



AFRL

REALIZING A FRAMEWORK & PLAYBOOK FOR SURGE

BRENCH BODEN, DIGITAL ENTERPRISE SENIOR TECHNICAL ADVISOR
AIR FORCE RESEARCH LABORATORY

DR. JOHN MATLIK, FELLOW - DIGITAL TRANSFORMATION STRATEGY
NORTHROP GRUMMAN

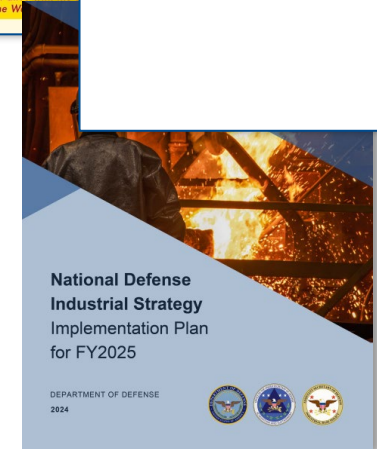
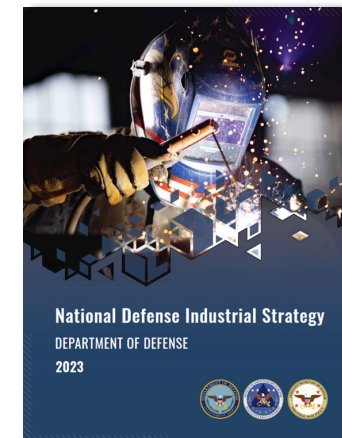
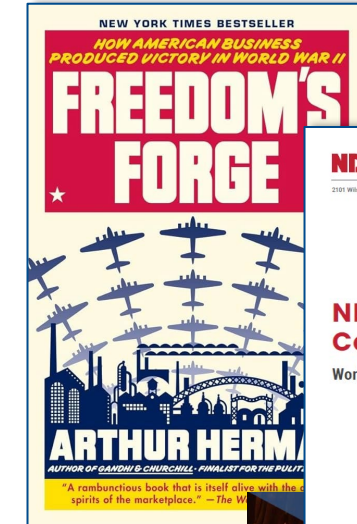
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Context

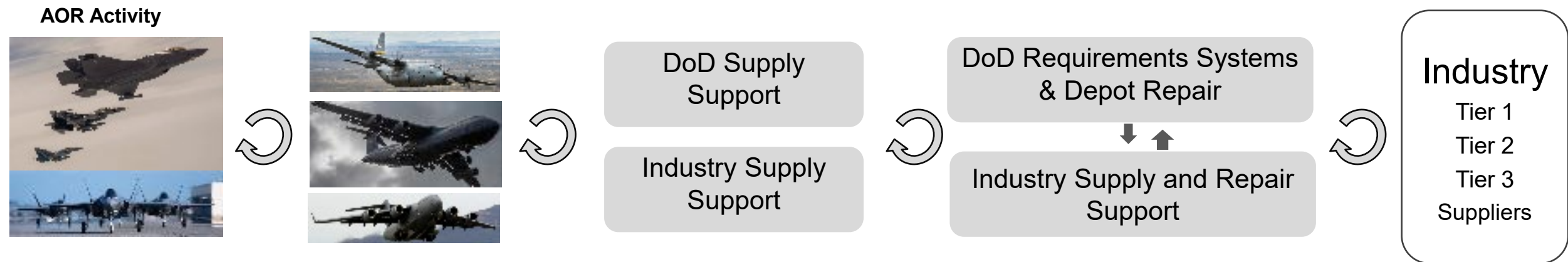
- Growing concerns over readiness for conflict
 - DIB shrinking; acquisition timelines unsupportable; excess capacity eliminated
 - Lack of centralized planning/direction
 - Recognition that “surge” will be required – but no clarity on that concept
- Industry starting to engage
 - High level policy guidance not (yet) actionable
 - No process to generate investment plans
 - Cannot be business as usual
 - Freedom’s Forge – inspirational, but...aspirational?

How does the US generate affordable mass?





