



# 2025 Federal Digital Engineering Forum

## Working Group Outbrief

Emerging Technologies in Digital Transformation  
Aaron Comis, Aerospace Corporation  
Peter Suyderhoud, Idaho National Laboratory (INL)



## Our Challenge(s)

- What do we define as an *emerging technology (or emerging capability)*?
- How do we identify, evaluate, prioritize, and mature emerging technologies for adoption within the Digital Ecosystem?
- How is Artificial Intelligence, such as GenAI and Machine Learning, being leveraged to enhance DE processes?
- How are we leveraging Digital Twins into our engineering and operational workflows and what benefits are being realized?
- How are we addressing interoperability challenges when integrating emerging technologies with legacy systems?



## Past – The Current Landscape PS1

- **Inconsistent Adoption Across Agencies**
  - Uneven capability maturity due to varied leadership support, funding levels, and organizational inertia
- **Siloed Applications, Data, and Tools**
  - Systems, templates, and data are often need-to-know and/or not shared outside the project, mission, or agency/department
- **Complex and Lengthy ATO/FEDRAMP Processes**
  - Processes essential for security are frequently slow and resource-intensive, inhibiting the ability to rapidly prototype and deploy new technologies or capabilities
- **Fragmented Cybersecurity Postures**
  - Security strategies vary widely between agencies, often based on legacy models that are inconsistent with zero-trust principles
- **Limited Interoperability and Standardization**
  - Reuse and extensibility is restricted by a lack of common data model, APIs, and modular architecture
- **Diverse Needs and Uneven Resourcing**
  - Divergent capabilities and timelines between agencies/department stem from differing mission scope, operational tempo, and funding levels

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### PS1 Body Text (Bullet Points)

Include the limitations and pain points.

Example: "Limited data interoperability, siloed toolchains, lack of standardized processes, inconsistent security implementations and a limited understanding of specific needs for small businesses to adopt these practices."

Peter Anton Suyderhoud, 2025-07-08T22:48:52.452



## Present – The Current State Trends PS1

- **From Government-Led to Public-Private Co-Investment**

- Example: The CHIPS and Science Act allocated \$52 billion with required matching or complementary investment from private-sector chipmakers to rebuild domestic semiconductor manufacturing

- **From Compliance-Centric to Continuous Assurance**

- USAF Platform One includes a continuous ATO framework with operational approval achieved via ongoing automated compliance and real-time monitoring (not static documentation)

- **From Monolithic to Modular, Interoperable Architectures**

- MOSA (Modular Open Systems Approach) will ensure new DoD systems are developed with open standards and nodular components, promoting long-term flexibility for technology upgrades across a diverse set of vendors

- **From Isolated Innovation to Enterprise and Beyond Learning**

- The DEBoK (Digital Engineering Body of Knowledge) is intended as the cross-federal government repository for knowledge capture and sharing

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### PS1

Body Text (Bullet Points)

Highlight any ongoing initiatives or research that is attempting to address the problem

State where there are opportunities to bridge capability gaps

Example: "Multiple and siloed efforts to advance DE, lack of cohesion between government and industry, and continued high cost of implementation for small business."

Peter Anton Suyderhoud, 2025-07-08T22:55:50.039



## Future – Our vision

- **Proposal: An integrated, capability-centric taxonomy for Emerging Technologies in Digital Transformation**

- Multi-tiered framework to organize *emerging capabilities, technologies, and practices* driving enterprise digital transformation in the U.S. federal government
- Structured around *high-level capability domains* vs. technologies
- Traceability from *strategic objectives* to *implementation*
- *Agency-agnostic yet informed by best practices* from DoD, NASA, DOE, DOT and others, emphasizing common themes of digital modernization



