Transforming Defense Engineering Through Open, Agile and Digital (OAD)

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Approved for Public Release

Introductions

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NOTE: The content of this presentation has been approved for public release

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Topics

Why Open, Agile, Digital (OAD)?

A compelling reason to act

What is OAD?

Principles and value

How to Leverage OAD to Enable Mission Success

Adoption across the enterprise and lifecycle

Closing

Bringing it all together

Explore the transformative impact of OAD on solution delivery

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Why Open, Agile, Digital (OAD)?

The Defense Market Demands It

In the defense industry, things change rapidly (adversaries, technologies, competitors)

There is a need to build resilient and robust systems rapidly with the ability to adapt to changing needs

Customers want confidence in solutions early with the ability to quickly make changes based on technology and/or situation

Solution providers want to react and predict with speed and agility

Safety, speed, agility and affordability – these are the goals

"Deliver Performance at the Speed of Relevance"
- DoDD 5000.01, "The Defense Acquisition System," September 9, 2020; Incorporating Change 1 on July 28, 2022 (whs.mil)

"A world-class engineering culture requires an engineering capability that adapts and mitigates evolving threats faster than the opposition can produce them."
- Paul Mann, Chief Engineer, Assistant Secretary of the Navy for Research, Development, and Acquisition

To remain a leader, organizations must change

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Challenges Require an Integrated Solution

Solution architectures are often not modular, built on standard hardware, and decomposed into capabilities that can evolve incrementally

Flow of value is impacted by dependences, resource constraints, regulatory bottlenecks, supply chains, SoS coordination, technical complexity, etc.

Software Factories can't deliver effectively unless there is an architecture of interchangeable parts, measurable specifications and rigid quality definitions

Organizations are delivering fast and iterating but it's often unclear toward what they are iterating

Just because solutions can be deployed quickly doesn't mean they will be reliable or effective under real-world conditions

One technology is not enough to address market needs/challenges

Digital
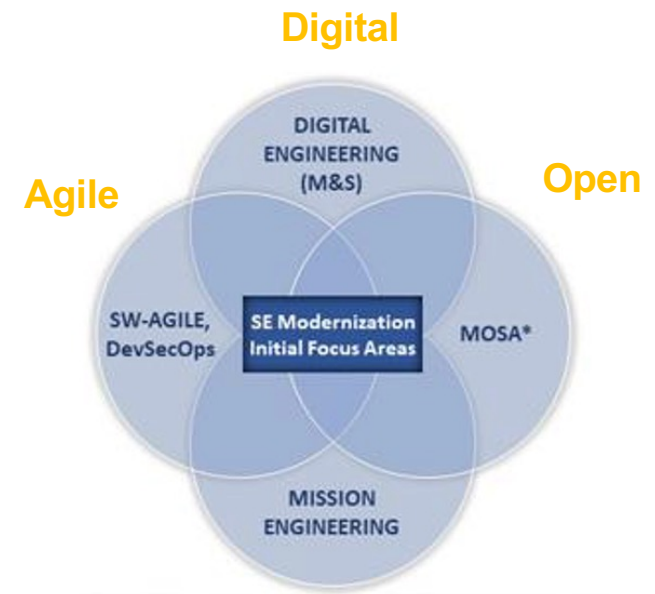
Agile

Open

Image source: https://www.cto.mil/sea/se/
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"[Digital Trinity] Rather than just building better systems, it builds systems better"
- Will Roper, "There Is No Spoon," October 7, 2020.

Open, Agile and Digital are Foundational to Defense Modernization

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What is Open, Agile, Digital (OAD)?

What is OAD?

