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

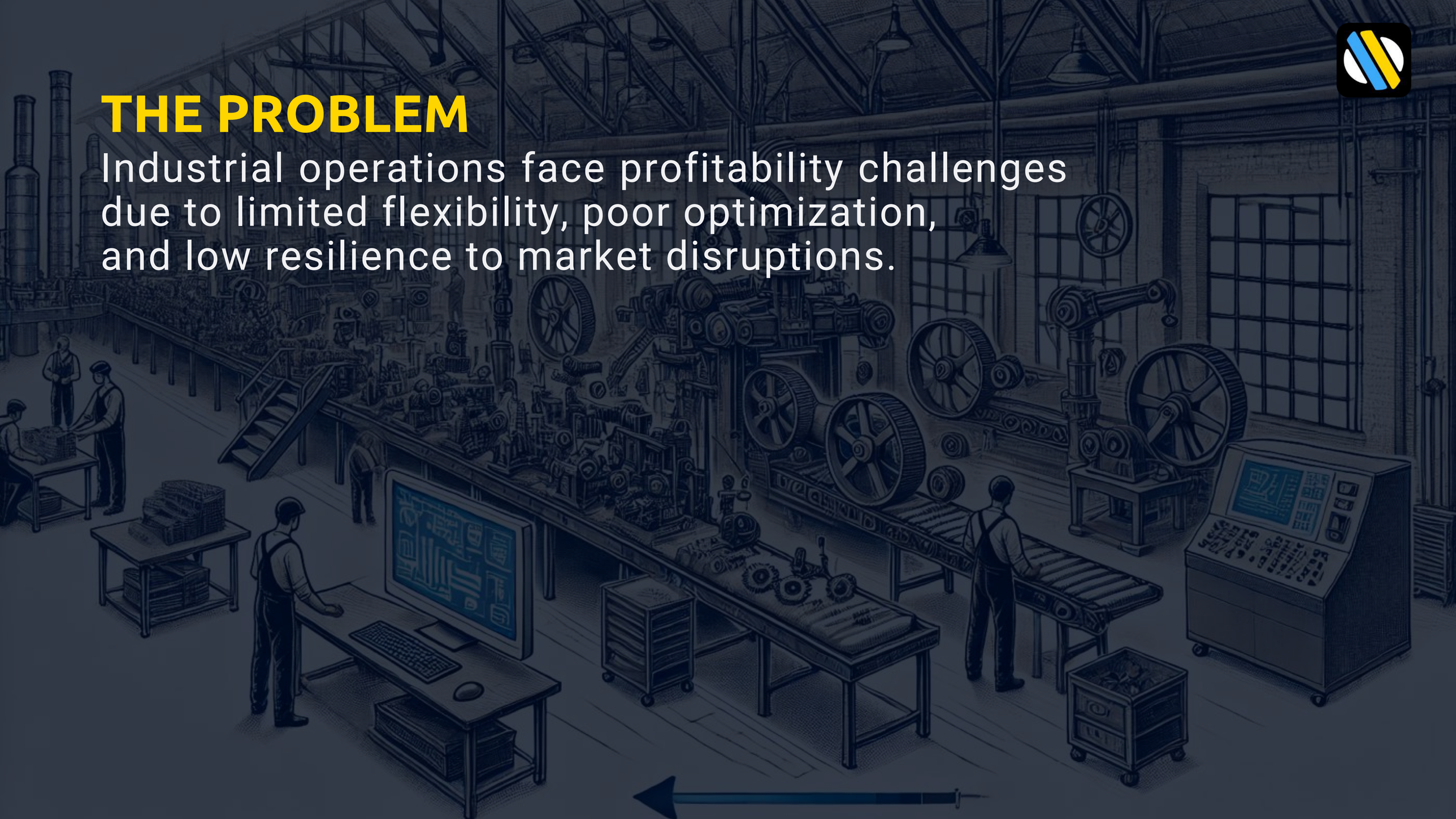
save resources
increase process
sustainability

