Breakout Group Outbrief: Alternative Ops Concepts

Session 11c
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New Ops Concepts

- Theme: Perspective shift from stovepiped systems to user-centered networked assets.
  - Integration—multi-user, multi-asset
  - Automate processes
  - Evolve and Extend

- Critical for new integrated and networked world: multinational cooperation, new military interoperability needs (RMA, effects-based operations), civil cooperative efforts.
Multi-user Multi-asset Integration

- The technology exists now:
  - Multiple vendors of Enterprise Application Integration software: Message bus (XML or analog); workflow manager, transaction monitor, integrated security/admin. Connect legacy systems via “adaptors” as needed. Change process flow with graphical interface.
  - Significant commercial base/success in methodology and technology maturity in recent years, including DoD applications in logistics and information applications

- Don’t have to “shut down” for block implementation.
  - Integration is incremental, based on needs, particular systems and processes.

- Additional technologies are relevant to solve aspects of problems.
  - These include peer to peer technologies, and JINI.

- Web Services standards emerging rapidly.
Automation of Processes

Jeff Langston, The Aerospace Corporation on

Knowledge-based systems for automation and decision support

– Difficult to construct so they are complete and reliable.
– Important to capture and preserve specialized knowledge
– Result in faster and improved decision-making in dealing with complex data.

Ron Cohen, Jet Propulsion Labs on

Automated satellite tasking

– can be constructed to enable user intervention (joy-stick operation) or by default, to use multiple criteria effectively for determining target collects.
– Well-constructed software avoids violating satellite operations constraints.
– Optimizes asset utilization, significant improvement over humans, ROI especially for sustained long-term missions.
– Social and political barriers to transition are real. Experience with system resulted in gradual adoption and increasing use of automated operation.
Evolve and Extend

- Enterprise Application Integration technology designed to support incremental migration and evolution
  - Component/service based architecture using MOM
  - Accommodates legacy systems via adaptors to variable level of granularity without enforcing internal changes
  - Enables gradual, experience-based migration to full component services architecture with native interfaces.
  - Increases flexibility and agility of system for plug and play replacement of services, parallel testing
  - Extensible to other similar systems, procured by other enclaves, via XML/messaging or adaptors.
  - Supports emerging, experience-modified conops with changes to workflow.
- Emerging Web Services and future approaches promise to be even more agile and flexible
Issues

• Security: Still a challenge, in any system.
  – Security challenges are different and multiple in component services systems.
  – Use lessons learned in industry.
  – Use university open applications to explore and test.

• Why should contractors take the risk of changing their method of delivery now to ensure “future interoperability?”
  – Risk may be that others do—who will get next contract?

• Semantic compatibility of data, metadata:
  – Problem remains! Need users/providers to work together to understand and reconcile.
  – Model clashes need to be resolved!
  – Advantage is that data dictionary need not be complete to start implementing the architecture.
“Features” and Observations

- Standards: Open/Internet standards handle many issues.
  - Interface standards are critical

- Dot-com crash may be a windfall: new talent for DoD/contractors
  - EAI systems (for instance) not “rocket science” programming; new tech, distributed systems is the way of thinking among recently trained tech people.

- University satellite ground systems
  - currently being successfully implemented with these component services, distributed systems approaches.

- Some “stealth” applications of these technologies
  - in new and emerging DoD related systems; and in some traditional contractor solutions.

- Adopting commercial solution enables riding on commercial support/development
  - but it means acquiring and evolving on commercial model, not traditional procurement, O&M terms and schedule
Conclusions

• Not a magic bullet—but a promising opportunity with significant advantages. You still have to “do it right.”

• Layering of architecture, and multiple technologies enable some problems to be decomposed and addressed at appropriate levels.

• Political, turf, compatibility issues and different concepts of operation still exist, but may be easier to try out and modify with experience in agile, flexible system.