

# Testing in an Agile Program

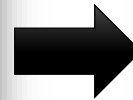
*Evolve or Become Extinct*

**DEFENSE COUNTERINTELLIGENCE AND SECURITY AGENCY**



**Terry L. Carpenter Jr., SES, NBIS PEO**

# Evolution





# Industrial Revolution



“Brownie III”



“Folding Brownie”

1888



?????













“...a radical rethinking of how an organization uses technology, people and processes to radically change business performance”

George Westerman

Principal Research Scientist

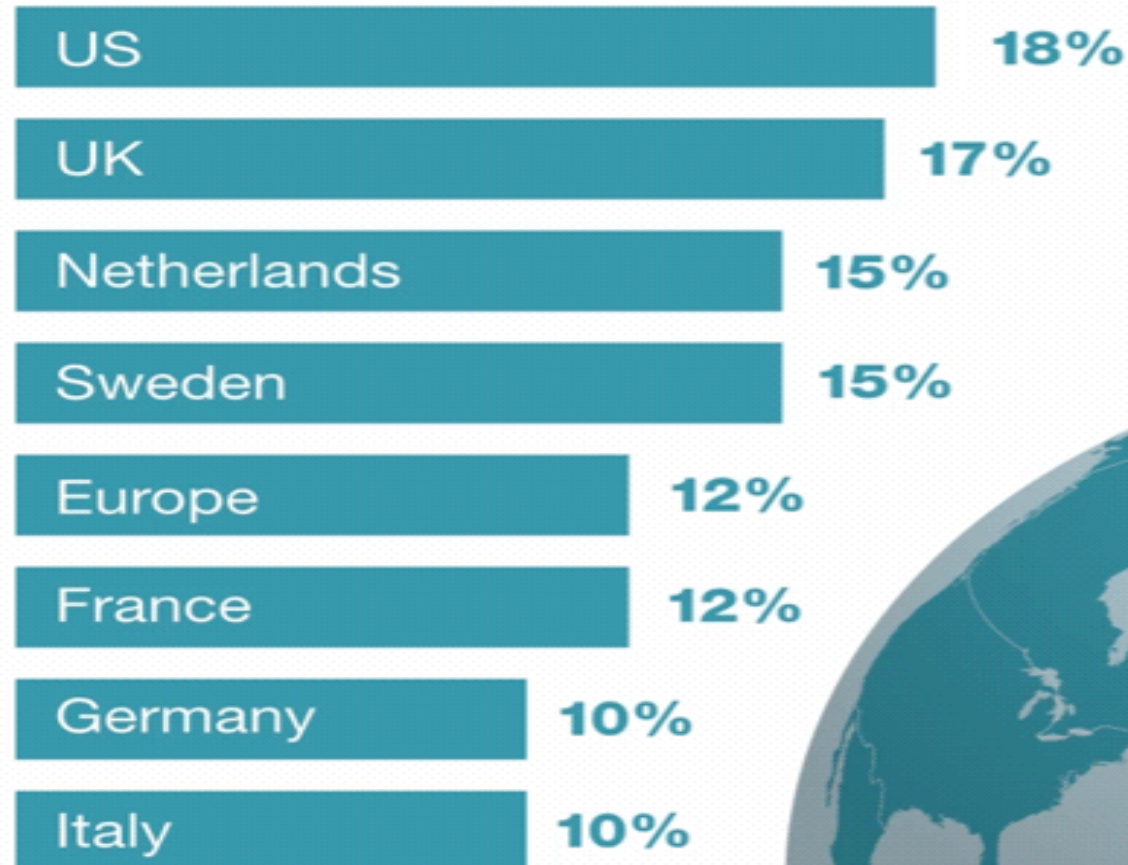
MIT Sloan Initiative on the Digital Economy





# We have a long way to go...

## Captured digitization potential



**Europe** and the **United States** have captured only a small percentage of the potential from digitization.



McKinsey&Company

Source: McKinsey Global Institute (MGI) analysis; see "Digital Europe: Realizing the continent's potential," MGI, June 2016, on McKinsey.com

#DigitalEurope

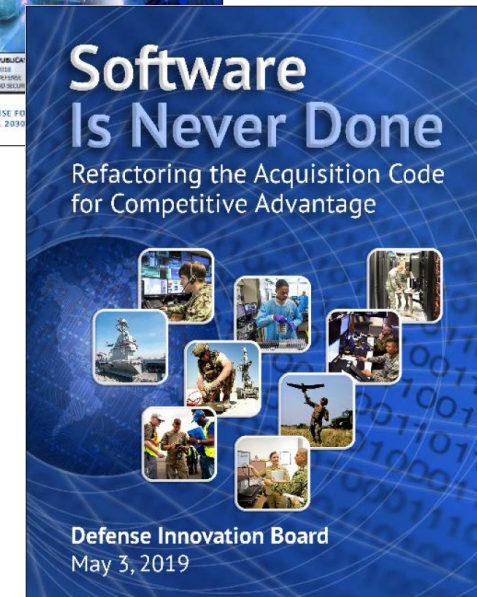




# Guidance and Advice from USD(A&S) – Honorable Ellen Lord



- “I am committed to creating a *culture of creative compliance*, scaling innovation from pockets of excellence, and mainstreaming authorities provided by Congress.”
- “We have to get a lot *better, faster, more agile*”
- “Software development requires different skill sets. We need to change how we train and maintain talent. We need to develop centers of excellence with broad reach across the acquisition *and operational communities*.”
- “Defense technological advantage today is enabled by hardware, but its capability is defined by software. There is an undeniable urgency to *develop and deploy software faster, faster than our adversaries*, in order to maintain strategic and tactical advantage.”