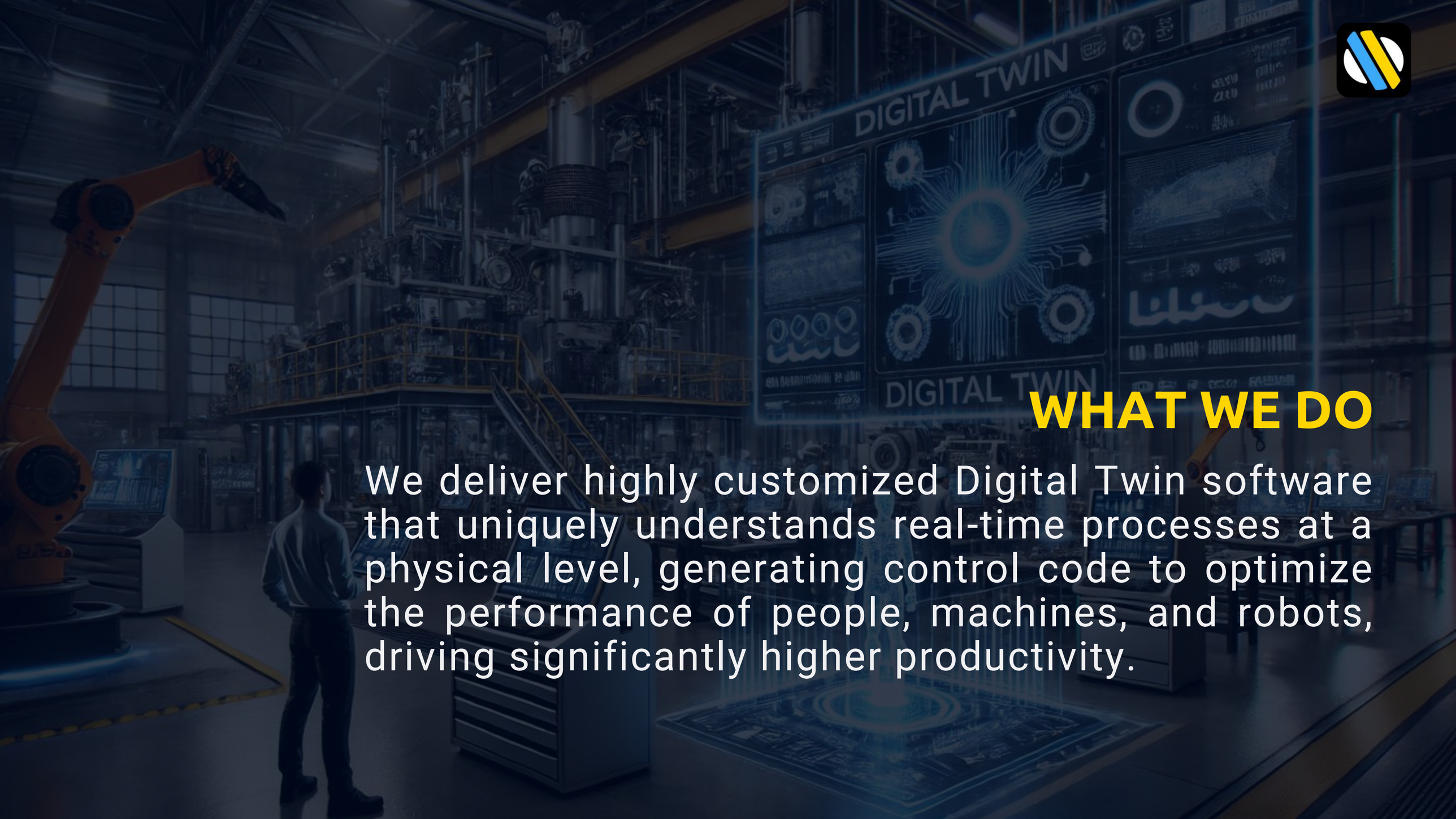
DIGITAL

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

50 %
Efficiency

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

200 %
Flexibility

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 coordenation

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

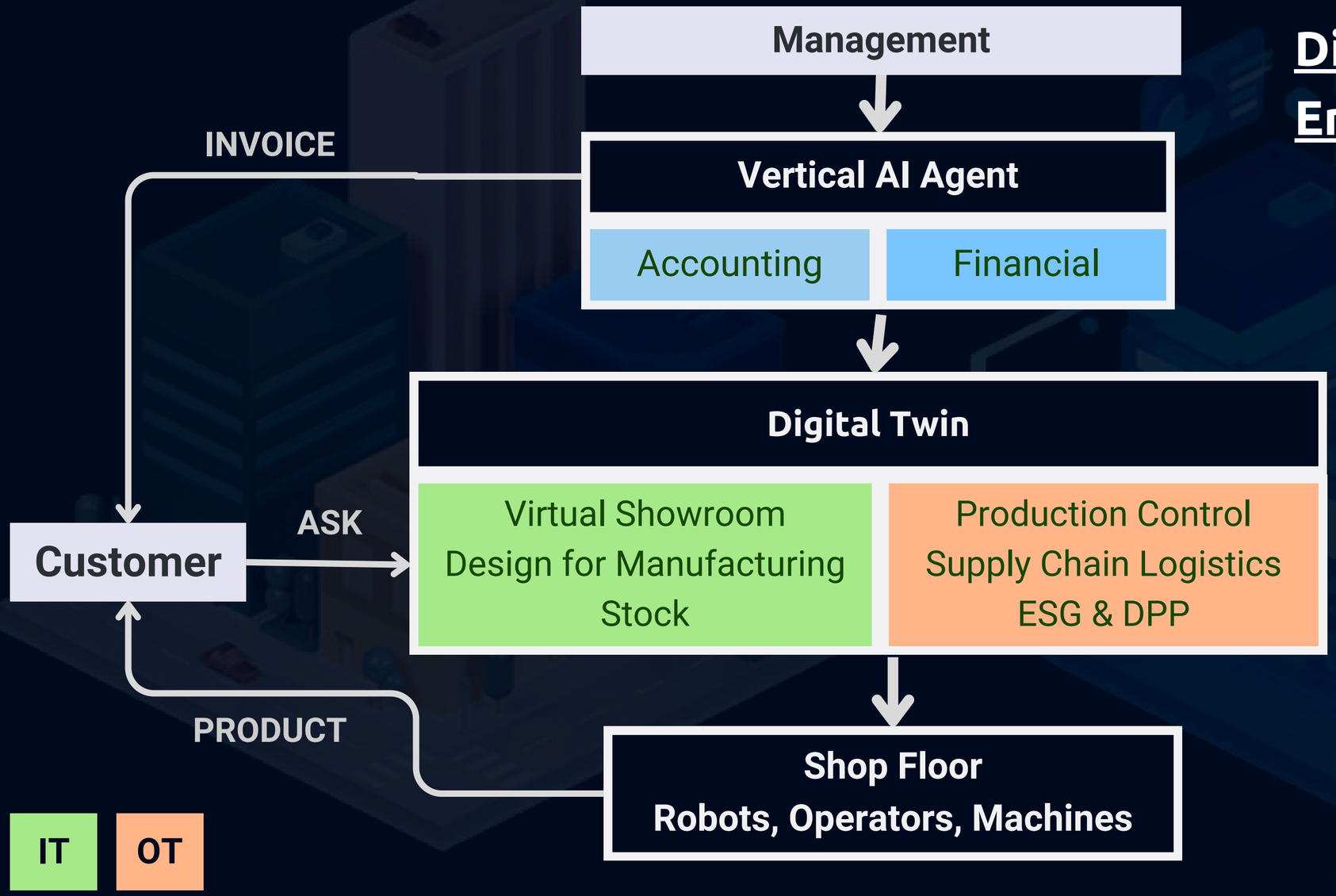
Revolution in System Control with Digital Twin

