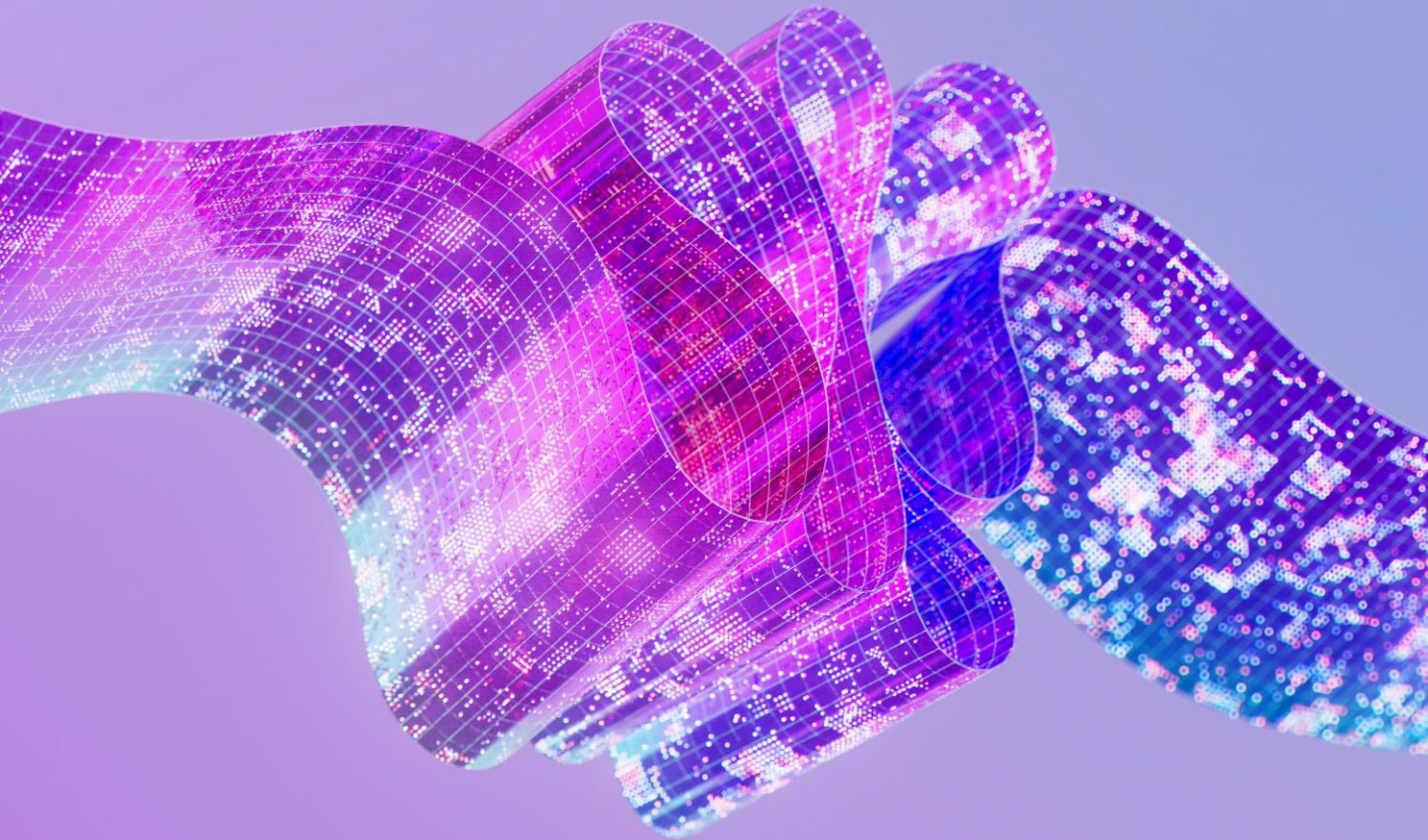


SmartTwin Solution

Accelerate innovation and
faster-time-to-market



In today's hyper-competitive and hyper-connected global marketplace, organizations are finding ways to shrink the gap between their physical and digital worlds in order to get a deeper understanding of complex systems and processes while also finding ways to optimize them. They look to continuously innovate, minimize downtime and pivot quickly to adapt, scale and grow.

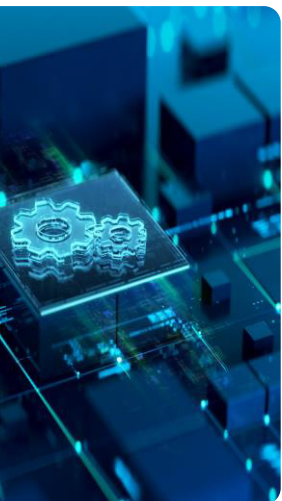


Our solution

The AI advantage for your business

HCLTech SmartTwin is an advanced digital twin solution that's supercharged with AI and GenAI, to help enterprises transform how they interact with the digital and physical worlds. The solution helps create accurate and intelligent replicas of physical worlds comprising assets, processes and products that are constantly updated in real-time to provide AI-powered predictive analytics for enhanced decision making, connected innovation cohesive transformation. The solution provides an in-dept view of risks, dependencies and shifting priorities to give the ability to understand what-if and if-what scenarios. Based on digital simulation, workforce as well as autonomous assets can be trained outside the limits of real-life processes and systems.

