SOLVING OPERATIONAL CHAOS BY RETHINKING RISK WITH DIGITAL TWINS AND AI

protiviti®
Global Business Consulting

Meet Our Speaker

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Managing Director &

Global Practice Leader Supply Chain & Operations

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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

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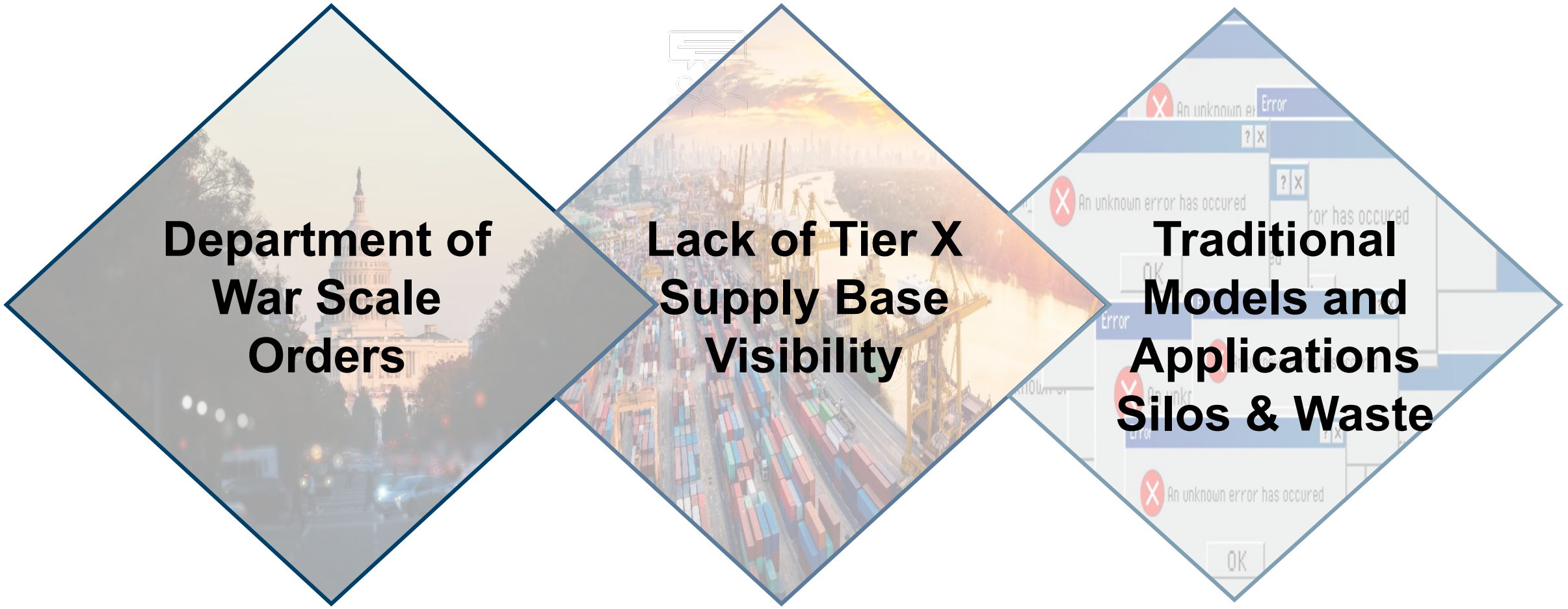
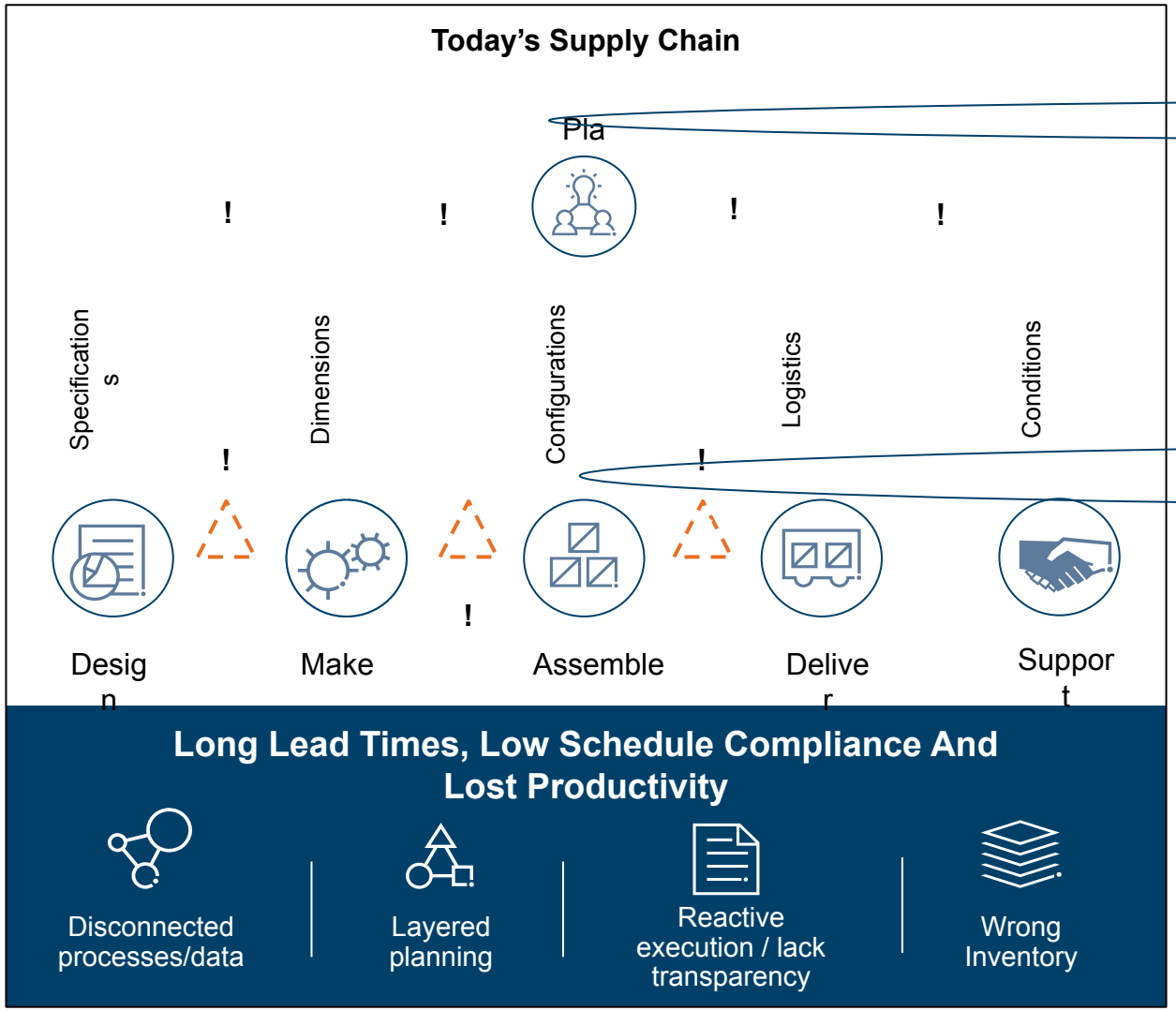
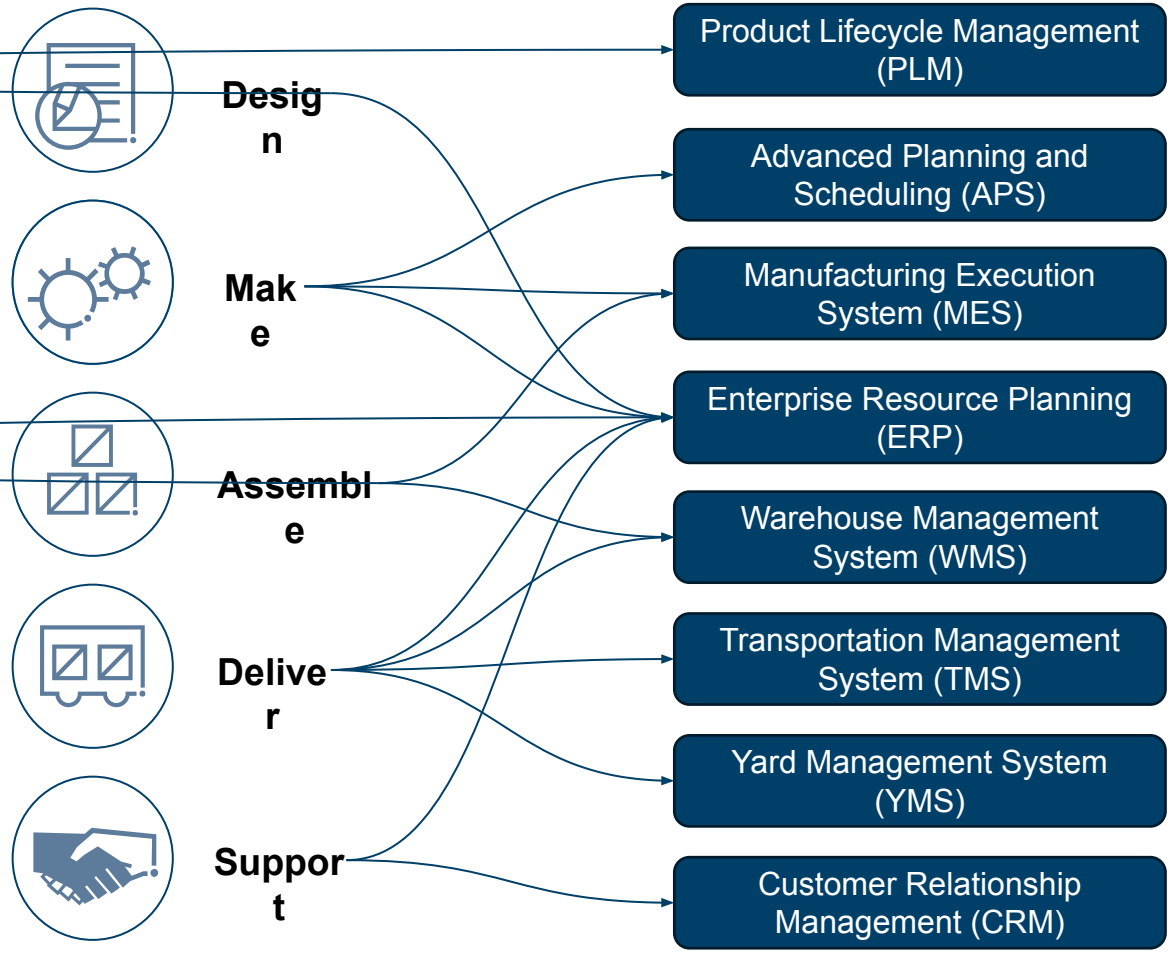
Key Problem Statements

