



# Enabling Small Business Innovation Through Open Architecture

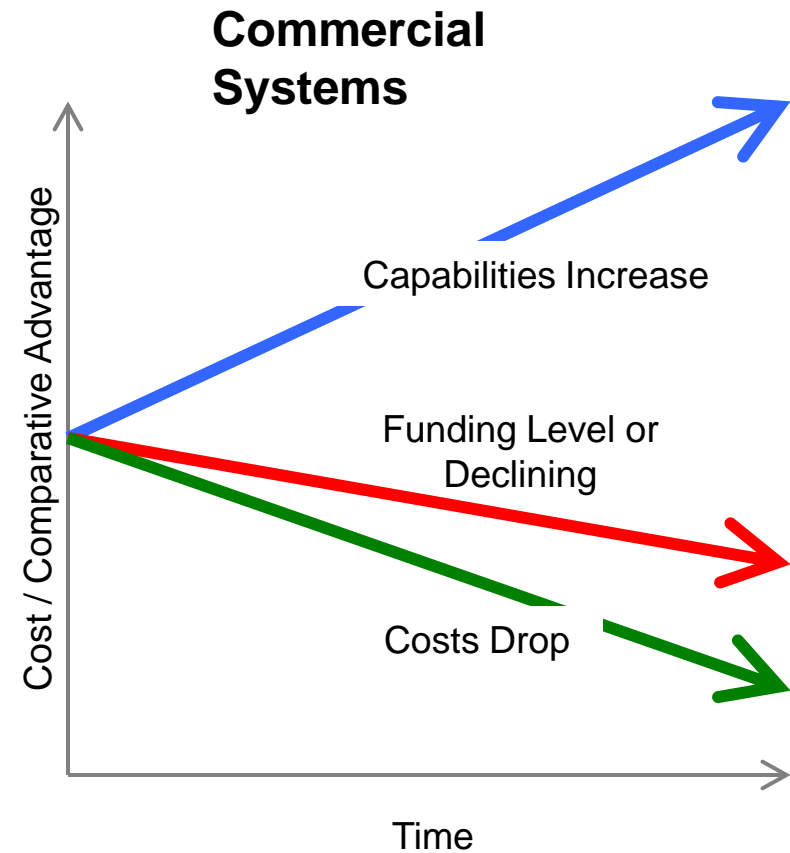
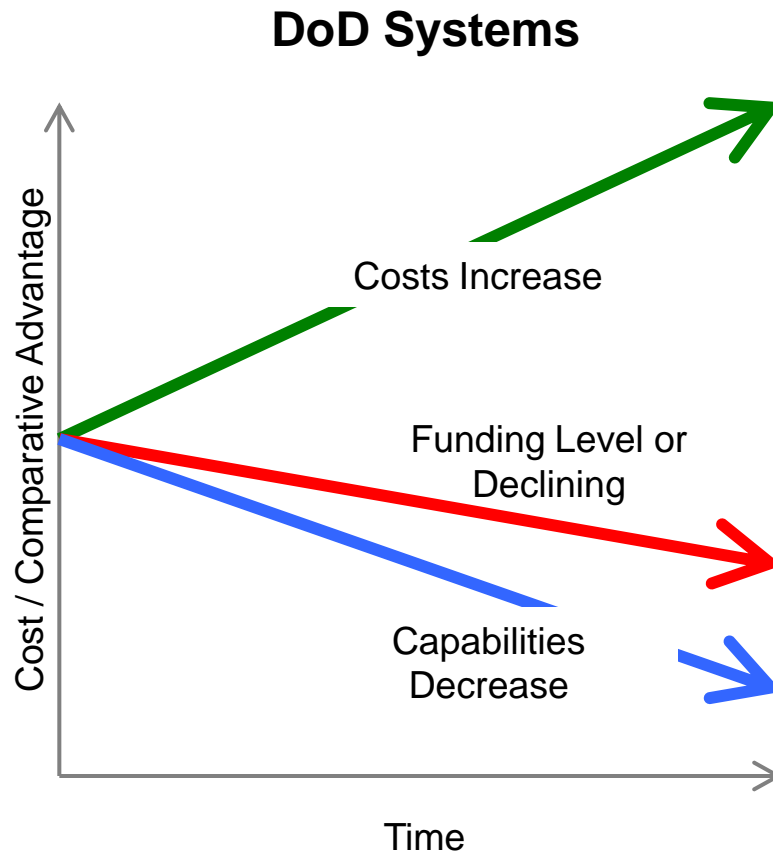
# Recent Article on Defense Costs

