



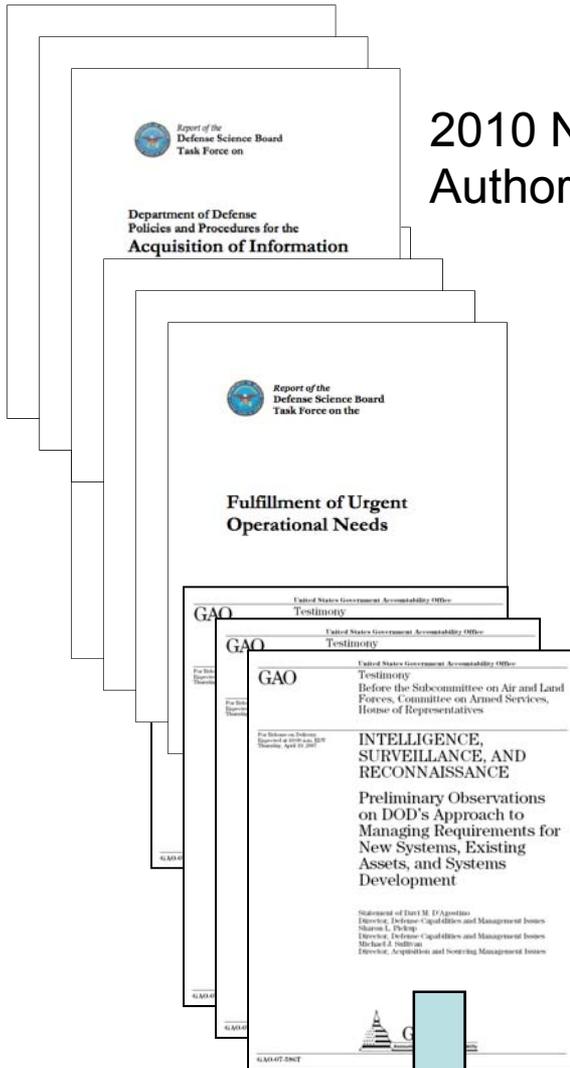
Rapid Evolutionary IT Acquisition (REA) ... Success* is all about the way we build it!

ITEA Conference
19 – 21 July 2011

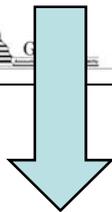
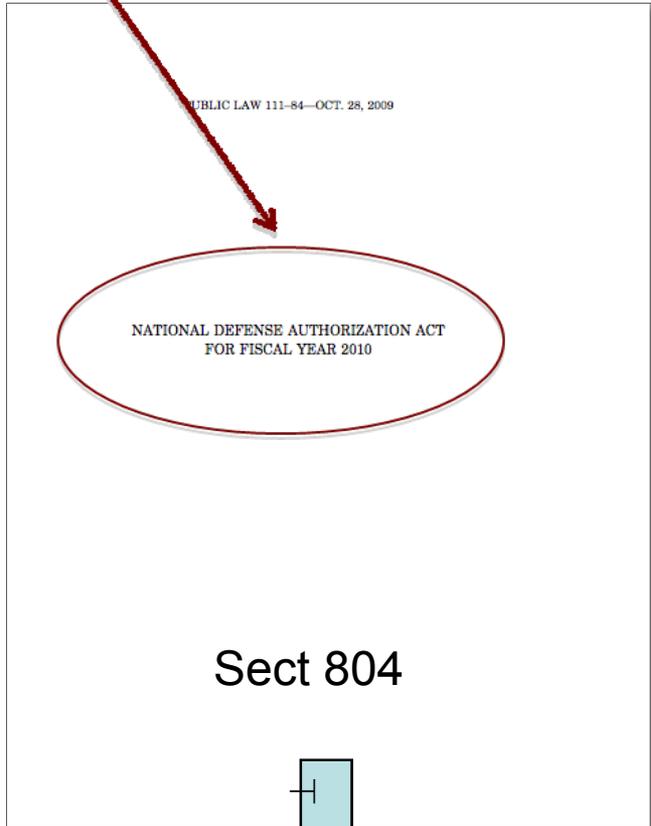
*Success always depends on value
proposition and business model...



