



Army's Search for a Better Uniform Camouflage Pattern—A Case Study



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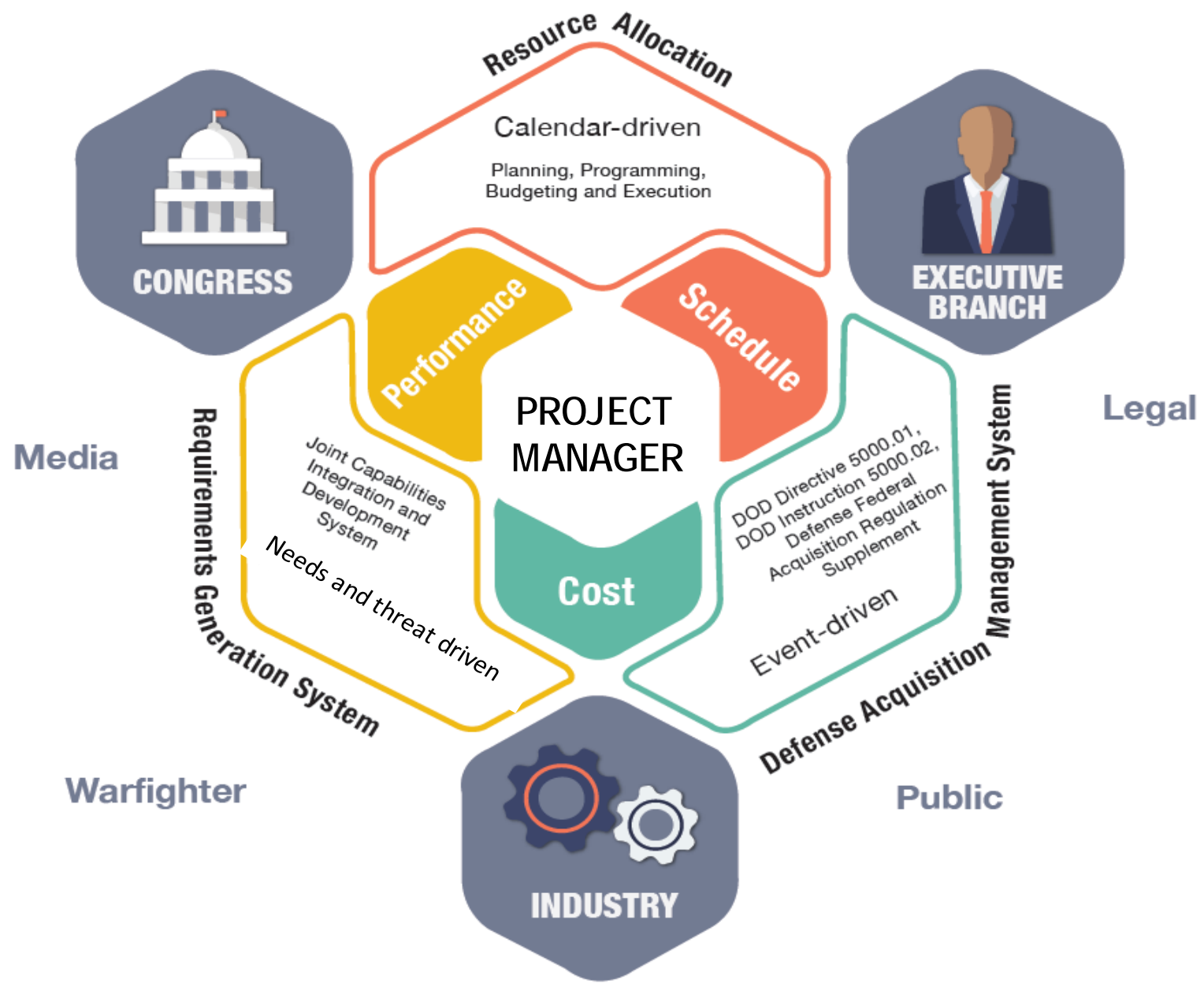


