DIGITAL TWINNING FOR THE HIGH-TECH INDUSTRY

Digital factories offer industrial companies several ways to increase their efficiency. Within the ICT Group we strengthened our expertise and created a consortium of partners to gain the required Industry 4.0 skills and know-how to support our customers' digital transformation journey.
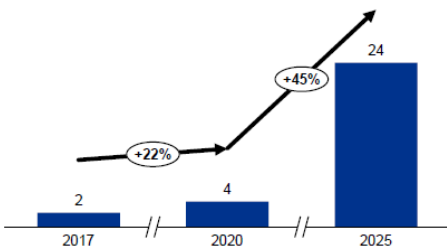
High Tech

ICT Group aims to stretch the boundaries of mechanics and electronics in high tech machines, raising the performance and robustness to the highest level. Thereby supporting our customers to deliver state of the art machines to their customers. As a partner throughout the life cycle, we advise on the best software solutions to be used for this purpose.

A Digital Twin (DT) is a dynamic digital representation of a product, process or person, which analyzes existing business systems using real-world data. It bridges the gap between model and reality, bringing together sensors enabled via IoT technology, connectivity networks and data analytics.

DT a nascent technology slowly entering mainstream use in the industries with complex assets or processes. The high-tech industry is already using DTs. Companies in this sector constantly have to develop faster and DTs are of great help in this.

Creation of a digital twin for complex assets and processes is increasingly adopted in the industries with high value physical assets and R&D projects and which can allow low margins of error.

Digital Twin is a nascent technology slowly entering mainstream use in the industries with complex assets or processes

+22%
+45%

2 — 2017
4 — 2020
24 — 2025

Digital Twins | Design, visualize, optimize
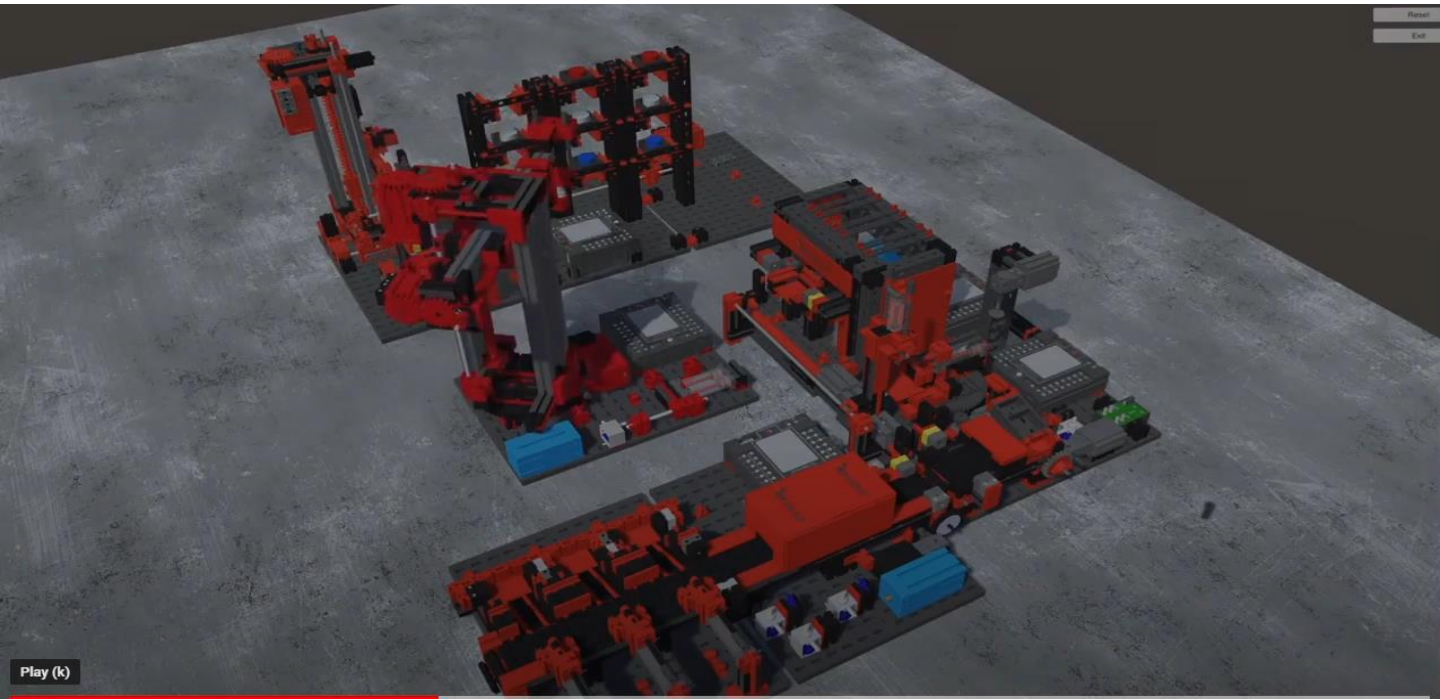
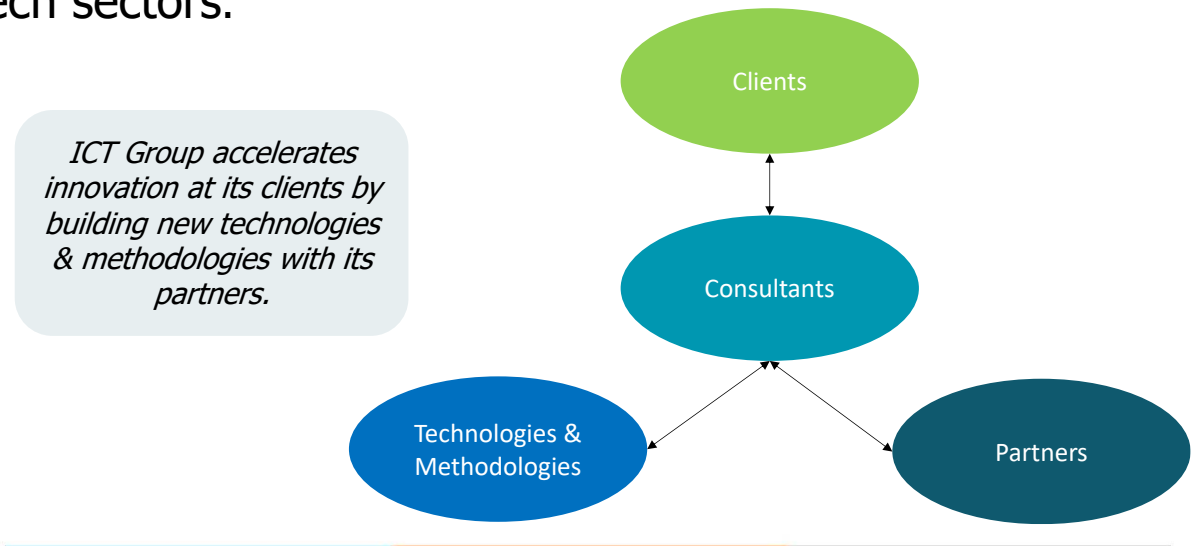*A digital twin for digital engineering*

