



**InfiniteFoundry**  
3D Digital Plant

*Delivering efficiency and innovation*

**REAL TIME DIGITAL TWIN PLATFORM**



# EXECUTIVE SUMMARY

## *Pioneering 3D Digital Twin*

**Real-time** 3D virtual replicas + physics-based AI-driven **virtual sensors**

Remote monitoring, process optimization, and automated decision-making

## *Industry Applications*

Manufacturing, logistics, retail, construction, professional sports

Modular layouts, 5G connectivity, AI-driven automation

## *Next-Generation Smart Factories*

Highly automated precision component factories

**2x faster** production, **50% cost reduction**

**Hyper-Customization** – AI-assisted product design & manufacturing

# WHO WE ARE.



**established in 2017**

**32 employees**

**€ 2.3M Revenue**

*pipeline across 3 dimensions*

*€ 5M private customers*

*€ 2M public customers*

*€ 2M public grants*





# Peter Thiel

co-founder of PayPal, Palantir Technologies, Founders Fund,  
and the first outside investor in Facebook

**Technological advancement has narrowed to  
primarily digital realms while progress in the  
physical world has nearly halted since the 1970s**



# MISSION



*Provide efficiency & Innovation*

## LEAN

flexible  
efficient  
problem-solving

## GREEN

save resources  
increase process  
sustainability

## DIGITAL

traceability of parameters  
across entire operation





# THE PROBLEM

Industrial operations face profitability challenges due to limited flexibility, poor optimization, and low resilience to market disruptions.







## WHAT WE DO

We deliver highly customized Digital Twin software that uniquely understands real-time processes at a physical level, generating control code to optimize the performance of people, machines, and robots, driving significantly higher productivity.



# VALUE WE BRING



15% by solving known problems  
25% by solving unknown problems  
(identified by the digital twin)  
10% by improving process automation

100% by simulating change to find  
best configuration  
100% by implementing the change  
through digital twin







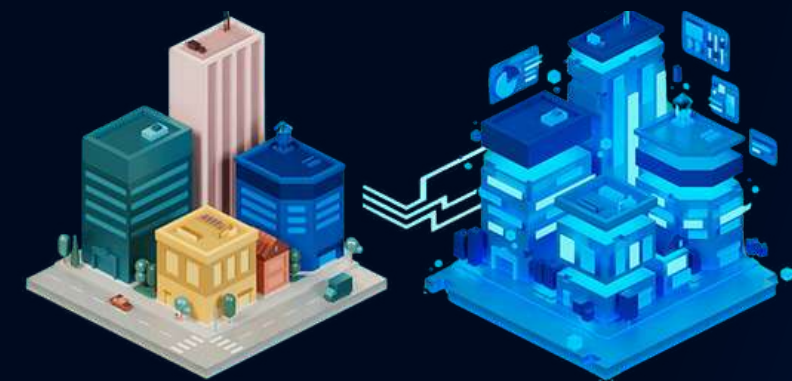
# Revolution in System Control with Digital Twin

## *Centralization of Control in Server and Edge*



IoT with PLC controlling operations

*System Control*  
*Individual process optimization*



Digital Twin controlling and integrating all operations, people, machines, and vehicles

*operational efficiency*  
*flexibility*  
*enhanced coordination*

From PLC to Digital Twin: A New Era in Operations Control and Holistic Transformation of Business



# Revolution in System Control with Digital Twin

## *Centralization of Control in Server and Edge*

Powered by:



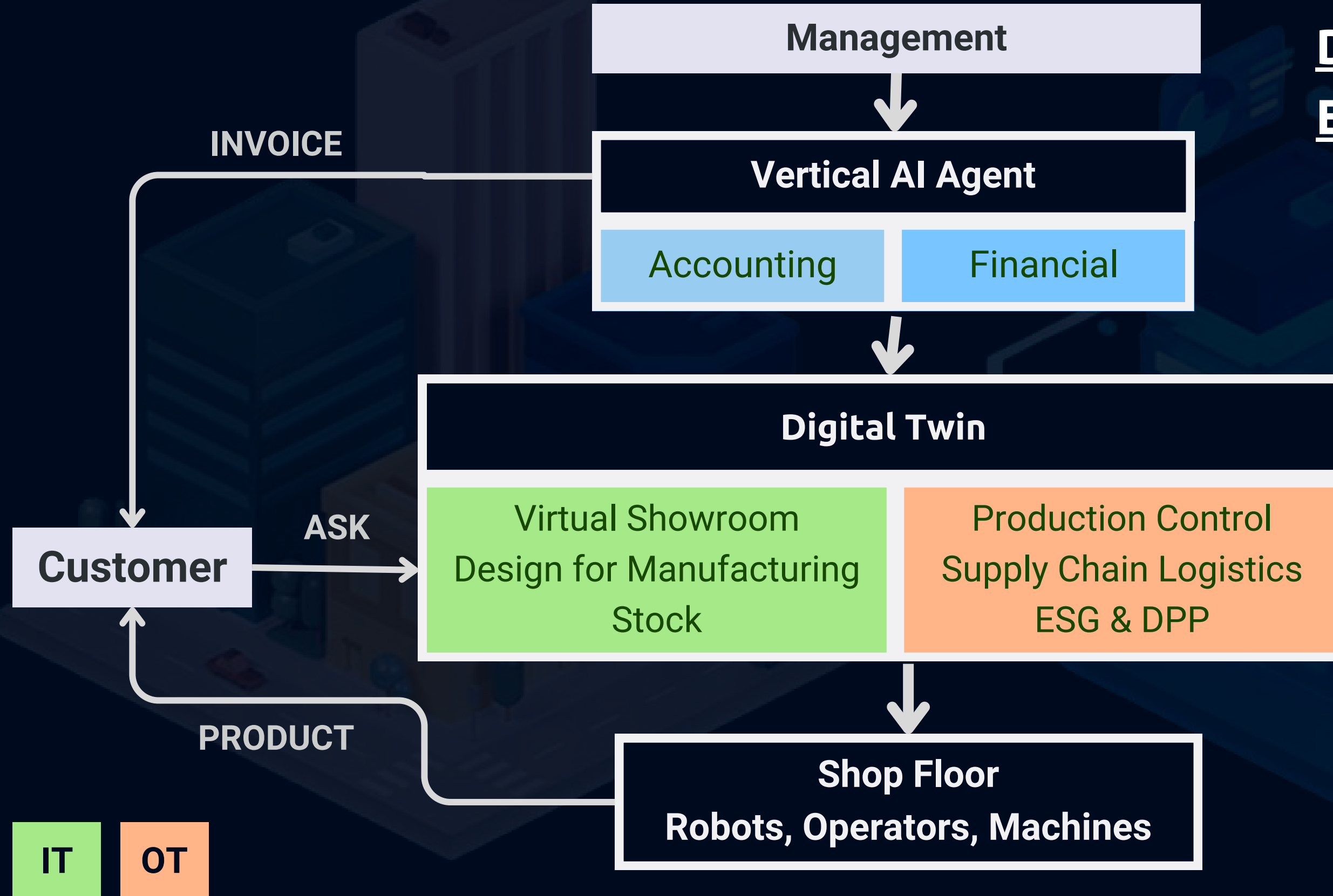
Omnichannel:







# Digital Twin: The Perfect Convergence of IT and OT



## Digital Twin is Reinventing Enterprise IT

- **Simplified IT:** stop retrieving and showing data through multiple applications, simply answer questions
- **Faster decision-making on OT level:** through intelligent operational orchestration directly connected to customer.
- **Cost reduction:** by eliminating redundant software layers and complex integrations

