

# SOLVING OPERATIONAL CHAOS BY RETHINKING RISK WITH DIGITAL TWINS AND AI

protiviti®  
*Global Business Consulting*



# Meet Our Speaker



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David Petrucci is a managing director with global consulting firm Protiviti and leader of its Global Supply Chain and Operations practice. He has 30 years of experience in supply chain, operational improvement and innovation in technology, consulting and industry roles. David has assisted companies in a variety of industry sectors, including the defense industrial base, manufacturing, and energy to reimagine their operations and balance efficiency with flexibility and resiliency. Prior to joining Protiviti, Petrucci held leadership roles at Microsoft, Oliver Wyman, IBM and Honda.

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# Uncovering Root Causes of Operational Chaos

Defense Industrial Base organizations are experiencing persistent operational disruption across the value chain

**Supply Chain Bottlenecks**  
*Delays in production and parts delivery forcing organizations to retain older fleet driving fuel, maintenance, and leasing costs*



**Geopolitical Intensification**  
*Navigating evolving regulatory landscapes is a growing challenge across manufacturing industry  
Compliance failures can halt production, delay certifications, and expose organizations to risk*



**Tariff-Driven Cost Inflation**  
*Geopolitical instability and volatility has disrupted sourcing strategies  
Inability to make swift decisions triggered by market volatility*



**Siloed Data and Lack of Digital Continuity (Applications)**  
*Disconnected data sources across design, production, and logistics create delays  
Limited or lack of unified view of operations*

**Multi-Tier Supplier Risk Visibility**  
*Limited transparency and visibility into risks and exposure across multi-tier supply chains  
Reactive supplier risk and lack of traceability between supplier, part, and product*



**Limited Scenario Planning Capabilities**  
*Risk models are static and spreadsheet-based  
Inability to simulate potential risks and impacts  
Trade-off analysis is manual*



# Key Problem Statements

Supply chain disruptions have driven Defense Industrial Base organizations to address pressing challenges and explore solutions that go beyond conventional methods.