Based on 3D CAD files, a 3D model is created. Thanks to tools from our partners the 3D model can easily move and act exactly as its physical twin. This technology enables many use-cases, among others:

❑ **Real-time high quality data visualisation**: all data known about the physical twin can be projected onto the virtual twin for interactive visualisation using Virtual Technology (VR) in a fully 3D virtual experience or the virtual twin augments the physical twin with virtual dashboards and 3D models using Augmented Reality (AR), such as the HoloLens. Data include status and variables as well as documentation and 3D visualisation of the entire machines.

Digital Twins | Design, visualize, optimize

❑ **Throughput optimisation**: a Digital Twin also enables optimisations. Experimenting safely in the virtual world to explore the boundaries of the efficiency of assembly lines configurations make it possible to reach higher throughput over a single line as well as an entire factory composed of several lines.

❑ **Digital engineering**: a Digital Twin enables the development and testing of software without the required hardware. Test machines are expensive and overly used. A Digital Twin can act as a complete simulator against which software can be tested at early stages. The hardware test bench is still required but with a reduced scope and time. In combination with model based test automation, a Digital Twin supports better robustness testing.

With our partner, we completed Digital Twin projects at different customers in the manufacturing and the high-tech sectors.

ICT Group accelerates innovation at its clients by building new technologies & methodologies with its partners.

Clients

Consultants

Technologies & Methodologies

Partners

Model Based Test Automation | Test agility

Model based test automation is the next step in efficient testing. The idea is to capture requirements in a model and let the AI of the test generation tool create, execute and analyze test cases. The benefits of using this effective testing techniques include:

❑ **Higher scenarios coverage**: thanks to the automated and random nature of test generation, more scenarios can be tested. This increases the probability to hit corner cases.

❑ **Robustness testing**: in combination with a digital twin, this technique offers the possibility to test more extreme error scenarios and in particular random combination of errors.

❑ **Shift left**: this technique supports early modelling and testing, ensuring that mistakes are found at the early stages of development.

With our partner, we applied Model Based Test Automation successfully in the railway and high-tech sectors.

The challenge for ICT Group is to push the boundaries with increasingly clever software solutions. In this way we can compensate physical imperfections of machines in an affordable manner and raise performance to a higher level. This rapidly moves software from an enabler to the core of processes within the high-tech industry.