# The business case for AI in R&D – Accelerating innovation

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Artificial Intelligence is making inroads in laboratories from R&D to manufacturing, living up to much of its hype by generating new insights from more relevant data, harmonising data for use across the full product life cycle, and adding blazing speed to the discovery process.

No longer science fiction, AI is helping organisations today overcome research challenges, such as overly complex workflows, unmanageable data warehouses, and segmented overhead infrastructures that prevent end-to-end maximal use of data that can unite R&D and manufacturing.

Researchers, manufacturing, and quality teams are using AI in their workflows to collaborate around internal proprietary data, as well as external data sources and business drivers that shape scientific discovery and business priorities. Access to high-quality, real-time scientific data – and the advanced analytics solutions needed to interpret that data – is key to building productive teams and the innovations they deliver.

## Lessons from pharmaceutical R&D

Known for its time-consuming, deliberate processes, the pharmaceutical industry seems an unlikely adopter of AI solutions that helped drive its latest, greatest success: the discovery, approval, and deployment of COVID-related vaccines and therapies in only two years.

The industry compressed a decade-long innovation timeline into months by casting aside conventional, sluggish approaches and adopting real-time, digitally enabled access to high-quality scientific data. With other factors at play – such as government financial incentives and emergency use authorisation – the pharma industry used advanced analytics to probe the data behind more than 200 years of vaccine development, and decades of mRNA research, to accelerate COVID-19 vaccine and therapeutic production.

Researchers not only accessed data using AI techniques, they rapidly analysed it and modelled with it. Using predictive analytics to contextualise clinical trial data, they could more rapidly identify vaccine candidates with the highest probability for success. AI platforms enabled life sciences companies at the forefront of COVID research to identify and proactively resolve potential manufacturing challenges and supply chain bottlenecks. The insights also accelerated downstream decision-making, effectively clearing the road for rapid commercial scale-up as soon as formulations were approved.

This AI-fuelled, data-driven approach to collaborative scientific discovery has changed the life sciences landscape, but it isn't stopping there. Researchers at work in laboratories across multiple industries are adopting these lessons, and applying these technologies, to discover new products and enhance existing products – getting innovations to market ever faster.

## How LabVantage brings AI to your lab

LabVantage, a leading provider of Laboratory Information Management Systems (LIMS) for four decades, has significantly expanded the capabilities of its lab informatics platform to incorporate AI-powered solutions.

In addition to our powerful, no-code, configurable LIMS platform – which incorporates an Electronic Laboratory Notebook, a Lab Execution System, a Scientific Data Management System, and performance-enhancing modules – we've integrated advanced analytics from AI and machine learning to Large Language Models and semantic integration and search.

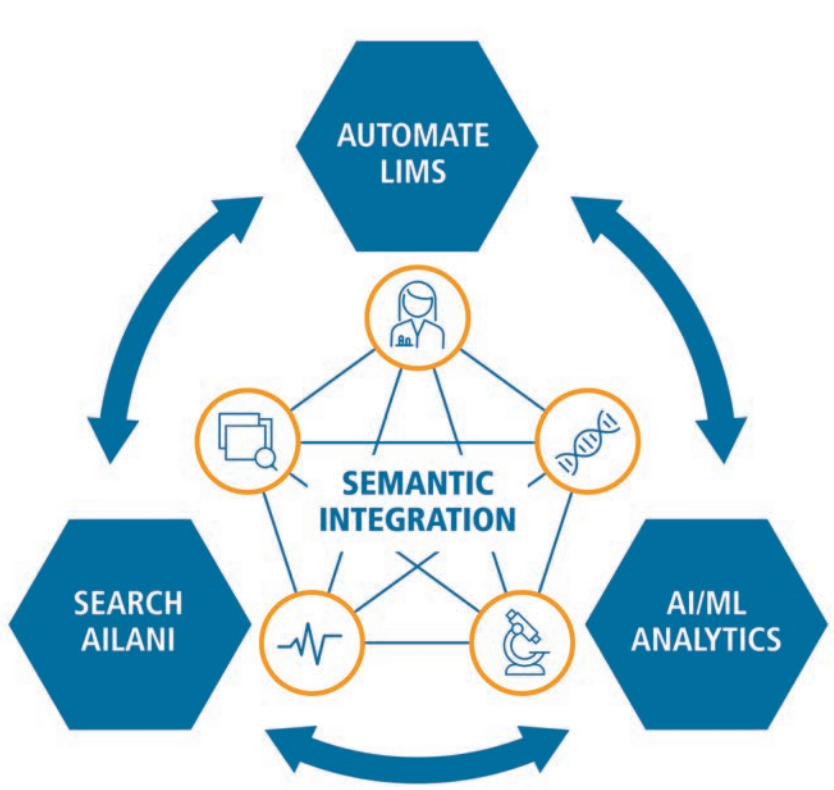
LabVantage Analytics, powered by tcgmcube™, accelerates discovery, increases lab throughput, and reduces downtime by applying AI-powered predictive analytics that yield actionable scientific and business insights. With LabVantage Analytics as part of your technology stack, you gain:

- A single source of truth for internally generated data – both structured and unstructured
- Interactive visualisations and dashboards with drill-down capabilities for greater insight
- A library rich with more than 1,000 statistical and AI/ML models that support low-code AI models, beyond standard BI solutions

AILANI, LabVantage's Artificial Intelligence Language Interface, is a deep learning platform that increases the self-service analytical skills of R&D teams so they don't need to rely on data scientists to dig into the data. Instead, they gain the speed and super-intelligence of advanced AI-driven algorithms that apply to their research. Using AILANI's intuitive interface answers R&D's questions, drawing from proprietary and public data sources.

AILANI is able to:

- Recognise a researcher's intentions and search for contextually relevant information across disparate data sources, enriching insights.
- Discover hidden relationships in data, facilitate groundbreaking research and new discoveries, and foster interdisciplinary collaborations that drive innovation.
- Give teams access to data lake houses – a new data architecture that meets researchers' true need to find and analyse a far more diverse yet contextualised array of internal and external data, regardless of format.




Working together, these solutions from LabVantage deliver value at every step. Lab-driven organisations employing LabVantage AI solutions increase their competitiveness by reducing the time from R&D to new product production. They increase efficiency by enabling the actionability of data through adherence to the FAIR data principle (data must be findable, accessible, interoperable, and reusable). Importantly, innovation is accelerated by empowering analytics and AI in a controlled manner.

## AI is driving growth, accelerating innovation

For organisations looking to unleash innovation and growth, it's time to leverage AI solutions to create a targeted, highly efficient research funnel that dovetails right into your manufacturing operations. A single, integrated lab informatics platform with capabilities for AI/ML, semantic search, and more overcomes challenges and barriers by giving scientists the intuitive tools that help them answer their questions faster and make smarter decisions, while working more efficiently and collaboratively.

These technologies are designed to help organisations of all kinds leverage data to respond more quickly to shifts in market demands, innovate faster, and meet the evolving needs of customers.