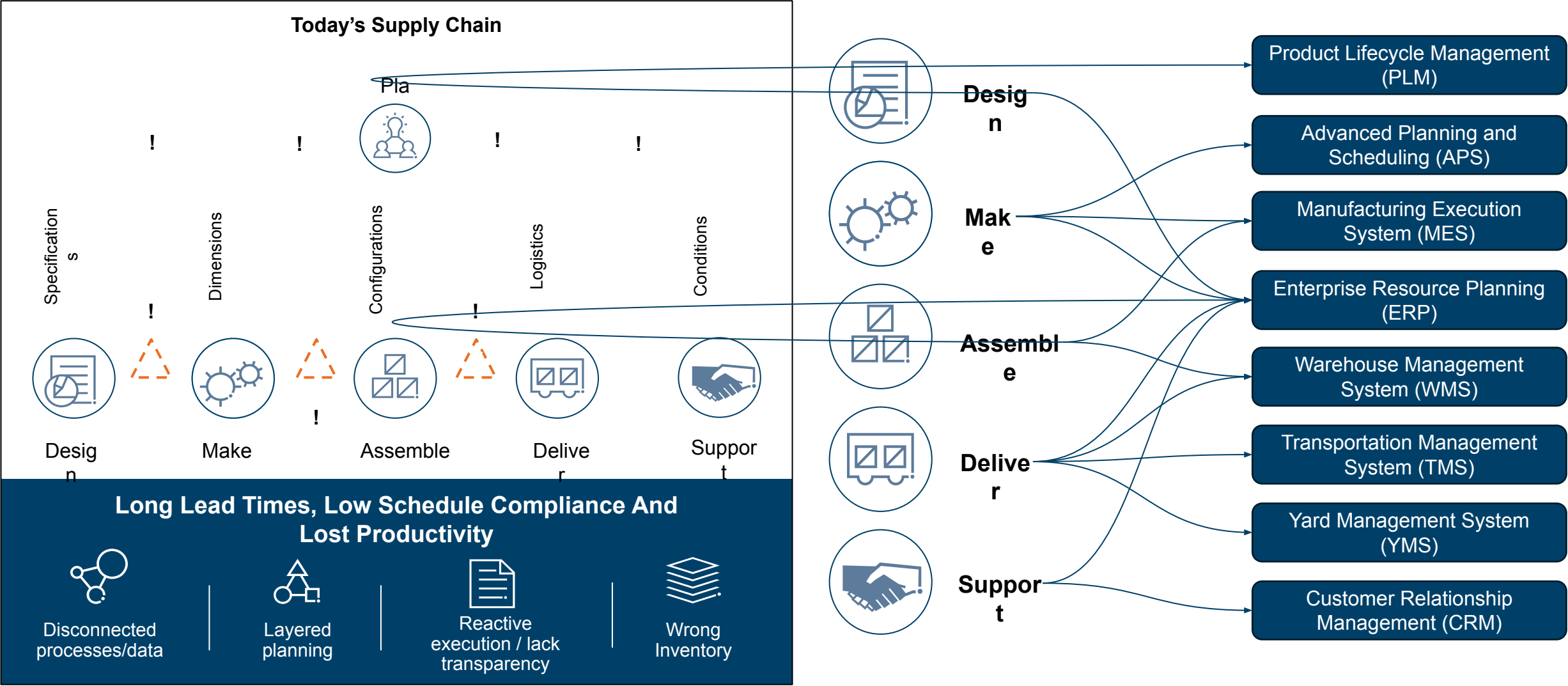


**Department of  
War Scale  
Orders**

**Lack of Tier X  
Supply Base  
Visibility**


**Traditional  
Models and  
Applications  
Silos & Waste**

# We Create Artificial Barriers and Waste Through Layers of Applications & Silos




# What If We Just Blew It Up!

Specifications



Design

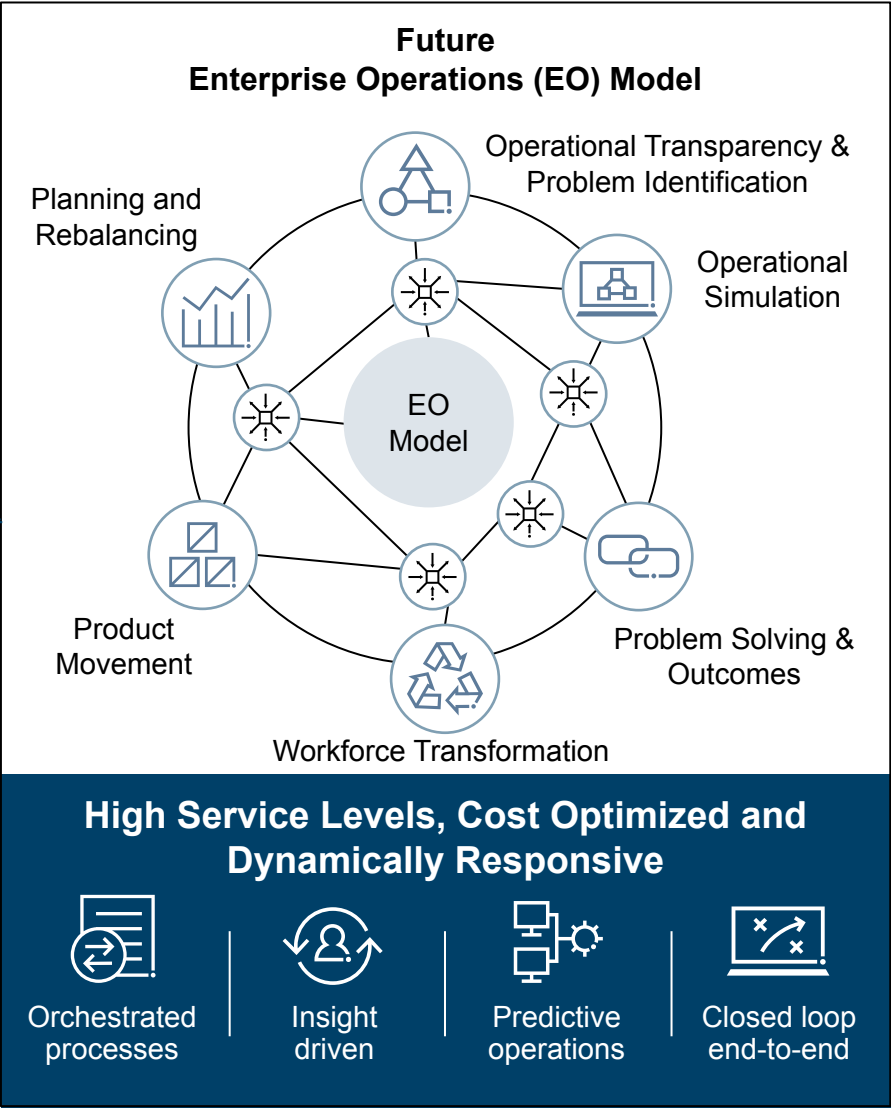
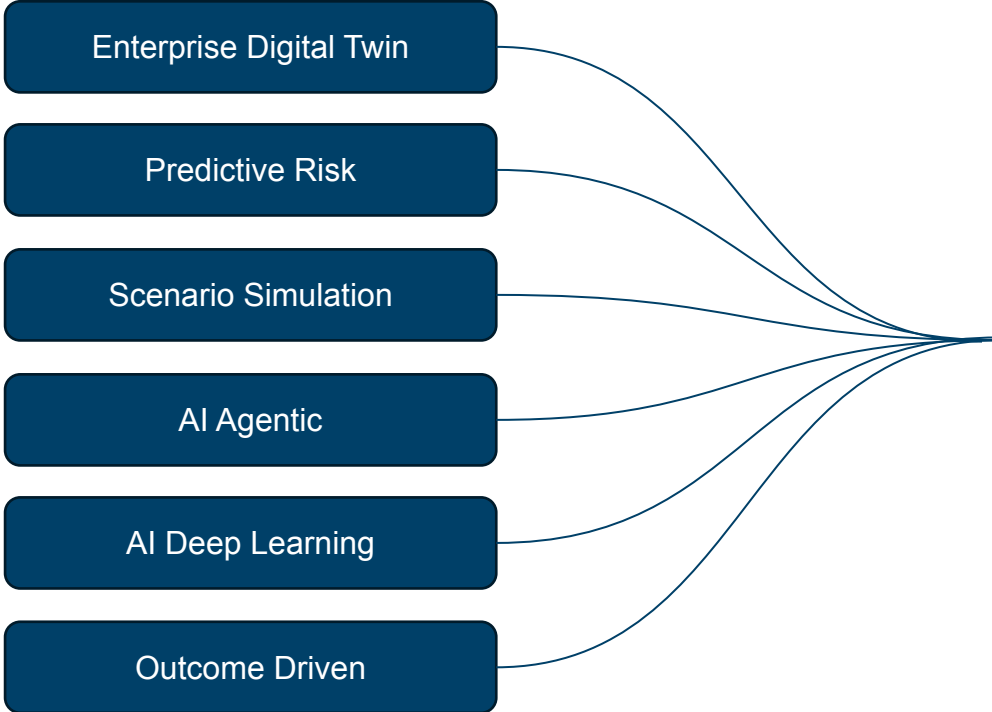


Disconnect processes/c



- Product Management (LM)
- Planning and Scheduling (APS)
- Production Execution (MES)
- Resource Planning (RP)
- Warehouse Management (WMS)
- Transportation Management (TMS)
- Enterprise System (MS)
- Customer Relationship Management (CRM)

# What If We Had a Better Way?



# Digital Twins: Everyone Has Them Already Right?

## Product Twin



## Product Twin Component View



Fig. 3 F-35 global supply chain.

