

Process Digital Twin for Pharma

Solution overview

With our digital twin solution, pharmaceutical companies can accelerate time to market, reduce costs and improve product quality, with optimized processes in R&D and manufacturing.

Thanks to new digital capabilities such as Internet of Things (IoT), big data, artificial intelligence (AI), and advanced analytics, it is now possible to build advanced digital twins to unlock new value. A digital twin is a virtual and connected model of a process, product or service. This pairing of the virtual and physical worlds allows analysis of data and control of systems to head off problems before they occur, prevent downtime, develop new opportunities and plan using simulations.

Atos and Siemens have developed a pre-integrated process digital twin for pharmaceutical customers to analyze process performance and optimize operations and quality. Using in-line sensors, the solution provides feedback, insights and analysis of near real-time data and can trigger appropriate actions within core Operational Technology/Information Technology (OT/IT) applications.

Increase situation awareness and make better decisions in R&D and manufacturing

Through the implementation of a process digital twin and a platform to host the reusable framework architecture, your R&D department will be able to experiment in-silico with multiple use cases and your manufacturing teams will be able to focus on increasing the quality, profitability and sustainability of their processes.

Achieve operational excellence

- Improve critical quality attributes and process reliability through continuous verification
- Ensure higher yield through cost-optimized manufacturing processes with preventative maintenance, for example
- Ensure better quality of the end product

Control costs

- Lower costs by optimising resources and economies of scale
- Reduce overall batch waste through enhanced in-line monitoring and advanced control strategies for manufacturing processes
- Significantly increase product margins by reducing out-of spec products

Accelerate time to market

- Bring new products to market faster by simulating essential sub-processes and conducting fewer physical experiments
- Implement data-driven process design and optimization to eliminate delays
- Save time and effort with virtual training capabilities using digital twin simulation instead of the productive environment

Atos and Siemens have been working with a large global pharmaceutical company to improve the production process of a vaccine and eliminate wastage of time and costly raw materials. We developed and implemented a process digital twin; this collects real-time data via in-line sensors at each stage of the production process and combines this with physical, chemical and biological models to create a live in-silica replica of the physical process. With the ability to simulate changes and optimize operations, the company has new insights to improve the development and control of the pharmaceutical manufacturing process. The digital twin has enabled the company to significantly improve product quality, make cost savings and achieve faster time to market

A pre-configured and integrated solution

The Process Digital Twin for Pharma is based on a pragmatic and modular implementation approach.

Connectivity / data integration (non-invasive)

- Sensors / Analyzers / Process Analytical Technology (PAT)
- Enterprise systems including ERP, LIMS, MES

Analytics: online process and control model

- Simulation of the essential part of the production process
- Predictive and preventive models recommending control actions

Digital twin frontend (web application)

- Monitor sensor values and process parameters in real time
- 2D/3D visualization of physical process

IoT / analytics platform

- Centralized data management, security, regulatory compliance

A virtual and connected model of the essential production process is created in an incremental approach for quick time-to-value.

Physical Process



Sensors
Analyzers



Actuators
PLC

Live Data



Control



Virtual Process



Continuous
+historical data



Machine
Learning



Process Models



Simulation



To learn more about the solution or contact an expert, visit atos.net/iot or email dialogue@atos.net

Atos, the Atos logo, Atos | Syntel, and Unify are registered trademarks of the Atos group. October 2020. © 2020 Atos. Confidential information owned by Atos, to be used by the recipient only. This document, or any part of it, may not be reproduced, copied, circulated and/or distributed nor quoted without prior written approval from Atos.