- "Quite bluntly ...the cost of everything we have been doing in defense has been accelerating upward too fast even for growing budgets to keep up... The growing price of weapons does much to explain why the expense...has climbed so high," - analyst Stephen Daggett
- "Intergenerational cost growth refers to the fact that military weapons systems, unlike almost every other category of high-tech equipment, are more expensive than they were 20 years ago."
- Systems become "all things to all requirements writers" – the "the 99 percent solution, vs. a much more affordable 75 percent solution"

Quotes from Article by Shaun Waterman  
United Press International  
February 11, 2009

# DoD Cost Curves are Unsustainable

DoD Intergenerational Costs Have Been Rising for Decades



We must shift DoD platforms to model the commercial approach that results in intergenerational cost *reduction*

# Predictable Outcomes

of long cycle times and intergenerational cost growth

The penalty for failing to add capability at rates that match our adversaries is increased risk of defeat on the battlefield.

**The penalty for for failing to add capability at rates that match our adversaries cost effectively is the collapse of our ability to fundamentally defend ourselves.\***

**We are doing Cold War tactics to ourselves**

# Designing and Acquiring Scalably

- Capability is delivered increasingly by software (~2/3 of weapon system cost)
- We must design our large acquisitions to be able to deliver capability at increasing rates over the life of the system
- Capability delivery is sustainable only if intergenerational cost growth is managed
- The techniques for managing accelerated capability delivery AND intergenerational cost growth are well known, mature, and demonstrable

We can no longer afford rigid, expensive, proprietary acquisitions

# The Acquisition Model must also be Scalable

- The usual DoD approach is to solve scalability problems with acquisition techniques
  - E.g., figure out what is common/similar and create a new bureaucracy (stovepipe) to acquire it
  - This approach almost universally results in:
    - Loss of the ability to innovate and rapidly field new capability
    - Overall higher costs with longer fielding times
    - Large, complex bureaucracies to resolve requirements and design issues
    - A narrowing of the industrial base supporting the area that is consolidated
- Collaborative solutions require collaborative development and acquisition models

# Scalable Networking Application Proxy (SNAP)

- Open-source, hardware-independent software framework supporting multiple UAS programs
- SNAP demonstrates:
  - The recipe for an infrastructure that facilitates the development and use of scalable, fault-tolerant, and secure distributed computing software applications across a wide variety of tactical platforms
  - The ability to solve difficult, real-time challenges with an 80% reduction in software development and sustainment costs

SNAP is an example of the approach for applying scalable concepts within the current acquisition environment

# SNAP Small Business

## Construct

- Adoption of a scalable, common framework allows small business to:
  - Compete for providing applications for otherwise monolithic, proprietary platforms
  - Provide innovations that rapidly reach fleet capability
- It is this lack of market “scale” that is the primary inhibitor to transition of small business innovation today
  - New applications get developed and the cost & time to transition is exorbitant, and each platform requires unique software

# SNAP Small Business Collaboration

- A common, scalable framework also allows *multiple small business to collaborate* on developing capability
- Currently, SNAP includes the coordinated effort of six small business via SBIR, STTR, and Navy contract
- Will result in applications demonstrated on unmanned aircraft over the next several years



# Backup

# Scalability

- Scalability is a desirable property of a system, a network, or a process, which indicates its ability to either handle growing amounts of work in a graceful manner, or to be readily enlarged.

*Source: André B. Bondi, 'Characteristics of scalability and their impact on performance', Proceedings of the 2nd international workshop on Software and performance, Ottawa, Ontario, Canada, 2000, ISBN 1-58113-195-X*

- Scalability is more than an interface
  - Scalability covers the three main dimensions:
    - software, communication (networking), hardware
  - To achieve true scalability, the implementation must use open system principles and affect all three dimensions, as well as the underlying business model