The HCLTech SmartTwin solution integrates design systems, physics, process simulation and IoT data into a unified 3D photorealistic view. with AI, Generative AI in a unified, secure and scalable environment spanning the entire product lifecycle, from conceptual design to delivery. Built on NVIDIA Omniverse™ and AI Enterprise and HCLTech's advanced engineering, multi-domain and scalable AI enterprise architecture expertise, it delivers deep insights and proactive decision-making capabilities while safeguarding sensitive data. Leveraging GenAI and synthetic data generation, the solution rapidly simulates diverse scenarios — especially critical in dynamic or data-sparse environments reducing development costs, accelerating time-to-market and ensuring first-time-right reliability.



Solution features

Evolving beyond Digital Twin



Data Utilization

Leverages AI and machine learning to anticipate outcomes, optimize performance and autonomously execute decisions.



Technology Framework

Enhances traditional Digital Twin capabilities with AI-driven predictive analytics, automated decision-making and dynamic system optimization.



Adaptability and Evolution

Continuously learns, evolves and refines its decision-making capabilities over time.



Decision-Making Approach

Operates as an active system, continuously learning from historical and real-time data to make autonomous decisions and predictions.



Primary Applications

Applied in intelligent, autonomous environments such as self-optimizing industrial processes, next-gen manufacturing and mission planning and simulations.

Key benefits

Focus on value delivery

Successful New Product Introduction (NPI):

62%+ increase in success rate with new product introductions through early-stage virtual testing of industrial design

Cost savings:

30%+ increase in cost savings through virtual simulations and optimized processes

Faster time-to-market:

44%+ faster product development cycles through real-time simulations and virtual prototyping

De-risk innovation:

Digital validation of designs and reduced physical prototyping ensure 'first-time-right' launches

Mass customization and scalability:

Easy adaptation of production lines for different product variants or fluctuating demands



Industry case studies

Leading Energy Company Root Cause Analysis of Wind Turbine Drive Train

Objective

The drive trains in wind turbines were failing at a rate higher than anticipated, resulting in increased downtime, maintenance, and warranty costs

Solution

- Connected turbine and drive shaft sensors to an IoT gateway
- Superimposed field conditions on simulation models to replicate actual field behavior
- Identified and validated failure causes with respect to product specifications



Impact delivered

Enabled the simulation of physical product behavior, facilitating significant improvements in product reliability.

Leading Aerospace OEM Digital Twin for tool dispatch process in production

Objective

On the shop floor, manual intervention was necessary to determine the status of tools at drilling stations, complicating communications between drilling robots and tool dispatch robots (TCC). Operators were required to manually transport tools across the hangar, from the TCC to the stations

Solution

- Automated manual shop floor tasks using AGVs controlled by a Fleet Management System (FMS).
- Developed a Composite Twin (Process + Asset Twin) platform to monitor tool status, automatically triggering orders to the TCC for new tools and to the FMS for their transportation



Impact delivered

Achieved a significant increase in productivity through high level automation. Ensured scalability and modularity in operations.

Why HCLTech for your transformation Journey

Proven Industry Expertise and Partnerships

Extensive R&D and New Product Development capabilities leveraged from HCLTech Engineering and R&D Services

Global Centers of Excellence in multiple global locations, offering expert support and innovation labs

Partnerships with NVIDIA, AWS, Azure, Google Cloud, and major engineering software providers (Siemens, PTC, Dassault Systemes, AutoDesk, FlexSim and more)

Rich Domain Knowledge and Global Footprint

Over 500+ customer engagements across Manufacturing, Automotive, Aerospace, Energy & Utilities, Retail & CPG, Transportation and Logistics, Healthcare and Smart Cities

Industry-specific insights and best practices built into solution accelerators and templates

Track Record of Success

Deployed Product Operation Twin solutions for global wind turbine manufacturers and aerospace OEMs, enabling real-time operational visibility and predictive analytics

Delivered an AI-optimized visual analytics solution to enhance operational efficiency for a global aerospace leader

Demonstrated up to 62% more successful product introduction and launches for clients through robust digital twin deployments

Technology and Integration Capabilities

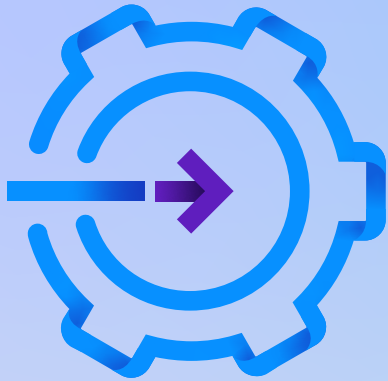
Largest provider in the industry of Ready-to-SIM 3D Assets with specialized robotic programming and AI optimization software development capabilities ensure performance at scale

Endorsements and Analyst Recognition

Recognized by leading analysts for digital transformation and advanced manufacturing capabilities

NVIDIA's Global System Integrator partnership underscores HCLTech's commitment to delivering cutting-edge AI-driven solutions to customers worldwide





Ready to transform your business?

With HCLTech SmartTwin solution, you can unlock unprecedented levels of efficiency, innovation and resilience, across product design, manufacturing, supply chain and beyond.

Contact us today to explore how HCLTech SmartTwin can revolutionize your enterprise operations and drive your next wave of innovation.

HCLTech | Supercharging
Progress™