# Vertical AI Agent

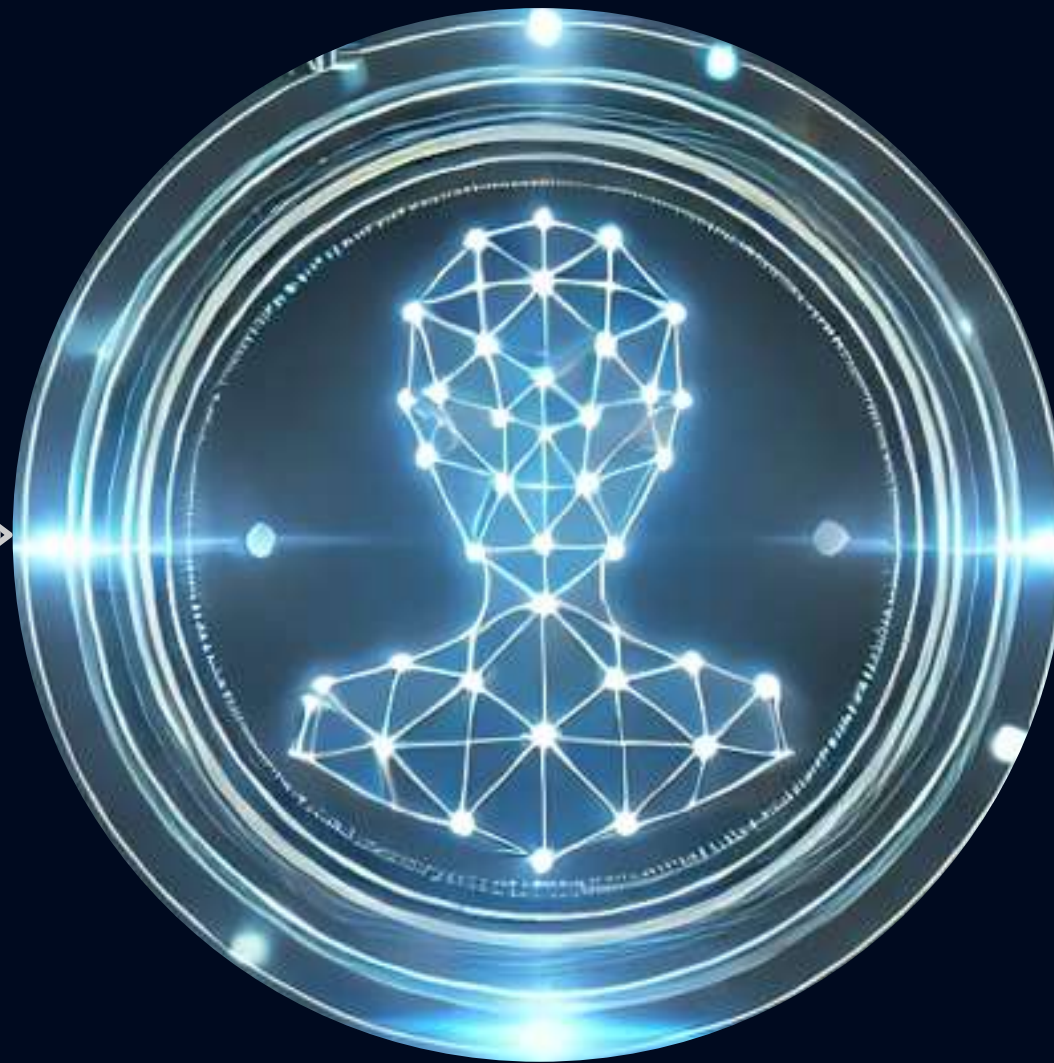
*Seamlessly Connecting Business and Operations*

## Enterprise Data Integration

*Unified access to accounting, sales,  
and HR data powered by Oracle  
Database 23ai*

## Customized AI Models

*Tailored to understand and analyze  
enterprise data.*



## Intelligent Insights

*Optimizes operation with  
business forecast*

## Seamless Integration with Digital Twin

*Synchronizes business and  
operational systems.*





# DATA QUALITY

*Standard AI provides minimal gains, never massive efficiency gains*

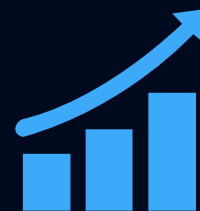
Is your data enough to understand phenomenologically all details of your operation?

**NO!**

Your data is for the machine and operator to know what to do, not for process reengineering.



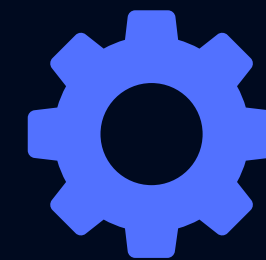
**Digital Twin Intelligence**



**Quality of Data**



**Quality of Knowledge**



**Degree of Implementation**

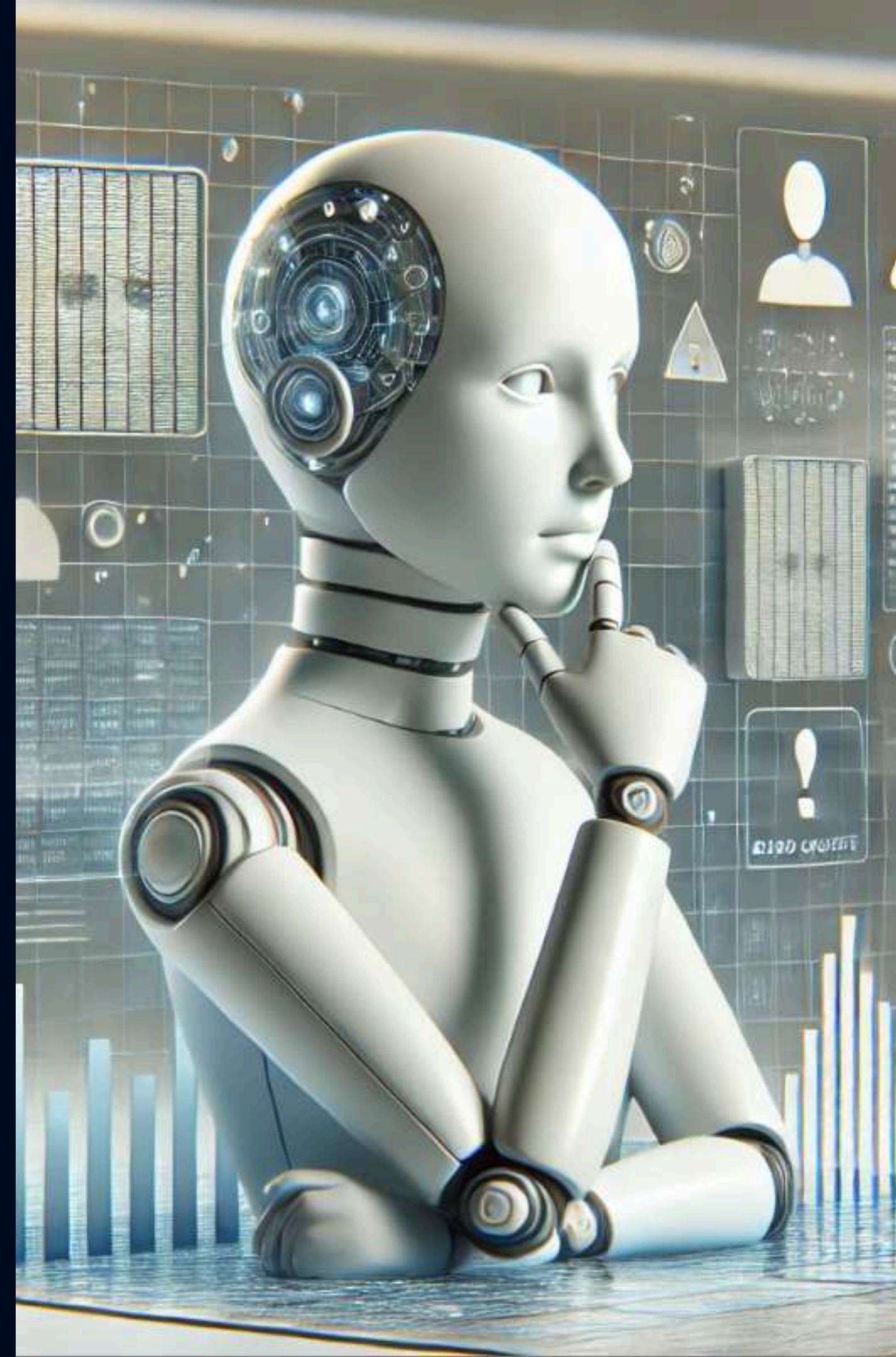
# Unleashing the Full Productivity of AI Agents with Digital Twin Technology