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

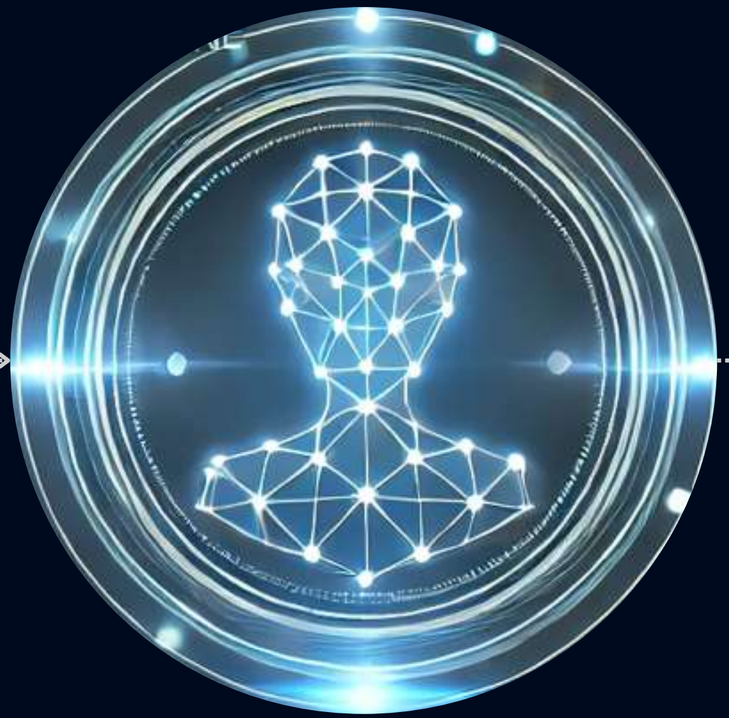
Seamlessly Connecting Business and Operations

Enterprise Data Integration

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

Intelligent Insights

Optimizes operation with business forecast



Customized AI Models

Tailored to understand and analyze enterprise data.

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.