Joint Capabilities Integration & Development System
 (need driven)

Defense Acquisition System
 (event driven)

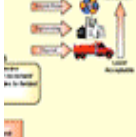
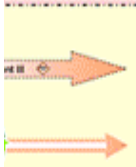
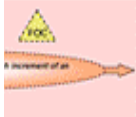
PMD Budget Estimate
 PMO PDM Input

Planning, Programming, Budgeting, & Execution Process
 (biennial calendar driven)



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Phase
 of performance requirements and... of its... life cycle... of the... of the... life...





Combat Camouflage Uniforms

Why are stakeholders so passionate about camouflage ?



Camouflage

- How do you test for effectiveness?
- How important is it to force protection and mission effectiveness?

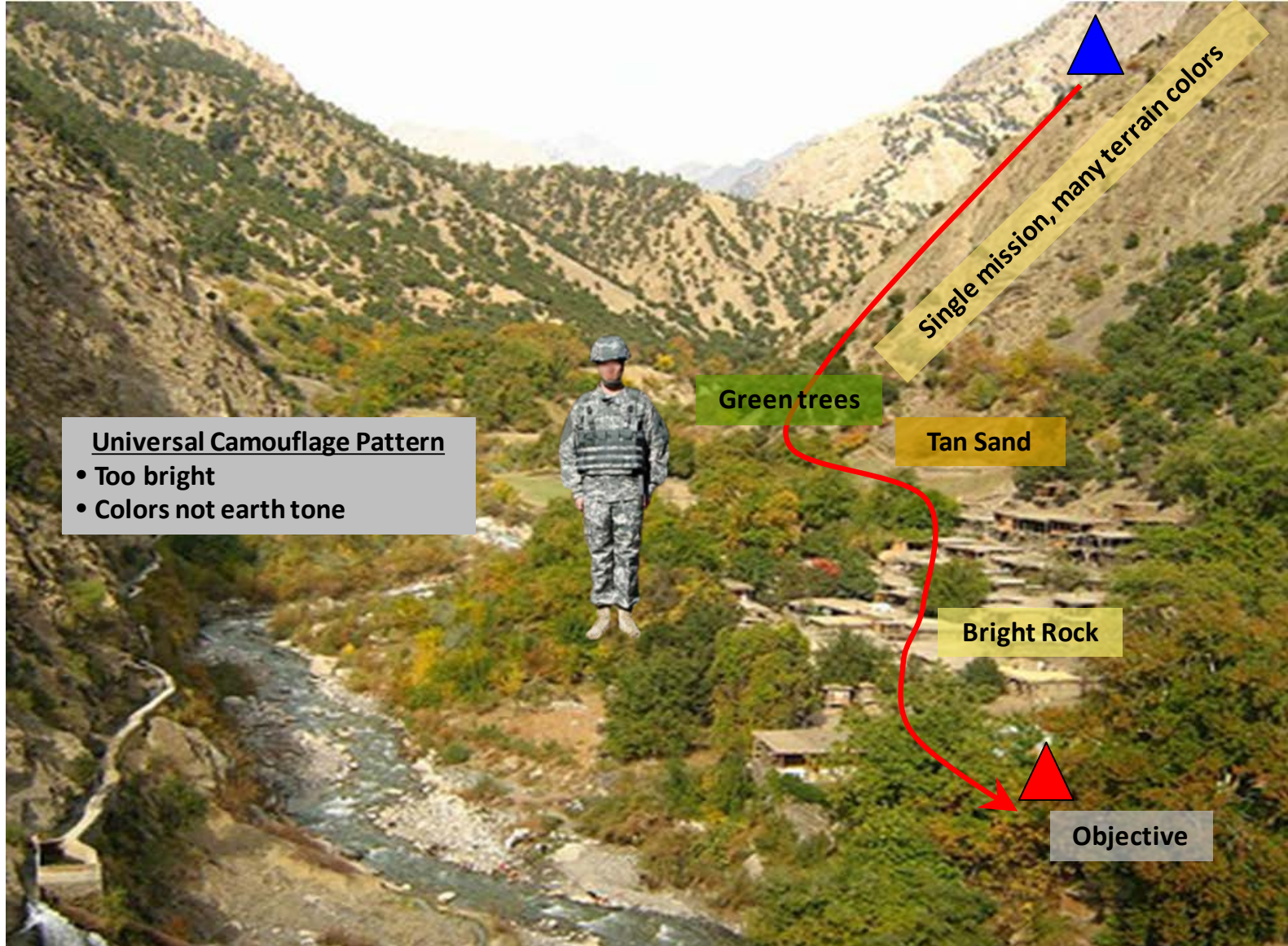


Camouflage Uniforms





The Army's Camouflage Issue



Universal Camouflage Pattern

- Too bright
- Colors not earth tone

Green trees