# Guidance and Advice

DEPARTMENT OF DEFENSE  
DEFENSE SCIENCE BOARD

DESIGN AND  
ACQUISITION OF SOFTWARE  
FOR DEFENSE SYSTEMS

February 2018




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OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING  
WASHINGTON, D.C. 20301-3140

# Software Is Never Done

Refactoring the Acquisition Code  
for Competitive Advantage



Defense Innovation Board  
May 3, 2019



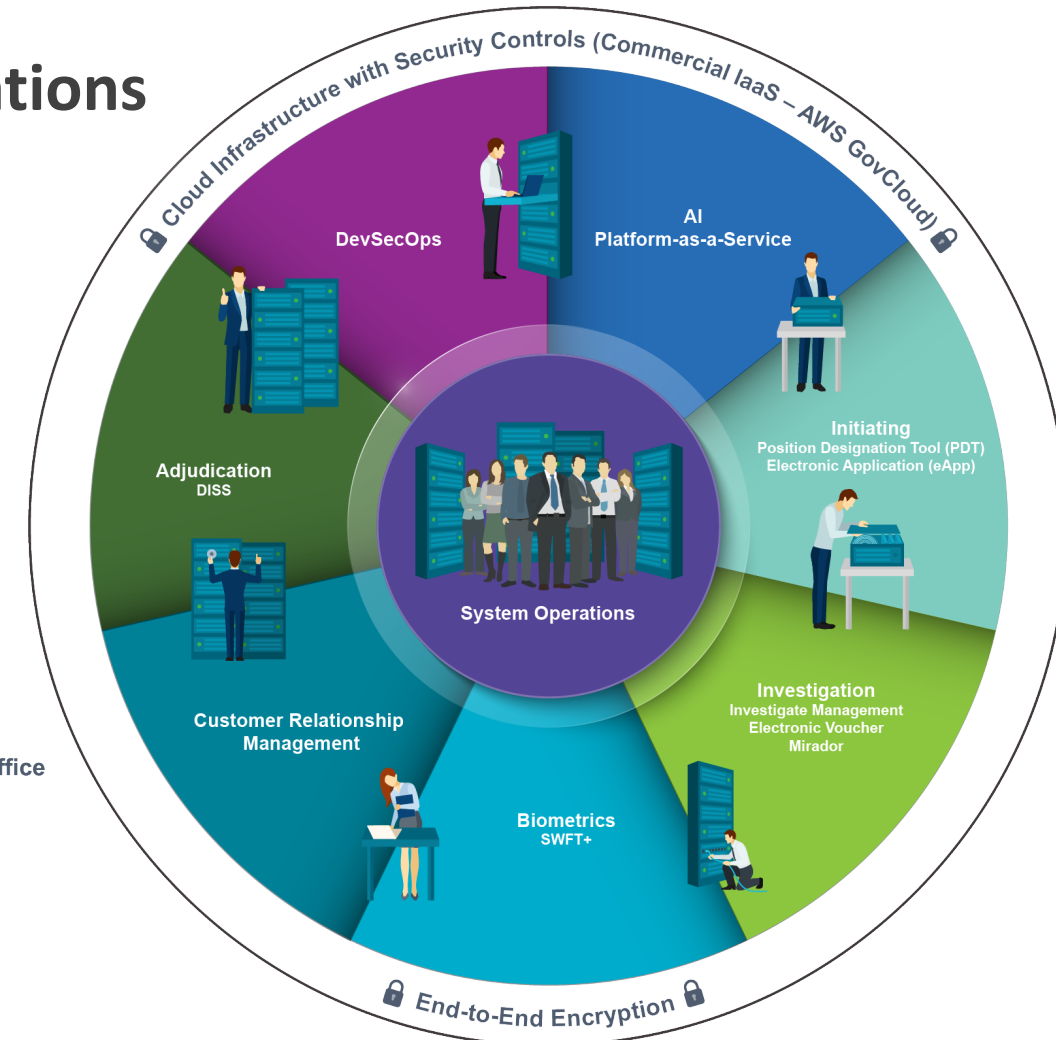
# What is National Background Investigation Service (NBIS)?

- Federal information technology service
- Suitability, security, and credentialing investigations
- Civilians, military, & government contractors

## DoD Acquisition Program

- NDAA Section 874 Agile Pilot
- Robust cybersecurity
- Flexible and adaptive architecture
- DevSecOps software factory

- 👤 Data Scientist
- 👤 Data Analyst
- 👤 Subject
- 👤 Investigator
- 👤 Quality
- 👤 Field Worker
- 👤 SMO/FSO
- 👤 Bus. Mgr.
- 👤 Ent. Business Office