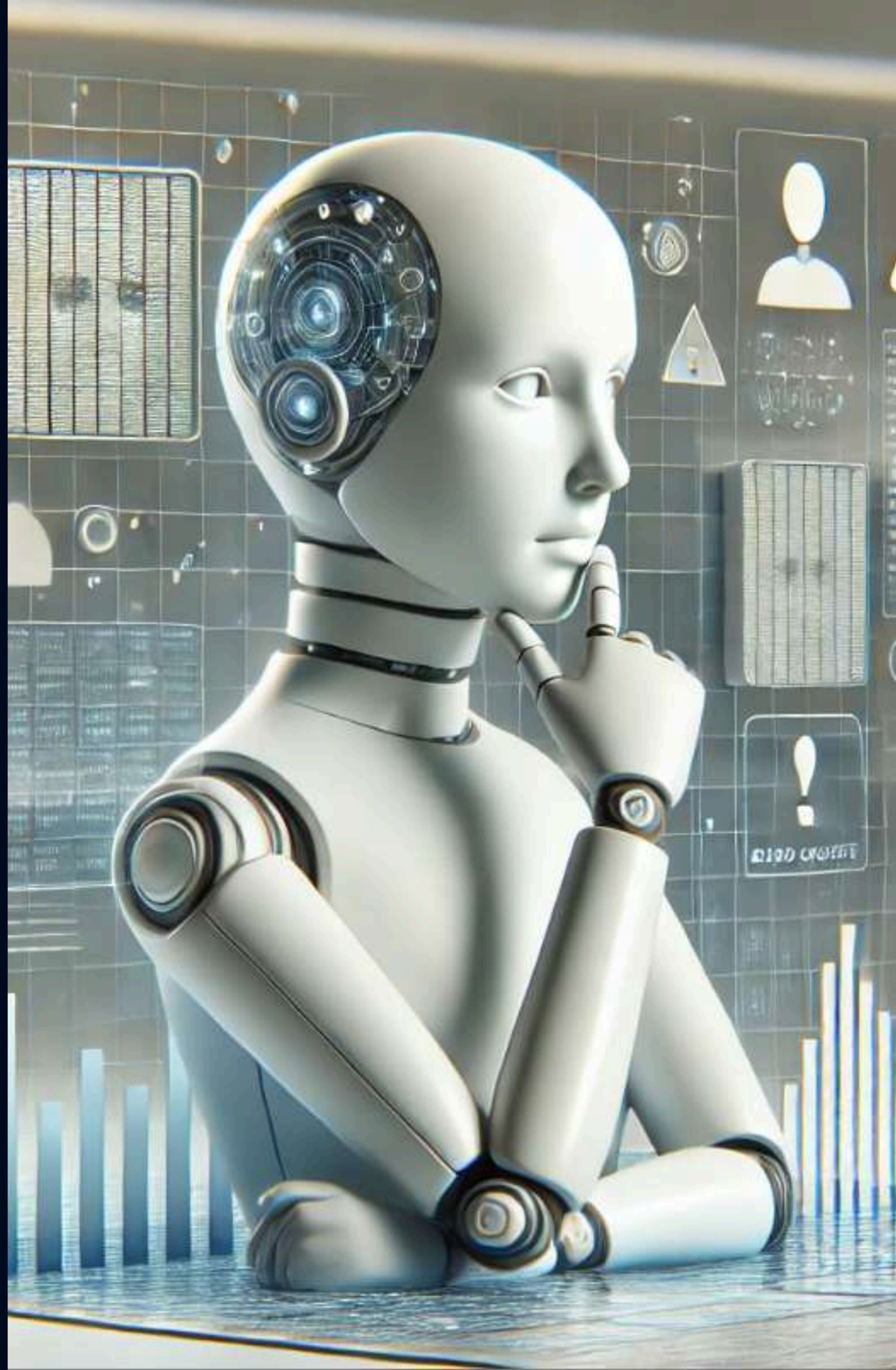
Unleashing the Full Productivity of AI Agents with Digital Twin Technology

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.

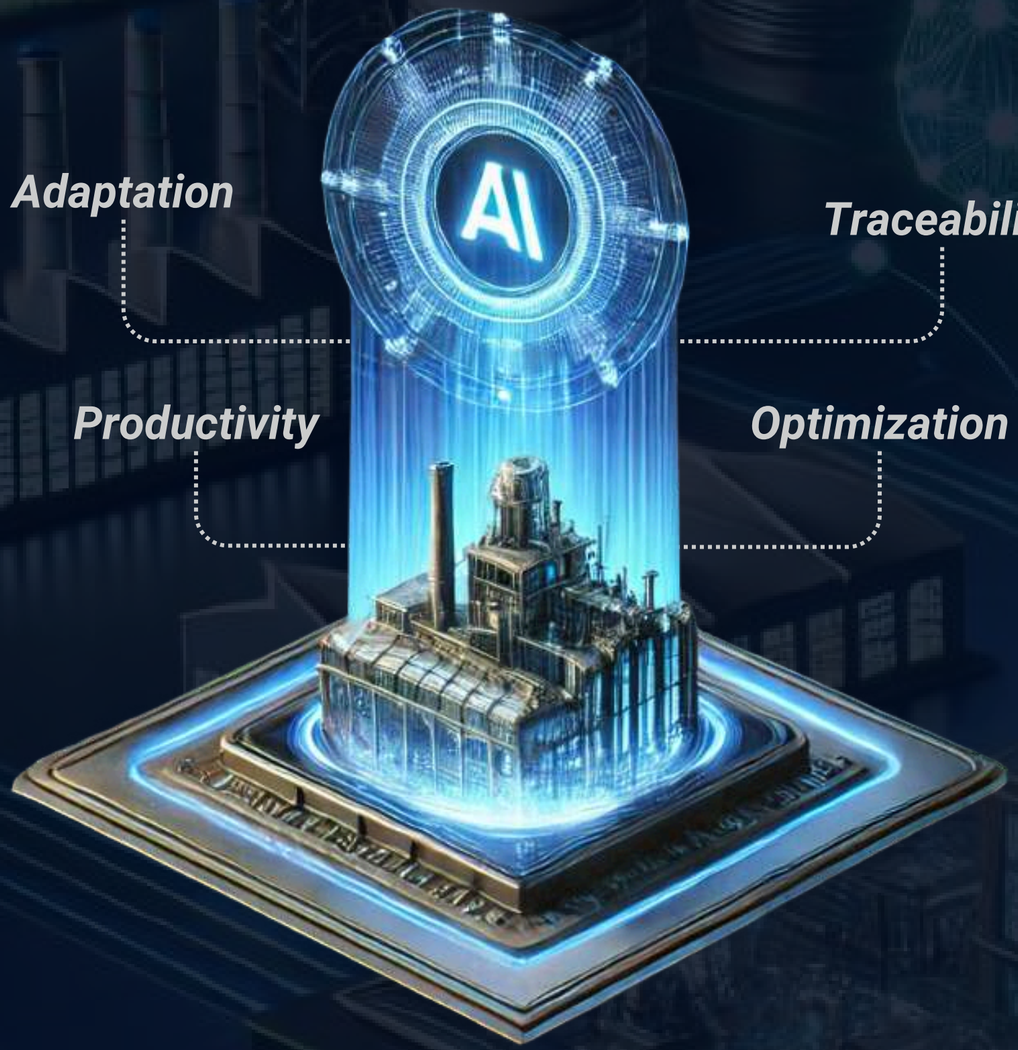
Ensures AI agents learn optimal methods rather than replicating inefficient practices.

