



THE RAPID DEFENSE INNOVATION PARADIGM

DR. FRANCESCA SCIRE-SCAPPUZZO

DEFENSE INNOVATION STRATEGIST

CHAIR IEEE AEROSPACE & ELECTRONIC SYSTEMS SOCIETY - BOSTON SECTION

AMERICAN AEROSPACE AND DEFENSE SUMMIT

SESSION: AI & EMERGING TECHNOLOGIES

DECEMBER 5, 2025

GLENDAL, AZ

“...THE TROUBLE WITH WEAPONS TECHNOLOGY...”



July 1, 1986

By Bill Watterson

Andrews McMeel Publishing

Affiliated - Simon & Schuster

5 FACTORS CONTRIBUTING TO THE ACCELERATION OF DEFENSE INNOVATION



New Business Models



Alternative funding sources



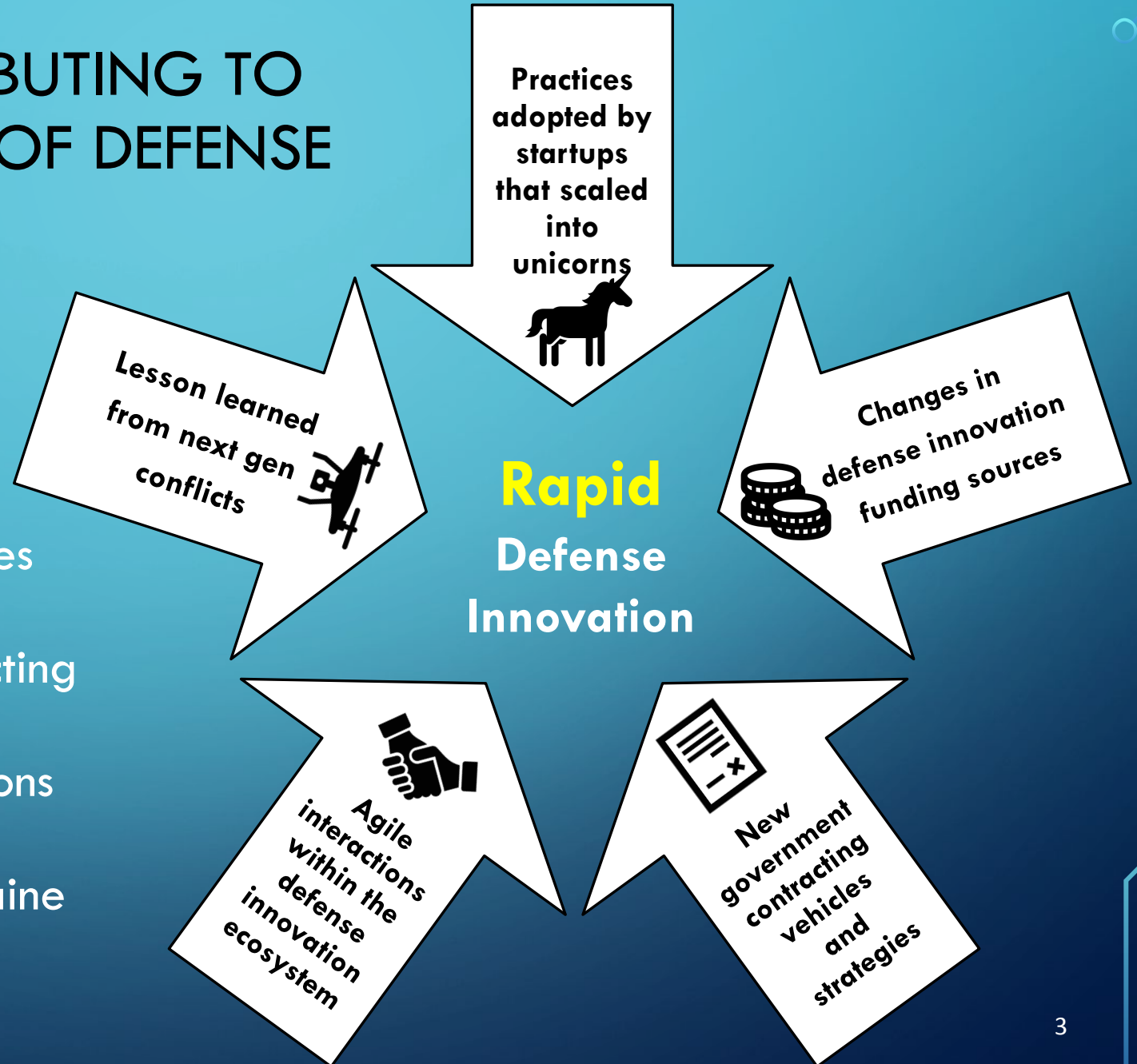
New Government contracting



Agile ecosystem interactions



Lesson learned from Ukraine

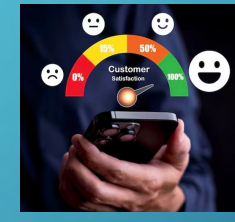


WHAT IS INNOVATION?

Problem



Solution



NEED

Mission
Pain Points

IDEA

Concept &
Prototype

**TECHNOLOGY
TRANSFER**

Bridging the
Valley of Death

**PRODUCT &
SERVICE**

Fieldable
Capability

**VALUE TO
CUSTOMER**

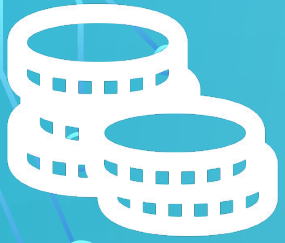
Mission
impact



FACTOR #1

PRACTICES USED BY U.S. DUAL-USE STARTUPS: FROM EARLY-STAGE INTO UNICORNS

- **Self-funding of R&D** through private capital
- **Silicon Valley practices:** Agile development cycles and iterations
- **Vertical integration:** Prototyping, testing, manufacturing, & scaling
- **Close collaboration** with users and stakeholders
- **Software-first architecture:** integration & updated hardware
- **Product market fit at the Tactical Edge**



FACTOR #2

CHANGES IN HOW DEFENSE INNOVATION IS FUNDED: THE ROLE OF PRIVATE INVESTORS

- **Startups:** Private capital accelerates early tech development
- **Small Business:** Combined private and government funding
- **Defense Primes:** ~4% of revenue for R&D. Rely on government contracts, facing speed of innovation challenges. More IRAD?
- **Commercial Corporations:** Invest over 14% in R&D & innovation
- **Universities:** More industry collaborations – AI & Manufacturing