## Factory Twin



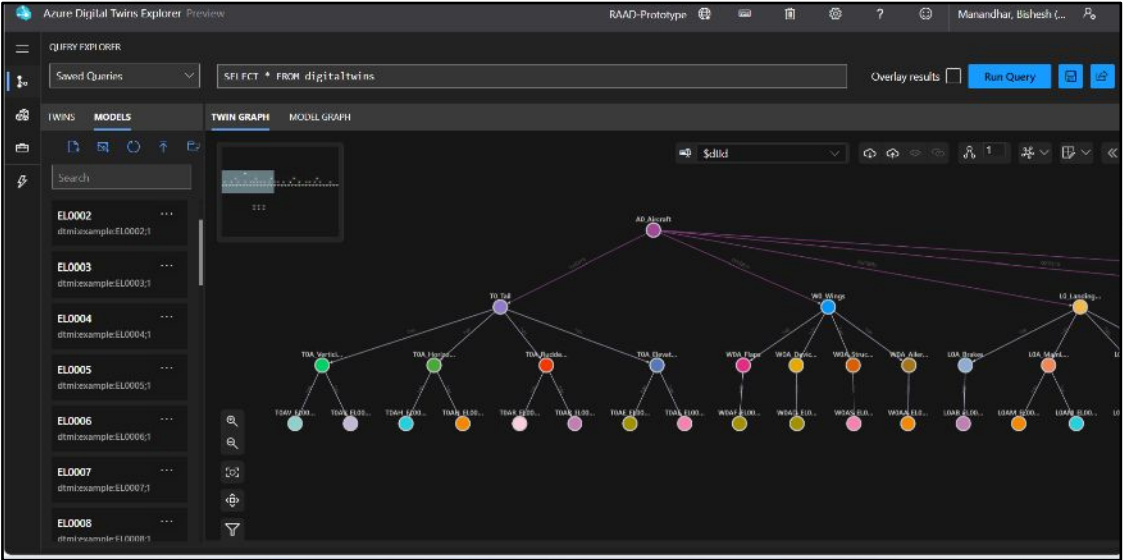
# Not So Fast: Enter The Enterprise Digital Twin

## Product Twin

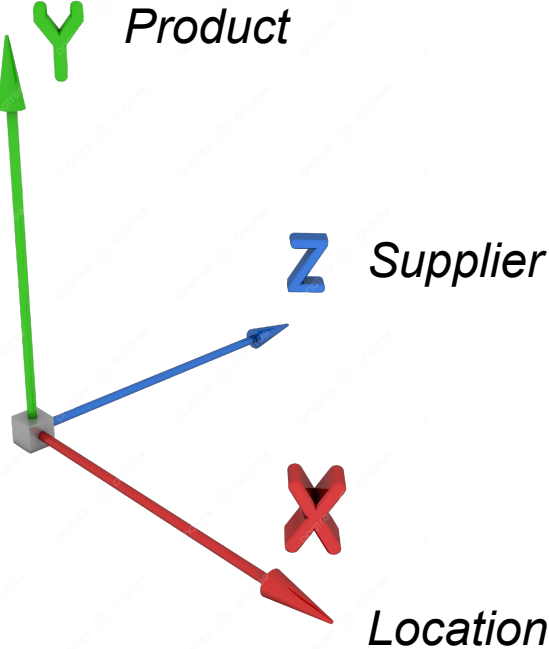


Fig. 3 F-35 global supply chain.

## Enterprise Twin

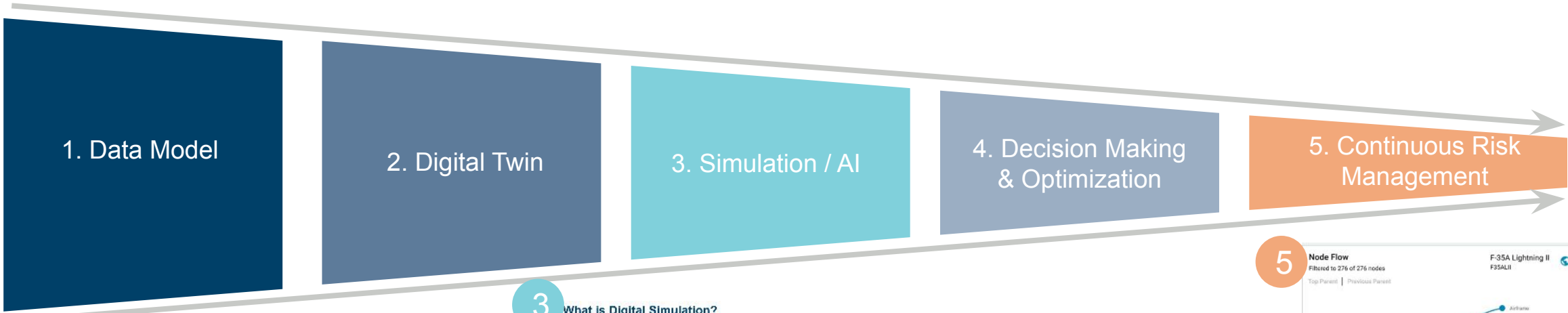


## 3D Data Model



# Enterprise Digital Twin Value

The enterprise twin drives operational outcomes through AI and monitors and manages risk



### 3 What is Digital Simulation?

Simulation software used to create models of systems and processes. Using 3D geospatial capabilities, it enables the accurate emulation of real-world environments, facilitating the testing of various layouts and strategies to produce optimal results.

