



CELLS™ ANALYTICS RAM SUMMIT

CONCURRENT **E**NGINEERING **L**AYERED **L**OGISTICS **S**TRUCTURE (CELLS)

AVNIK DEFENSE SOLUTIONS, INC.

A WOMAN-OWNED SMALL BUSINESS (WOSB)

NOVEMBER, 2025

IP: AVNIK maintains full ownership of CELLS Intellectual Property (IP) under SBIR rights.
AVNIK will provide a license to the US Army to use the CELLS IP.

EXECUTIVE SUMMARY Click/Scan for Demo Video:



<https://www.youtube.com/watch?v=NDVN5XB3MEo>

- **Problem:** Army supply chain metrics are "stovepiped" - preventing visibility into critical interdependencies
- **Solution:** CELLS™ links disparate metrics to "look-across" operations, readiness, sustainment (Maintainability/Reliability), and cost domains
- **Innovation:** Application of commercial correlation and ML technologies specifically adapted for defense supply chain analytics
- **Commercial Readiness:** Proven Technology Readiness Level (TRL) 4-5 technology with 6+ years Navy SBIR validation (\$2.17M) - commercially ready and viable
- **Army Alignment:** Directly supports Army Modernization Strategy goals of predictive logistics and precision sustainment
- **No Disruption:** Works with existing Army **performance metrics (NMC, MTBF, MTTR, cost, supply)** - requires no process changes
- **Enterprise Scale:** Supporting continuous transformation across Army modernization
- **Benefits:** Accelerates root cause identification, improves situational awareness, enables predictive planning
- **Ready:** No changes to existing Army processes required

Innovative commercial technology ready for immediate Army enterprise deployment - supporting the Army of 2030/2040 sustainment transformation

CELLS FOR R&M-BASED ANALYSIS



- CELLS data usage optimization for R&M-based analysis
 - Optimization of disparate, siloed data using common time series alignment & data fusion
- Link metrics and reveal relationships between key performance factors:
 - Readiness, Sustainment, Cost, Supply, Operations, etc.
 - R&M-based analysis:
 - Link Reliability metrics (e.g., Mean Time Between Failure (MTBF) to Supply
 - Link Maintainability metrics (e.g., Mean Time To Repair (MTTR) to Readiness NMCM

CELLS analytics engine aligns & integrates disparate data sources into a cohesive view for R&M analysis