## *The Challenge*

AI agents assume the data they're trained on is high quality. However, many companies operate with incomplete operational tracking, leading to blind spots in the data. This results in AI agents that:

- Learn and automate suboptimal or poorly executed tasks.
- Overcomplicate operations due to flawed assumptions.
- Fail to adapt, perpetuating inefficiencies without realizing competitors may be doing better.

*Training AI agents on **incomplete or suboptimal data** creates **ineffective systems** incapable of delivering true productivity improvements.*





# *The Solution*

## **Digital Twin Integration with AI Agents**

Digital twin technology ensures AI agents are trained on complete and optimized data, transforming their capabilities far beyond automation

### **Complete Operational Traceability**

*Tracks all tasks, even in areas without physical sensors, eliminating blind spots for AI agents.*

### **Process Optimization Insight**

*Provides a phenomenological understanding of tasks and processes to identify the most efficient ways to execute them.*

*Ensures AI agents learn optimal methods rather than replicating inefficient practices.*

### **Continuous Learning & Adaptation**

*Maintains a seamless connection between the digital twin and AI agents.*

*Enables real-time adjustments as the operation evolves with new market conditions and customer requirements.*

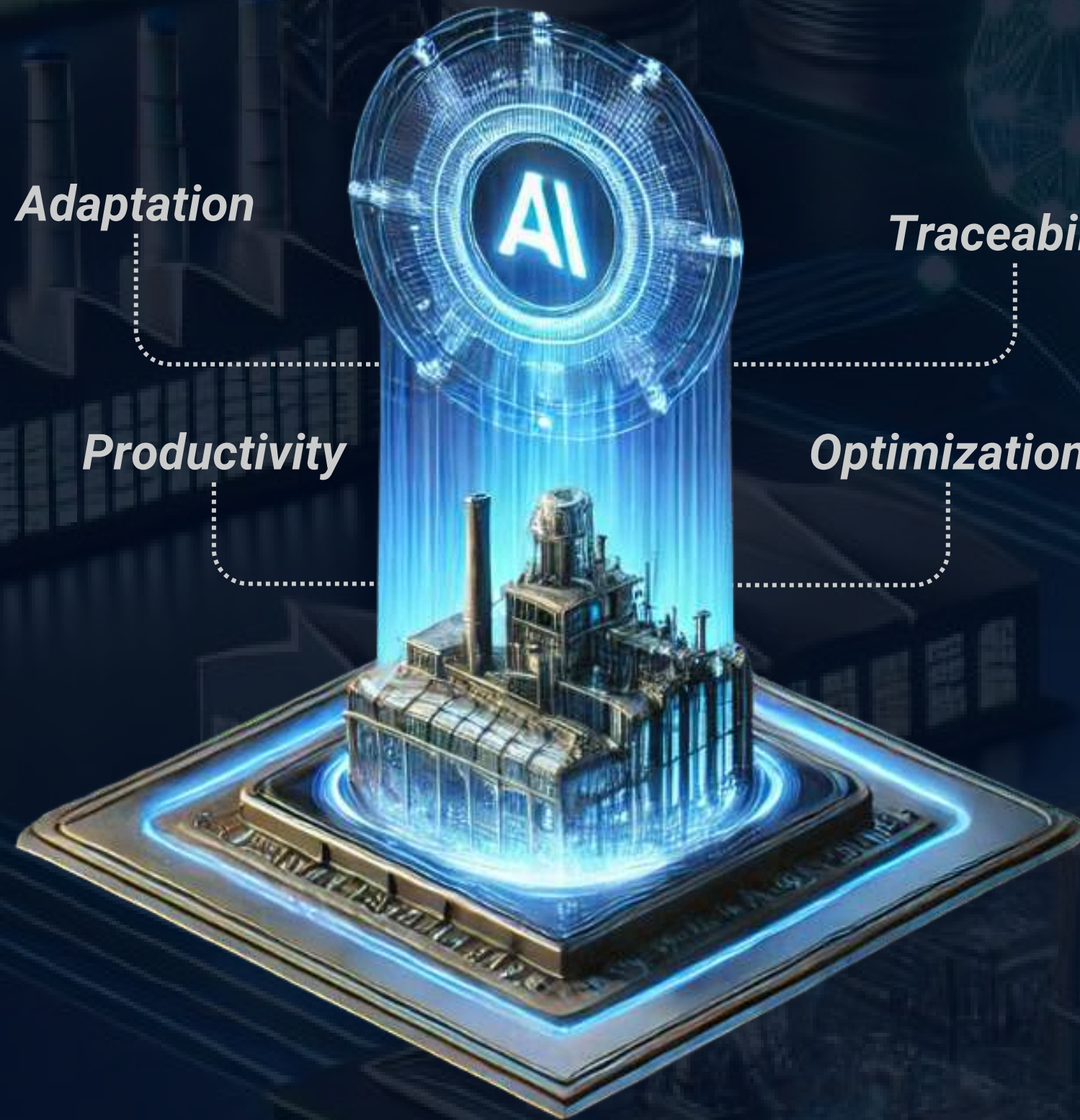
*Digital twin orchestrates optimal execution, teaching AI agents continuously.*

*Adaptation*

*Traceability*

*Productivity*

*Optimization*



*Digital Twin + AI Agents*

## **The Result**

A powerful synergy between digital twin technology and AI agents that drives unprecedented levels of productivity, ensuring operations are efficient, adaptable, and optimized for ever-changing business needs.



# Industrial Automation with Digital Twin

## The Results

**Streamlined Operations:**  
Standardized and digitally tracked workflows.

**Efficient Automation:**  
Systems operate with precision and reliability.

**Maximum ROI:**  
Achieve operational excellence and cost-effectiveness.

## The Solution Digital Twin Technology

**1. Operation Systematization**  
Analyzes and monitors workflows to reduce variability and create repeatable processes.

**2. Automation Planning**  
Identifies areas where automation delivers maximum impact, optimizing ROI.

**3. Virtual Commissioning**  
Simulates real-world scenarios to validate and optimize system performance before deployment.