Open

Modular Open Standard Architecture (MOSA)

Government Reference Architecture (GRA)

Use of modular architectures based on open standards to enable **interoperability**

- *Supports interoperability and integration of technologies from diverse sources, enabling innovation, flexibility, scalability, and affordability, while reducing time, cost and risk*

Agile

Scaled Agile Framework (SAFe)

Scrum

Kanban

Use of iterative processes and continuous feedback to deliver rapidly and **respond to change**

- *Focuses on delivering value quickly using iterative and incremental development process, and continuously improving based on feedback, reducing risk*

Digital

Digital Twin

Modeling & Simulation

Artificial intelligence

Software Factory

Intelligent Factory
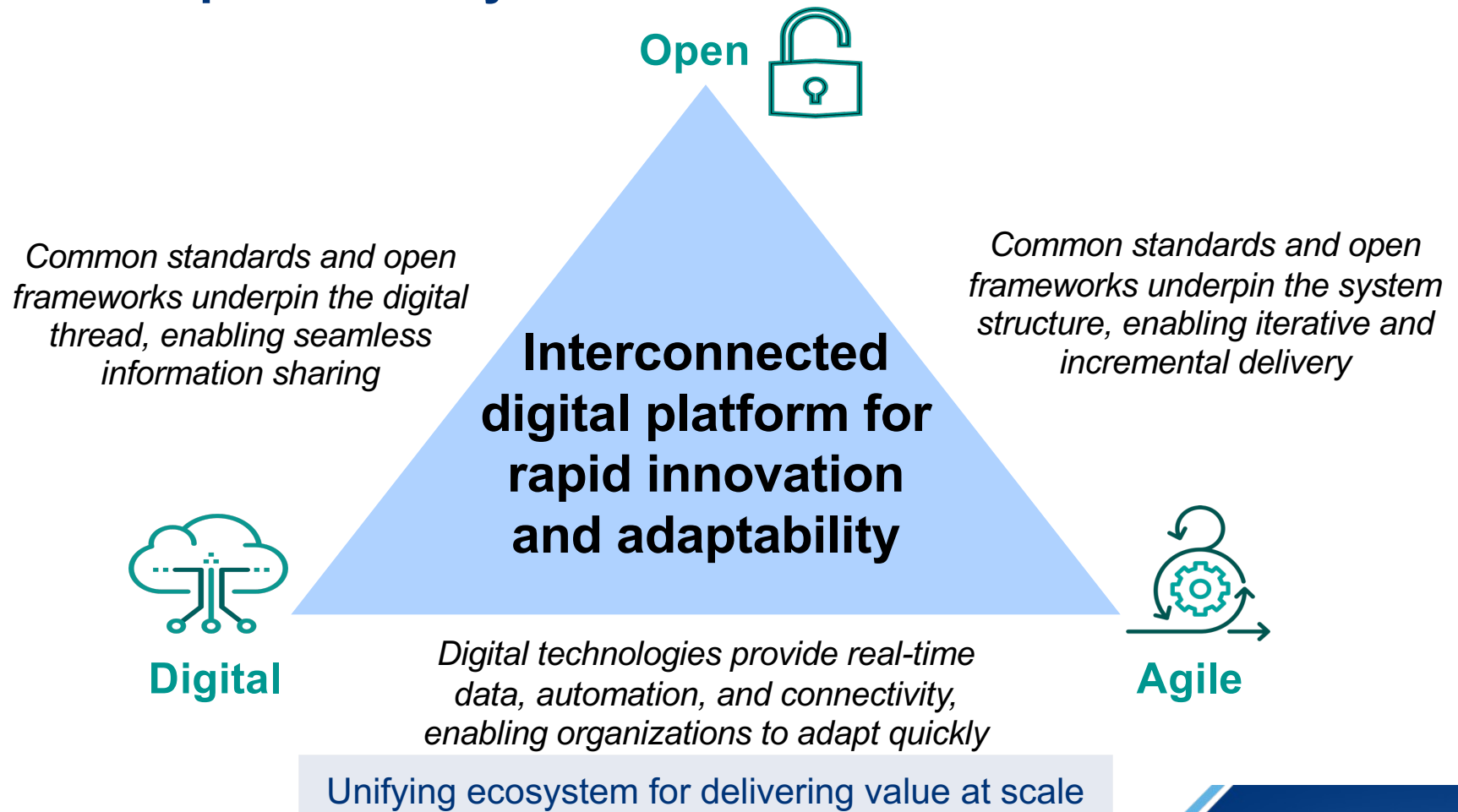
Use of a digital environment where data, resources and capabilities are connected by digital threads that enable **seamless integration**