Tan Sand

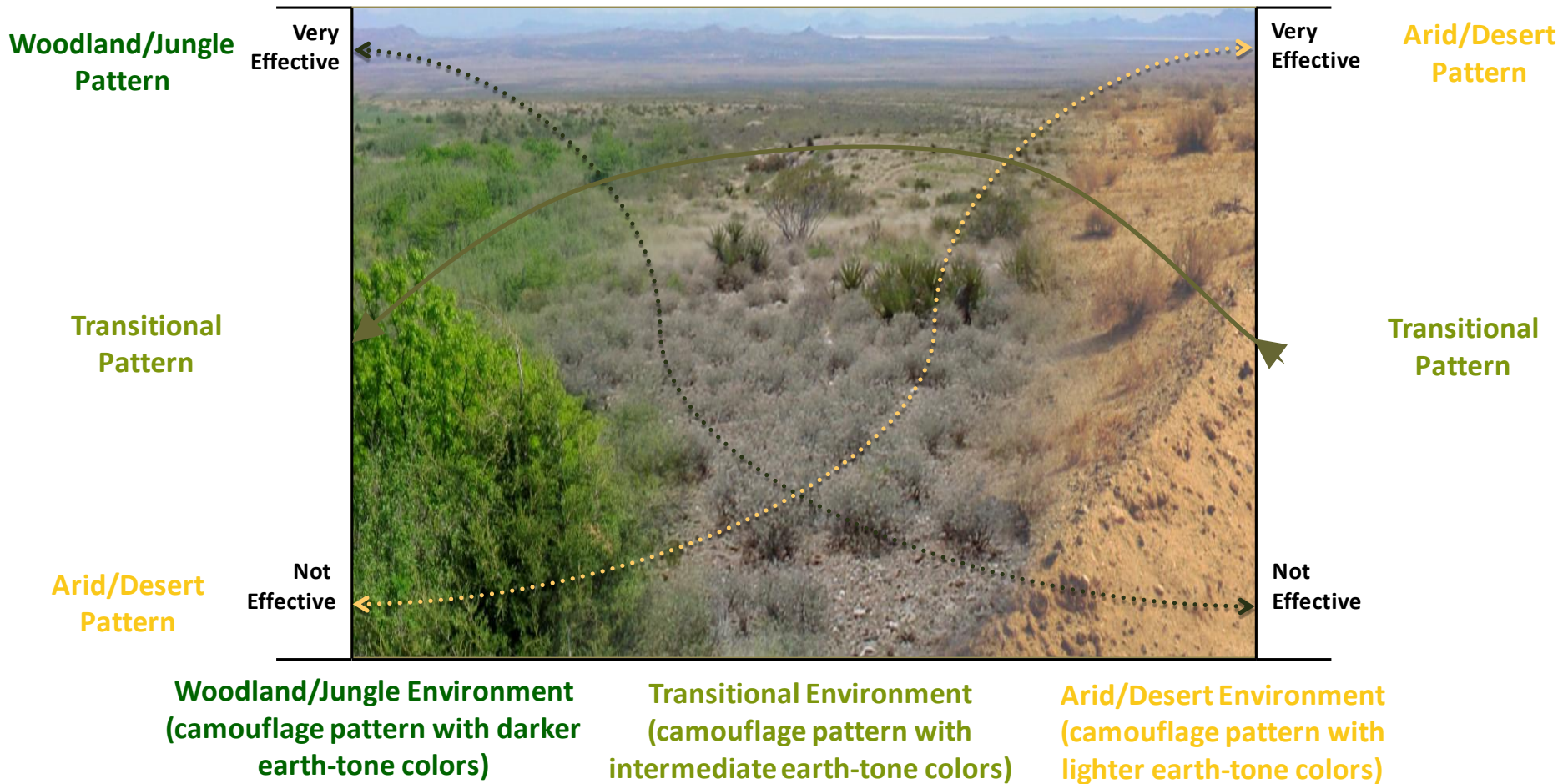
Bright Rock

Objective

Single mission, many terrain colors



Camouflage Uniforms

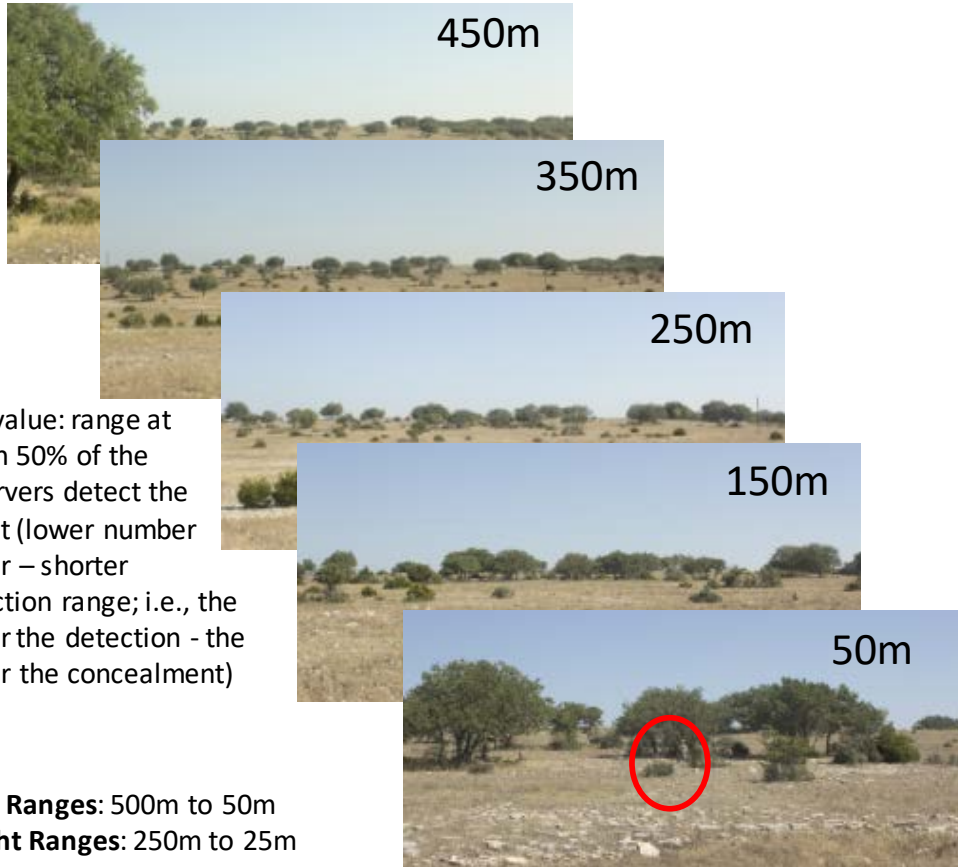




Camouflage Uniform Testing

Detection

(Photo Simulation and Field Trails)



Blending

(Photo Simulation)



How well the system blends with the background at 50m (day) and 25m (night) distance. Determined by the average scores of observers on a 1 to 100 scale.