**1** Available knowledge sources

With permissions for the copilot you can also create your own connections for other apps within the copilot. Manage security settings.

Q: keywords to the data you're looking for

**Featured**

- Add existing knowledge: Convert previously added sources to knowledge for this copilot.
- Public website: Incorporate any relevant web content found on Bing.
- File: Upload documents from your local computer.
- SharePoint and OneDrive: Search, integrate and manage internal data.
- Database: Connect and deploy structured data (SQL).
- Microsoft Fabric: Connect and deploy structured data (SQL).

**Bring your enterprise data (16)**

- Enterprise website (preview)
- Acron OneDrive (preview)
- Custom connectors (preview)
- Atlassian Confluence (preview)
- Google Mail database (preview)
- Sendinblue (preview)
- CSV (preview)
- Microsoft SQL (preview)
- NextMVA (preview)

**2**

**4**

**5** Node Flow

Filtered to 276 of 276 nodes

F-35A Lightning II F35ALIT

Top Parent | Previous Parent

- Airframe
- Engine
- Avionics
- Cockpit
- Health Technology
- Weapon Systems
- Electronic Warfare Systems
- Flight Control System
- Landing Gear
- Fuel System

Show Nodes by Risk Severity

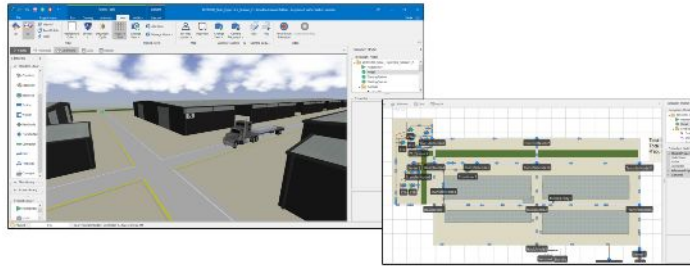
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# Manual Simulation to Real Time Agentic AI Best Outcome Modeling

We have rethought the business-as-usual approach. What used to take months can be done in real-time by run.

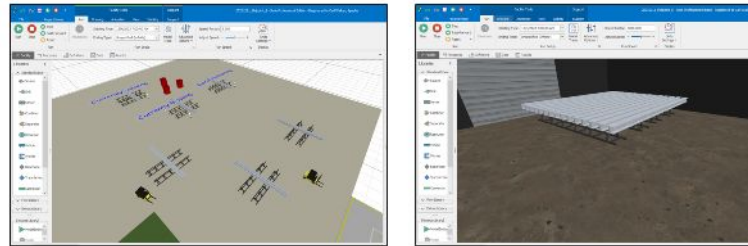
## What is Digital Simulation?

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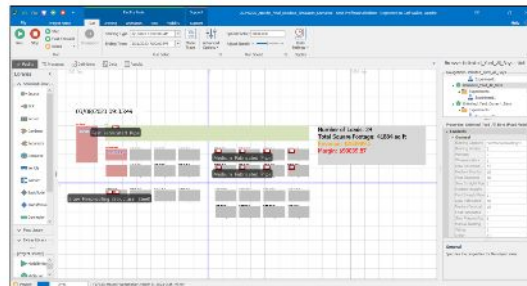
## Initial simulation - 3D process logic

Using the time study and category data from the previous slides, the Protiviti team created a 3D simulation to represent the production processes. The model simulates the general process – arriving to the yard for prep, blasting, coating, and drying.



