

Industry embraces AI capabilities

Implementation of artificial intelligence to transform production of chemicals

↳ Sotirios Frantzas

The term *artificial intelligence* (AI) was among the most used in 2023 following the rapid developments that took place in the field during the year. The use of AI and AI-powered tools by the chemical industry is rapidly increasing, and their utilization is seen as gradually becoming an integral part of the industry's digital transition. The chemical industry is also expected to adopt AI technologies at higher rates in 2024.

Chemical manufacturers are beginning to embrace AI as part of their overall digitalization journey, Andreas Eschbach, founder and CEO of Germany-based software vendor Eschbach GmbH, told *CW*.

"We expect to see more chemical companies integrating AI tools into their systems as they prove their worth and demonstrate a positive [return on investment] ROI in terms of efficiency, process optimization, quality improvement and sustainability. The growth of AI will be driven in large part by ongoing digitalization in the industry, which generates the data needed by AI systems," Eschbach said.

AI encompasses a large set of different tools and programs, ranging from very simple process-automation tools to more complex and comprehensive AI programs for data analysis, decision support and knowledge management, he said.

"Plants can start small, with some simple applications for AI in particular areas of the plant. Eventually, what you're going to see is not a single plant-wide AI system but an AI software stack that sits on top of and supports other tools in the software stack, such as a plant process management [PPM] system that also includes an overall equipment effectiveness [OEE] system. These AI tools will not be something separate to access but will be seamlessly integrated into all plant systems and processes," according to Eschbach.

The chemical industry recognizes the value that can be derived from AI across various business processes, Justin Newell, CEO of Inform North America, an AI and mathematical optimization systems provider, told *CW*.

"[AI] can significantly streamline and improve production processes from predicting raw material costs, monitoring inventory levels, improving inventory planning and management, to demand forecasting, pricing, quality control and safety. It can help a company lower its operating costs and increase revenues," Newell said.



NEWELL: Improving production processes.



ESCHBACH: Enhancing human potential.

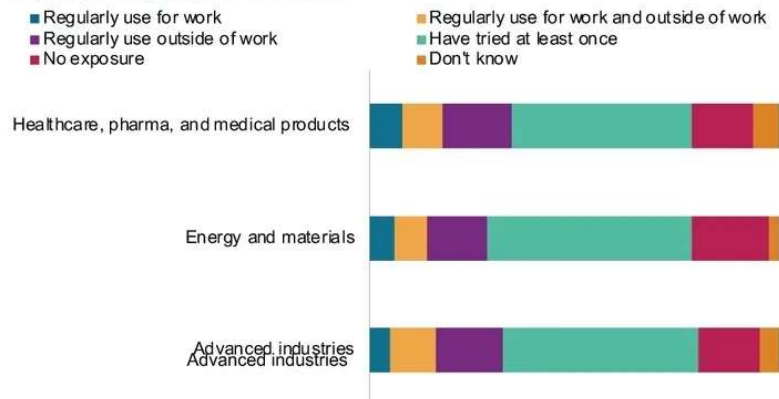
other industries, and with the guidance of an organization with deep AI expertise and experience and AI-powered solutions that have proven track records," he said.

According to Eschbach, chemical manufacturers will be able to produce smarter, safer, more efficiently and with more agility with the use of AI. "The typical plant generates massive amounts of data, including sensor-driven equipment and process data and human-generated data from shift logs, production schedules and inspection rounds. AI allows this data to be discoverable and put to use to drive efficiencies and operational improvement," he said.

AI can be beneficial for a chemical company in many areas such as predictive maintenance, process optimization and demand forecasting, quality control and supply chain optimization, he added.

"One of the biggest benefits of AI is the way

Exposure to generative AI tools



Notes: Respondents across regions, industries, and seniority levels to McKinsey Global Survey in April 2023. Source: McKinsey & Co. © 2024 S&P Global

An IBM survey has shown that only an estimated four out of 10 chemical companies are widely implementing AI because of a lack of AI workforce expertise and of quality data, as well as undeveloped technologies, concerns regarding trust and transparency and uncertainty over ROI, Newell said.

"These can be overcome with more insight and knowledge regarding AI and its impact in

it can be used to augment and enhance human potential. AI can help people sort through vast amounts of data to uncover insights. In the end, communication becomes more transparent, leading to better decision-making. For operators in chemical plants or pharma facilities, communication is critical in day-to-day activities as well as in times of crisis," Eschbach said. ■