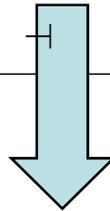
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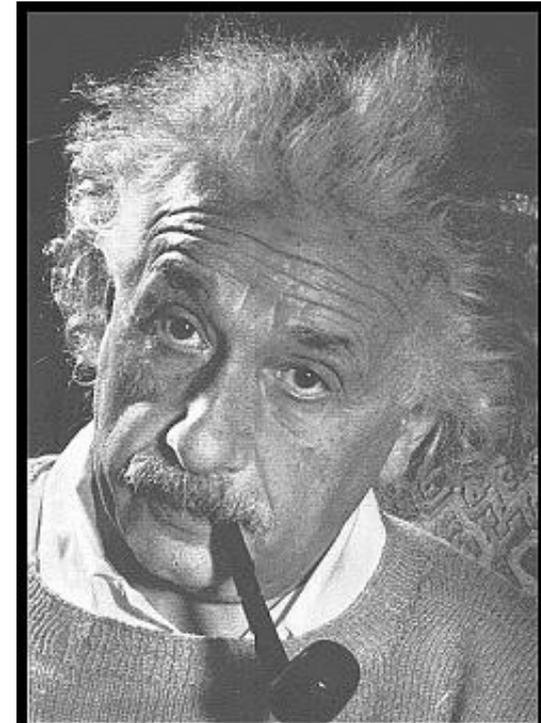
2010 National Defense Authorization Act



IT Acquisition is broken!



Fix It!



Insanity is endlessly repeating the same process and hoping for a different result.

-Albert Einstein

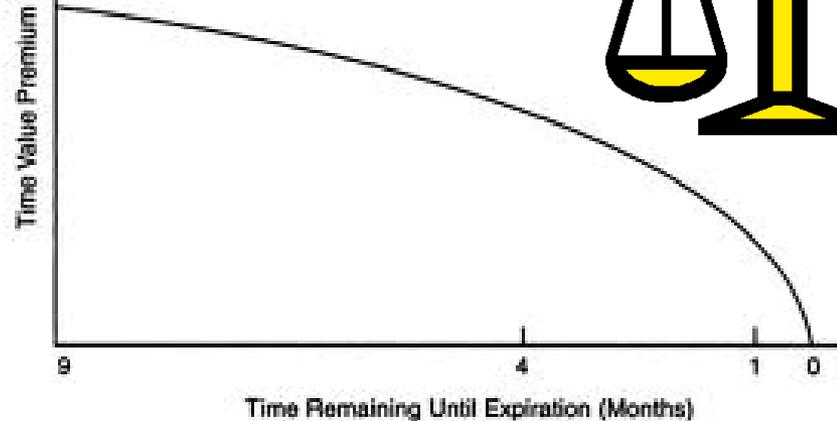
ChromaLuna.com

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Problem and Solution

- Asymmetric Warfare, in some sense, is the Holy Grail. Long recognized, Sun Tzu: “Speed is the essence of war. Take advantage of the enemy's unpreparedness; travel by unexpected routes and strike him where he has taken no precautions.” In the cyber-domain, with Information Warfare, current non-state terrorists have captured and kept this advantage. They obtain, field, and use newer and better performing COTS, often our own, than we allow our war fighters.
- Proposed Solution: REA, a new model for IT acquisition. This is an approach which has the aim to implement the mandate by profound transformations in doctrine, organization, and equipment in response to the changing military threat, a new fiscal reality, and the current technological landscape.