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



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





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What If We Just Blew It Up!

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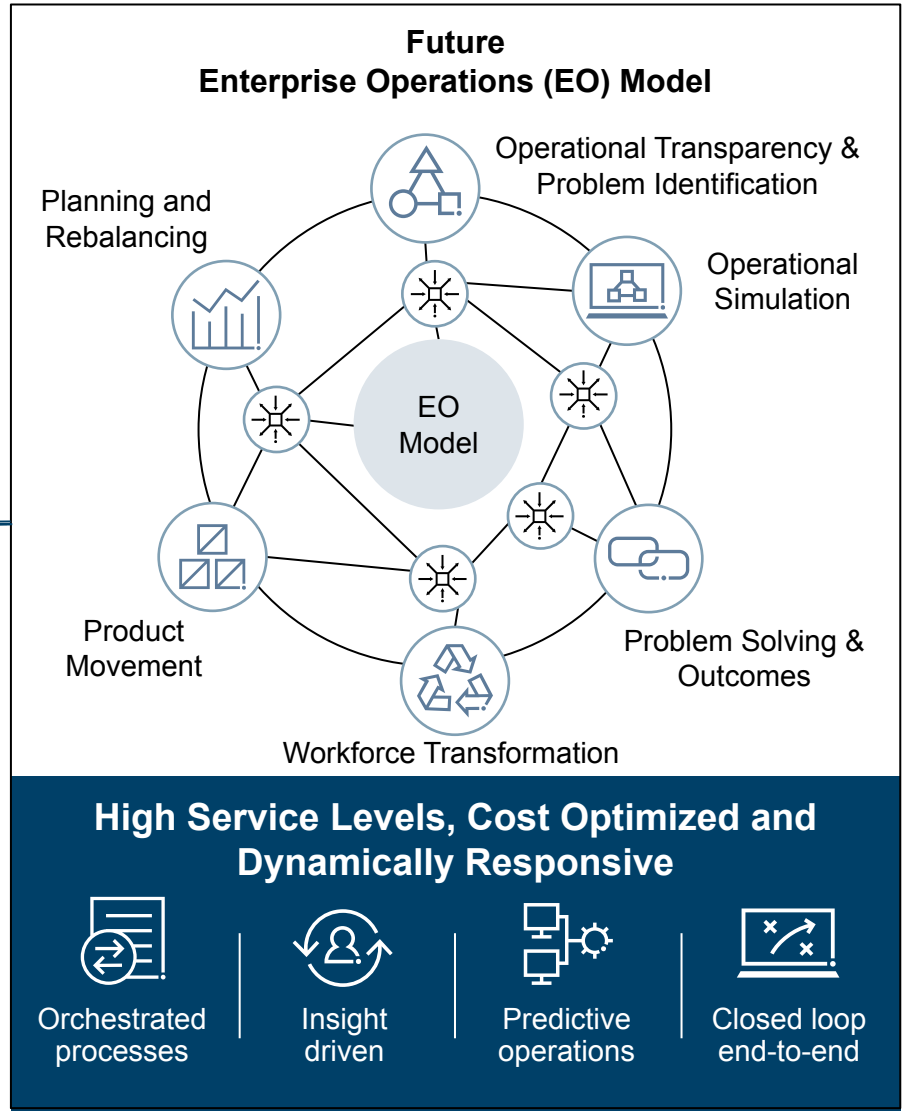
What If We Had a Better Way?