Contested Logistics – Kill Chain to Supply Chain



Predictive

CLOUDS
Connecting AOR
Scenarios to Sorties

DRT
Connecting Sorties
to Logistics
Demands

RCM Toolset
Model Based Pdx Supply
Chain Forecasting

**Fulfilment Systems
(reactive)**

*AF Supply Ordering Sys
(SCOS)*

*EXPRESS
Camm (CavDx)

ALIS/ODIN (etc)
Contractor*

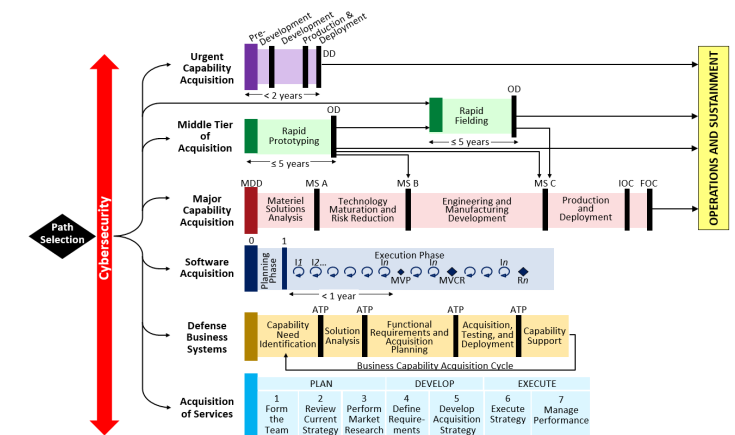
*ESCAPE / D200
DLA MDR
Actuarial (Propulsion)

Contractor*



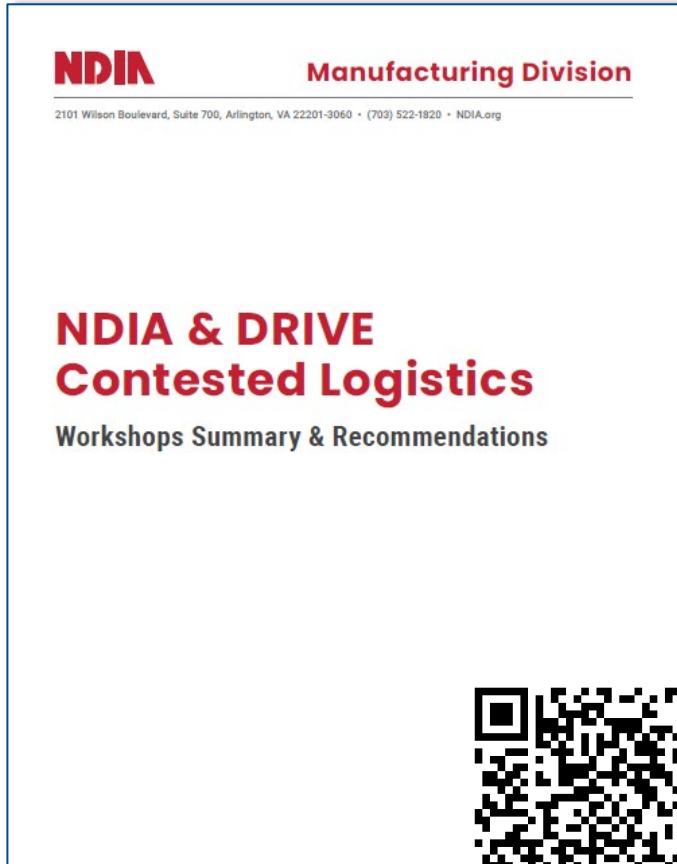
Nature of the Challenge

- The problem space can be decomposed:
 - “Surge” Product Support – Parts and services for systems already in O&M. Primary actors are Service combat commands, sustainment centers, and DLA
 - These complex enterprises sit between the demand signal and Industry response
 - Accelerated Production – ongoing programs, modifications, upgrades, etc. for MDAPs
 - Adding capacity to an existing production enterprise (to include partner nations)
 - Rapid Fielding of New, Integrated Capabilities – laboratories, DARPA, commercial firms, etc.
 - Maturing new tech and scaling production from anywhere; 90 days to IOC in Ukraine, e.g.
 - Clear overlap with mods/upgrades mechanisms to insert new technology
- Technology and policy vectors
 - Demand profiles – constant updating to avoid reactionary posture
 - Agile response – organizing the enterprise to move quickly to need
 - Plus rehearsals
 - Industrial Base Curation – designing the supply side for agility