Value-based Acquisition Framework (VAF)



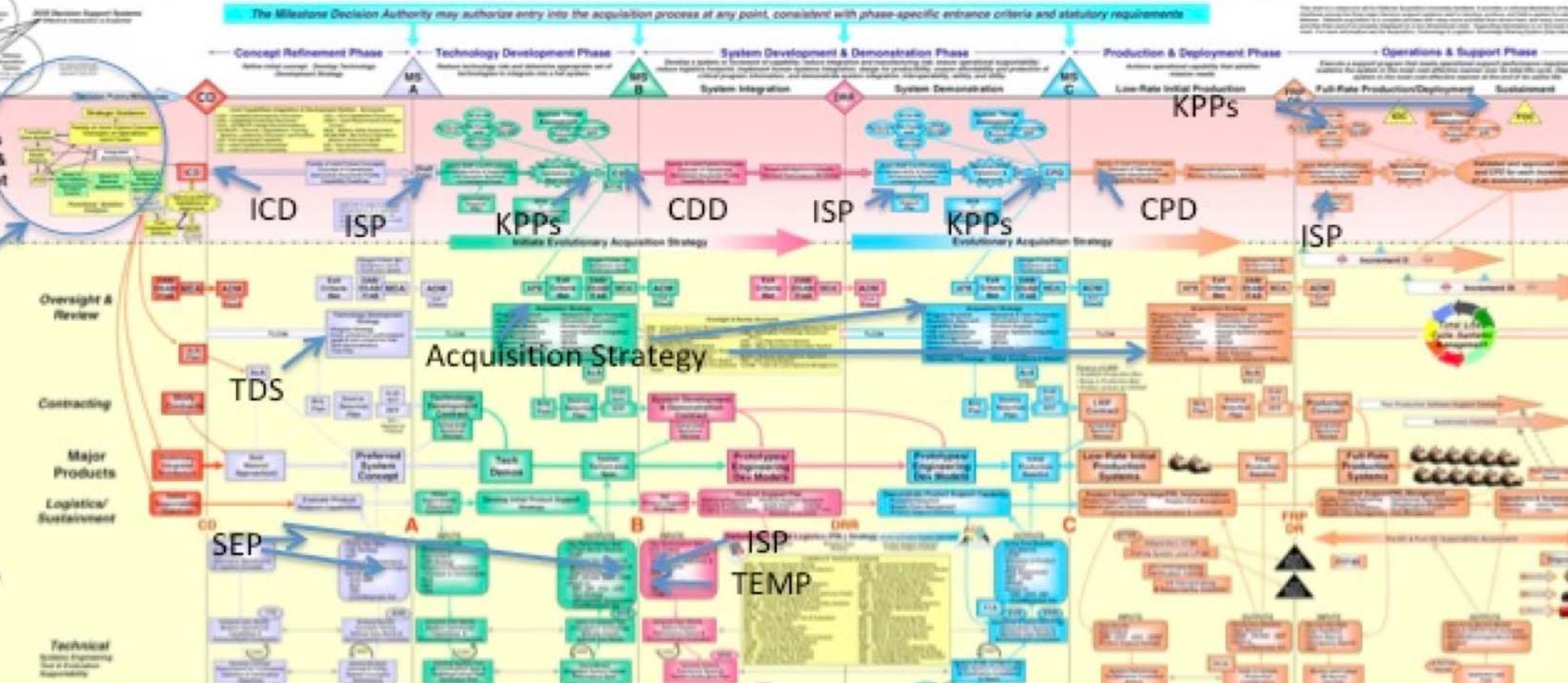
Measure (and Buy!) What Matters

$$\text{Value of Acquisition} = (\text{Value/Capability}) \times (\# \text{ of Capabilities}) \\ \div (\text{time discounted in favor of sooner}) \div (\text{cost})$$

This provides a Value Proposition (VP) which is very similar to the current best practices Business Model pr Proposition for many IT companies. With it we can reliability and repeatedly Use metric we can measure to demonstrate improvements in capabilities we want to deliver.

Integrated Defense Acquisition, Technology, & Logistics Life Cycle Management Framework

The Milestone Decision Authority may authorize entry into the acquisition process at any point, consistent with phase-specific entrance criteria and statutory requirements