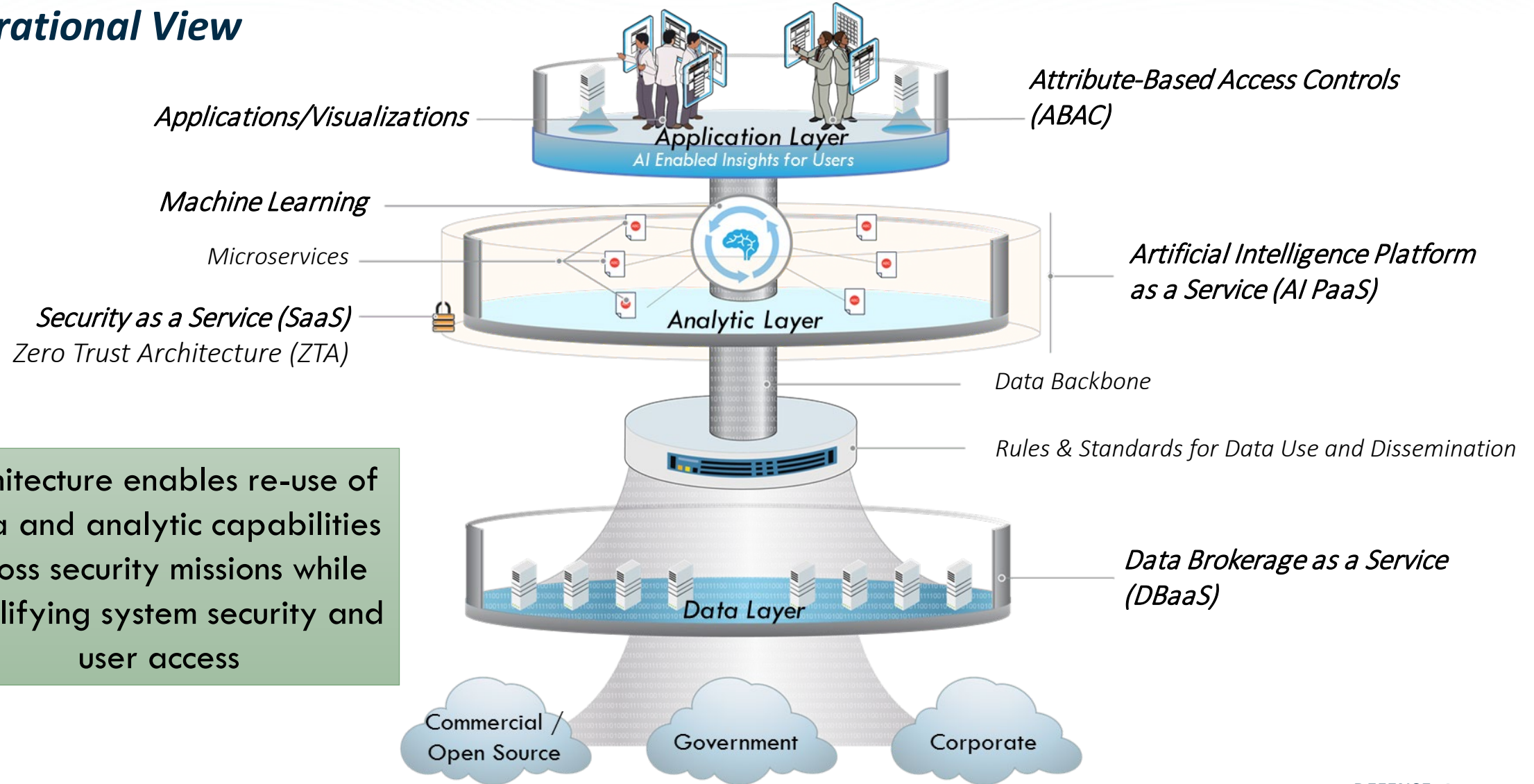






# Enterprise Data & Analytic Architecture

## Operational View



Architecture enables re-use of data and analytic capabilities across security missions while simplifying system security and user access