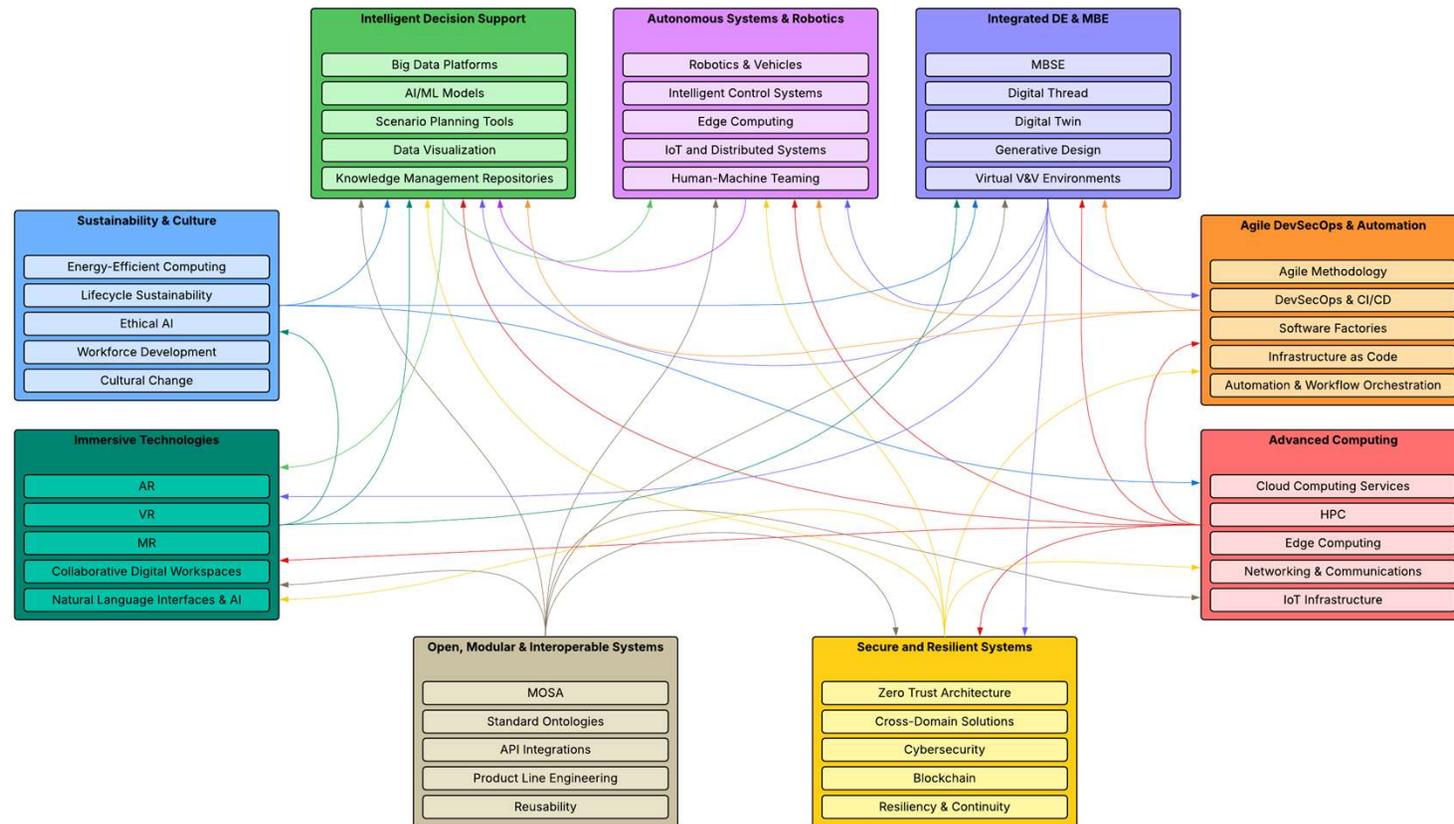


## Our Approach – Federal Digital Capabilities Compass

- **Intelligent Decision Support:** Better decisions and mission outcomes enabled by tech
- **Autonomous Systems & Robotics:** Smart systems previously not feasible
- **Integrated DE & MBE:** Connecting the digital ecosystem for increased collaboration
- **Agile DevSecOps & Automation:** Connecting strategy with tactics
- **Advanced Computing:** Enabler that makes all forward-facing digital innovations possible
- **Secure and Resilient Systems:** Guarantor against adversaries and mishaps in DE
- **Open, Modular & Interoperable Systems:** Future-proofing federal digital investments
- **Immersive Technologies:** Maximizing the synergy of people and technologies
- **Sustainability & Culture:** Ensuring that digital transformation is holistic and responsible



# The Interconnected Nature of the Taxonomy



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## Conclusion PS1

- **Key challenges for Emerging Technologies in Digital Transformation**
  - Defining and managing Emerging Capabilities
  - Integrating AI & Digital Twins Effectively
  - Interoperability & Legacy Integration
- **The goal for Emerging Technologies WG was to develop and share a first draft of a capability-driven framework to the community for feedback**
  - Federal Digital Capabilities Compass
- **The approach for effective identification, evaluation, prioritization, and maturation of Emerging Technologies is through model-based and collaborative innovation**
  - Continue building upon DEBoK and FED DEF to establish common frameworks, attribute-based definitions, and share/collaborate as much as possible
- **Build Together, Move Together**
  - Greatest success can be achieved with collaborative coordination on capability-focused actions for Emerging Technology using common standards, sharing what we can, reusing infrastructure, etc.

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### PS1

Reiterate the key challenge.

Reiterate the goal and the approach, and the need for collaborative effort to make the change.

Conclude with a clear call to action.

Peter Anton Suyderhoud, 2025-07-08T22:58:41.429