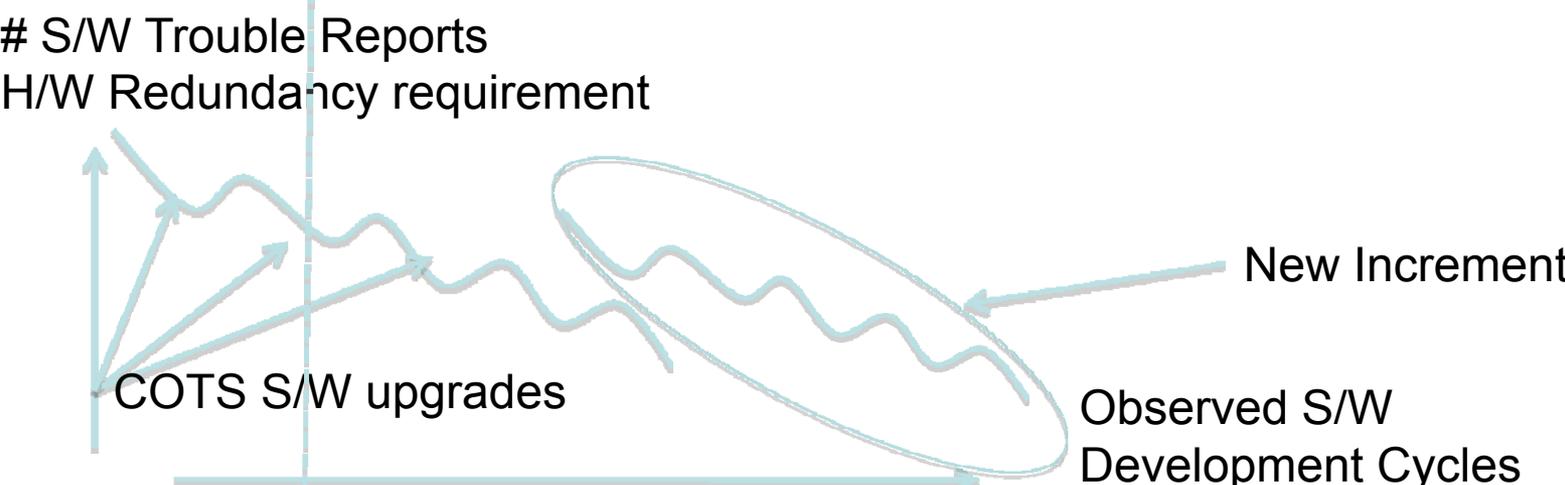
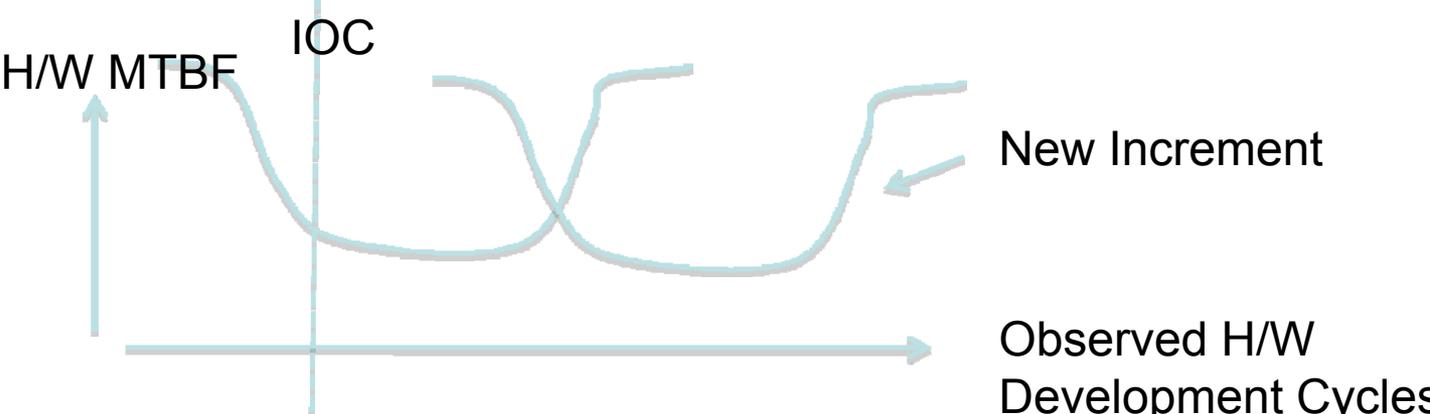
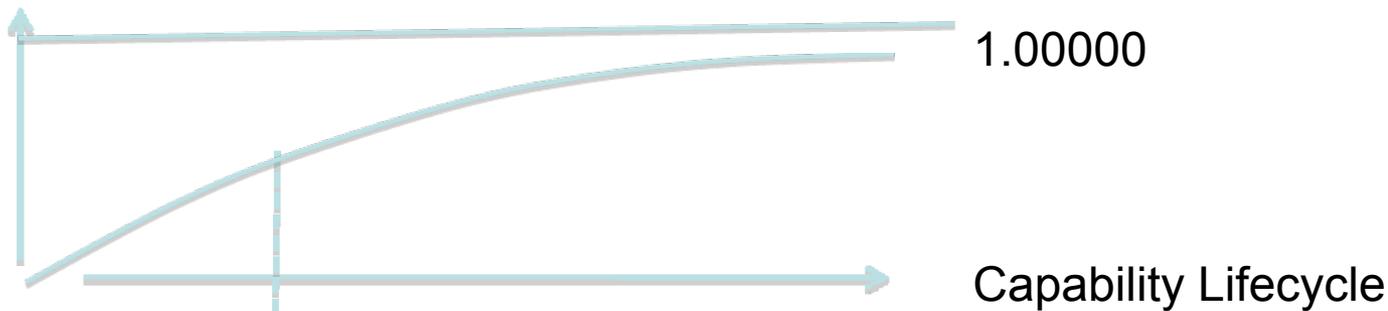