THE ARMY SUPPLY CHAIN CHALLENGE



Operations
Mission Metrics



Readiness NMC
Rates

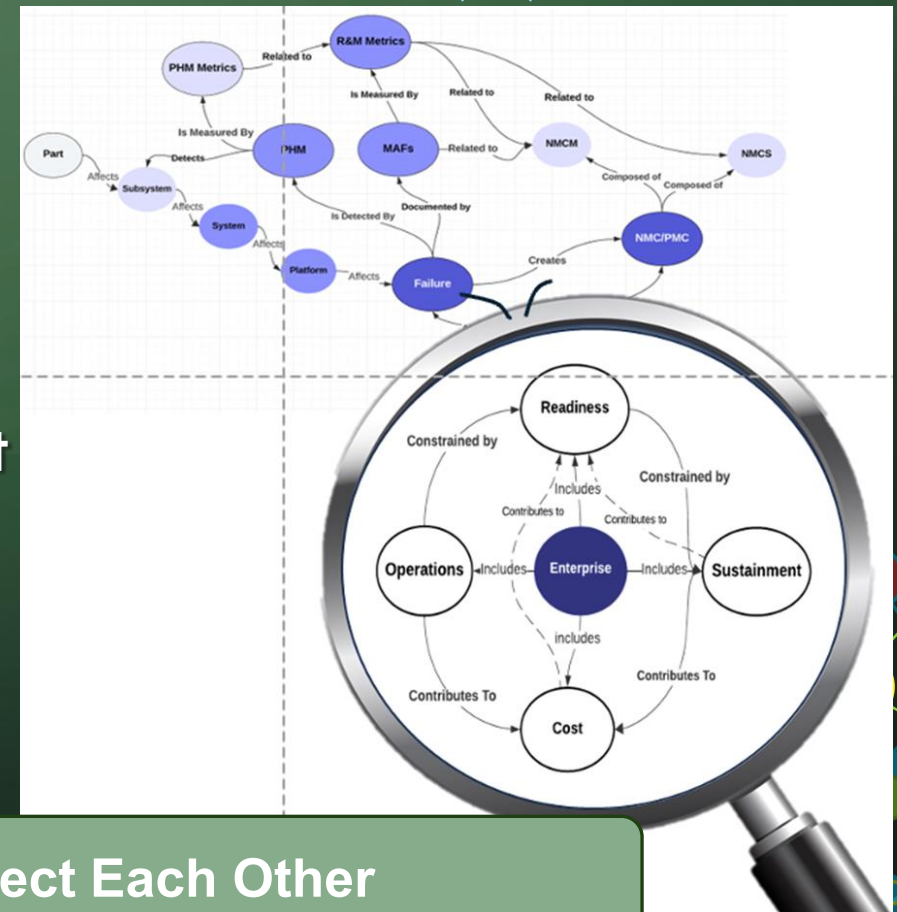


Sustainment Data
MTBF & MTR



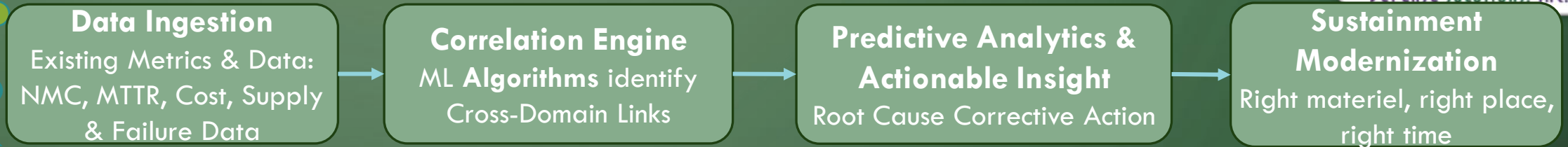
Cost
Budget Metrics

- Hundreds of Metrics Viewed in Isolation
- Limited Understanding of Interdependencies
- Slow Problem Identification and Resolution
- Reactive Rather than Predictive Management
- Sub-Optimal Resource Allocation Decisions



Metrics Are Often Inter-related and Effect Each Other

CELLS™ SOLUTION OVERVIEW



What CELLS Delivers for Supply Chain Performance:

- Identifies metric correlations and interaction signatures
- Synchronizes time-series data across enterprise
- Applies machine learning for pattern recognition
- Provides predictive analytics capabilities for trending
- Generates **common operating picture** for Army supply chain visibility & drilldown
- Supports predictive logistics by linking **sensor anomalies** to parts demand, depot workload
- Supports precision sustainment by correlating performance degraders across domains per Army Modernization Strategy

Innovation: CELLS uses New Technologies (correlation analysis, ML, predictive analytics) specifically adapted for defense **supply chain** logistics - filling the Army's methodology gap for enterprise-wide degrader identification.

WHY AVNIK'S CELLS IS DIFFERENT



- **CELLS Solution Presents New Capabilities** – using Correlation Analytics, Machine Learning, Natural Language Processing (NLP)
- **Application of an Innovative Commercial Product** – Leverage NAVAIR CELLS Phase II Small Business Innovative Research (SBIR) Topic # N192-065 Contract# N68335-21-C-0448
- Unique Aspects of CELLS as it relates to R&M: CELLS Is Different as it allows visualization to Multiple Supply Chain Data Exploration Pathways:
 - “Look across” multiple focus areas/metrics by WUC
 - Correlations between metrics across moving time windows by WUC
 - View source metrics monthly data by WUC
 - Display raw data records (e.g. Maintenance Records)
- AVNIK can provide an immediate Demonstration of CELLS to the US Army
 - Suggested pathway to mature CELLS for the Army through a pilot project
- CELLS technology is proprietary to AVNIK via SBIR data rights

ENTERPRISE BENEFITS AT THE EXECUTIVE VIEW LOOK ACROSS CAPABILITY BY FOCUS AREA



Notional Data



- Reduces time from problem detection to a possible root cause
- Improves situational awareness of effects upstream/downstream
- Highlights dependencies across any actual performance data

Look Across – Analytic engine shows WUC metrics by multiple focus areas
- Readiness, Maintenance, Maintainability, Reliability, Cost & Supply

TECHNICAL ARCHITECTURE



**Local or Web
Application**
Browser-based
access

**On-Prem or
Cloud**
Secure Environment

**Python
Analytics**
Data Processing

**Machine
Learning**
Pattern Recognition

Tableau
Visualization
Engine

Key Technical Features:

- **Demonstration of existing commercial technology – available now**
- **Data Manager:** Local or Web-based tool for data source configuration
- **Analytics Engine:** Python-based correlation and ML processing
- **Visualization:** Interactive dashboards with “look-across” & drill-down capabilities
- **Security:** On-Premises or Government-approved cloud infrastructure
- **Scalability:** Handles large-scale enterprise data volumes

Physical Access: AVNIK requires permission to install CELLS onto the Army enterprise and physical access for Data Ingestion

KEY BENEFITS FOR ARMY SUPPLY CHAIN



Faster Recovery

Reduces time from problem detection to root cause identification



Enhanced Visibility

Cross-enterprise awareness of upstream/downstream effects



Improved Planning

Identifies dependencies based on actual **performance data**



Predictive Capability

Early anomaly identification and trend analysis



Cost Optimization

Better resource allocation through data-driven insights



No Disruption

Uses existing metrics - no process changes required

CELLS Is Different – Multiple Data Exploration Pathways:

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ARMY-SPECIFIC APPLICATION



Army Integration Points:

- **PEO/PM Systems:** Cross-program WUC performance alignment
- **Sustainment Commands:** Multi-domain metric correlation
- **Supply Chain Operations:** End-to-end visibility and optimization
- **Logistics Data Analysis Center (LDAC):** Central data hub integration

Mission Impact

Direct support to Army Modernization Strategy through data-driven sustainment improvements



Immediate Value

Works with existing Army metrics - NMC rates, MTR, Cost Data, Supply Performance

Customers: Maintenance Managers, operations analysts, and supply chain directors in Aviation, Missile, Ground who need to rapidly diagnose why their systems are failing and predict problems before they impact operations.

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Click or Scan to watch the Demonstration Video:

<https://youtu.be/NDVNsXB3MEo>



Scan for video
demonstration

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