## The Challenge

**High variability:**  
Industrial operations are inconsistent due to years of manual processes.

**Non-Standardized Procedures:**  
Tasks rely on personal experience instead of uniform workflows.

**Integration Challenges:**  
Automating systems is difficult in unpredictable, non-standardized environments.



# AI Adoption & Transformation

## Think Big, Start Small, Scale Fast.

*Clearly envision the transformative potential of AI for your organization.*

*Begin with clearly defined, manageable projects that deliver immediate, measurable value.*

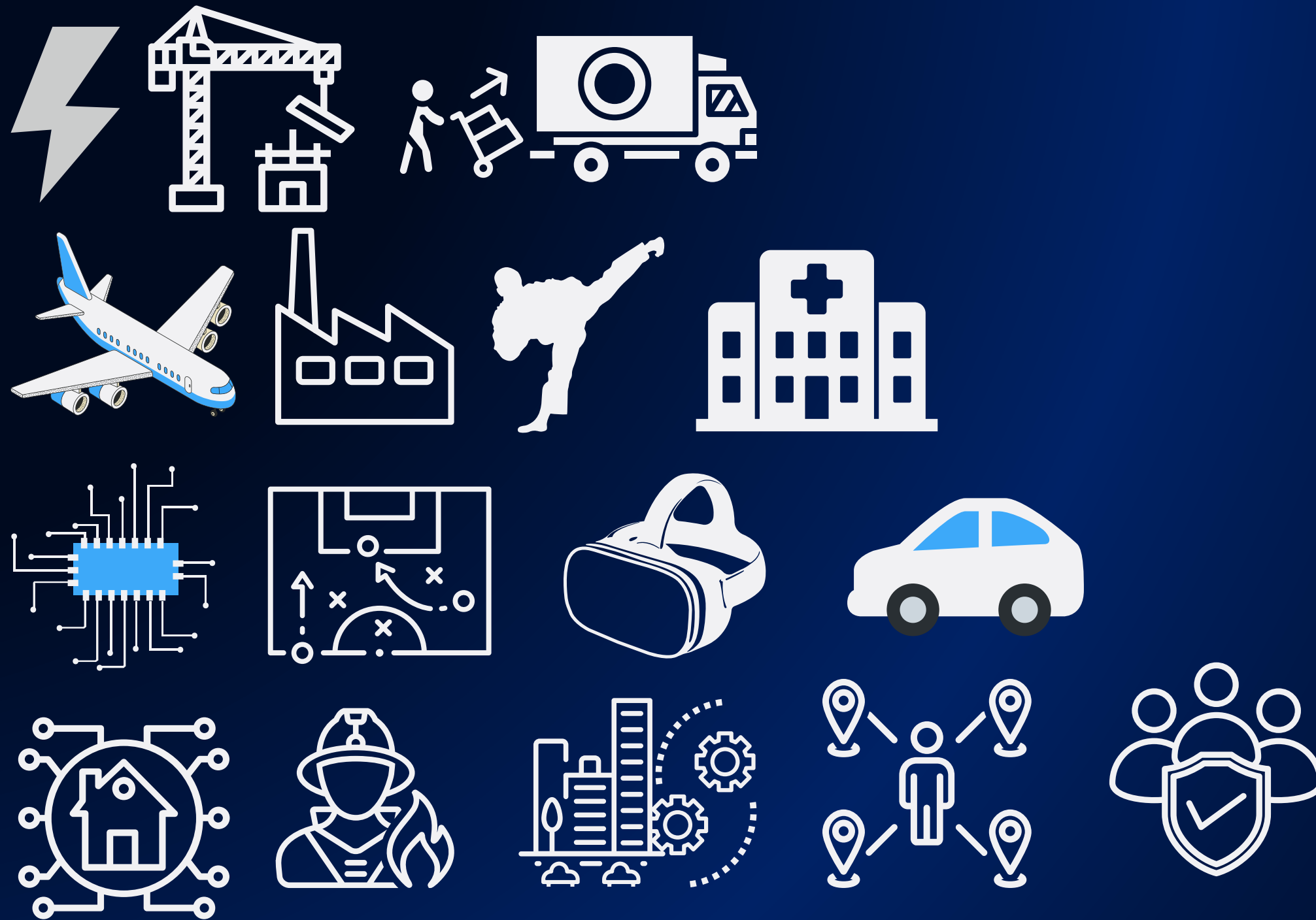
*Build the right infrastructure, data, skills, and organizational readiness early to enable fast growth from pilots to full-scale transformation.*

### Key Insights

*Avoid "POC Purgatory": Don't let promising AI projects stall due to inadequate preparation.*  
*Sustainable Growth: Small AI wins build capability and confidence, paving the way for broader adoption.*

*AI security: Implement one robust AI framework from the outset to ensure transparency in AI decision-making processes*





**INDUSTRIES WE TARGET**



# Clients

## Portugal



## Brasil



# Partners





# 3D SYSTEM VIRTUALLY CONTROLS QUALITY

## Physics-Driven Insights

*Calculate quality parameters with 50% improved control accuracy*

## 3D Real-Time Sensor Fusion

*Combine multimodal data streams in a seamless virtual environment*

## AI Training Integration

*Render 3D operational environments to accelerate AI-driven robotics development*