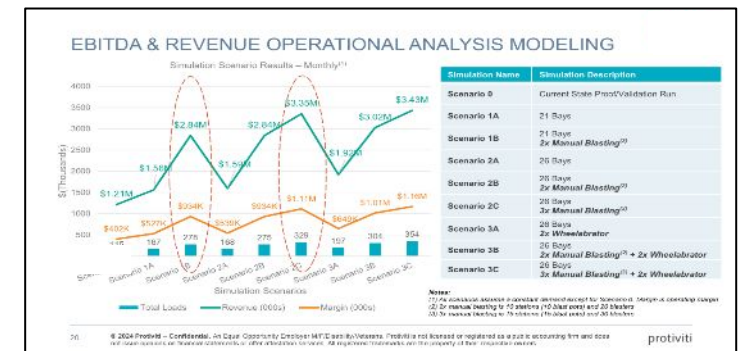
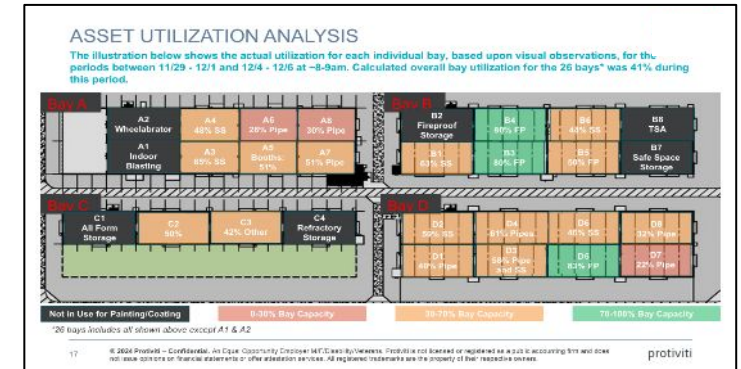
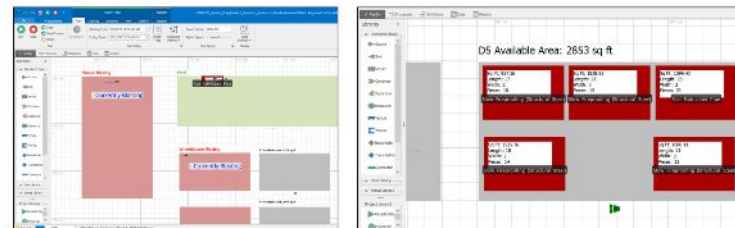
## Multiple experiments simulation

After the model was validated, Protiviti expanded the model to enhance its comprehensiveness, enabling the execution of a wider range of scenarios that can be easily configured and manipulated.



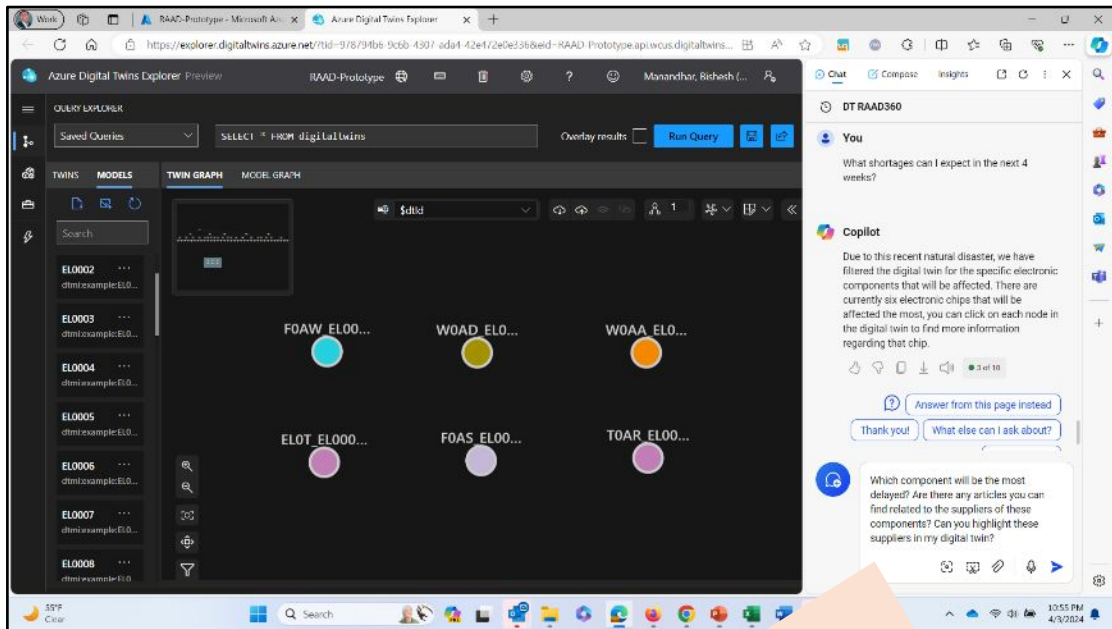
## Running the simulation to find best fit and next best action execution