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.



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 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.

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 Results

Streamlined Operations:
Standardized and digitally tracked workflows.

Efficient Automation:
Systems operate with precision and reliability.

Maximum ROI:
Achieve operational excellence and cost-effectiveness.

AI Adoption & Transformation

Think Big, Start Small, Scale Fast.

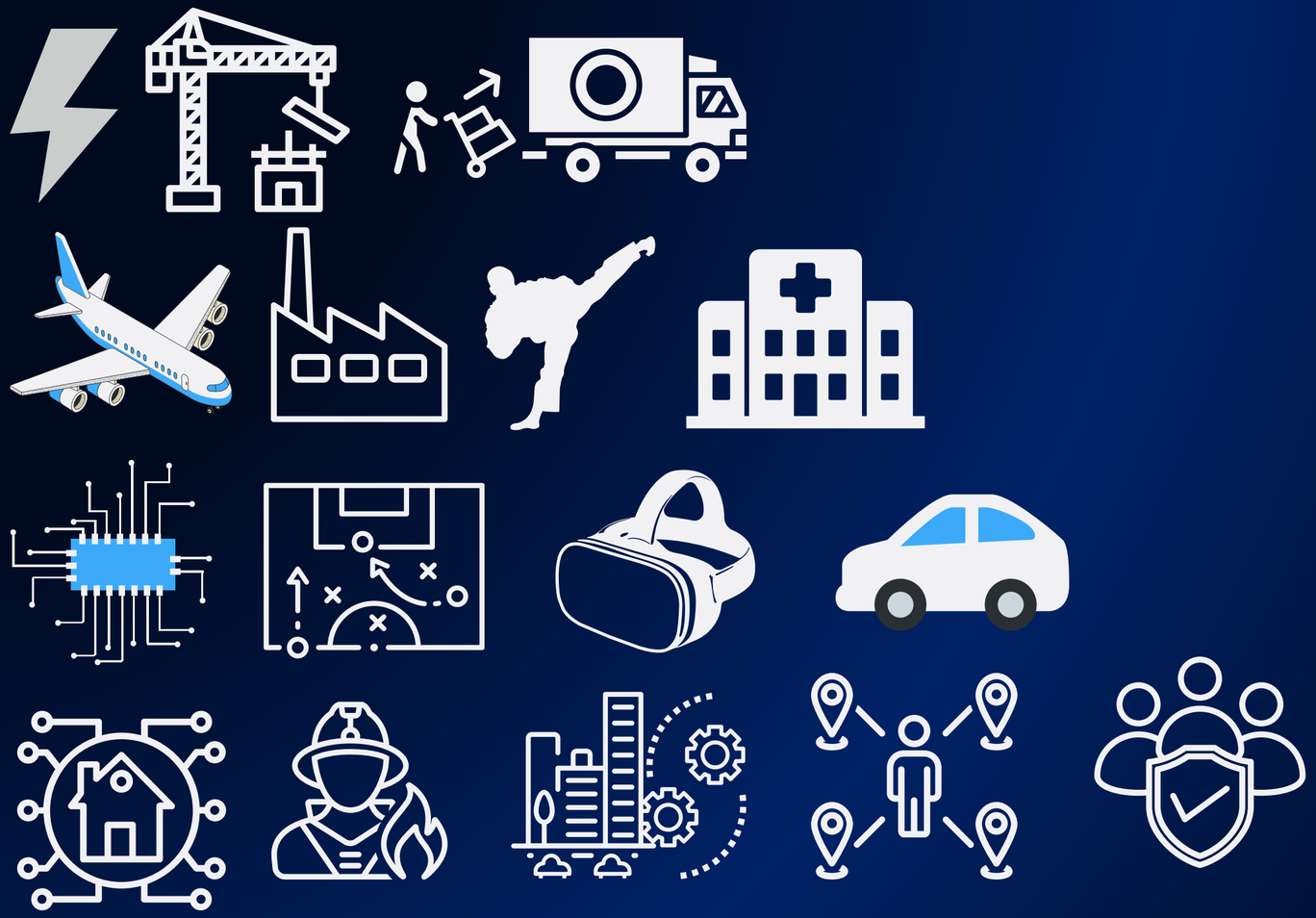
Clearly envision the transformative potential of AI for your organization.

