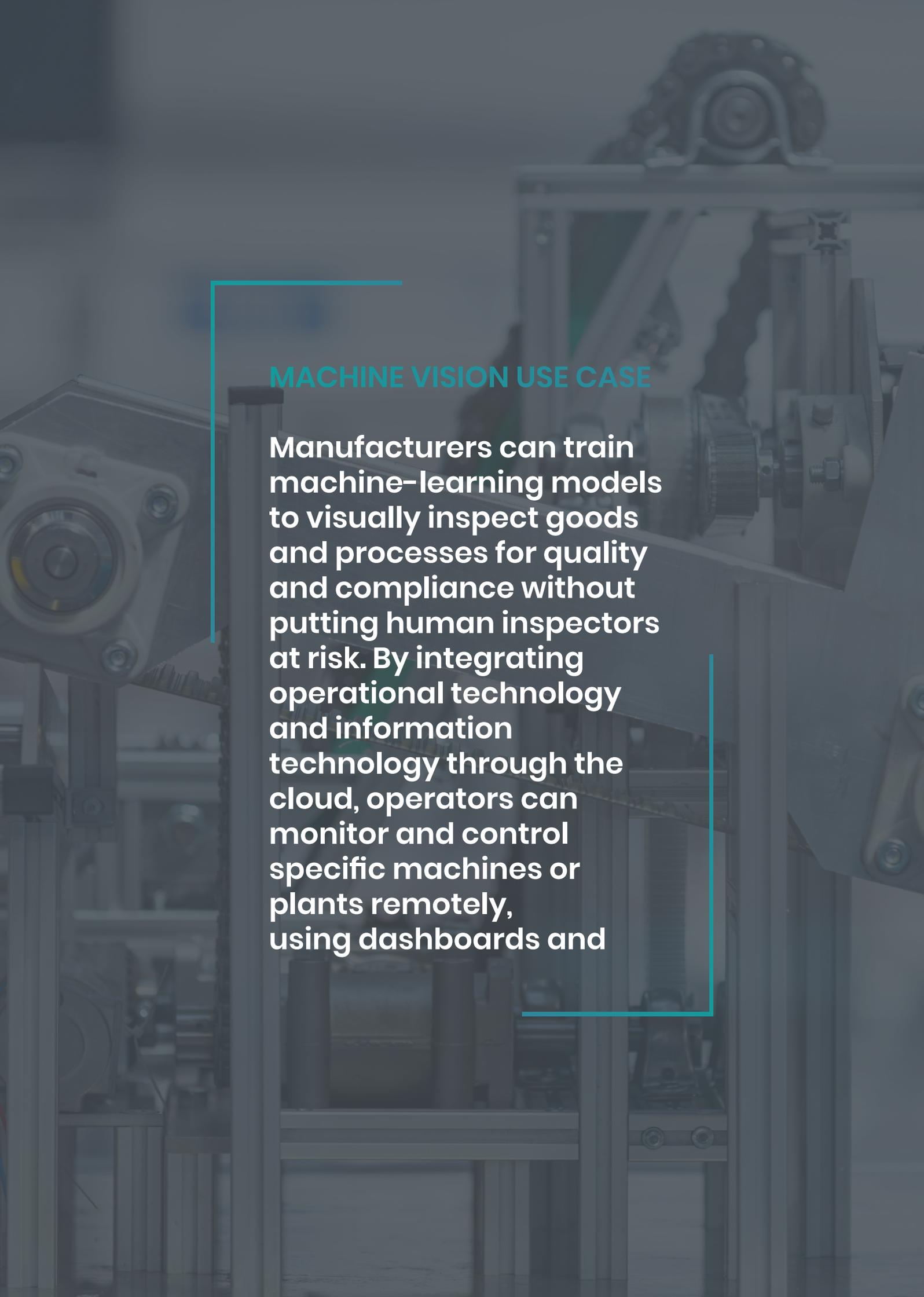
Manufacturers can train machine-learning models to visually inspect goods and processes for quality and compliance without putting human inspectors at risk. By integrating operational technology and information technology through the cloud, operators can monitor and control specific machines or plants remotely, using dashboards and

Collaborating with DotModus to become a data-driven business

Mining and manufacturing companies work with DotModus to become highly efficient, data-driven enterprises. Many clients collaborate with us to use our tried-and-tested methods for collecting and transforming data into relevant and reliable information, in turn driving better business outcomes such as improved health safety, higher operational efficiency, enhanced process accuracy and streamlined decision-making.

Contact us on sales@dotmodus.com to learn more about how our solutions enable you to build a more holistic view across the activities in your business.

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VISIT US
WWW.DOTMODUS.COM

Contacts :
M : info@dotmodus.com
W : www.dotmodus.com

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