- Enterprise Digital Twin
- Predictive Risk
- Scenario Simulation
- AI Agentic
- AI Deep Learning
- Outcome Driven



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Digital Twins: Everyone Has Them Already Right?

Product Twin

Product Twin Component View

Fig. 3 F-35 global supply chain.

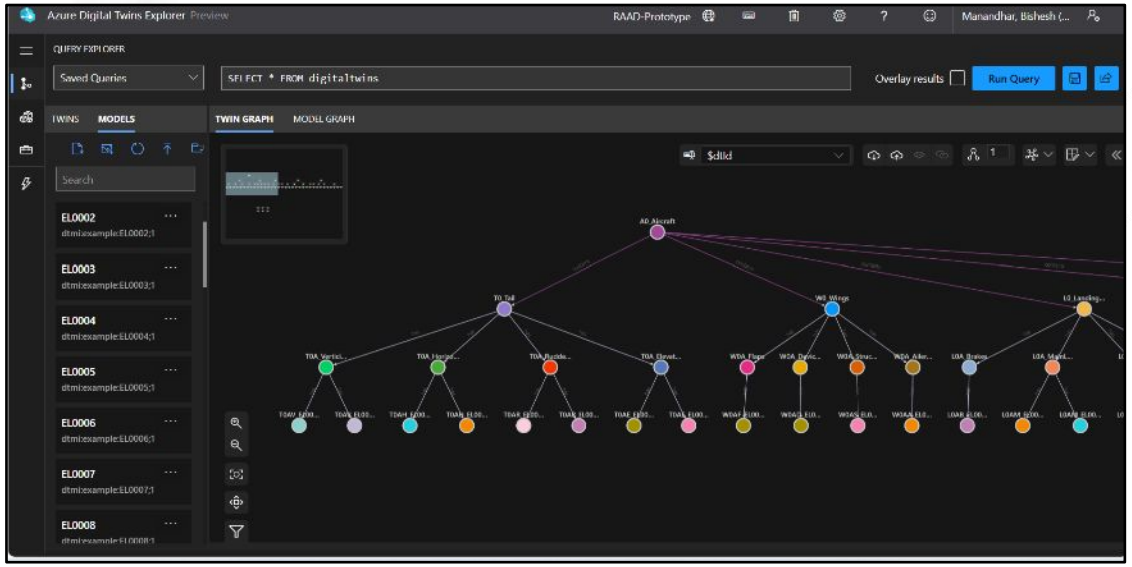
Factory Twin

Not So Fast: Enter The Enterprise Digital Twin

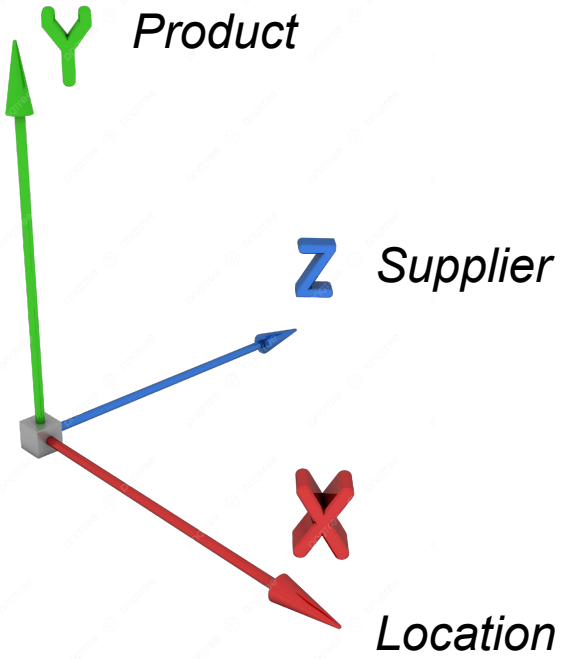
Product Twin

Fig. 3 F-35 global supply chain.

Enterprise Twin



3D Data Model



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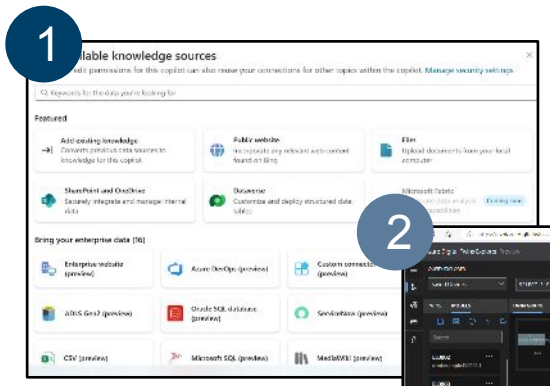