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

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

Input Data

3D Replica of System

Virtual Sensors

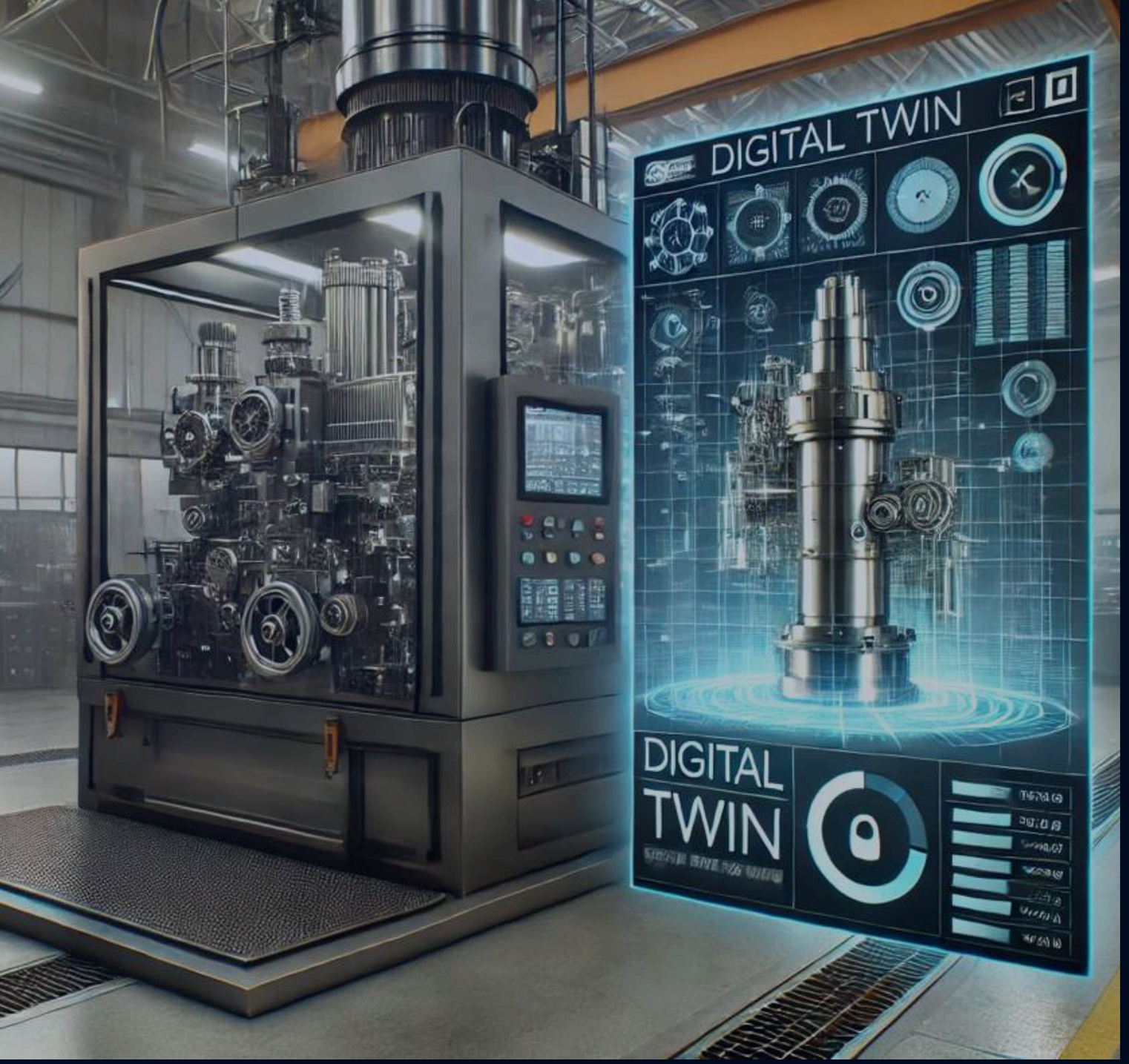
Physical Simulations

Machine Learning and AI Models

Full all understanding of all operational parameters

Output - Precise Control

Continuous simulation for optimization real-time integration of 3D and data processing



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

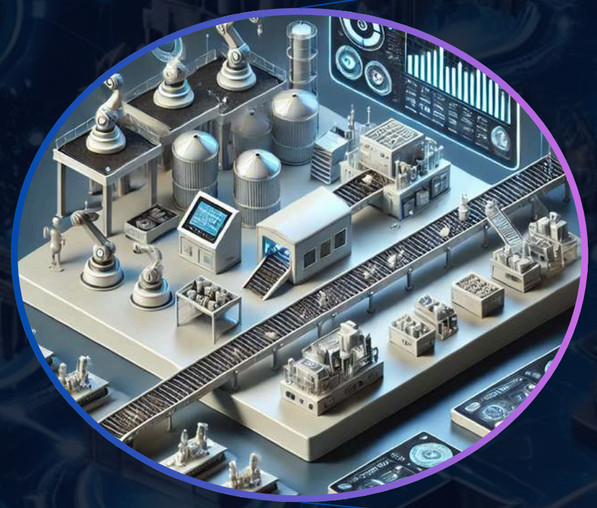
Benefits & Advantages

Customization
Tailored calculations for all operational parameters

Traceability
Full process visibility enhances precision and control

Process Knowledge
Hollistic 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