Detection and Blending scores depend primarily on camouflage pattern, distance, movement, background, and brightness



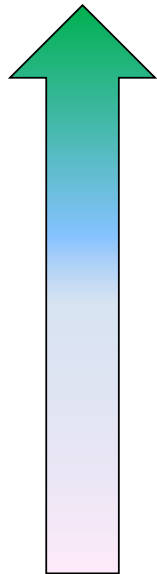
Camouflage Uniform Testing

Test Paradigm

Shift:

Relevance to
Pattern
Selection

(More Objective)



(More Subjective)

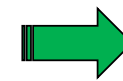
Less
Operationally
Relevant

More
Operationally
Relevant

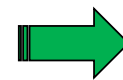
Testing & Evaluation Lines of Effort

- **Photo Simulation**
 - Detection scores and blending scores in multiple backgrounds (day/night)
- **Spectral Reflectance**
 - Measured the amount of light reflected and absorbed (brightness and contrast) for each pattern in visible, Near Infrared, and Shortwave Infrared (SWIR) Bands
- **Static Observation**
 - Detection scores (meters) in specific test site backgrounds (day/night)
- **Soldier Maneuver Testing**
 - Detection scores, blending scores, and soldier observations in specific test site backgrounds (day/night)

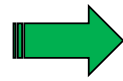
Test Output



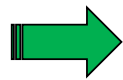
Blending scores
Detection scores



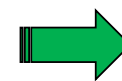
Reflectance
Measurement



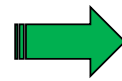
Detection scores



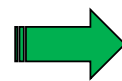
Detection scores
Blending scores
Soldier observations



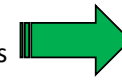
Pattern
Selection



Performance
Explanation



Performance
Confirmation



Performance
Confirmation
and
Operational
Insights

Test Purpose

Photo Simulation is the basis for pattern selection because it provides statistically significant data and controls test variables like distance, movement, background, and brightness



Camouflage Uniform Case Study

- **General Approach:** Use the Army camouflage uniform effort to enhance critical thinking, decision making, and document lessons learned
- **Applicability:** primary target is Defense Acquisition professionals (PMs, BMs, engineers, logisticians, testers) as well private sector PMs
- **Overall Learning Objectives:**
 - Critical thinking
 - Decision making and problem solving
 - Stakeholder management/engagement
 - Strategic leadership



Camouflage Uniform Case Study

Learning Objectives

- Develop the ability to critical analyze a project at key decision points—**critical thinking.**
- Identify and engage key stakeholders—**stakeholder management and engagement.**
- Develop alternative recommended strategies—**decision making with uncertainty or ambiguous data.**
- Compare alternative strategies and identify decision criteria—**decision making with uncertainty or ambiguous data.**
- Identify second-order considerations of the recommended strategies—**strategic leadership.**

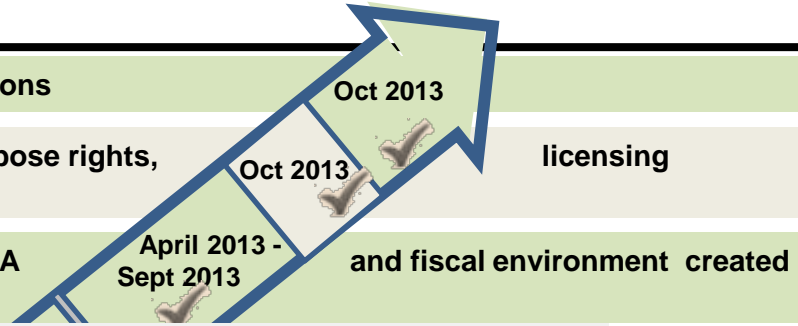


Army Camouflage Uniform Evolution

Army considers revised strategy consistent with potential FY14 NDAA restrictions

Army strategy stalled due to failed contract negotiations over government purpose rights, agreements, and affordability concerns.