NDIA / DRIVE 2024 Contested Logistics Workshops



- Industry-led workshops organized by NDIA Mfg Division and DRIVE Consortium
 - Fictional Contested Logistics scenario to evaluate demand utilizing GaTech CLOUDS simulation platform
 - Industry workshop at NDIA to develop response strategies
- Key Recommendations include:
 - Development of a playbook approach to connecting kill-chain to supply chain
 - A campaign of continuous wargaming which includes projected DIB response
 - Focused supply chain pressure-testing
 - Long term campaign of intentional industrial base expansion
- Next steps - Expanding the Playbook Approach
 - 2024 efforts focused on exquisite systems (e.g. F-35, C-130, C-5, etc.)
 - However, Ukraine experience highlights impact of non-exquisite systems
 - New capability emerging <90 days (e.g. weaponized toy drones, etc.)
 - 2025 efforts focusing on building out surge playbook for affordable mass

Digital Thread for the Supply Chain - Overview

Objective: Connect information about Operations / Missions Needs with supply chain capability to better inform decisions to increase speed of response. This will enable us to respond to a rapidly changing opportunity and threat environment while informing how we increase supply chain agility and resilience through leveraging data and digital collaboration.

Current State:

- Lack of visibility
 - Demand visibility for supply chain
 - Supply capability visibility for Customers
- Slow response to sudden demand changes
- Supply exchanges in one way
- Limited standard adoption
- Aircraft programs take decades to complete

Proposed features of future state:

- Clear understanding of value cases for collaboration
- Increased speed of delivery with level of quality needed
- Order of magnitude faster response to opportunities / threats
- Trusted collaboration / information sharing across ecosystem
- Data driven, risk-based decision making
- Continuous access to needed data over lifecycle of product
- Continuum of knowledge to inform decision makers

Opportunity: Partner with NDIA, AIAA, AIA & USAF to organize and execute an Aerospace Digital Supply Chain Summit to scope & prioritize a suite of value-add use cases and pathfinders for increasing Supply Chain agility and resilience.

Digital Thread for the Supply Chain – 2025 Efforts

- May 8 AIAA / NDIA / AF Workshop @ Dayton Digital Transformation Summit (Dayton, OH)
Obj #1: Evaluating CCA-based scenario for utility in IB surge planning
Obj #2: Identifying specific mfg and supply chain constraints for affordable mass
- August NDIA / AIAA / AF Workshop @ NDIA ETI Conference (Washington DC)
Obj #1: Present Industry aligned OV1 for Surge Production Framework & Playbook
Obj #2: Highlight key recommendations for resourced Gov't & Industry activities
- Key Outcome: Publish follow-on NDIA & AIAA sponsored Industry white paper articulating proposed surge production framework, playbook & recommendations for realization.

Digital Thread for the Supply Chain – Working Groups

- Calling all passionate participants!
- Get engaged today through one of the three working groups
 - Agile & MOSA Framework – Suzette Johnson (NDIA S&ME Division)
 - Digital Framework – Salena Zavorka-Bonacci (AIAA DEIC)
 - Surge Production Framework – Mike McGrath (NDIA Manufacturing Division)