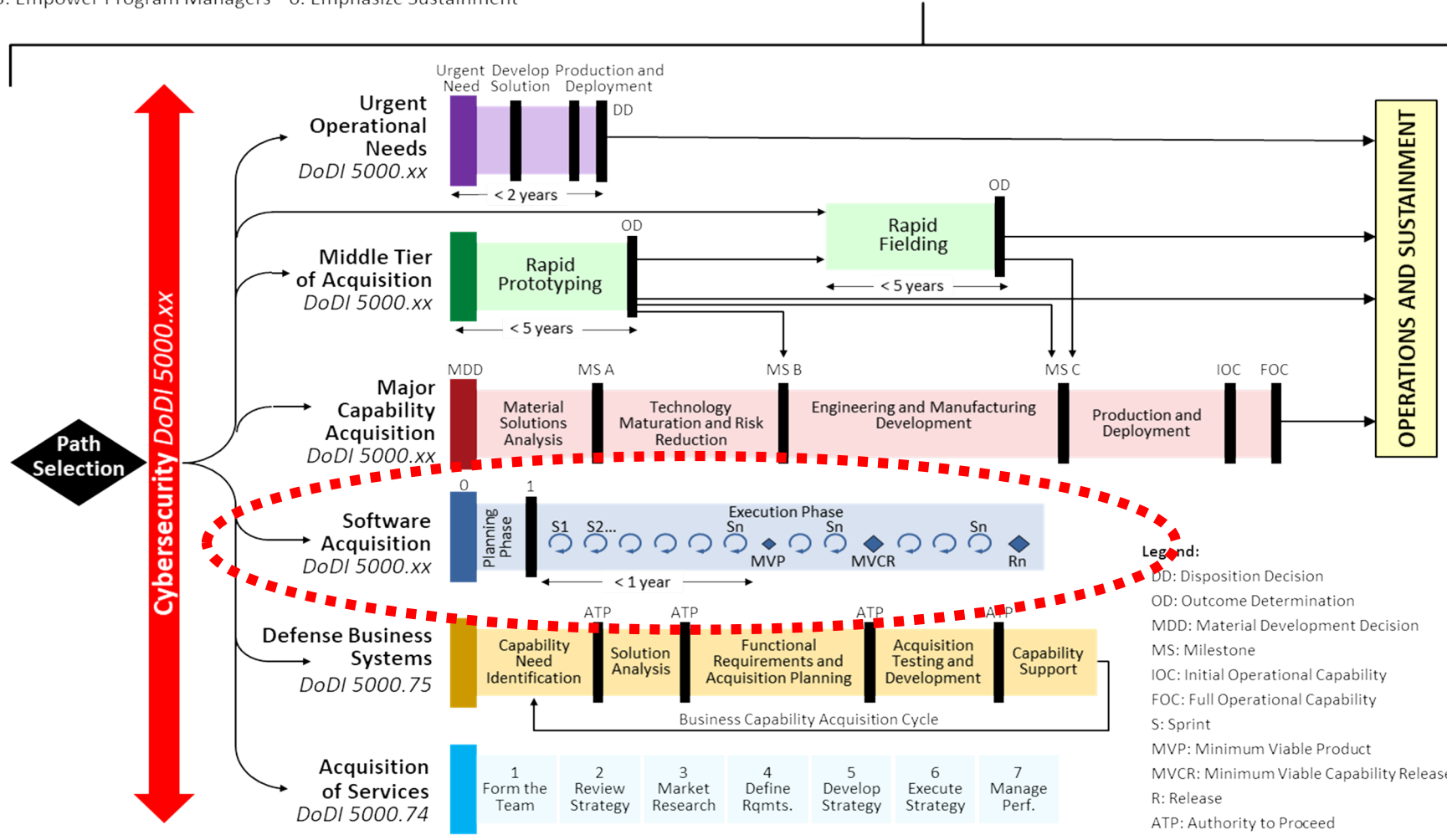
# Adaptive Acquisition Framework

## Tenets of the Defense Acquisition System

1. Simplify Acquisition Policy
2. Tailor Acquisition Approaches
3. Empower Program Managers
4. Data Driven Analysis
5. Active Risk Management