Army strategy revised and implementation delayed because of draft FY14 NDAA by sequestration



Vendor Submissions
Government Baselines

Phase three transition with a

Universal Camouflage Pattern (UCP)



Army Combat Uniform (ACU)

Flame Resistant Army Combat Uniform (FRACU) with Organizational Clothing and Individual Equipment (OCIE)

2013



Operation Enduring Freedom (OEF) Camouflage Pattern (OEF CP)



Flame Resistant Army Combat Uniform (FRACU) with Organizational Clothing and Individual Equipment (OCIE)

better than UCP
early
and
the

is tested

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deployers

in-country

is in OEF

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Army adopted ACU (6 color digital camouflage) operationally effective in OEF (urban and desert)



Camouflage Uniform Case Study

Part 1: Path Forward

- **Situation:**
 - Unacceptable camouflage performance
 - History of Congressional oversight/high stakeholder interest
 - 4 year development/testing effort
 - Contract award announcement screw-up
 - Sole source contract OEF CP
 - Sequestration/Government shutdown
- **Dilemma: develop a recommendation for a path forward in a VUCA environment**

Contracting, statutory, legal and intellectual property challenges



Camouflage Uniform Case Study

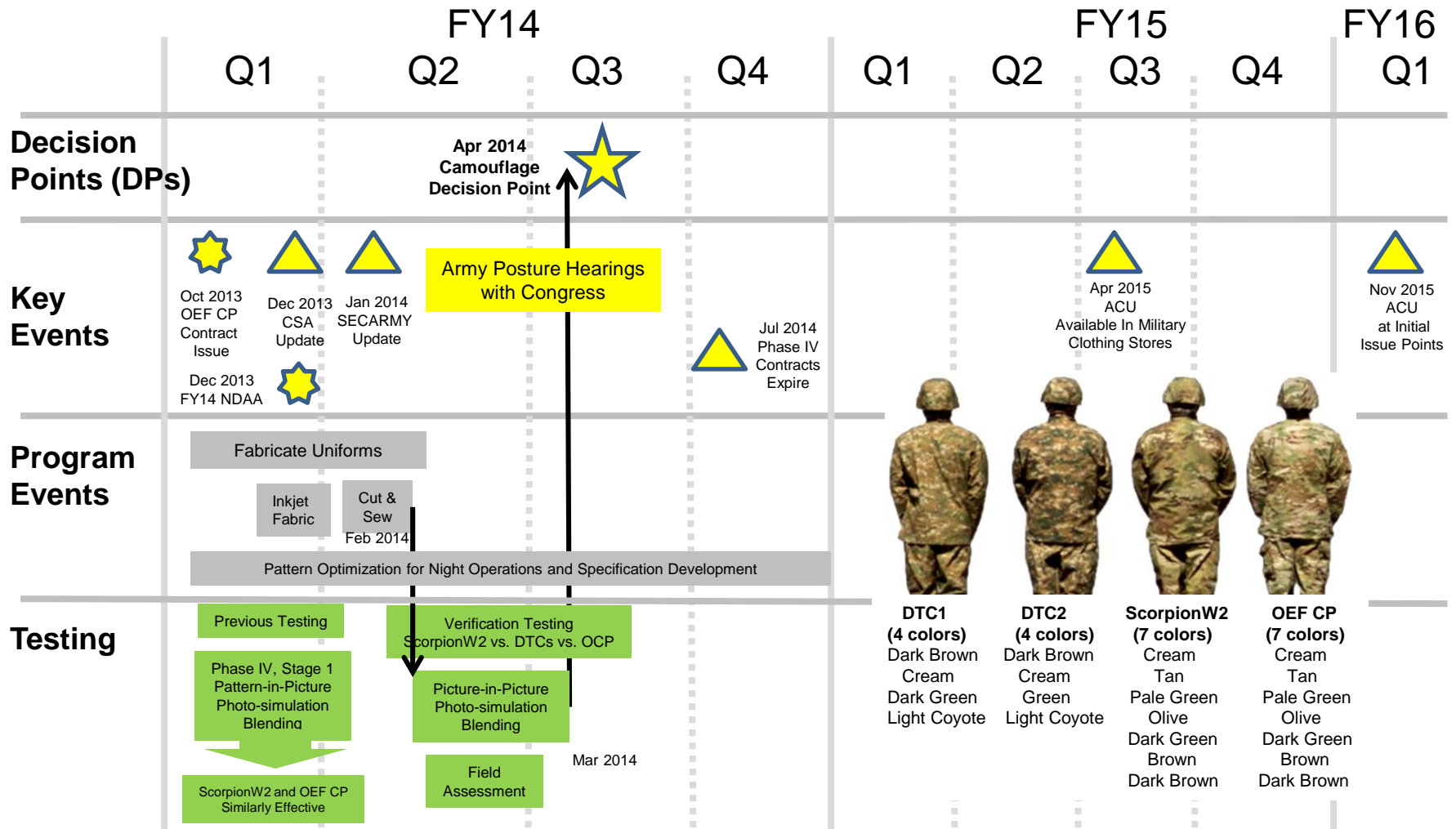
Part 1: Path Forward

- Who are the key stakeholders in combat camouflage uniforms?
- Who is the ultimate decision-maker?
- How relevant was the test paradigm shift in this decision?
- What is a realistic test and evaluation strategy and schedule leading to decision in terms of key program and testing events planned by quarter?
- What options should the Army consider?
- What criteria should the Army use to compare options and then select the best path forward?



Camouflage Uniform Case Study

Part 2: Procure and Field Decision





Camouflage Uniform Case Study

Part 2: Procure and Field Decision



DTC1



DTC2



OEF CP



ScorpionW2



UCP



MARPAT
Woodland
(MPW)



MARPAT
Desert
(MPD)