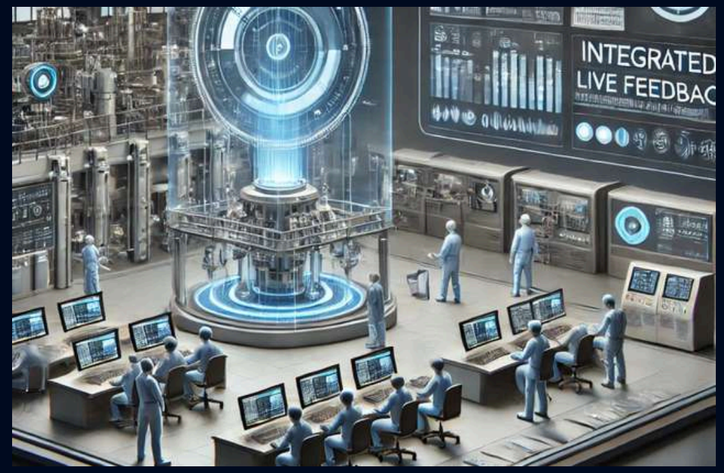
1. Product Design
2. Product Line Design
3. Offline Simulation
   line balancing
   workflow optimization

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

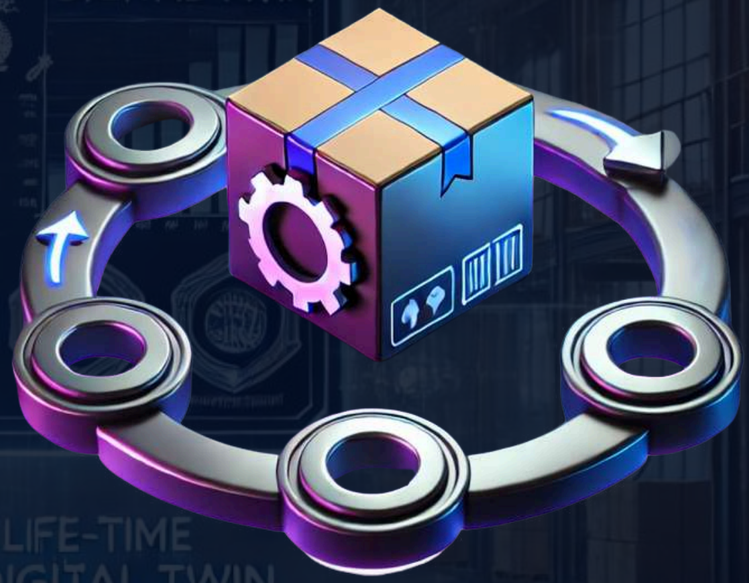
Differentiates products and services based on their full production journey.

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.



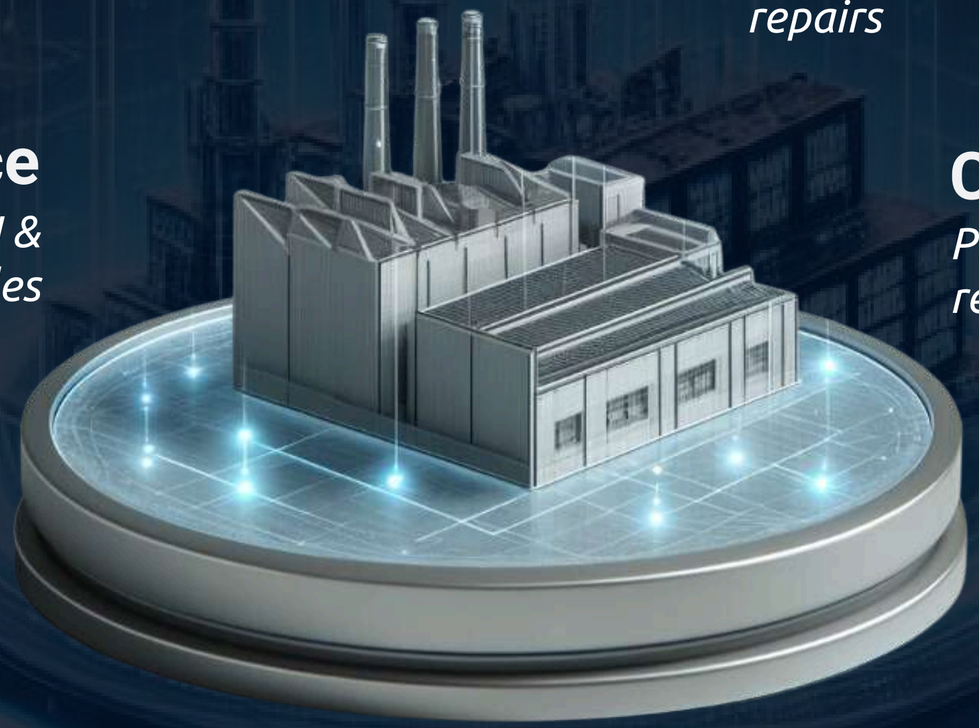
How Digital Twin Technology Supports DPP Creation