6. Emphasize Sustainment

DoDD 5000.01: *The Defense Acquisition System*

DoDI 5000.02: *Operation of the Adaptive Acquisition Framework*







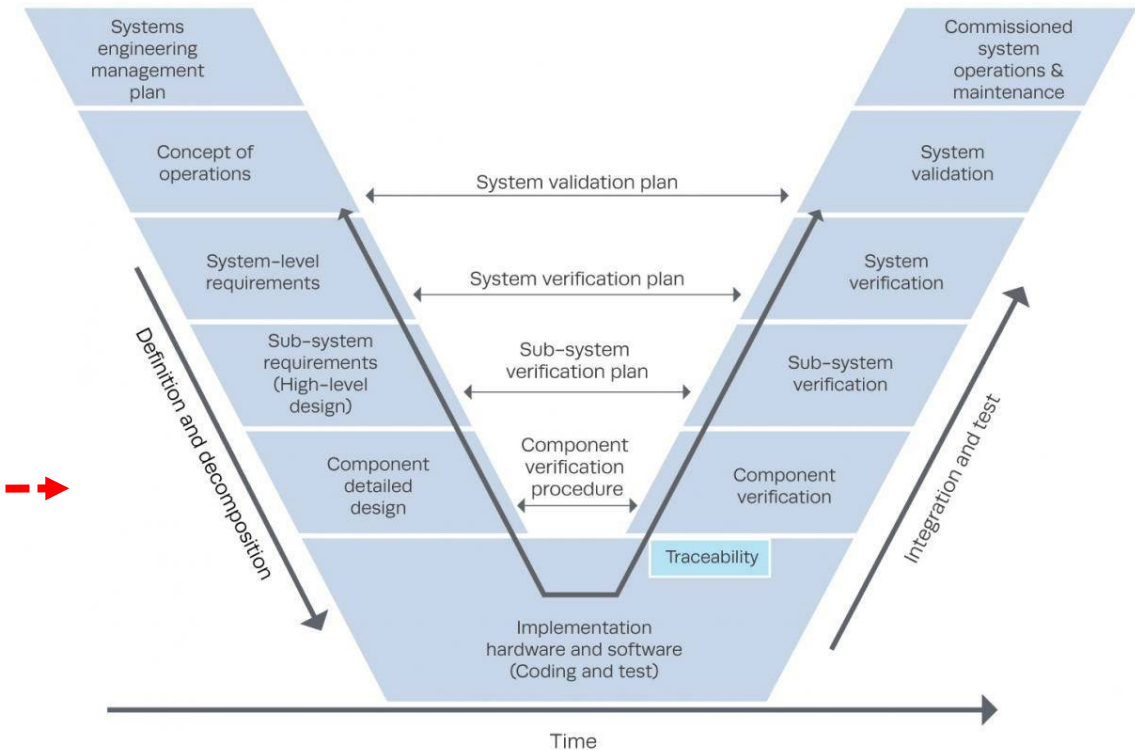
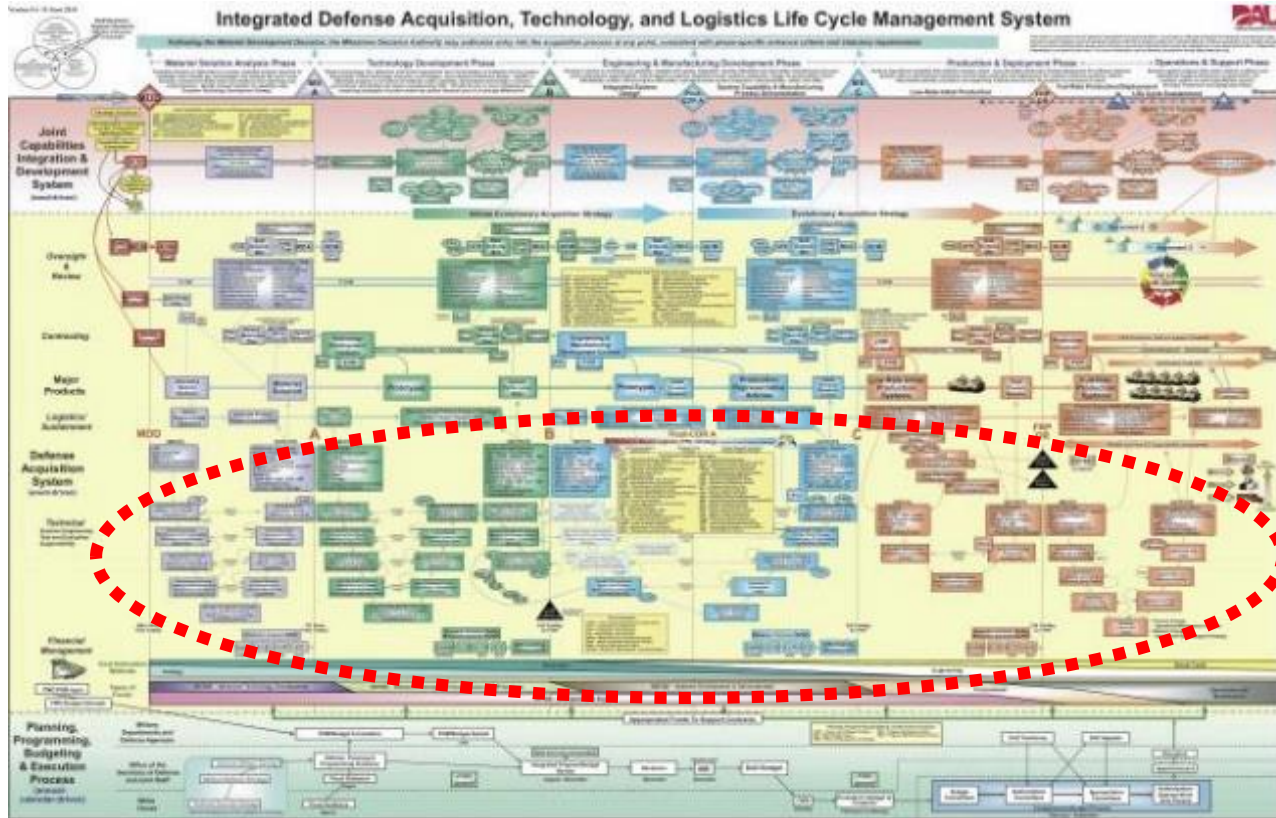
# Foundations of Agile