DRAFT

NDIA Manufacturing Division

14 May 2025

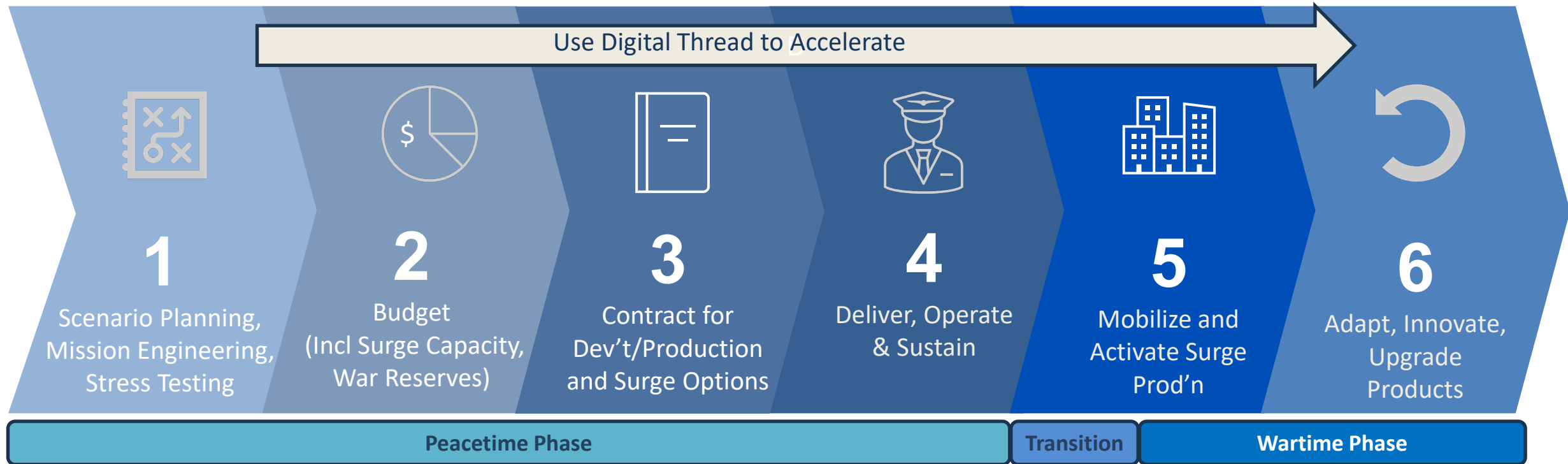
Playbook for Investing in Surge Production Capacity

Steps Beyond Current Peacetime Planning

We Have Prototyped a Thought Process

- **Step 1 – Estimate Wartime Surge Production Demands**
 - Scenario Planning, Mission Engineering, Simulation
 - Connect kill chain to supply chain
- **Then What? (Rest of the Playbook)**
 - What has to happen to make needed investments in surge capacity?
 - How do we plan and manage industrial mobilization when needed?
 - How does the digital thread make us faster?
 - How do we rapidly adapt to meet battlefield urgent needs?

Framework for Surge Production Planning



Rapid Iterations and Adaptive Acquisition Throughout

1. Scenario Planning, Mission Engineering and Stress Testing

- **Need Leadership Commitment and Priority**
 - Willingness to invest in peacetime based on wartime surge demand profile
- **Build on Defense Guidance, Wargames, Exercises**
 - Heavy emphasis on inputs from COCOMs and Services. Include industry constraints.
- **Define and Model Wartime Scenario(s)**
 - Timeframe, warning time, mission engineering, CONOPs/TTPs, duration and intensity over time
 - Simulate kill chain operations and evaluate materiel requirements for mission/sortie turnaround, maintenance, supply, transportation, realistic attrition
 - Identify kill chain risk areas where rapid adaptation may be needed (E.g. EW)
 - Include commercial and economic factors in the model, as well as allies
 - Simulate stress tests of supply chain and workforce ability to support kill chain (with industry inputs)
- **Quantify end item, ordnance and critical spare parts needs**
 - Peacetime operations (Unit equipment plus initial spares plus war reserves)
 - Surge production quantities needed to support wartime operations
 - Workforce and accelerated training needed for surge
 - Risk analysis
- **Comply with requirements validation policy as needed**
 - Service and joint interoperability considerations

