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### NATIONAL DEFENSE RESEARCH INSTITUTE

# Resourcing a Mosaic Force: Lessons from an Acquisition Wargame

Joel Predd, Jon Schmid, Elizabeth Bartels, Jeff Drezner, Bradley Wilson, Anna Jean Wirth, Liam McLane

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## Project Overview

#### **Motivation**

DARPA has an ambitious vision of Mosaic warfare

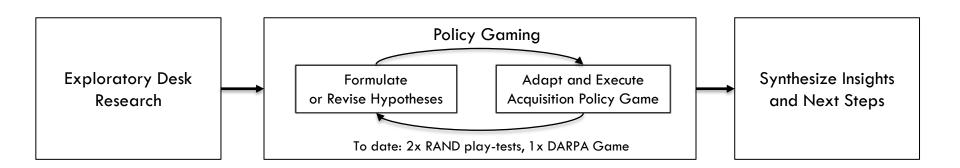
The Mosaic vision

- is conceived by STO leadership as a
  - warfighting concept
  - means to accelerate capability development & fielding
- depends on DARPA advancing multiple technologies
- is inherently more challenging to "transition" than a program

#### **Research Questions**

- Are DoD's existing requirements, resourcing and acquisition system compatible with fielding a Mosaic? Are those management systems compatible with envisioned increases in time-effectiveness?
- 2. If not, what are viable alternatives to the existing management systems?

#### Research Approach: Embrace Policy Gaming as Means to Experiment with Acquisition Models



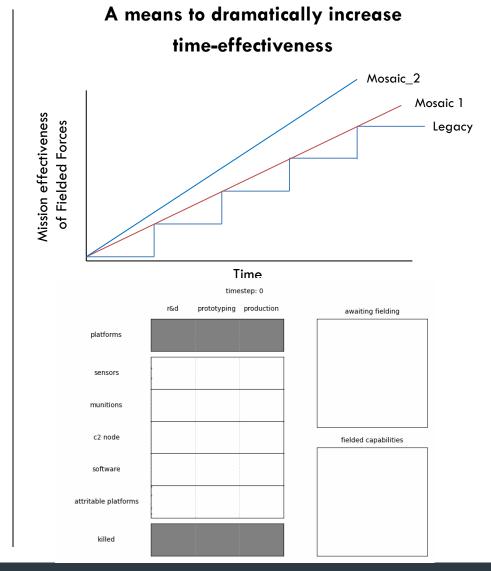
## How did we conceptualize Mosaic?

# Heterogenous, fractionated capabilities, dynamically composed on tactical timelines



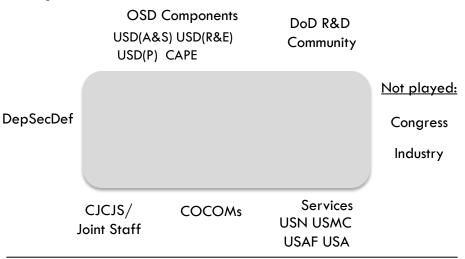
- Heterogenous: more diverse
- Fractionated: functionally simpler
- Composable: architecturally uncommitted to specific kill chains until mission execution

**DevOps + Systems of Systems** 



# Concept: Gain insight by requiring DoD reps to make decisions within, live with consequences of a Mosaic world

#### Players inhabit the roles of DoD decision-makers



#### A three half-day virtual event

	Half Day 1: Mosaic in Today's System	Half Days 2&3: Mosaic in an Alternative Model
Goal of exercise	Identify conditions under which today's requirements, resourcing & acquisition systems support a Mosaic model	Exercise an alternative to today's management systems to assess viability & identify improvements
Role of participa	Experienced professionals and analysts	Role playing DoD stakeholders

#### Force Planning Scenario w/in an Acquisition Scenario

#### **Acquisition Scenario**

- 2028 to 2032
- Strategic Continuity (DoD committed to priorities of 2018 NDS)
- Overall military competition between U.S. & China is contested
- U.S. has advanced new JWC but remains committed to a post-Cold War force structure
- DARPA in collaboration w/ USAF & USN R&D demo initial ASuW Mosaic

• SecDef and Congress note success,

move to institutionalize a Mosaic

- Force Planning Scenario
- •2035
- Chinese invasion of Taiwan
- •Mission: ASuW

# Players' Backgrounds Reflect Assigned Roles

#### Players in RAND Play-test I and II

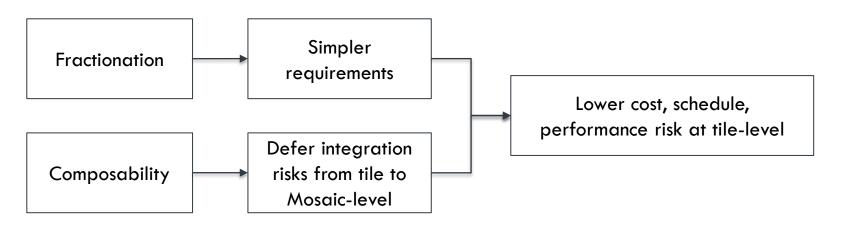
Former DoD officials on RAND staff, e.g.

