

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 decisionmaking 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.