2. Budgeting for Development, Production and Sustainment

- **Leadership set aside funds for surge capacity investments**
- **Use scenario results in PPBE process**
 - Peacetime production quantities (including sustainment)
 - War reserve stocks (end items, ordnance, spares, consumables, raw material and long lead stockpiles) based on wartime op tempo
 - Deliberate peacetime investments for surge capacity and “Ready Reserve” workforce training, both prime and additional sources
- **Advocate Budget Flexibility with Transparency for Oversight**
 - Rapid prototyping and transition
 - DoD ability to rapidly reprogram dollars where needed
 - Portfolios of capability
 - Use of Title III “no year” funds
- **Understand that budgeted dollars and quantities are an important advance demand signal for industry**
 - Will be tracked in appropriations process
 - Industry investments will be based on anticipated returns from contracts

3. Contracting for Development, Production and Sustainment

- **Use rapid acquisition pathways, agile software development, multiyear**
 - Use OTAs or similar means to deal with commercial suppliers, incl. production
 - ~30 DoD OTA Consortia can help and can provide path to production
- **RFPs should include both peacetime and anticipated surge production rates**
 - Proposals that invest in surge capacity should not be penalized
 - Contracts are the ultimate demand signal for industry
- **Need for rapid contracting for surge should be built in**
 - Pre-negotiated contract options for surge capacity, incentives for industry to invest
 - Prime may offer licensing to additional sources for surge and/or DoD may separately qualify additional sources. Anticipate use of Defense Production Act authorities.
 - Use IDIQ contracts and undefinitized contracting actions where appropriate
 - Contracts for workforce training should address surge needs
- **Enable access to tech data to enable additional sources for surge production of critical items**
 - Leverage digital thread, data escrow and patent pooling for use during surge
 - Maximize MOSA and be sensitive to industry IP protection
 - Contract with critical alternate sources to exercise “Manufacturing Digital Twin” and become certified.
 - Consider CRAF*-like arrangements.

*Civil Reserve Air Fleet

4. Deliver, Operate and Sustain

- **Implement Life Cycle Sustainment Plan**
 - Learn from T&E and early field experience
 - Use digital twins with physical counterparts
 - Feedback for MOSA-enabled improvements
- **Capture ops, maintenance, supply and transportation data**
 - Optimize maintenance and supply for resilience as well as readiness
 - Simulate wartime operational tempo to estimate surge demands
 - Feedback to budget to maintain readiness, including surge readiness
- **Maintain configuration control, keep digital thread updated**
 - Tech Data as a Service, data escrow for suppliers exiting defense
- **Maintain supply chain visibility**
 - Update risk assessments
 - Track and mitigate parts obsolescence

5. Mobilize and Activate Surge Production

Peacetime

- **Industrial Mobilization Board with Clearly Assigned DoD Leader**
 - Annually informed by scenario planning
 - AI-assisted visibility of industrial capabilities and capacity (incl commercial and allies)
- **Regular tabletop exercises with industry participation**
 - Simulations to stress test supply chains and workforce capacity
 - Include commercial and dual use companies and private capital sources
 - Feedback to budget (PPBE process)

Wartime

- **Presidential Determination to Mobilize**
 - Congressional action to provide contingency funds
 - Use of Defense Production Act authorities
- **Exercise contract options for surge production**
 - Industry operate with added manpower, added shifts, expanded supply chains, licensing
- **Rapidly contract for additional surge capacity (90 days to IOC as in Ukraine)**
 - Use OTAs for both prototyping and production (like covid vaccine)
 - Build on existing relationships (e.g. consortia with non-traditional members)
 - Leverage commercial and allied capacity

6. Adapt, Innovate and Upgrade Products

- **Keep mission engineering and design teams focused on battlefield feedback**
 - Rapid prototyping (virtual and physical) of solutions
 - Warfighter in the loop
 - Leverage commercial and allies' solutions
- **Rapid feedback loop, including industry input, to modify products in surge production pipelines**
 - Streamlined authorization of changes and funding release
 - Involve commercial industry
- **Budget Flexibility, Top Level Support**
 - Like MRAP

Implementation Steps

- **To be completed**
 - Who needs to do what, when
 - Requires top level support from industry and DoD



QUESTIONS?