- Retired O6, Navy rep for JCIDS
- Retired Acting Director CAPE
- Former USD(ATL) Staff member
- Former Navy Dir for Analysis, NAVAIR

#### Players in DARPA Game

- DARPA STO Leadership & Staff
- Retired OPNAV N81
- Former USD(ATL) Staff member
- Senior Advisor to USD(A&S)

# "Why not, let's try it": The logic of Mosaic may promote faster, cheaper, more responsive acquisition at the tile-level, regardless of the model



#### Thus, enabling various virtuous cycles

Faster schedules  $\rightarrow$  more responsive to threat  $\rightarrow$  less requirements creep

Faster adaptation → shorter services lives → less cost, time to design & build-in sustainability

Lower risks (cost)  $\rightarrow$  less onerous oversight by OSD & Congress  $\rightarrow$  faster schedules

Simpler requirements  $\rightarrow$  expanded performer base  $\rightarrow$  increased competition, innovation

In game(s), players tended to translate simpler requirements, lower costs into willingness to experiment, take risks

# Game Explores A Set of "Vignettes" That Instantiate Mosaic Acquisition

	Capabilit	ability Thread "A" Ca		pability Thread "B"		"B"	Capability Thread "C"			'C''	
1. ELINT sensor demoed at White Sands	4. Integration in aerostat funded	demond in live tire			10. Aerostats maintained/sustained by USN, sensor developer provides continual upgrades				provides continual		
2. Analysis indicates sensor increases M.E.	5. Firm pu contract to 48 units	ot on o produce	fielded to a	Final aerostats Ided to assigned ces in PACOM  1. XLUUV reaches IOC early			5. Firms demo swarm tech				
finds	peline analysis no suitable titutes	6. Prime deli 10 sensor- equipped ae		9. Sensors by USN a program		2. M&S → + swarms increase A	$\rightarrow$	sU	Integration UV swarm t nded	tech	8. Capability maintained /sustained by USN
	3. Analysis finds new EW + UAS restores M.E.		initiative ated to fund ation	9. Fie	•	show	peline c s no sui itutes	analysis table	7. Live f XLUUV - Pacific		
1. Intel: onew long Chinese	g-range to	. USAF funds fir o mature EW ayload	equi	0 EW- ipped UAS led to PAC	со	). Vendor ntinually pus grades	hes	4. R&D i spun up sUUV sw	to develop		
	2. M&S indicates threat degrades M.E.	-			rformance ld less than yzed	11. UA	S maint	tained/sus	stained by l	JSN	
Yeo	ar 1			,	Year 2		Ye	ar 3			

\*Placement of steps along time axis for graphical purposes only. No information is conveyed in width or precise placement of individual steps.

Time

## PPBE features, consequences, and contrast to Mosaic Warfare

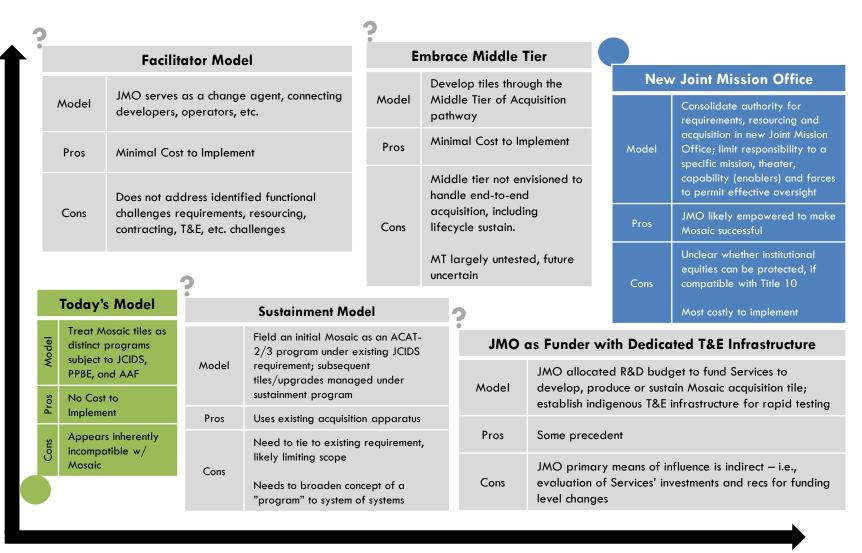
Feature of Current Resourcing	Consequence	Mosaic Warfare Seeks			
System					
PPBE is a calendar-driven process involving a two-year gap between resource allocation and resource availability	Limits ability to respond to unanticipated technology opportunities	Ability to rapidly incorporate new technology into force			
	Limits responsiveness to threats	Responsiveness to a dynamic threat environment			
	Limits new- and non-traditional firm entry into defense innovation marketplace	A defense innovation system comprised of a greater diversity of contributing organizations			
PPBE is inflexible with regard to reallocating resources	Limits ability to respond to unanticipated technology opportunities and threats	Ability to rapidly incorporate novel technology into force and respond to threats			
	Encourages technology lock-in	Ability to rapidly switch technological approaches			



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# Supportability of Mosaic

## Choice of Acquisition Model Subject to Trade-offs



Cost and Risks of Implementation ("Institutional china Broken")