

ACCENTURE CHEMICALS

**PROCESS
REIMAGINED**

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

 **accenture**

CHEMICAL COMPANIES STAND READY TO SEIZE THE OPPORTUNITIES OF AI

In organizations across the world, smart machines powered by artificial intelligence (AI) are rapidly reinventing how work is done. It's a major shift being seen in all industries, as organizations leverage these technologies to accelerate processes and achieve lower costs, while also freeing up their employees from repetitive and routine tasks.

Compared to other sectors, chemical companies are at a relatively early stage in their adoption of AI. But this is set to change in the next few years, as the benefits and business case for investments in AI become clearer. As usage takes off, the unique characteristics and challenges of the chemical sector will shape where and how AI is applied.

AI IS ABOUT MORE THAN SPEED AND COSTS

Whatever ways chemical companies use AI, it's clear they have no choice but to harness technological innovation if they're to remain competitive, attract skilled talent and retain the knowledge of an aging workforce. As these imperatives underline, an approach based on using AI just to save time and money will not be enough. Such a strategy will miss out on the full opportunities that AI offers—and also risk driving away the very people companies will need to guide and work with machines to achieve breakthrough results.

An enterprising set of forward-thinking organizations 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 our view, this reinvention and reimagination of processes represents a great leap forward that will unlock entirely new roles and new ways for humans and machines to work together.

TAKING THE TEMPERATURE OF AI IN CHEMICALS

What does it mean for chemical companies? Many are now exploring the potential of AI and machine learning to optimize day-to-day operations, create enhanced next-generation experiences for customers and develop innovative products—as well as improve operational efficiency and reduce costs.

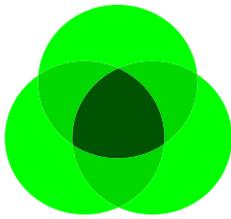
Examples in the marketplace include the use of AI in operations and research to simulate processes to support product development, as well as for maintenance and “smart plants.” Agrochemical companies tend to be most advanced, with some players now providing farmers with AI-enabled services and tools to

empower better operational decisions and help optimize yields.

To help map out AI's usage and impacts going forward, we conducted cross-industry research¹ among more than 1,000 process professionals that are early adopters of AI. Zeroing in on the

chemical companies in our study, we find their usage of AI is advancing, with 61 percent having gone beyond the pilot stage to start implementing machine learning or other forms of AI in their operations, and 91 percent agreeing or strongly agreeing that machine learning-

enabled processes help them realize previously hidden or unobtainable value. And chemical companies that have taken the plunge are seeing big benefits—with 72 percent reporting at least a 2x improvement in some process KPIs, and 37 percent a 5x improvement.



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, research also reveals that leaders across all industries—chemicals 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 chemical companies—just 7 percent of those interviewed, compared to the 10 percent across all industries—are doing all three of these systematically.

A closer look shows chemical companies are developing capabilities in the three areas at different speeds:

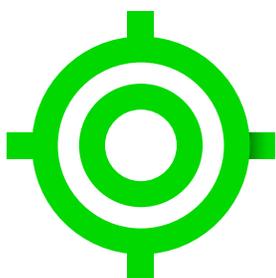
17 percent are systematically applying AI to reimagine processes and process change, compared to 27 percent of companies in all industries and 21 percent across the resources-based sectors.

31 percent are harnessing data plus AI to capture exponential improvements in agility and KPIs, a similar level to 34 percent overall and 33 percent in resources.

45 percent are rethinking how humans and machines work together, exceeding the 39 percent we found overall and 42 percent in resources.

There are good examples of all three lenses in the chemical sector. In terms of reimagining processes, one company is using a digital tool that combines advanced robotics with advanced image technology to predict the performance of marine coatings. In rethinking the workforce, another organization plans to begin flying drones to inspect its plants. And in using data plus AI for exponential gains, yet another company is using data science to determine the attributes of the most successful leaders.

As such advances continue, our research indicates that the area where chemical companies are relatively more advanced than other sectors is in using AI to rethink the human/machine relationship and create new complementary roles for both. This reflects the importance of worker safety in the chemical sector—with one of the main benefits of AI implementations to date being safer operations, for example by reducing the need for human maintenance visits to hard-to-access areas.



KEY FOCUS AREAS

As chemical companies build on their advances to date, we believe three focus areas will be key for them to realize the full benefits of AI and reimagined processes. These are:

The Customer:

Intelligent service agents and virtual agents have seen strong uptake in industries such as utilities. Chemical companies are now exploring their potential, whether as intelligent systems for internal use or service desks for customers.

The Asset:

AI can help manage the core chemical plant asset more effectively, creating an “intelligent plant” that utilizes cognitive

learning to provide predictive insights while factoring in data around asset utilization, asset reliability and so on.

The Worker:

In an intelligent plant, AI can help employees work and collaborate with machines in ways that augment their capabilities and help to keep them safe. Opportunities include using AI, predictive analytics and smart devices to inform workers on what needs to be done with a particular piece of equipment and how to do it.

CHALLENGES TO OVERCOME...

Focusing on these three areas will see chemical companies' use of AI grow rapidly. However, there are several challenges to overcome along the way. One of the biggest is the segregation of operational data that results from chemical companies' current organizational construct, with enterprise IT run by a centralized IT organization, and operational technology (OT) and data run by plants. Integrating these currently separate systems and data to support intelligent technologies including AI is a challenge that companies are working to address.

A further barrier is the chemical industry's engrained culture around investment. When considering investments, chemical companies instinctively think in terms of "big bang" capital projects and building an asset that will last for 20 years. To fully embrace AI, they need to undertake a radical culture shift in their IT and OT organizations, moving toward an acceptance of the need to be nimble and adapt to change incrementally over time.

...AND OPPORTUNITIES IN THE "MISSING MIDDLE"

Another challenge is the industry's aging workforce—an area where AI can make a huge contribution. Many chemical company employees with the most valuable knowledge and experience are aging and even approaching retirement. Here AI can help in two ways. The first is in helping to educate the existing workforce to pivot to new technology-enabled ways of working. The second is in helping to capture and retain experienced workers' learning and knowledge before they retire, by getting experienced workers to teach smart machines.

In the book, *Human + Machine*, the authors discuss other opportunities 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 other. The missing middle offers chemical companies scope to use machines to augment humans with data-driven insight—a dynamic that's widespread in the mining sector with digital twins and the "connected mine," and which will see growing application in chemicals. Notable opportunities also exist in using humans to train AI technologies like chatbots and robotic process automation (RPA) to improve performance, cost-effectiveness and productivity.



FOUR STEPS TO TAKE

So, what should chemical companies be doing now to prepare themselves for a future enabled by reimagined processes?

Our experience and research point to four steps:

- 1. Define what AI, machine learning and reimagined processes really mean for the industry,**
focusing particularly on how these can best be utilized in customer service, the asset-intensive core and workforce management.
- 2. Explore the feasibility of reimagining processes**
through out-of-the-box thinking, using design thinking and other creative techniques.
- 3. Consider the workforce and AI to be complements rather than competitors,**
and reskill the workforce so that AI augments—not automates or displaces—people.
- 4. Develop a single integrated source of data across the organization,**
whether it's numbers, text, images, videos or audio.

Our research shows that the chemical industry has made a measured rather than rapid start to its AI journey. But as usage increases, and reimagined processes begin to emerge across the sector, the pace of progress will increase. The message is clear: chemical companies must embrace the AI opportunity today—or face a struggle 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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