

Beyond Data Science: Driving Industrial Value through Data-Driven Decisions

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ABSTRACT

Artificial intelligence is increasingly delivering measurable impact in the chemical industry, moving from isolated pilots toward embedded analytics across operations, supply chain, and Research & Development. At the same time, a clear industry shift is emerging: while developing accurate models remains important, there is a growing emphasis on realizing sustained value from AI investments. This talk presents a practitioner's perspective on applied AI in the chemical industry, focusing on what is working, what is challenging, and where future opportunities lie. We begin with examples of AI applications that have demonstrated value in industrial settings, including process monitoring, demand forecasting, and computer vision-enabled inspection and automation. These successes highlight a critical principle, *i.e.* value is not created by models alone, but by extracting actionable insights from data and enabling data-driven decisions informed by those insights. It is ultimately the decisions that drive the measurable business impact. We then examine key challenges that continue to limit broader adoption. These include inconsistent

data quality, lack of contextualization across systems, and model degradation under changing environment. Additional barriers arise from difficulties in interpreting model outputs, translating insights into decisions, and embedding analytics into real operational workflows. Finally, the talk explores emerging directions in industrial AI, including hybrid modeling that combines physics and data-driven insights, scalable data infrastructures, and tighter integration between analytics, optimization, and automation technologies. The session concludes by outlining a forward-looking path toward more adaptive, integrated, and decision-centric AI systems that can reliably translate data into sustained industrial value at scale.

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