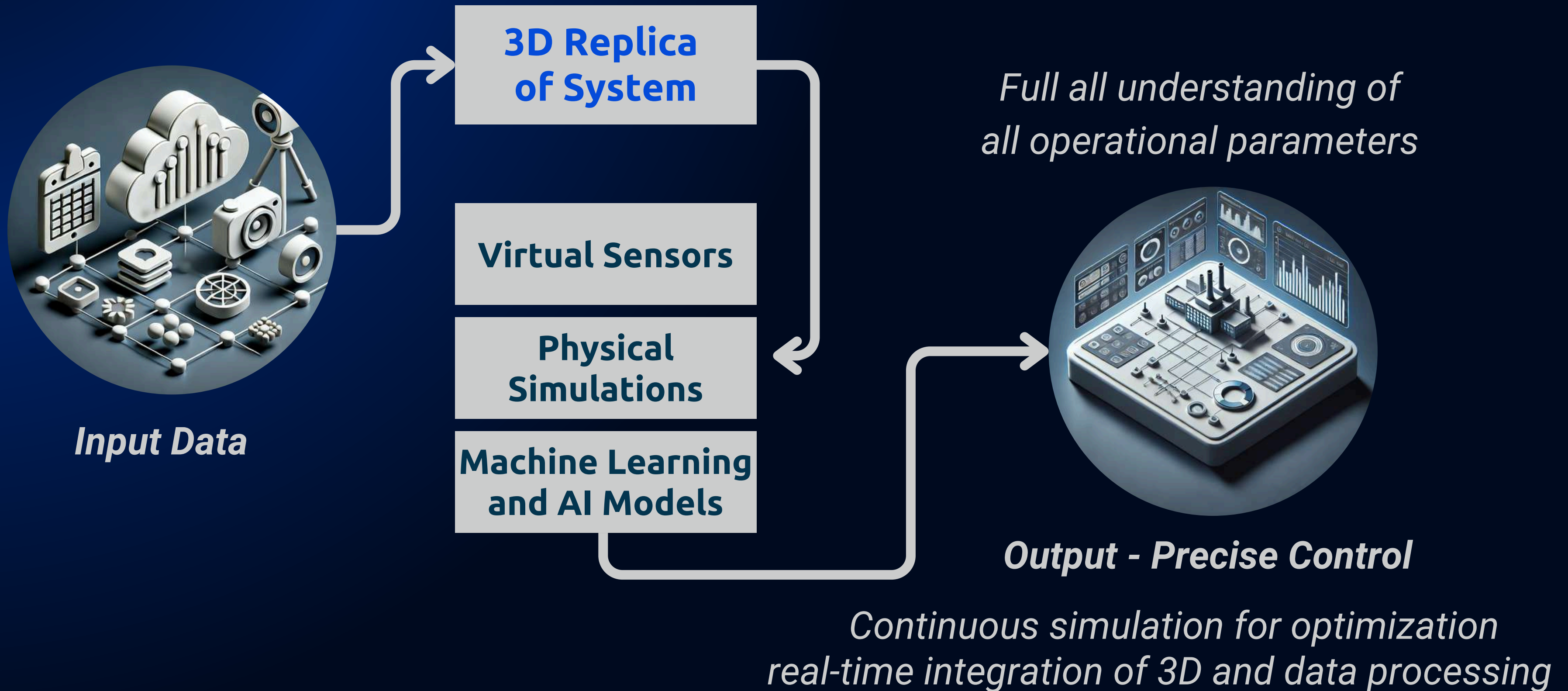
## Optimized Simulations

*Test and adapt parameters or layouts to enhance efficiency and performance*

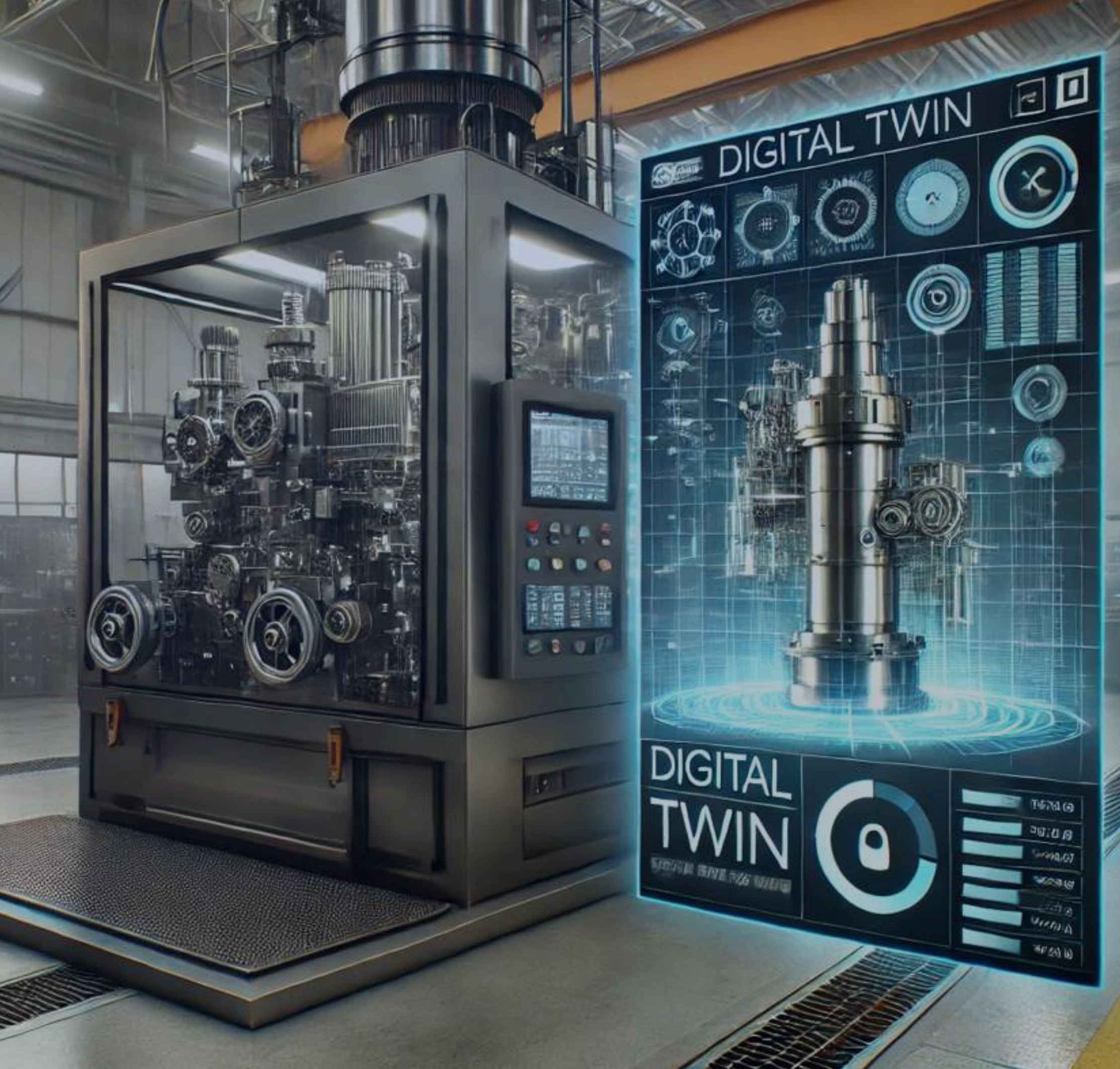




# Real-time Digital Twin Workflow







## **Virtual Sensors**

*Our Technology*

### **Real-Time Monitoring**

*Oversee operations without relying on physical sensors*

### **Cost-Effective Precision**

*Physics-based parameter calculations replacing traditional sensors*

### **Full System Views**

*Smarter, data-driven decisions*

### **Custom AI Solutions**

*Adapts to the unique dynamics of each operation, enhancing efficiency and control*



# Virtual Sensors

## *Benefits & Advantages*

### **Customization**

*Tailored calculations for all operational parameters*

### **Traceability**

*Full process visibility enhances precision and control*



### **Process Knowledge**

*Holistic insights optimize efficiency and sustainability*

### **Scalability**

*Reduces reliance on physical sensors, enabling cost-effective scaling*





**From individual challenges  
of each operation...**



**...to a zoom out across the entire  
value chain.**



# Simulation Software

*Offline engineering*

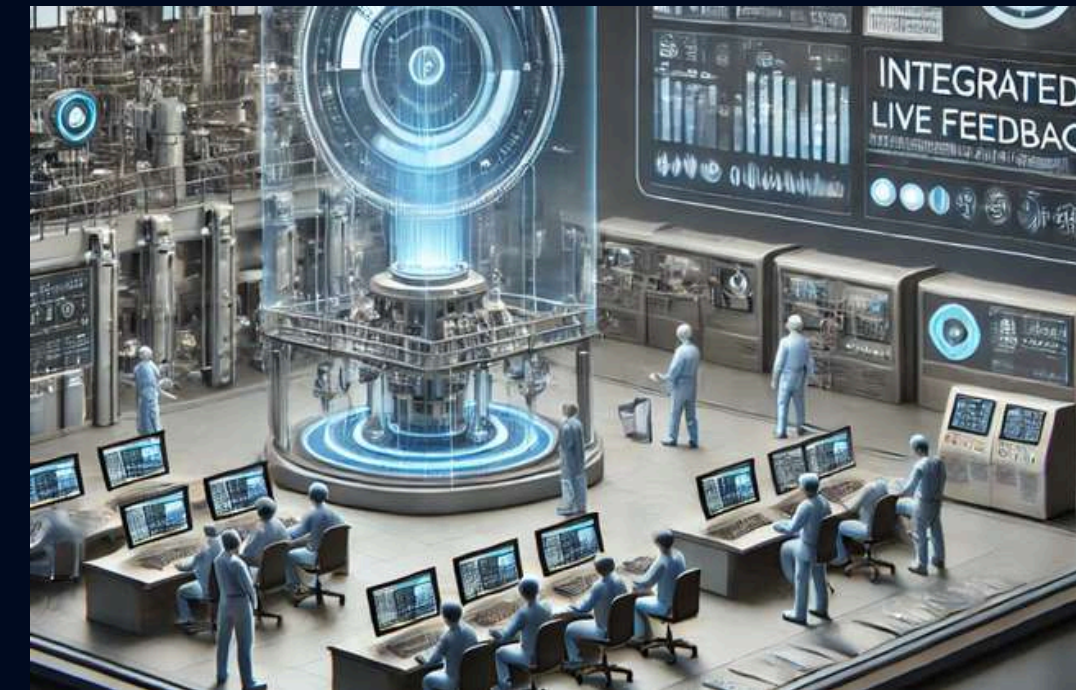


1. Product Design
2. Product Line Design
3. Offline Simulation  
*line balancing*  
*workflow optimization*

**from Offline Simulation  
to Real-Time Operations**

# Digital Twin

*Connecting simulation to reality*



- Real-time commissioning with feedback loops
- Precise 3D control using virtual sensors
- 3D replicas for quality tracking and optimization