- **Dilemma:** develop a recommendation to replace UCP on Army combat uniforms and equipment



Camouflage Uniform Case Study

Part 2: Procure and Field Decision

- Was \$10 million spent over six years in the RDTE of camouflaged uniforms a wise investment for the Army?
- Were the options considered by the Army appropriate? Were other viable options not considered?
- Was the source of funding (contingency or base) an important consideration? Why or why not?
- What were the affordability considerations for the Army in this decision?
- What were the important contractual and legal considerations in this decision?
- How should the Army compare the options and select the best path forward?



Defense Acquisition and Program Management Lessons

- Don't rush to failure; beware of schedule-driven efforts.
 - Strategic pause for final Congressional language and test additional patterns for which the government has data rights.
- Stakeholder Engagement—early, often and continuously.
- Rigorous decision making process comparing alternatives against clearly defined criteria.
 - Affordability implications, legal risk, and the perspectives of key stakeholders including Congress, soldiers, U.S. Marine Corps, and the media.
- PM's unique position: understands the business side of the project (cost and schedule) and the engineering side of the project (technology, testing, and risks).



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For more information:

- Mortlock, R. F. (2019, January). Army camouflage: you can't kill what you can't see. *International Journal of Instructional Cases (IJIC)*, Vol 3, 1-22. Available online at www.ijicases.com
- Mortlock, R. F. (2018, October). Hiding in plain sight: the Army's search for a better camouflage uniform. *International Journal of Instructional Cases (IJIC)*, Vol 2, 1-22. Available online at www.ijicases.com
- Mortlock, R. F. (2018, July). Operational Camouflage Pattern Case Study (NPS-AM-18-219). Available online at <http://my.nps.edu/web/acqnresearch/publications>