- *Digital technologies streamline operations and improve communication, collaboration, and decision-making, increasing speed and reducing costs*

Underlying foundation for the enterprise of the future

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The development ecosystem of the future

Open

Interconnected digital platform for rapid innovation and adaptability

Common standards and open frameworks underpin the digital thread, enabling seamless information sharing

Common standards and open frameworks underpin the system structure, enabling iterative and incremental delivery

Digital

Digital technologies provide real-time data, automation, and connectivity, enabling organizations to adapt quickly

Agile

Unifying ecosystem for delivering value at scale

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"The Power of Three" - OAD Benefits

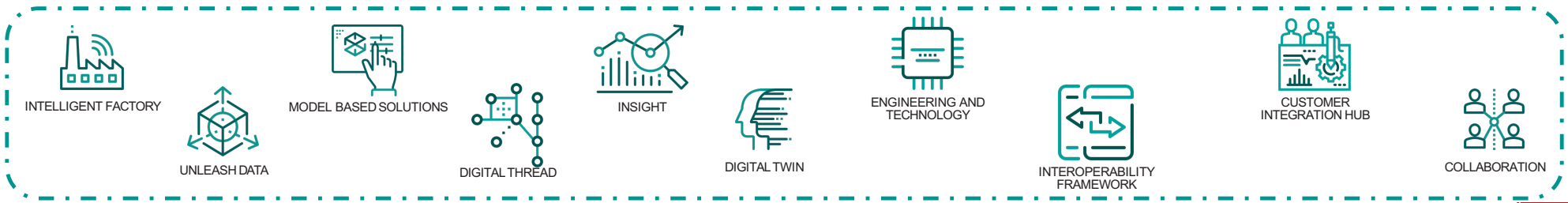| Competitiveness	Operational Excellence	Innovation and Adaptability	Customer and Employee Engagement and Satisfaction
Deliver technically superior mission-critical solutions faster and more affordably (better, faster, cheaper)	*Reduce cost, schedule, and risk through streamlined processes, automation and real-time insights*	*Deliver innovative solutions that evolve with the changing market*	*Build trust through transparent communication, collaborative decision-making, and a supportive infrastructure*
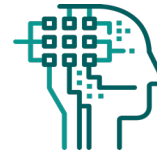
INTELLIGENT FACTORY

UNLEASH DATA

MODEL BASED SOLUTIONS

DIGITAL THREAD

INSIGHT

DIGITAL TWIN

ENGINEERING AND TECHNOLOGY

INTEROPERABILITY FRAMEWORK

CUSTOMER INTEGRATION HUB

COLLABORATION

Don't just survive, thrive

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How to Leverage (OAD) to Enable Mission Success

OAD Across the Lifecycle Phases

Open:
- Structure the system to reflect open-source patterns and reference architectures

Agile:
- Structure the system around mission capabilities
- Implement a lean-agile operating system

Digital:
- Capture the system structure and element traceability in an accessible digital model

Transition
Moved solution into operational use

Inception
Capture initial solution intent and system definition

Customer-focused, collaborative, iterative, incremental, feedback-driven, standards-based, model-based, digitally integrated

Concurrent Engineering

Open:
- Use open standards to integrate with existing infrastructure (vendor-agnostic transition)

Agile:
- Deliver value early and regularly, adjust quickly based on feedback (responsive support)
- Streamline and adapt processes for optimal performance

Digital:
- Use digital twins, real-time monitoring, and advanced analytics to streamline logistics and maintenance, maximize product availability and effectiveness, and provide feedback.
- Automate processes to reduce manual errors.

Realization
Design, implement and test

Open:
- Leverage open-source standards to share information across teams and tools and to integrate diverse systems
- Verify and validate against open standards

Agile:
- Deliver value iteratively and incrementally, highest value first, adapting based on feedback
- Continuous integration and testing - Test early and often

Digital:
- Use modeling, simulation and automation to accelerate development, enhance precision, and enable data-driven decisions (digital twins, digital thread)
- Integrate and automate workflows to enhance efficiency