# Supply Chain Efficiency

## *Connected Digital Twin*

### **Consistent Quality Standards**

*Maintain uniform product quality across production stages and factories.*

### **Enhanced Sustainability Tracking**

*Monitor environmental impact at every stage to reduce waste, energy use, and carbon footprint.*

### **Transparency and Risk Mitigation**

*Predict and manage risks to enhance resilience and ensure quality in all scenarios.*

### **Adaptive Production Planning**

*Simulate product changes to optimize resources and minimize disruptions across the supply chain.*





# Enhanced Sustainability Tracking

*Digital twin powered sustainability score*



## Product Specific

*Score tailored to each product or production line, enabling personalized communication.*



## Data Driven

*Incorporates life-cycle analysis for a unique sustainability passport*



## Real Time

*Calculated using reliable digital twin data without additional sensors or manual input.*



## Life-cycle Analysis

*Differentiates products and services based on their full production journey.*



# Enabling the Digital Product Passport with Digital Twin Technology

## *What is the Digital Product Passport (DPP)*

DPP is a key initiative of the EU to enhance **transparency, sustainability, and circularity** across the lifecycle of products.

By ensuring each product carries digital information about its **composition, origin, and environmental impact**, the DPP enables traceability, efficient resource usage, and informed consumer decisions.