Convert these ponderous static artifacts into machine-readable templates and collaboratively collect objective views of policy, use cases, constraints, and alternatives....Incentivize COTS marketplace to satisfy requirements

Critical REA Sub-Processes

- *Risk-tolerant acquisition oversight*
- *Agile architecting and engineering functions responsive to emergent business imperatives*
- *Persistent development, test, and certification environment (distributed, virtual, Intelligence System Integration Laboratory (ISIL))*
- *Managed, automated, workflow across sponsor, provider, consumer, and governing stakeholders*
- *Expert, agile, contracting, and legal support responsive to project manager*
- *Open transparent communications and forum for government/industry interaction*
- *Information-value-delivery-chain analysis*

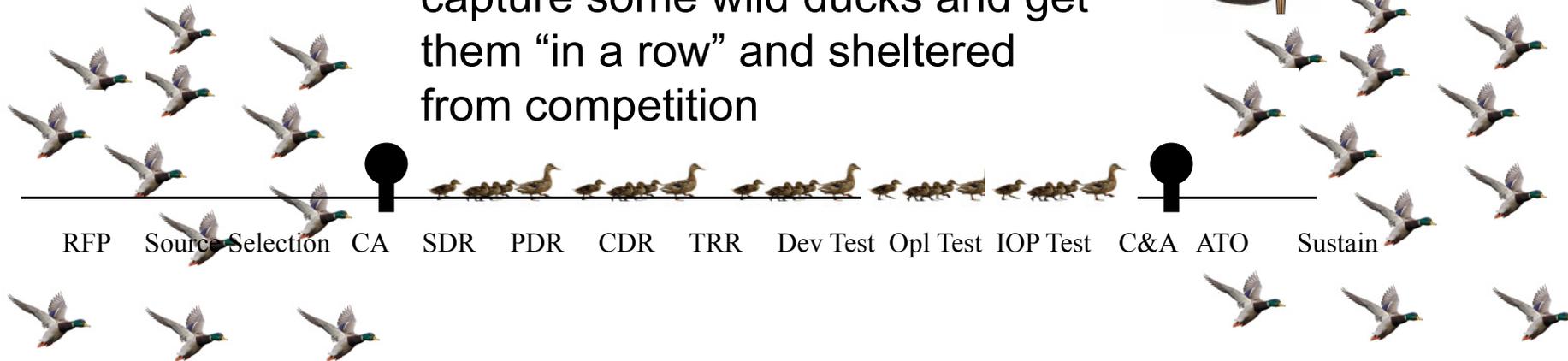
Information-Value-Delivery-Chain-Analysis



In the open market ecosystem of Moore's law and ever-evolving technology, "wild life" is always competing

The longer DoD ducks are away from the wild, the less likely they'll be able to compete when they return...