Leverage OAD across the lifecycle to revolutionize solution delivery

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Implementing OAD

Form a Guiding Coalition	Define the Vision and Execution Strategy	Establish the Foundation	Evolve Through Learning
Establish collaborative leadership to drive impactful and sustainable change	*Clarify where you want to go and how you plan to get there*	*Create a foundation for continuous evolution*	*Deliver a fit-for-purpose solution via feedback-driven releases*
Collaborative leadership to drive impactful and sustainable change • Responsible for end-to-end implementation • Have the authority and ability to change the existing system.	Proper alignment, coordination, and planning enable effective execution • Foundational Solution Definition: What OAD means to the organization • Objectives and Key Results (OKRs): What a successful OAD implementation looks like • Implementation Approach: How you will get there	Modular architecture designed for incremental development, adaptability and scalability • Decompose the OAD solution into capabilities that can be delivered incrementally • Build the core tech stack • Define a capability roadmap • Clarify where in the organization you will start	Incrementally evolve the solution and the implementation roadmap, delivering capabilities regularly to get feedback and adapt • Digital infrastructure (common tools) • Playbooks (common processes) • Education/Centers of Excellence (CoEs)

Old proverb: "A vision without a plan is just a dream. A plan without a vision is just drudgery. But a vision with a plan can change the world."

Accelerate implementation-at-scale with structure, clarity, and consistency

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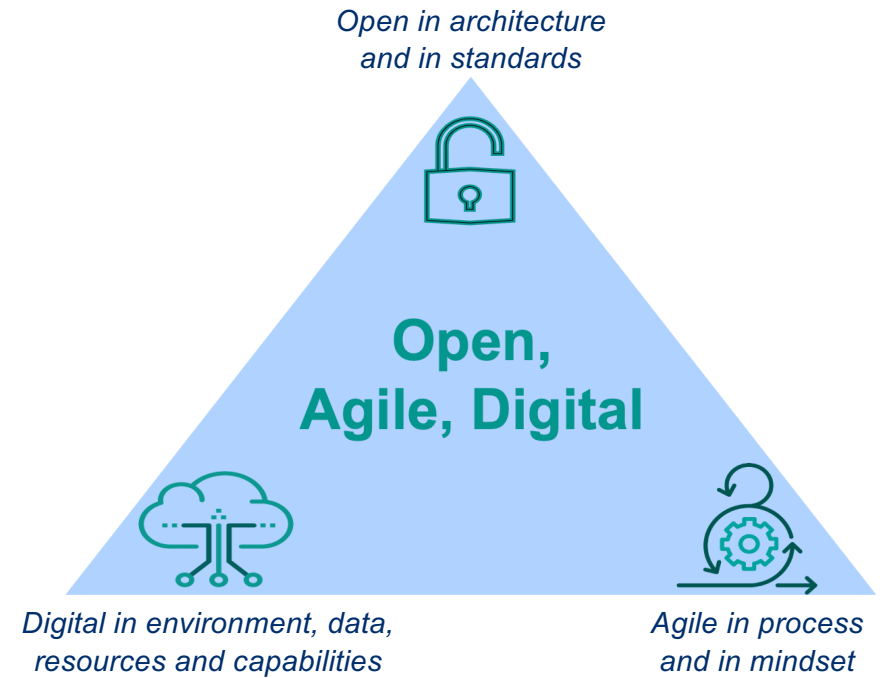# Closing

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Summary

Why: Enable Mission Success

- Never forget why you started – Safety, speed, agility and affordability are the goals

What: OAD-Based Enterprise

- Integrated ecosystem for delivering value at scale

How: Ongoing Journey of Doing, Reflecting, Learning, Adapting

- Structured implementation approach that provides clarity and structure, reduces churn and risk, supports scaling, and is adaptable
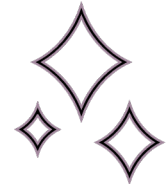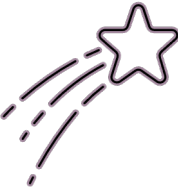- Configured the approach to be fit-for-purpose for your organization

Open in architecture and in standards

Open, Agile, Digital

Digital in environment, data, resources and capabilities

Agile in process and in mindset

OAD enables innovative and adaptive solutions at the speed of relevance

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What Questions Can I Answer?

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Thank you!

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