FACTOR #3

NEW GOVERNMENT CONTRACTING AND MEASURES TO REDUCE BUREAUCRACY AND MAXIMIZE INVESTMENT



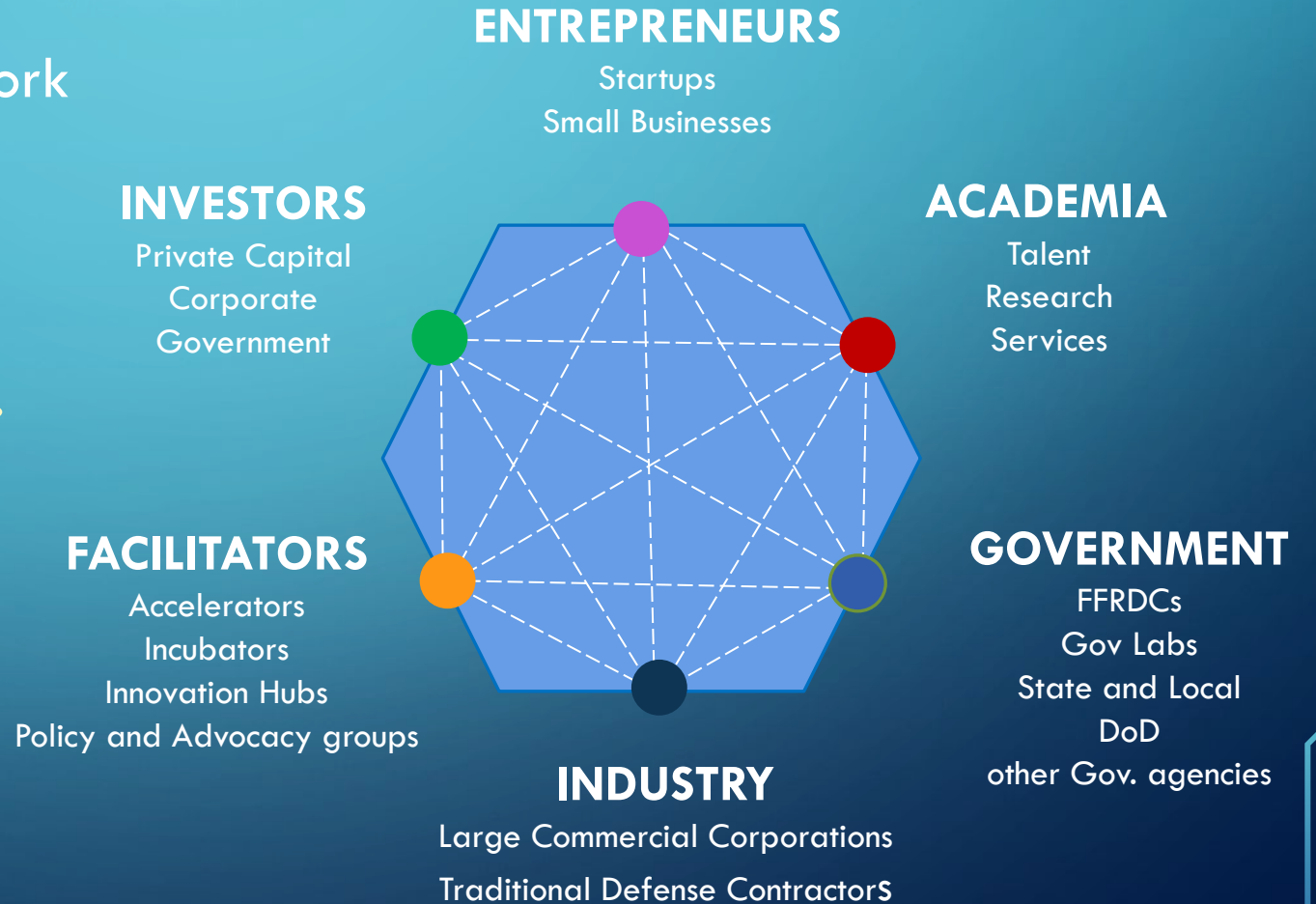
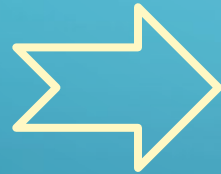
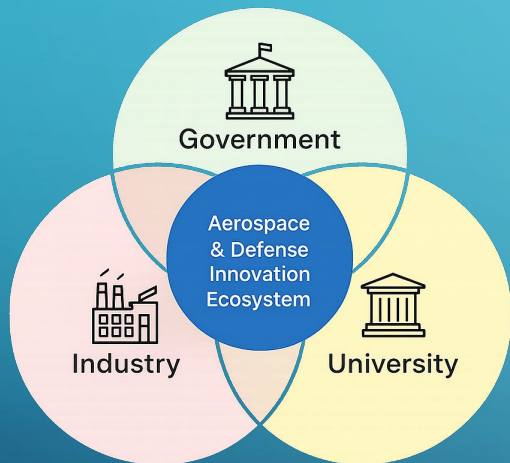
- **DoD restructuring procurement** toward a speed-focused, commercial-first model
- Priority on **rapid delivery of usable capability** over compliance & custom development
- Software acquisition centralized under the **Software Acquisition Pathway (SWP)**
- Enabled by
 - **Commercial Solutions Openings (CSOs)**
 - **Other Transactions (OTAs)**
- Agile and DevSecOps practices mandated to shorten development cycles



FACTOR #4

THE NEW DEFENSE INNOVATION ECOSYSTEM

From a triple-helix to a complex network





FACTOR #5

PREPARING FOR THE CONFLICTS OF THE FUTURE

Boeing	MQ-25 Stingray
Northrop Grumman	RQ-4 Global Hawk
General Atomics	MQ-9 Reaper
Lockheed Martin	RQ-170



\$10s to \$100s m per drone

Ukrainian home-built drone - *Defense News*

- US strict military requirements. Often focus on past conflicts (e.g. Afghanistan)
- Example: Skydio drones in Ukraine (2018 US Army SRR Short-Range Recon)
- Ukraine's "relevant environment" today differs from NATO countries
- Fast development cycle: design, prototype, test, & deploy in ~ 6 months
- Need engineers near the frontline for continuous testing and improvements
- New drone technology includes ease of use, self-repair, autonomy, Edge AI, swarming, and multi-domain capabilities

WHAT CAN INSTITUTIONS DO TO LEVERAGE THE 5 FACTORS AND BECOME MORE COMPETITIVE?