During DoD "Acquisition" we capture some wild ducks and get them "in a row" and sheltered from competition

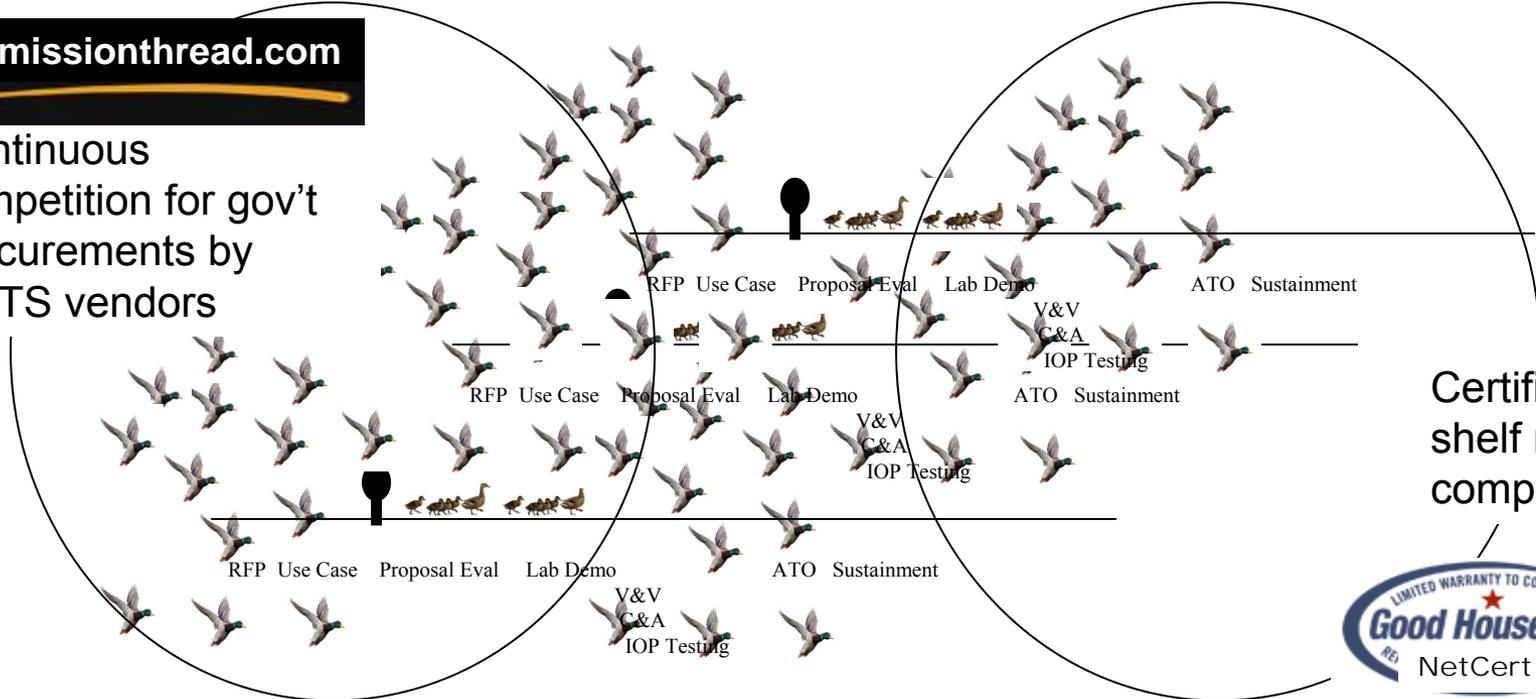


Strategy is to treat the four main acquisition risks in parallel

- **Cost & schedule**
 - Risk managed by continuous competition and frequent deliveries
- **Interoperability**
 - Risk managed by measurable/testable net-ready criteria
- **Performance**
 - Risk managed by Mission Threads
- **Assurance**
 - Risk managed by certified, reusable, high assurance GOTS components



Continuous competition for gov't procurements by COTS vendors



Certified off-the-shelf net-ready components



A Familiar Example

Systems Engineering 101

- System Availability, A_o

- $$A_o = \frac{MTBF}{MTBF + MTTR + MLDT}$$

A_o = Operational Availability

MTBF = Mean Time Between Failures

MTTR = Mean Time To Repair

MLDT = Mean Logistic Down Time

If one of my components is failure prone, A_o decreases.