# How Digital Twin Technology Supports DPP Creation

## Automatic Data Generation

*Real-time production data*

## Lifecycle Traceability

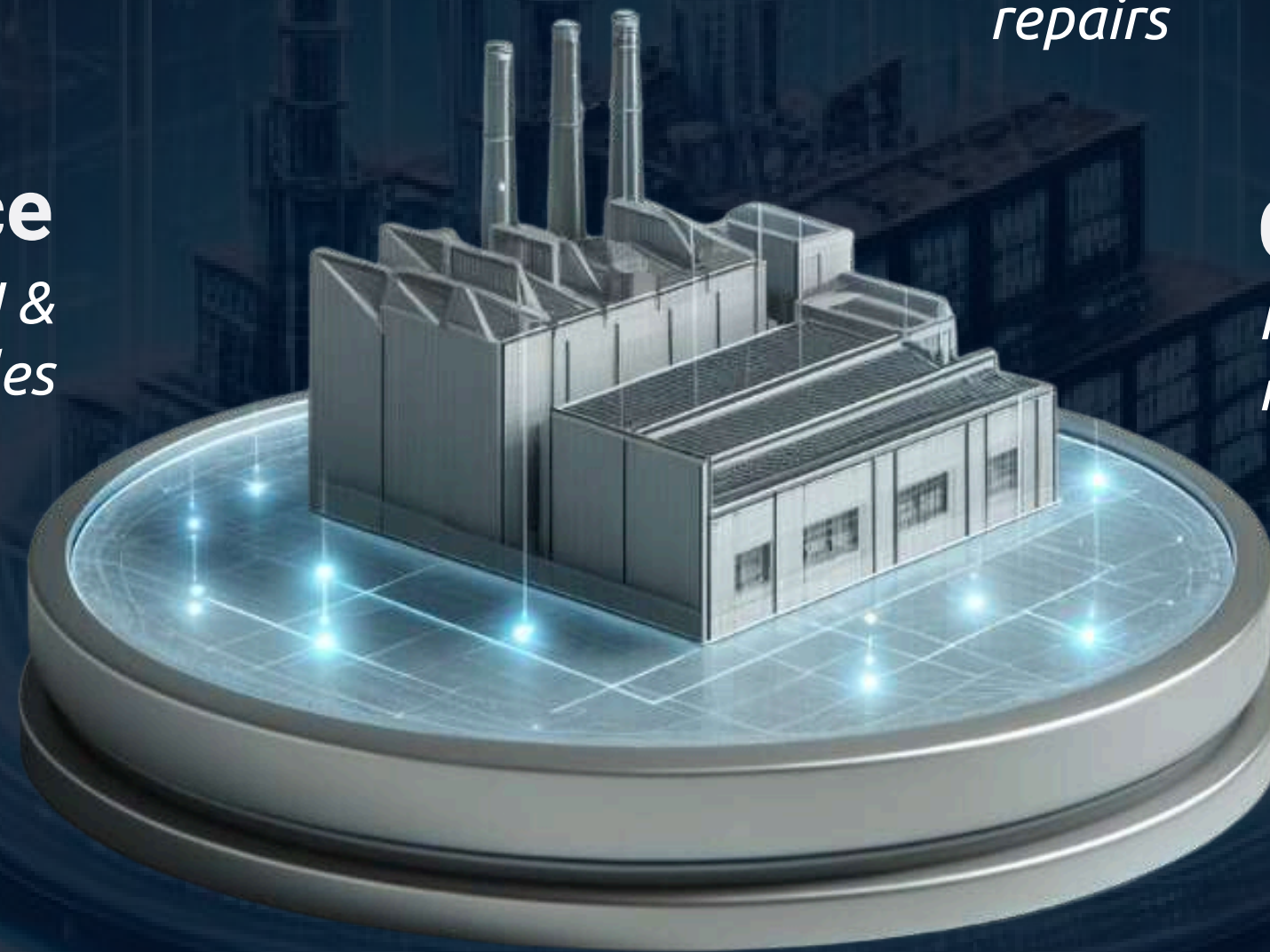
*Tracking product updates & repairs*

## Ensuring Compliance

*Validation against EU & environmental rules*

## Consumer Transparency

*Providing sustainability & recycling details*





# Automatic Data Generation

*Real-time production data*

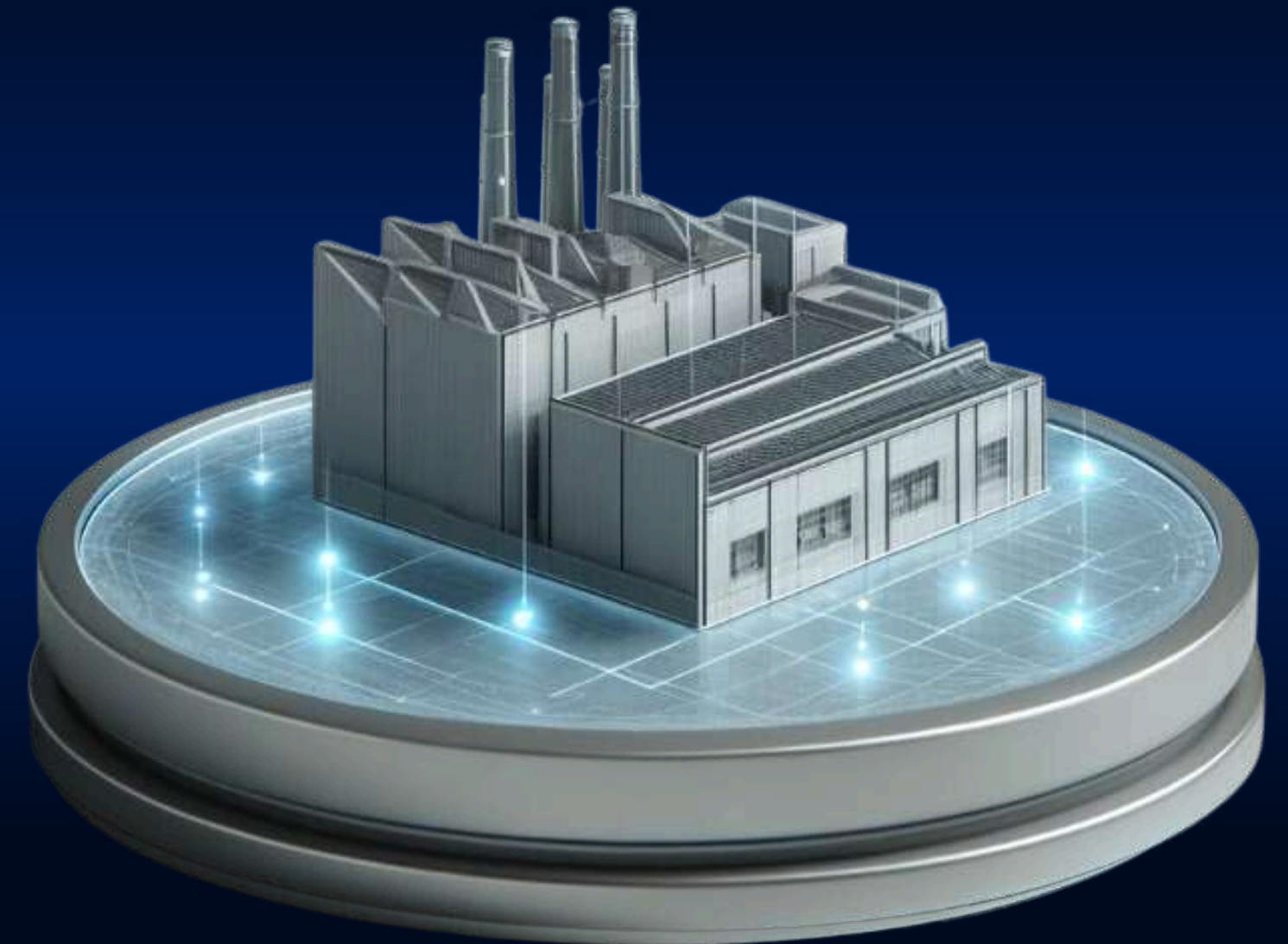
## Real-time Data

*Our technology captures real-time data for each product during its lifecycle, beginning with production*

*Data is automatically fed:  
no manual entry errors*

## Collected Data Points

*Raw material usage and origin  
Production energy consumption  
Process quality metrics  
CO<sub>2</sub> emissions*



**Digital Twin**

# Lifecycle Traceability

*Tracking product updates & repairs*

*Every product is linked to a virtual replica that dynamically updates throughout its lifecycle.*



*This ensures real-time traceability of updates, modifications, or repairs.*





# Ensuring Compliance

*Validation against EU & environmental rules*

*Automatically validates product data  
against EU standards and environmental  
compliance requirements.*



# Consumer Transparency

*Providing sustainability & recycling details*

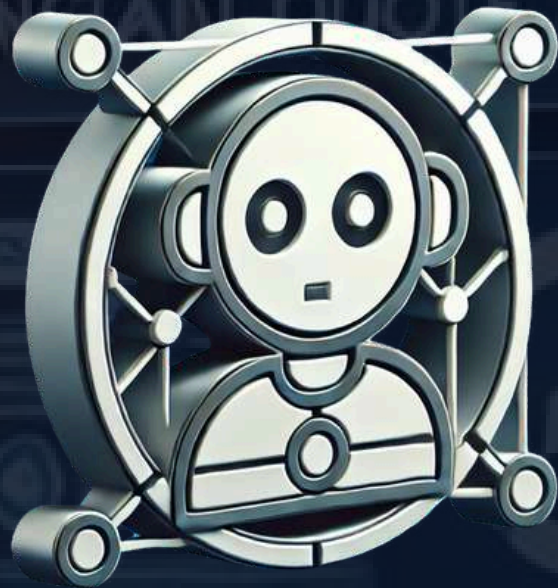
*The digital twin serves as the core repository for the DPP, enabling businesses and consumers to access details on product origin, sustainability metrics, and recyclability potential.*





# Revolutionizing sales with Digital Twin

*Personalization, Engagement, and Real-Time Insights*



## Virtual Companion

- Customization
- Immediate Quote
- Production Orchestration



## Gamification

- Positive Behavior Induction
- Engagement
- Real-Time Feedback



## Virtual Showroom

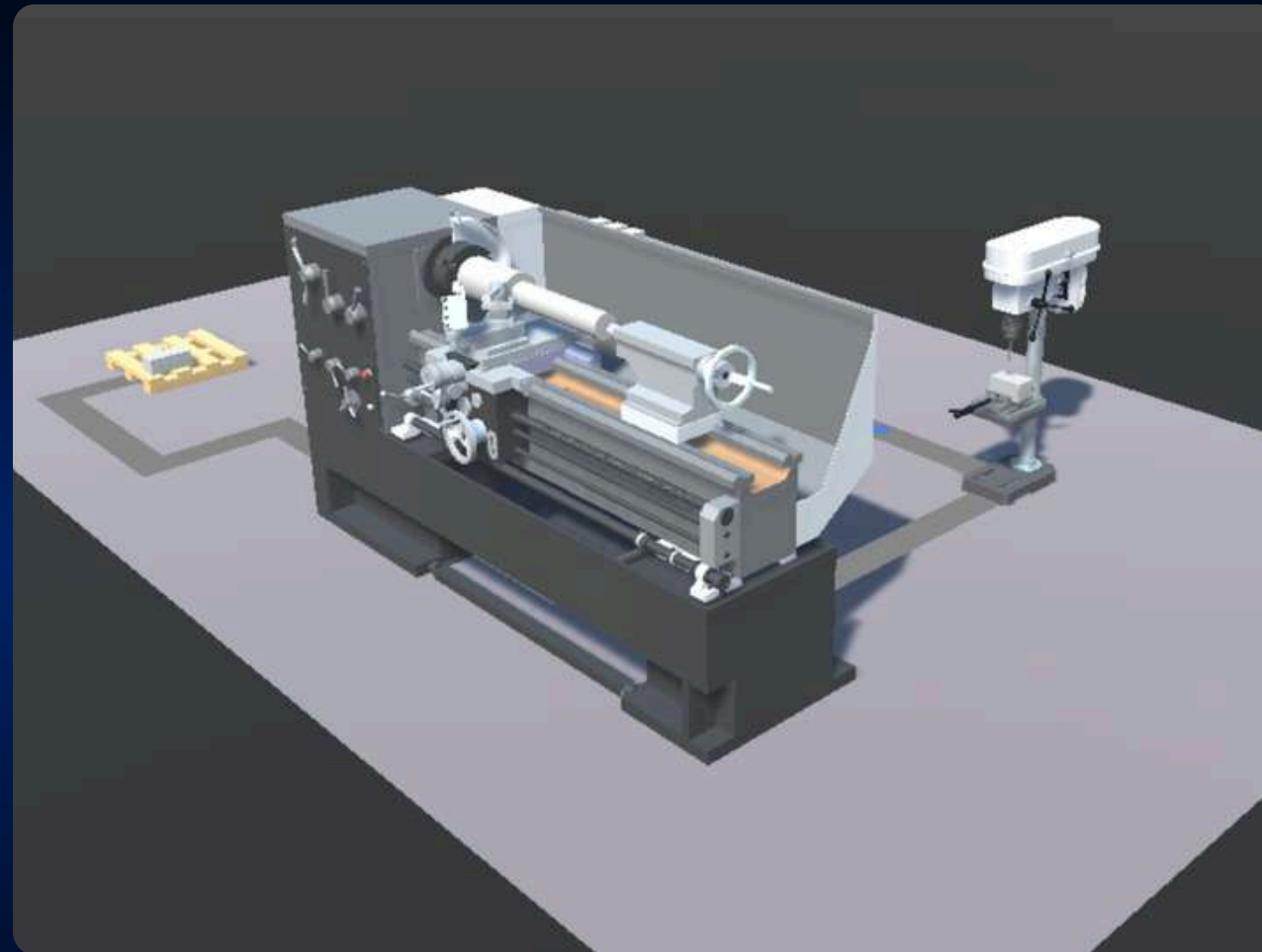
- Optimized Shopping Experience
- Personalization
- Enhanced Interaction



