



Accelerate manufacturing digitalization



Drive better business outcomes

Pharmaceutical companies are experiencing a fundamental shift in the advanced manufacturing landscape, as they try to keep up with changing demands and ongoing disruption. Adding to these challenges, manufacturers don't have visibility into important business information such as yield, non-conformances and raw material availability across sites. These challenges can negatively impact planning, operations and machine analytics.

The need for digitization is forcing manufacturers to reimagine their operations to fully realize the benefits of a connected ecosystem and improved operational efficiency.

ZS has partnered with Quartic.ai—an enterprise-scale artificial intelligence (AI) platform that advances autonomous manufacturing—to improve how manufacturers in life sciences and healthcare use technology, data and AI to speed up the launch of products and meet sustainability goals.

Creating real-world impact

20%

Improvement in yield, increasing production capacity with the same equipment

49%

Reduction in batch-to-batch variability, improving quality and customer satisfaction

15%

Improvement in cycle time, reducing total energy usage

25%

Reduction in process development (PD) time for your continuous-manufactured APIs

Impact where it matters.®

Increase adoption of Industry 4.0

Together, ZS and Quartic.ai help manufacturers drive resilience, increase adoption of Industry 4.0 and improve predictive decision-making. Engineers, plant head leaders and manufacturing leaders can drive better business outcomes by:

- Using AI to improve real-time decision-making
- Increasing adoption of digital manufacturing
- Shortening lead times for product development and commercialization
- Accelerating approved drug pipelines
- Resolving drug shortages due to manufacturing capacity constraints
- Moving quality from reactive to real time

Quality by design-based PD

Create and capture PD knowledge to model and establish the chemistry, manufacturing and controls strategy to create a foundation for continuous process verification. Increase PD performance, accelerate tech transfer and scale up, and manage design space in real time with process and quality data.

Process analytical technology (PAT) tools automation

Automated PAT analysis can help implement in-line monitoring, minimize transition times between unit operations, support real-time release and enable closed-loop control.

Yield optimization

Increase average yield, reduce loss between units and improve consistency with objective and constraint-based optimization within the operation space.

Asset health monitoring

Establish baseline health for multi-product and recipe assets and unit operations equipment; continuous risk monitoring of critical failure modes and early detection of process-induced faults; and an end-to-end digital workflow for reliability-centered maintenance through machine learning.

Non-conformance monitoring and abnormal event prediction

Identify deviation trends for intelligent quality management systems by using machine learning to discover underlying patterns. Support and implement real-time evidence-based corrective action and preventive action management.

Batch optimization

Continuously improve batch performance and outcomes using a golden batch profile with closed-loop AI.

To learn more about how ZS and Quartic.ai can help you drive resilience, increase adoption of Industry 4.0 technologies and improve predictive decision-making across manufacturing, contact us at SCM@zs.com.

About Quartic.ai

Quartic.ai is an industrial data and AI company building next-gen manufacturing automation for process industries. Quartic.ai is helping manufacturers develop new products faster and run their operations in a continuously optimized and reliable state. Learn more at www.Quartic.ai.

About ZS

ZS is a management consulting and technology firm focused on transforming global healthcare and beyond. We leverage our leading-edge analytics, plus the power of data, science and products, to help our clients make more intelligent decisions, deliver innovative solutions and improve outcomes for all. Founded in 1983, ZS has more than 12,000 employees in 35 offices worldwide.