What can I do to achieve the 9s I require?

- More hot spares
- More on-board spares
- More redundancy
- More technicians
- Better technology??

Software Intensive, Networked, Systems of Systems Engineering 401

$$A_{?}^{*} = \frac{\text{Mean Time}^{**} \text{ To } ??}{\text{Mean Time To } ?? + ?? \text{ Time}}$$

*A? = Better Capability
Availability

**Time = Run Time, Design
Time, Build Time, + Buy Time

Any number of factors beyond my control affect network performance. How do I get the “9”s I need at my node of interest?

- Topology?
- SOA vs. Thick Client?
- C&A, IOP, DT, OT?
- COTS vs. GOTS vs. OSS?
- Build vs. Buy vs. Lease?
- Enterprise vs. Seat License?
- FFP vs. LoE, Long vs. Short Term Contract?

Value-Based S-KPP: a build-time speed-to-capability *process* metric

$$S\text{-KPP} = A_{nr}$$

$$A_{nr} = \frac{(T_D)_{IE} + (T_D + T_T + T_C)_{CE} \times W_1 \times \dots \times W_n}{}$$

$$T_D = T_I + T_R + T_B + T_O$$

T_D = Development Time
 T_T = Test Time
 T_C = Certification Time
 $()_{IE}$ = Initial Estimate
 $()_{CE}$ = Current Estimate

W_x = Weighting function, e.g.
software currency, preferred
architecture, etc

T_I = Invention Time
 T_R = Re-invention Time
 T_B = Bundling Time
 T_O = Overhead Time

A_{nr} = Availability of Net-Ready Capability – a build time/buy time *process level* Measure of Effectiveness (MOE).

$$A_{nr} = DT_i / (CDT = DT_c + TT_c + CT_c)$$

e.g. $CDT \leq$ Moore's Law Cycle = 18 months

$$A_{nr} \geq .66$$

A_{nr} = Net-Ready Availability: a unit-less index that maps the obsolescence rate of the technology to the acquisition timeline, including development, test and certification.

CDT = Capability Deployment Time

DT_i = Initial estimated Development Time: calendar time required, in consideration of testing and certification timelines, to field an increment of IT capability prior to its obsolescence.

DT_c = Current, or revised estimate of Development Time at the time of evaluation

TT_c = Current or revised estimate of Test Time: calendar time required post development to complete any additional required testing.

CT_c = Current or revised estimate of Certification Time: calendar time required post testing to achieve any necessary certifications. .