*coming soon...*

# 3D Digital Twin Marketplace

*Revolutionizing Supply Chain Efficiency*



- > Template-based
- > User-configurable
- > For SMEs and midcaps
- > Accelerated digital adoption

- > Marketplace Model
- > Scalable & Sustainable
- > Proprietary Technology

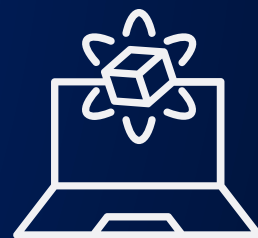
1. Select operation templates
2. Upload 2D drawings
3. Guided 3D digital twin integration
  - a. camera placement
  - b. module configuration
  - c. connectivity tests





## VR/AR

NAVVis  
unity  
Pixaera  
STRIVR  
luminousxr  
VISION  
SafetyBox VR  
Skills VR



## SIMULATION

DASSAULT  
SYSTEMES  
Ansys  
SIEMENS  
SIMSCALE  
rescale  
AUTODESK



## IOT/AI/IT

IBM  
ptc  
SAP  
AVEVA  
GE Digital  
Critical  
manufacturing  
an ASM PT company

+

+

+ Motion Tracking

+ Physics-based 3D AI

+ Supply Chain Integration

# DIGITAL TWIN COMBINES DISSIMILAR DISCIPLINES





**André Luz, PhD**  
*General Manager*



**Karyna Yurchenko**  
*CG Generalist*



**Fábio Ferreira, PhD**  
*Data Scientist*



**Vasco Ferreira, PhD**  
*Data Scientist*



**Guilherme Tavares**  
*Software Developer for  
Rendering and Simulation*



**David Carvalho, PhD**  
*Simulation & Data  
Specialist*



**Rita Magalhães**  
*Project & Community  
Manager*



**Gonçalo Garganta**  
*Computer Vision &  
Robotics Specialist*



**Bruna Bento**  
*Functional Operations  
Analyst*



**Diogo Campas**  
*Computer Vision & Machine  
Learning Specialist*



**Maria Inês Carvalho**  
*3D Graphic Designer  
& Developer*



**Mário Travassos**  
*3D Software Engineer*

**Infinite Foundry Portugal**  
*Meet the Team*





# Use Cases



## USE CASES

# Automatic Operations: Maintenance Traceability

WATCH VIDEO

WATCH VIDEO

## *CHALLENGE*

Line produces many different types of products, and this variability precludes using traditional AI approaches to calculate remaining lifetime of components

## *SOLUTION*

Virtual sensors are based in physics calculation and can calculate component stresses for any kind of movements, ensuring precise prediction of remaining lifetime

## *RESULTS*

Precise predictive maintenance of components decreased 80% number of components replaced per year



## USE CASES

# Automatic Operations: Quality Traceability

WATCH VIDEO

WATCH VIDEO

## *CHALLENGE*

Variability of raw materials causes different heat treatment of components inside furnace, which results in quality non-conformance

## *SOLUTION*

Virtual sensors measure in real time the heat treatment of each component, automatically adjusting furnace parameters to ensure high quality of all components at the end of process

## *RESULTS*

Reduction in 75% of number of components with non-conformity due to bad quality



## USE CASES

# Manual Operations: Task Traceability

WATCH VIDEO

WATCH VIDEO

## *CHALLENGE*

Operators induce variability in a production process that causes loss of efficiency and quality

## *SOLUTION*

Virtual sensor task traceability in real-time using computer vision and avatars for precise remote monitoring by automatically logging every action in a traceable format

## *RESULTS*

Reduction of 90% in quality problems that are immediately not detected and are propagated during the production process



## USE CASES

# Manual Operations: Ergonomic Traceability

[WATCH VIDEO](#)

## *CHALLENGE*

Operators develop strain injuries due to improper ergonomics even in workstations that are designed to minimize the risk of injury

## *SOLUTION*

Virtual sensor uses avatars for real-time monitoring of operators as they perform their tasks, to enable the analysis of body movements and working postures continuously, generating alerts for the operator to make corrections

## *RESULTS*

Reduction of 50% in worker absenteeism due to occupational diseases



## USE CASES

# Logistic Operations: Inventory Traceability

[WATCH VIDEO](#)

## *CHALLENGE*

In many types of inventories, it is not possible to use tags to monitor their position in the warehouse, which results in mistakes in inventory tracking and management

## *SOLUTION*

Virtual sensors through computer vision allow real-time precise inventory tracking and optimizes the movements of forklifts and AMRs to maximize space utilization

## *RESULTS*

Reduce by 40% the time it takes to fulfill orders



## USE CASES

# Layout Optimization: Inventory Traceability

WATCH VIDEO

WATCH VIDEO

## *CHALLENGE*

Changes in customer requests cause bottlenecks and inefficiencies in the existing layout, which makes accommodating growth while maintaining efficiency highly challenging

## *SOLUTION*

Digital twin allows for the simulation of different layout scenarios, by understanding current traffic patterns like the flow of materials, products, and personnel, so that spaces can be automatically rearranged to streamline operations, reduce travel time and distance, and improve safety.

## *RESULTS*

Increase productivity by 50% – number of products produced and/or moved



## USE CASES

# Worker Training: Virtual and Augmented Reality

[WATCH VIDEO](#)[WATCH VIDEO](#)

## *CHALLENGE*

Labor shortage means retaining workers in operations is highly difficult, so hiring rates must continuously outpace quit rates to ensure growth and the effectiveness and efficiency of training programs plays a big role

## *SOLUTION*

Digital twin creates a highly accurate and detailed replica of a physical environment, which allows trainees to experience realistic and tailored workplace scenarios without the physical risks associated with on-the-job training

## *RESULTS*

Improve worker productivity by 20% and reduce accidents by 50%

## USE CASES

# Sports Training: Performance Traceability

WATCH VIDEO

## *CHALLENGE*

Athlete training involves multiple variabilities that are difficult to fully measure with sensors only to maximize performance analysis and prevent injury

## *SOLUTION*

Virtual sensors allow for the creation of a highly detailed, real-time avatar of an athlete, capturing every aspect of their physical performance during training and actual competition. This data-rich avatar can be analyzed to assess biomechanics, technique, and movement efficiency to pinpoint very specific areas for improvement and provide tailored feedback based on accurate, objective data

## *RESULTS*

Improve by 20% results in competition



## USE CASES

# Smart Cities: Mobility Traceability

WATCH VIDEO

## *CHALLENGE*

Urban mobility is a major issue in all cities, so promoting walking and biking as preferred modes of transportation is essential to promote sustainability and more pleasant environments

## *SOLUTION*

Digital twin of the city can analyze in real-time the flow of different types of traffic, including pedestrians and cyclists, and use gamification to engage with the public and promote behaviors that improve the mobility of the city without the need to invest in new infrastructure

## *RESULTS*

Decrease traffic congestion and overcrowding by 50%



# InfiniteFoundry

*delivering efficiency and innovation since 2017*