

FACT-

CHECK-

ING SIMULATION DIGITAL TWIN

AI
DATA
APPLICATIONS
ROI
IMPLEMENTATION
IOT
TIMING
INTEGRATION
IT
COST
USE

When faced with a transformative technology like Simulation Digital Twins, many business owners and operational efficiency experts find themselves in uncertain territory. Questions about AI, IoT, data requirements, implementation and ROI abound – so what is the truth about this innovative technology?



HOW DO SIMULATION DIGITAL TWINS COMPARE TO AI?

A Simulation Digital Twin is a Hybrid AI technology. Its modeling is not only built with data-based AI but also defined by knowledge-based AI. The way the system evolves - its dynamics with its causal rules, constraints, the interactions of its components - is shaped through human expertise. Predictions are more reliable compared to data-only approaches which are often incomplete and exclude infrequently occurring scenarios. Simulation Digital Twins can simulate scenarios that have never happened before, detect edge cases that would otherwise never be found, optimize action plans for any time scale (for the next minutes or the next 50 years) with the right sequence in which to execute these plans.



HOW MUCH HISTORICAL DATA IS NEEDED FOR A RELIABLE SIMULATION?

Simulation Digital Twins don't require the exhaustive data that AI-based data technologies demand to produce a reliable simulation of the replicated organization. Modeling embeds only the data that is necessary to complement the structure of the dynamics. This requires far less time to be invested compared to solutions that require data exhaustivity. Simulation Digital Twins can also identify the critical data that have the most impact on the organization, giving directions to complement simulation.



HOW CAN SIMULATION DIGITAL TWINS BE APPLIED FOR SMALLER POWER FIRMS?

Simulation Digital Twins can be used by, for example, producers of renewable energy and wind farm managers. Connected to IoT sensors and external conditions, Simulation Digital Twin technology helps power generation operators to optimize the efficiency of their energy production and the planning of wind farm maintenance over the coming weeks, months and years. In addition to monitoring, Simulation Digital Twins also help to predict asset degradation over time and account for operational constraints, weather forecasts and market opportunities in order to optimize operations and maximize overall profit and safety.



WHAT IS THE ROI ON A SIMULATION DIGITAL TWIN?

With Simulation Digital Twins, one energy firm realized a clear and immediate economic return in the range of three to four times the cost of developing and implementing the solution. Another energy company saw double-digit improvements in operational efficiency, 10% reductions in OPEX and CAPEX, and a 20% reduction in operational conflicts. Users benefit from the technology's capacity to align different stakeholders strategically and operationally, improving the agility of the organization and reinforcing a shared vision. As robust planning can be automatically generated, Simulation Digital Twins bring an important increase of planning productivity. What usually takes 2-3 weeks in a manual process can be achieved in a couple of minutes.



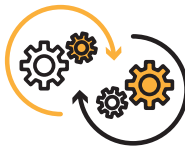
HOW LONG DOES IT TAKE TO IMPLEMENT A SIMULATION DIGITAL TWIN?

Developed to tackle Asset Management energy challenges, Simulation Digital Twins are ready-to-deploy and can easily be configured and customized to relevant use cases without any significant mobilization of client resources. The platform provides a very high level of modeling flexibility to adapt to new requirements or changes without starting over from scratch. As a result, you can start small to meet an initial business challenge with an 8-week implementation, and over time easily adapt and quickly expand the scope of the Simulation Digital Twin when adoption is approved by stakeholders.



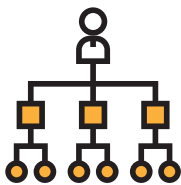
CAN SIMULATION DIGITAL TWINS HELP ME LEVER- AGE MY EXISTING INVESTMENTS IN IOT?

Investments in IoT have added significant value to organizations of all types over the last 20 years. IoT has helped inform decision makers about what has happened and the present state of almost every part of their business. Connecting these IoT devices to a Simulation Digital Twin, however, unlocks enormous additional trapped value and generates a real return on the investment in data. Thanks to Simulation Digital Twins, the IoT data is not only useful for understanding the past and the present of an organization, but also instrumental in the prediction and optimization of the future via the generation and leveraging of synthetic data.



CAN SIMULATION DIGITAL TWINS INTEGRATE WITH OTHER DIGITAL ASSET MANAGEMENT TOOL?

Simulation Digital Twins are designed to integrate smoothly with other asset management solutions. Advanced planning systems, Enterprise Asset Management (EAM) and Asset Performance Management (APM) solutions, computerized maintenance management systems (CMMS) and even traditional digital twins can all be connected to a Simulation Digital Twin which then generates the in-depth insights required by decision makers in complex and uncertain asset management contexts. Cosmo Tech delivers pre packaged pipelines and connectors that enable this integration.



CAN SIMULATION DIGITAL TWINS ONLY BE MAN- AGED BY DATA SCIENTISTS?

Simulation Digital Twins do not require investment in data expertise. Nevertheless, customer expertise in data science multiplies the value and facilitates robustness of scenarios config and post treatment. The software is user-friendly and offers an easy-to-configure platform and readable dashboards. They offer both a high level of configuration as well as ready-to-use “what-if” scenarios and “how-to” optimizations. Out of the thousands of possible parameters, the interface presents only the key parameters to be modified in order to automatically launch an optimization. Resources (Physical Assets, HR, Finance, etc) can be viewed by type, to allow each stakeholder to be a part of the process. All these features make the technology usable for specialists and non-specialists alike.