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

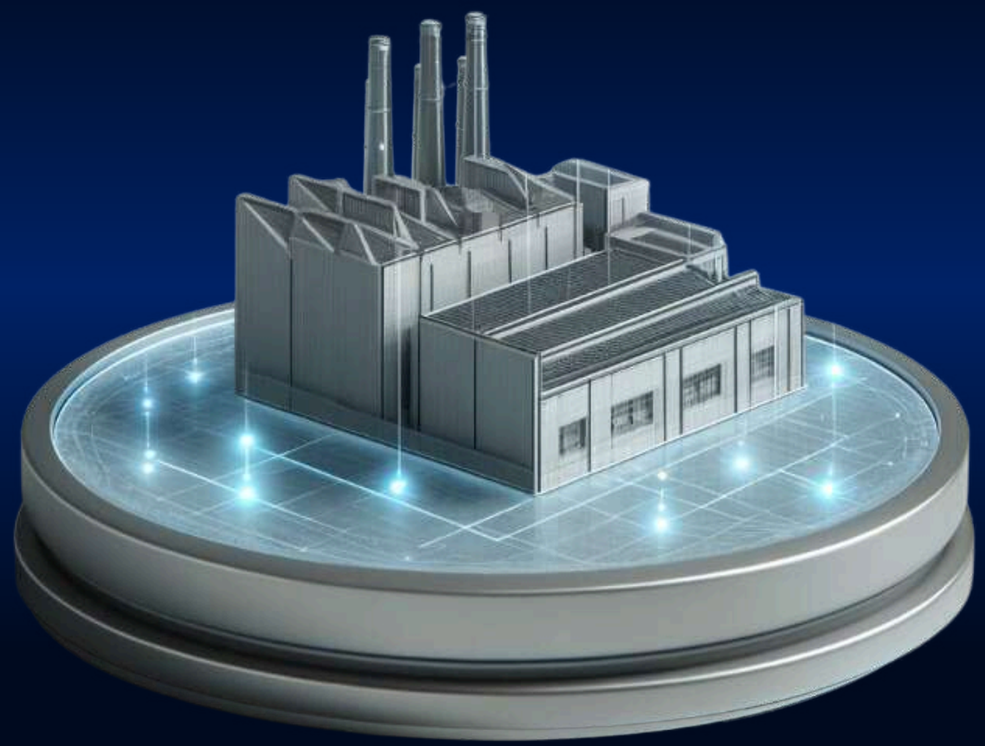
Real-time Data

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_2 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*

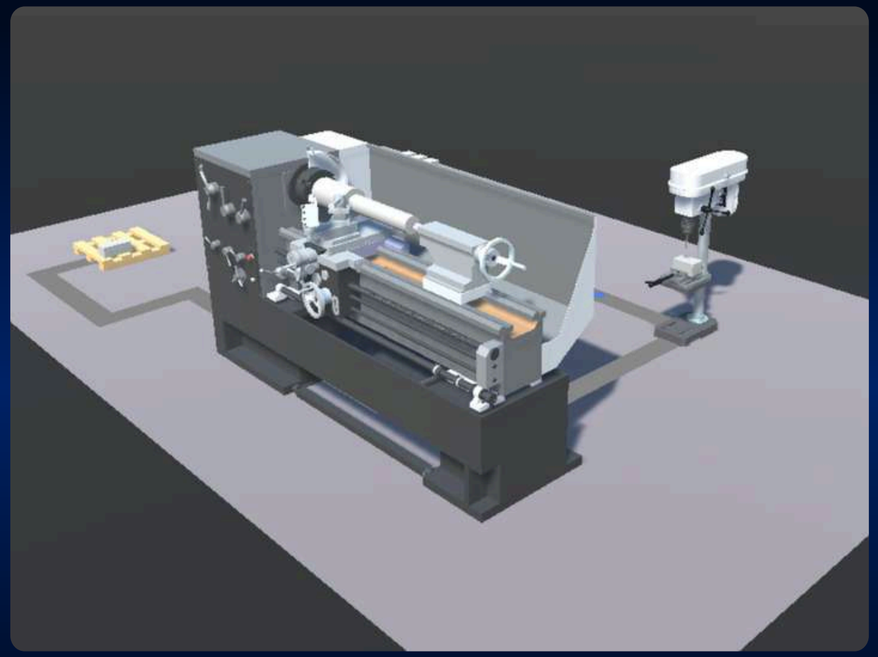
Virtual Showroom

- *Optimized Shopping Experience*
- *Personalization*
- *Enhanced Interaction*

coming soon...

3D Digital Twin Marketplace

Revolutionizing Supply Chain Efficiency



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

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

> Marketplace Model
> Scalable & Sustainable
> Proprietary Technology

VR/AR

NavVis
unity
Pixaera
STRIVR
luminousxr
VR 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*

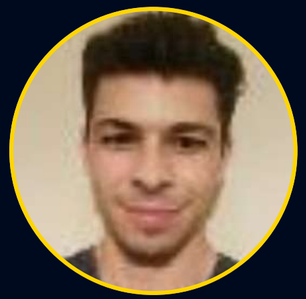
+ *Physics-based 3D AI*

+ *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
Data Scientist

Rita Magalhães
Project & Community Manager

Gonçalo Garganta
Data & Robotics Scientist

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

thlete 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