Sustained Innovation Through Composable Systems
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LAST 50 YEARS

TECHNOLOGY SUPERIORITY

↓ Disproportionate access to technology

EGALITARIAN TECH ACCESS

↓ Superiority strategy becoming obsolete

IMPLEMENTATION SUPERIORITY

PRESENT ↓ Rapid adaptation as key advantage

THE NEXT CONFLICT

Won't be decided by a particular technology

But by how quickly it is adapted for military use

shift our strategy from implementation superiority

MILITARY INNOVATION FUNNEL

COMMERCIAL TECHNOLOGY

ACADEMIC RESEARCH

OPEN SYSTEMS INTERFACES

DEFENSE RESEARCH LABS

„Deliberate curators"

COMPOSABLE ARCHITECTURES

ROBUST MILITARY SYSTEMS

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Six Acquisition Traps That Kill Innovation

- The "one-and-done" design trap
- 10-pounds of requirements in a 5-pound budget
- Overbuild by design, not need
- Custom for custom's sake
- Trouble letting go
- Silos of excellence

Architecture & Design – Same for Hardware & Software

- It's an assembly of parts
  o Well characterized, replaceable, upgradable
- Don't put a transmission behind the transmission
  o Where does the adapter go?
- Block is not cast with the frame
  o Architected span of control
- Adaptable to different platforms
  o Car, boat, doesn't require a full rebuild
- Interfaces designed prior to current technology
  o Electronic timing advance, for example
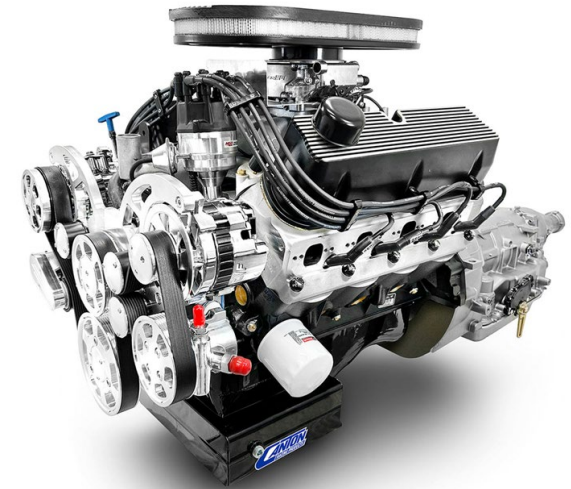
But...

- Software and Systems are also an Assembly of Parts
  o What Different (if anything)?
  o How do our Current Standards and Architectures stack up
  o What's needed to decouple?
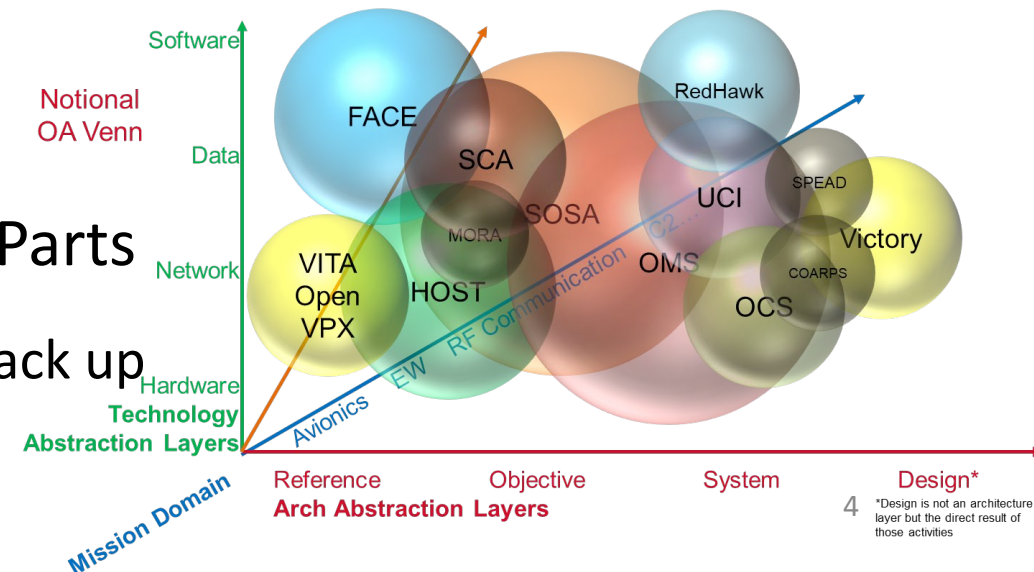
GAO Got It Wrong

- GAO Points to the need for more upfront requirements refinement
  - Presumes requirements are knowable and stable
  - With each technology evolutions that becomes less true
- Early requirement refinement must shift focus
  - Key architecture drivers for composability
  - Modularity that creates resilience to changing performance needs
  - Open interfaces that expands competitive market access
- Composable architectures are hard
  - If it was easy our enemies would have already done it
  - Open standards and architectural tools have made it tractable
  - We choose to do it, and do it right because it must be done

We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard; because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one we intend to win...

John F. Kennedy
September 12, 1962
Rice University

Contracts Language Matters

What the contract says	What industry hears
Do MOSA to the maximum extent practical	I'm not willing to pay for that MOSA stuff
SHALL comply with DoD MOSA policy	I just need to put a check in the box
SHALL document MOSA strategy in on Open Systems Management Plan (OSMP) • Delivered with proposal • Delivered after contract award	I've been told I have to do MOSA, but have no idea what to ask for, so you tell me • But I actually care about your answer • And I don't care about your answer
SHALL be designed in accordance with "XYZ" standard	I have a preferred "flavor" of MOSA, but I'm not willing to add program risk to enforce it
SHALL conform/comply to level "x" with "XYZ" standard • As defined in your test plan • As defined in my test plan • With certificate of conformance from "ABC"	I care enough to validate MOSA usage • But willing to accept your definition of good • To my definition of good enough • Independently against the standard
Add Clear Spec and SOW direction and test	I know what I want and willing to pay for it
Add Clear Selection Criteria	I want you to be invested in it

We've done it before. It's still about the interfaces.

Questions