Considering these configurations, the simulation operates under the assumption that there is always product available in the yard ready for blasting. This is because the goal of the simulation was to determine the maximum throughput of the facility. Also, when loads are going from blasting to bays, the simulation ensures a minimum of 2000 square feet of available floor space.



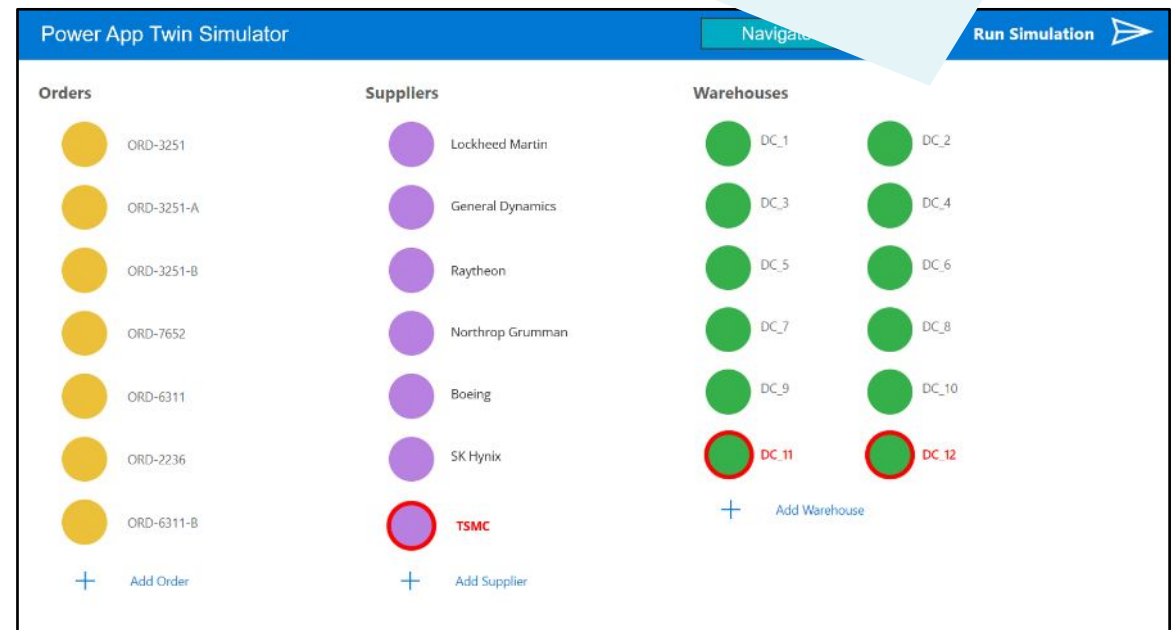
# Leveraging AI through the Enterprise Twin to Drive Outcomes

AI is no longer just a concept, it's delivering measurable, strategic impact across the Defense Industrial Base. Now is the time to shift focus toward how AI and real time scenario simulation can actively enhance and optimize your enterprise operations.



*Models learn constrained availability & provide recommendations on optimizing operations*

*Agentic AI to give real-time insights into potential alternative strategies to account for supplier bottlenecks and Tier N visibility risk*



# Operationalizing AI to Tame the Chaos

Traditional simulations require **manual scenario setup, execution, and review**. **Agentic AI enables dynamic, continuous simulations**, running **real-world scenarios** to identify the best possible operational strategies.

**Autonomous Scenario Testing**

AI continuously runs simulations to test different resource allocations, workflows, and system configurations.

**01**

**Iterative Learning for Optimization**

AI refines next-best actions by analyzing past results, identifying trends, and adapting recommendations.

**02**

**Real-Time Adaptive Decision-Making**

AI provides ongoing recommendations, ensuring operations adjust dynamically to disruptions, demand shifts, or process changes.

**03**

# Contact and Closing Remarks



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