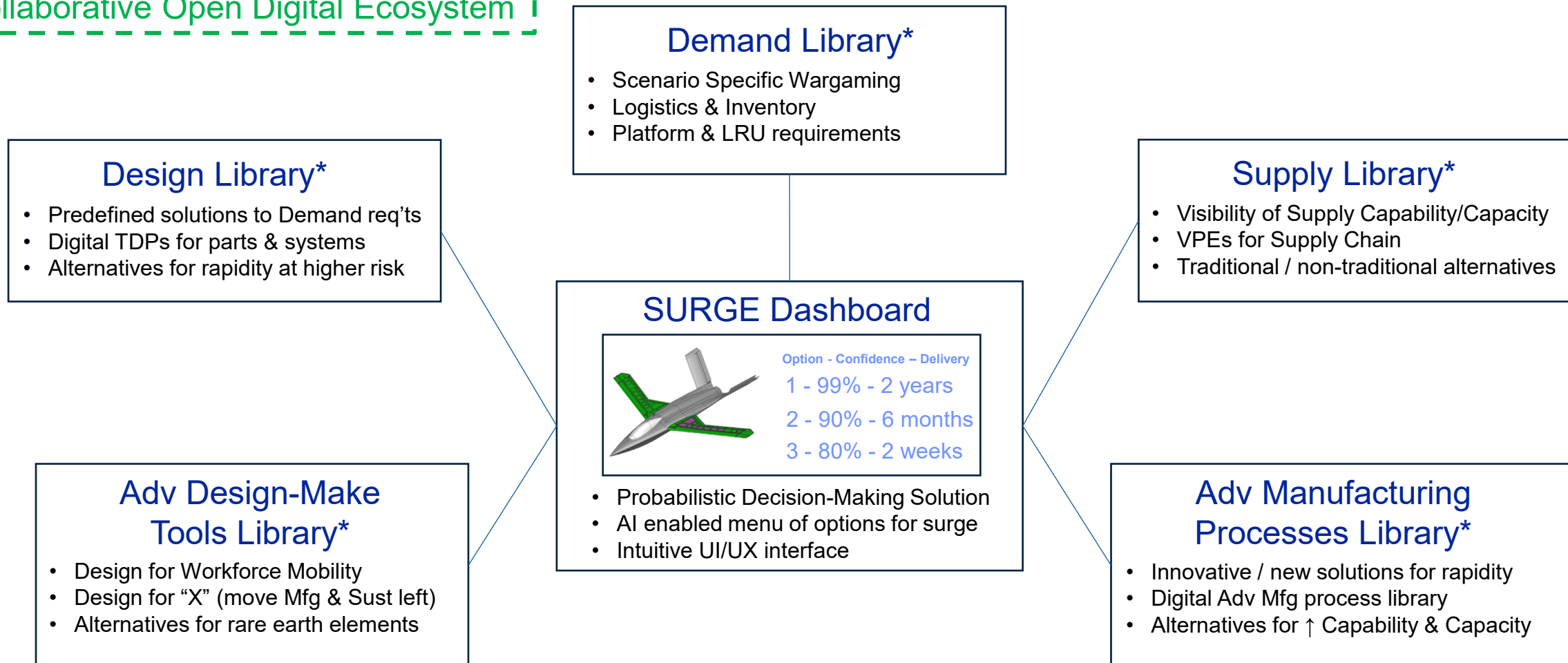


Use Cases for Consideration

- (1) Tech data sharing: As an OEM I want to share relevant technical data with current and prospective suppliers to facilitate rapid teaming and agile production
- (2) Design analysis toolset: As a design engineer I want to release designs that are known to be producible and ready for execution to enable low risk, speedy production
- (3) Sourcing/capability matching: As a supply chain manager I want technology to match product requirements to supplier capability in order to streamline the addition of approved suppliers to DIB
- (4) Quality “tradespace” / risk-based decision making: As an OEM I want to illuminate the risks of accepting alternative materials, process, and suppliers in order to quickly expand production capacity and shrink response time.

ENDER Program – Framework & Construct Library

Collaborative Open Digital Ecosystem



* Comprised of pre-certified constructs



DREAM – Designed Response Enterprise for Affordable Mass