- **Fix schedule and cost**
  - *Encourage Scope (aka Requirements) to change*
- **Metrics rule**
  - *Evaluate delivered capability and quality via metrics*
- **Build momentum for the factory**
  - *Start small with minimal risk*
- **Drive customer ROI**
  - *Require frequent deliveries*
  - *Attack highest ROI MVP first*
  - *Determine if value delivered justifies continuing*





# Remember our training... the Systems Engineering "V"

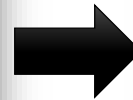


Source: Systems Engineering "V,"  
Washington State DOT



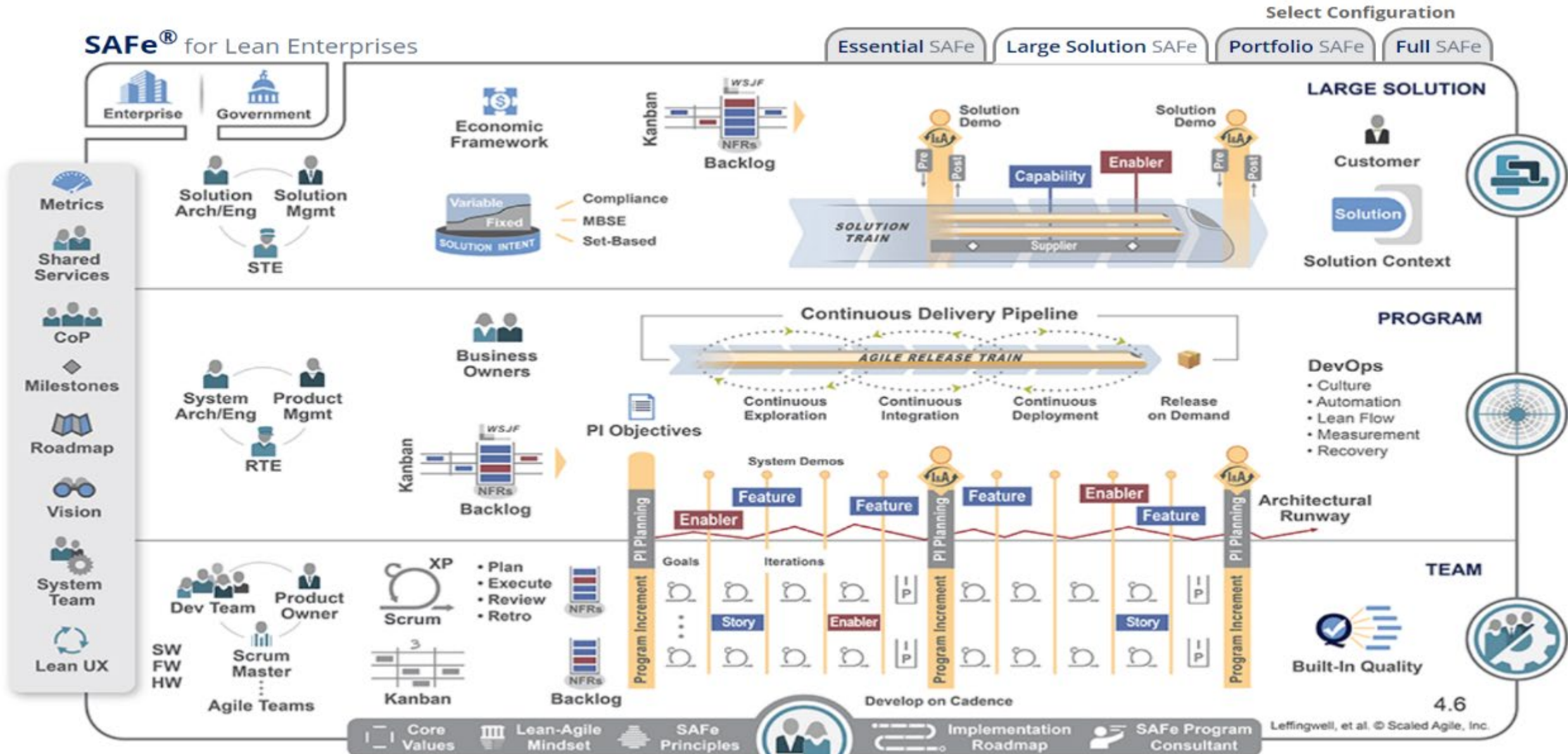


# Remember the asteroid?





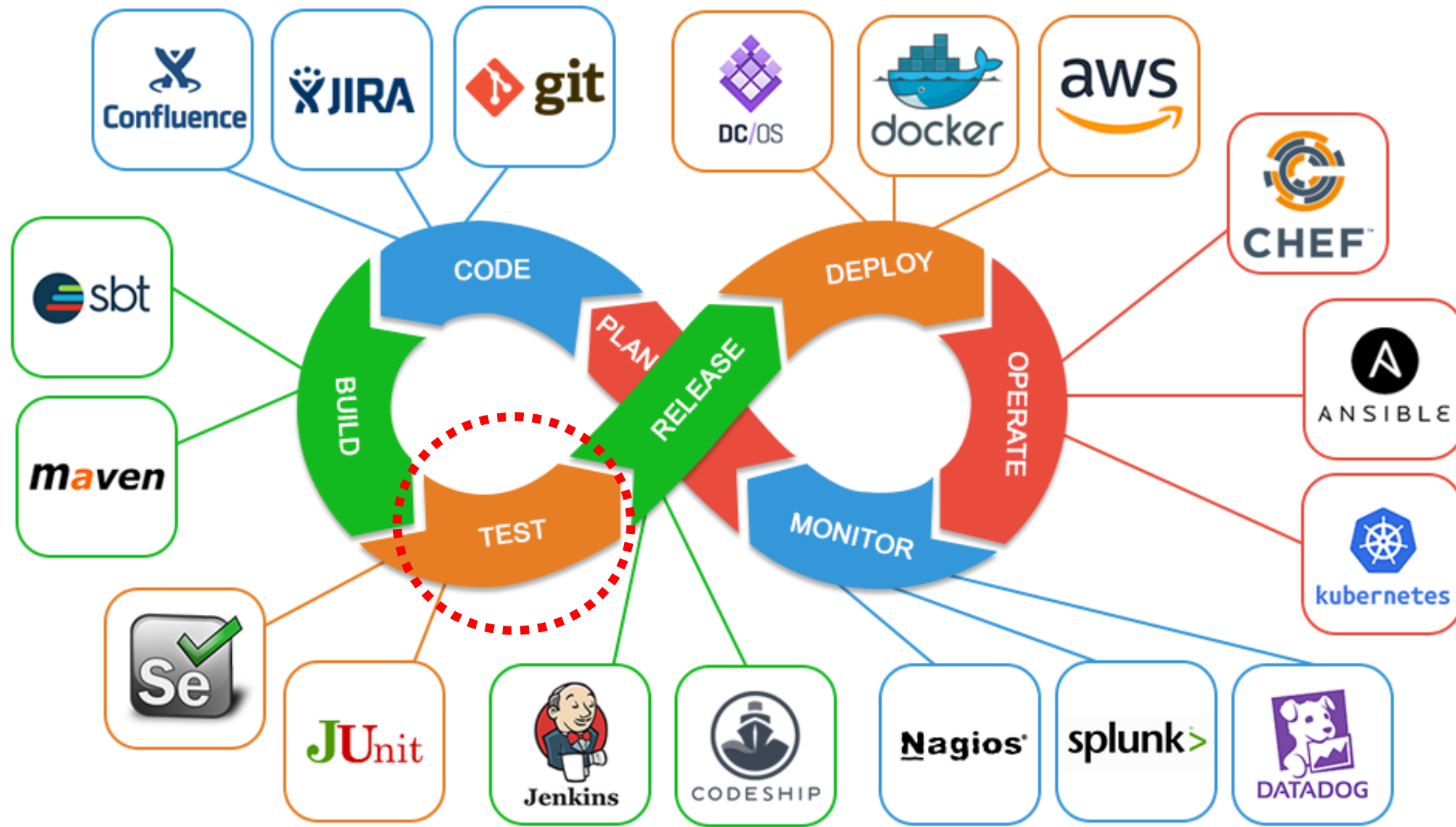
# Implementing SAFe Large Solutions





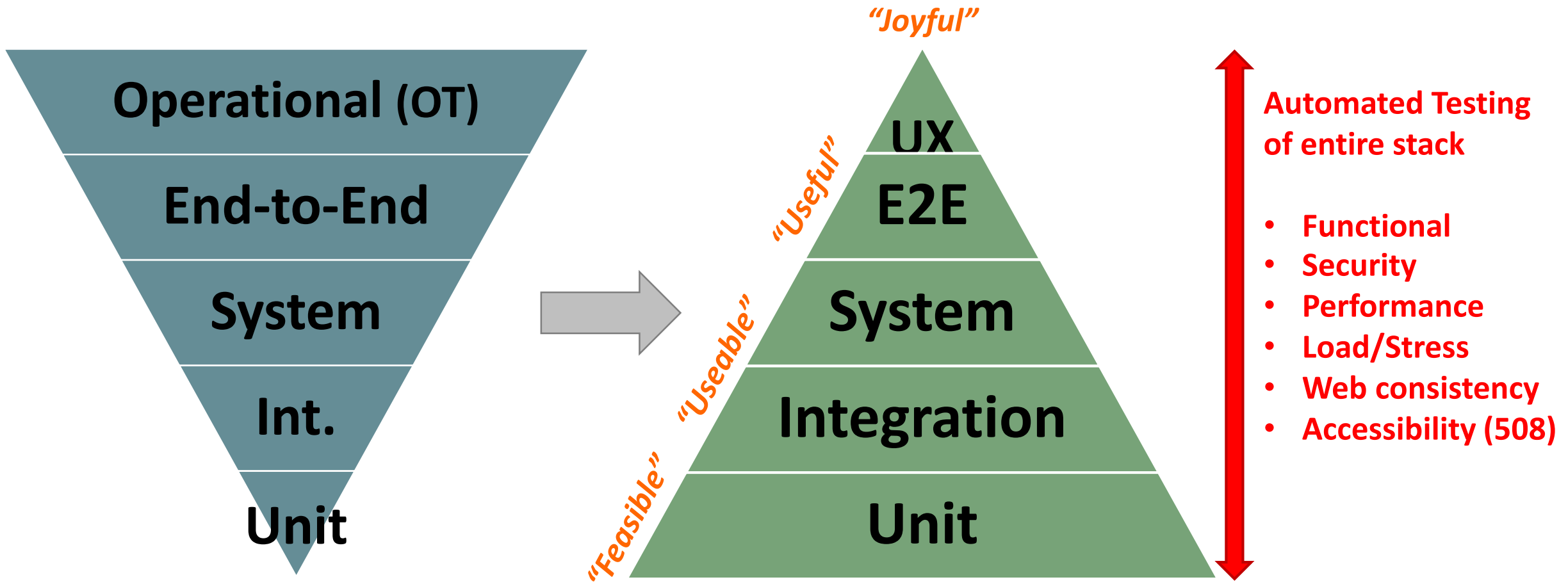