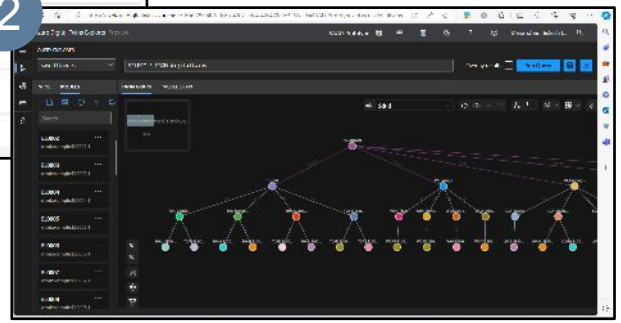
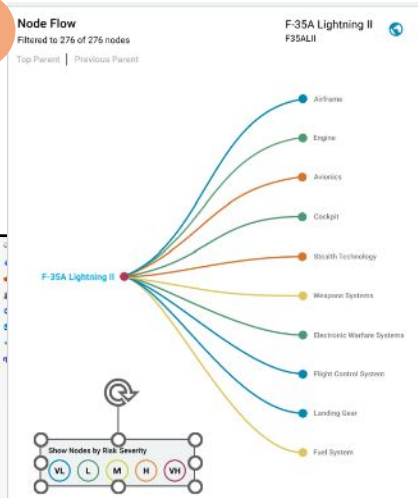
Enterprise Digital Twin Value

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

1. Data Model
2. Digital Twin
3. Simulation / AI
4. Decision Making & Optimization
5. Continuous Risk Management







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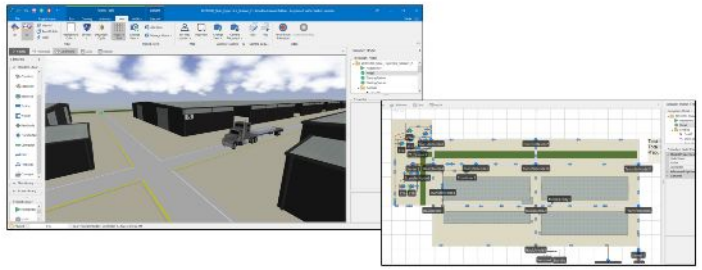
Manual Simulation to Real Time Agentic AI Best Outcome Modeling

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

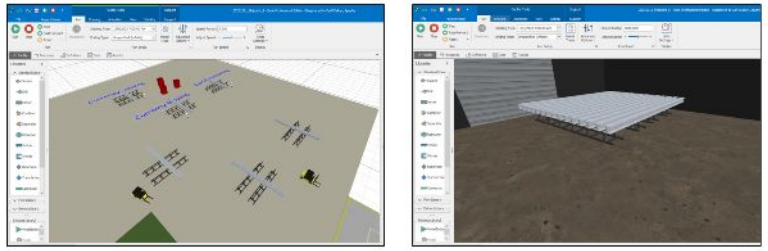
What is Digital Simulation?