Simplified Example

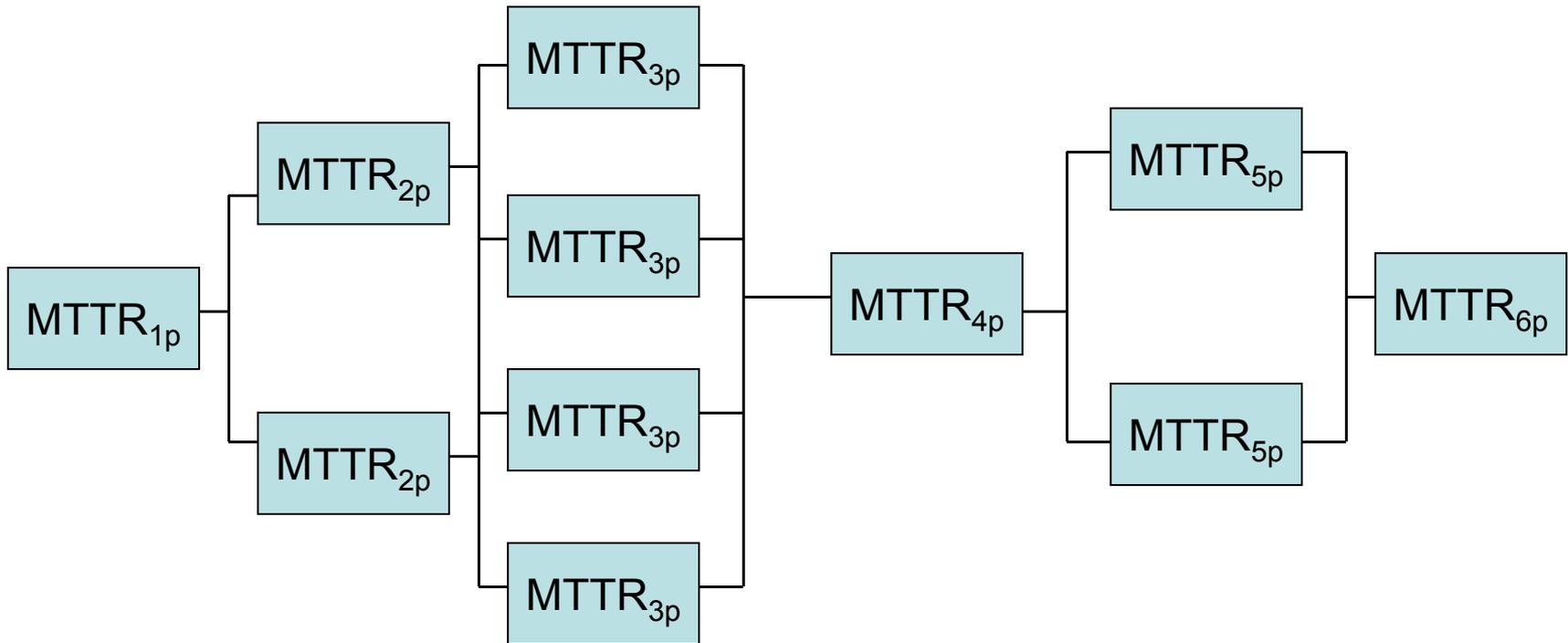
$$\bullet A_o = \frac{MTBF}{MTBF + MTTR + MLDT} = 0.99999$$

and

$$A_{nr} = \frac{DT_i}{DT_r + TT + CT} = 0.66$$

where $DT_r \leq DT_i$

At PDR, MTTR is xxxx hrs given



$A_o = 0.99999$, $A_{nr} = 0.66$, Cost = \$\$\$\$\$\$

Value Off the Shelf (VOTS) Acquisition Strategy

- Minimizes risk to cost, performance, and schedule with out-of-the-box functionality**
- Puts operational customer community in a feedback loop inside the production process**
- Makes the universally painful issues of certifying Interoperability and IA a “comes with” aspect of military Product Line Architecture**
- Provides pre-approved plug-and-play transition platform for research sponsors**
- Eliminates bureaucratic overhead for off-the-shelf product providers to robustly demonstrate compliance and value added and achieve pre-approved product status**
- Leverages flexible contractual vehicles that do not lock in, or lock out, any reasonably qualified provider or consumer**
- Includes marketing and outreach function to seek out fellow early adopter providers and consumers**

Current Best Industry Practice Modular Open System Architecture (MOSA)

In IT Companies, commonly called a Product Line Architecture (PLA)
-examples: iPhone, iPad, DROID, Nokia

Primary needs: Framework with detailed specifications, e.g. interfaces and Boundaries; stable plug-n-play environment, clear certification path
And reduce the cost of entry—everyone doesn't have to buy their own



Possible reason Defense Industry has not had much success with this very Successful commercial model; a lack of commitment to, or understanding of The value proposition, or an understanding of the business model and the Other than cost benefits of it.

A Place To Start

- Historically, the government has often been very successful when it provided two components: (1) breakthrough technology and (2) reduced risk to certification: e.g. TCP/IP, GPS, NWS, federal highway.
- For Information Technology, a Plug-Fest (or Jamboree):
 - Where interoperability is a necessary but not a sufficient condition
 - Where VP must be demonstrated against customer use case
 - Where persistent framework for certification and interoperability is used
- Bring what you have, prove how it plays, get it certified, bundle it and add to your catalogue.

QUESTIONS