# Testing is in the Sprint Cycle





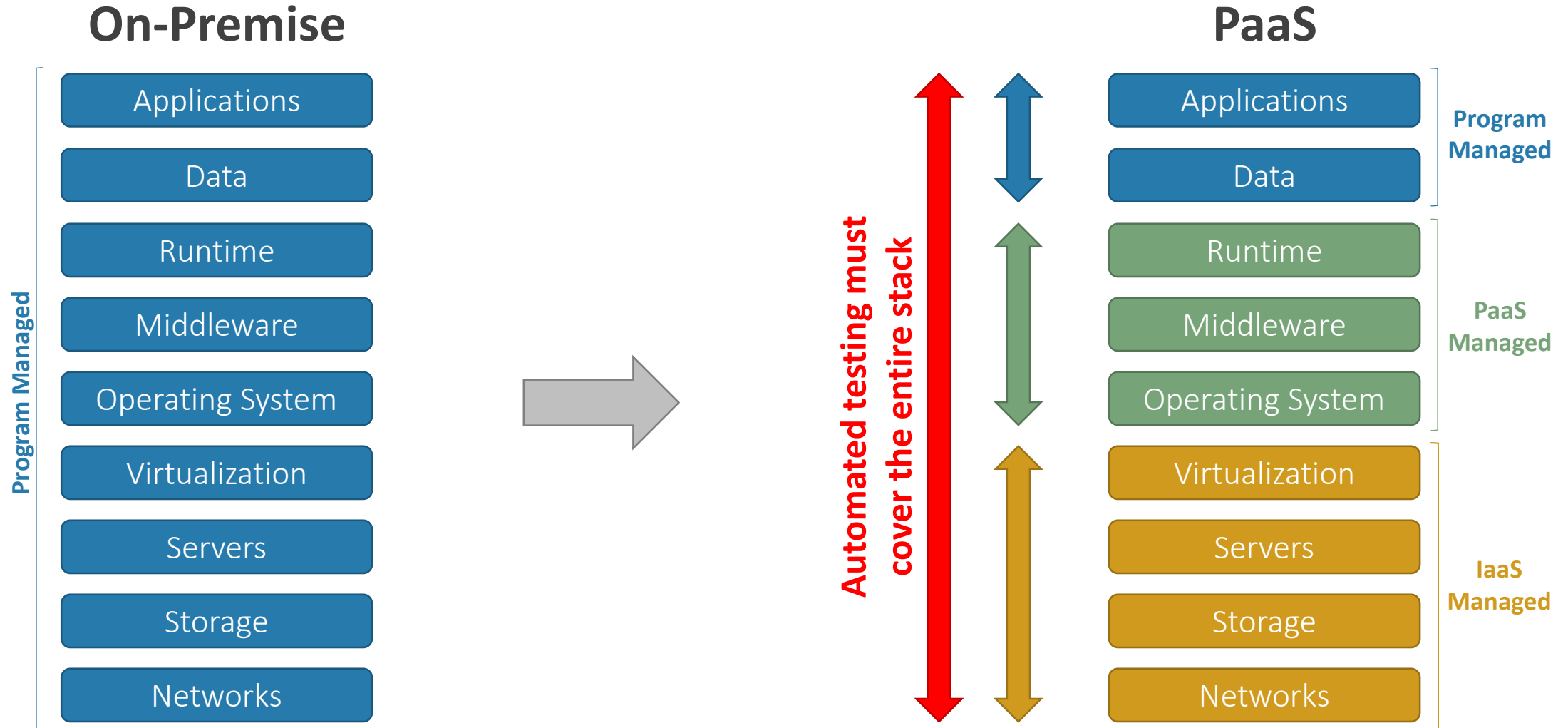
# Inverting the Testing Pyramid





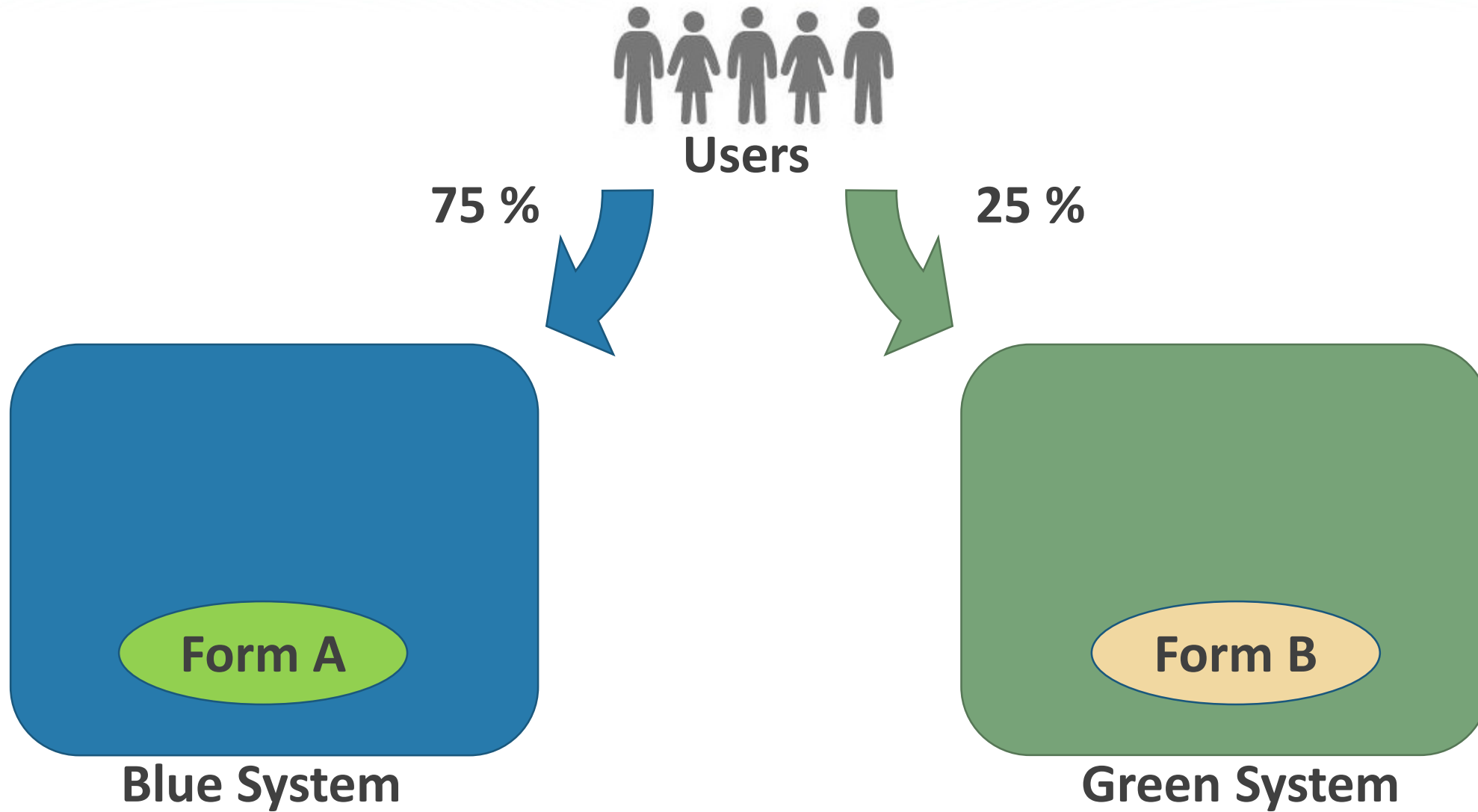


# Platform as a Service (PaaS) is key!





# Blue-Green Deployments = New Testing Approaches





# NBIS T&E Approach base on Best Practices and Scar Tissue



- Software is never done
- Empower Product (sprint) Teams:
  - Drive non-functional equities as hard as functional
  - Automated sprint testing lowers ROI of independent testing (inverts DoD test pyramid)
  - Move traditional T&E activities into sprint process to reduce poste development delays
- Gall's Law = Complex systems that work -> result from simple systems that work
  - Automated unit testing = greatest value (not manual end-to-end and exploratory testing)
- Automation + abstraction = repeatable and reliable test efficacy; IaaS, PaaS, APIs, etc.
  - Test community needs to understand software coding competencies
  - Configuration manage test scripts the same as source code
- Plan non-Agile (external systems and data connections) items in advance

**Focus on building the “right thing” not the “thing right”**

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# QUESTIONS

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**DEFENSE  
COUNTERINTELLIGENCE  
AND SECURITY AGENCY**

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