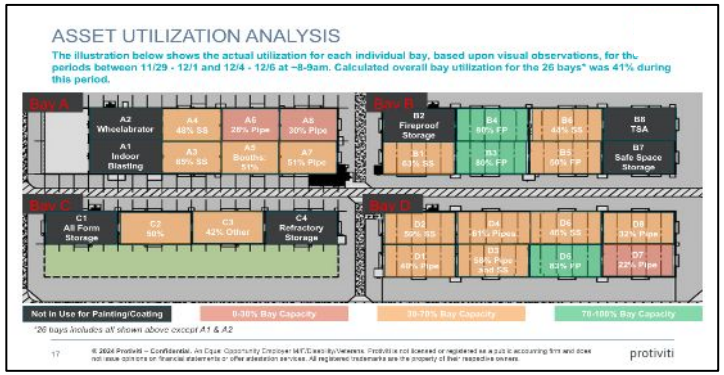
Simulation software used to create models of systems and processes. Using 3D geospatial capabilities, it enables the accurate emulation of real-world environments, facilitating the testing of various layouts and strategies to produce optimal results.



Initial simulation – 3D process logic

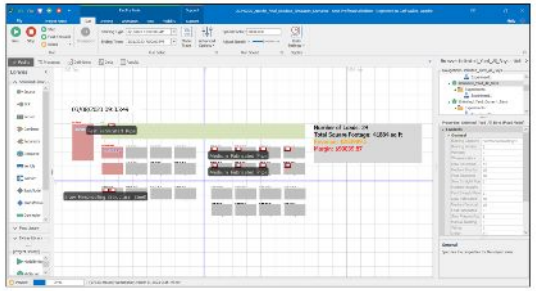
Using the time study and category data from the previous slides, the Protiviti team created a 3D simulation to represent the production processes. The model simulates the general process – arriving to the yard for prep, blasting, coating, and drying.





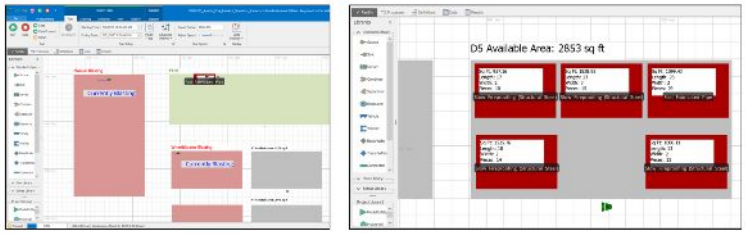
Multiple experiments simulation

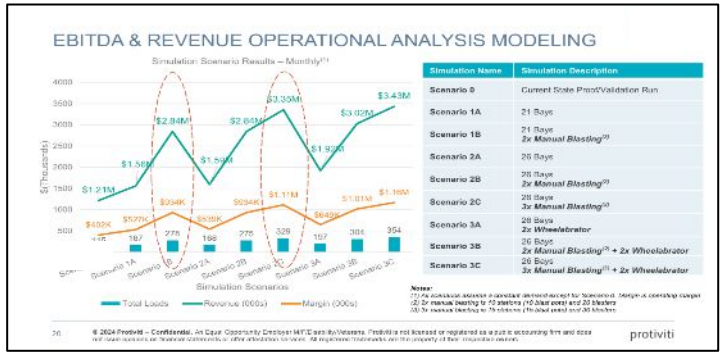
After the model was validated, Protiviti expanded the model to enhance its comprehensiveness, enabling the execution of a wider range of scenarios that can be easily configured and manipulated.



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.