THE PROBLEM

Traditionally
slow-moving
businesses

Culture change
New processes
New type of leadership
Embrace “Agile”
Fast development cycles
Digital Transformation
R&D funding strategy



THE SOLUTION

Innovative
fast-moving
businesses



New Business Models



Alternative funding sources



New Government contracting



Agile ecosystem interactions



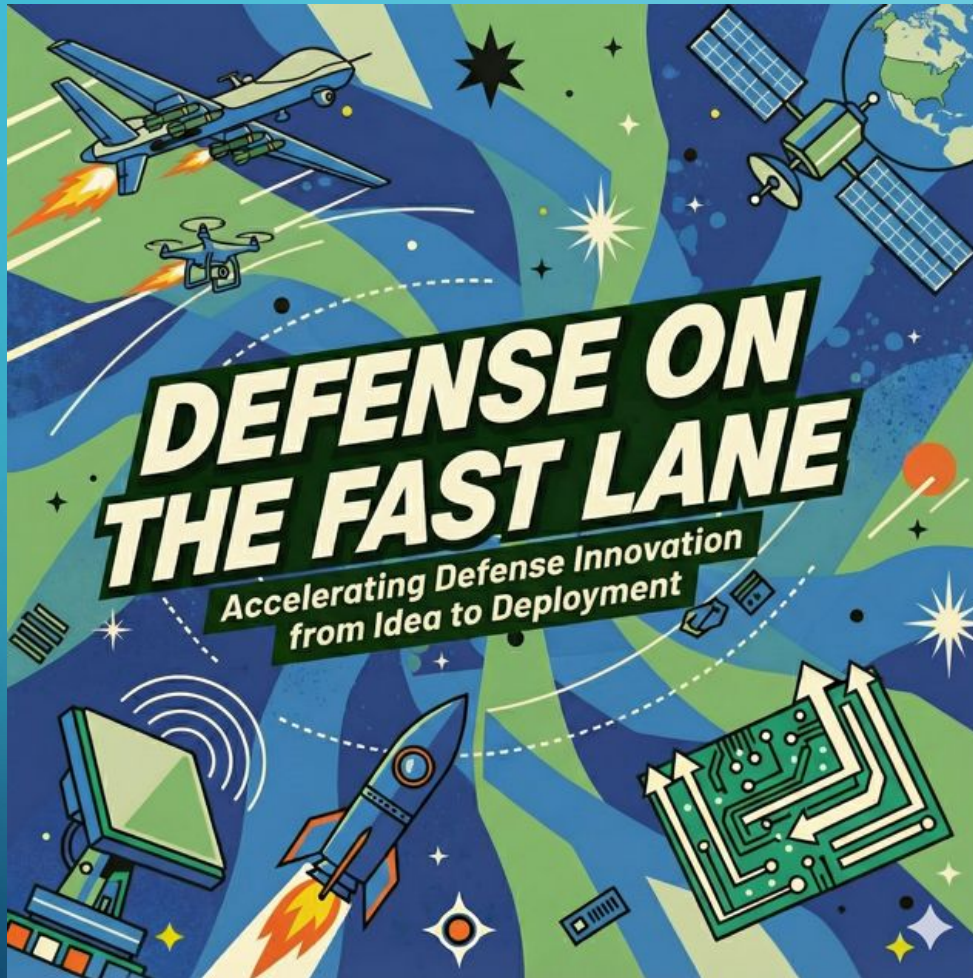
Lesson learned from Ukraine

Article Series

“DEFENSE ON THE FAST LANE”

*Accelerating Defense innovation
from Idea to Deployment*

Francesca Scire-Scappuzzo & Endy Lau



substack.com/@scirex?
www.linkedin.com/in/fscire

Q & A



DR. FRANCESCA SCIRE-SCAPPUZZO

Defense Innovation Strategist

Chair IEEE AESS Boston Section

Inspiring-Fifty 2024



e-mail: fscire@alum.mit.edu

linkedin: www.linkedin.com/in/fscire