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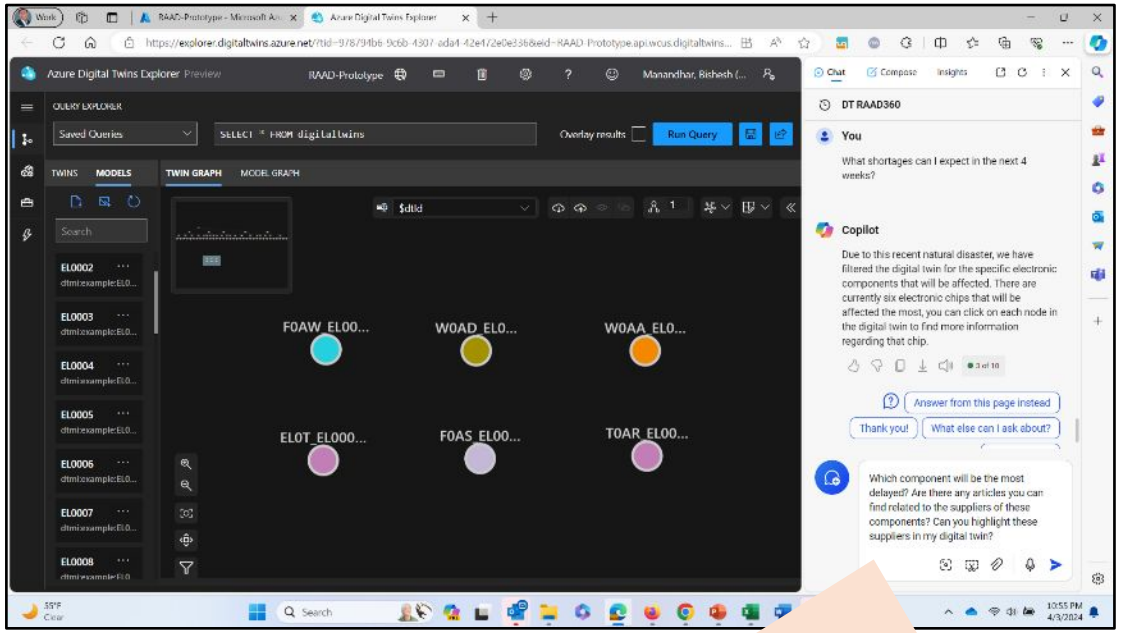
Leveraging AI through the Enterprise Twin to Drive Outcomes

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.



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

Models learn constrained availability & provide recommendations on optimizing operations

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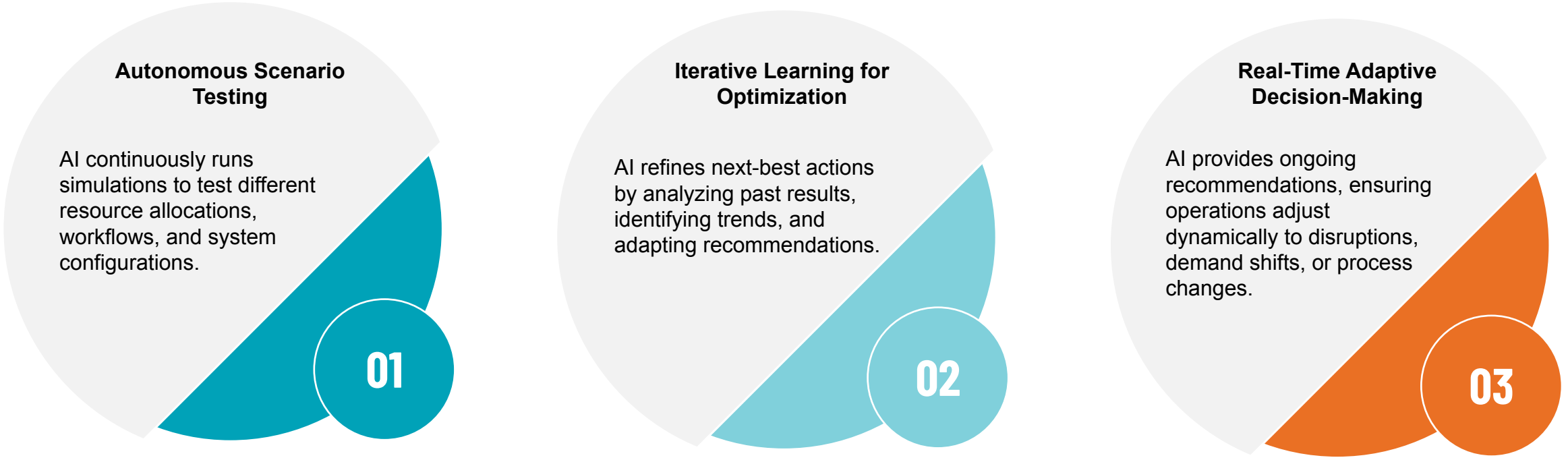
Operationalizing AI to Tame the Chaos

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.



Contact and Closing Remarks

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