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Integration: Reinventing an Expensive Wheel

Larry McQueary (larry@talarian.com)
Talarian Corporation
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http://www.talarian.com
Introduction

- Talarian Background
- Infrastructure Software
- COTS Best Practices and Benefits
- Commonly heard COTS Observations
- Top Issues: Resistance to COTS Software Use
- Top Issues: Vendor-Client Communication
- Summary and Suggestions
- Q&A
A Vendor Perspective: Talarian

- **Talarian Background**
  - Founded 1989, from Lockheed Martin roots
  - 1989 – 1995
    - Specializing in infrastructure building blocks for command and control systems (RTworks)
  - 1996 – Present
    - Generic infrastructure solutions, aerospace, financial, telecom, OEM

- **Talarian in Aerospace**
  - Command and control of NASA’s Hubble Space Telescope
  - Real-time monitoring of data for Space Shuttle
  - Raytheon ECLIPSE
  - Aerospace STARS
  - SMC Det 12: RSC/CERES/“COBRA”
Infrastructure Software: A Common Build vs. Buy Decision

Every ground system depends on common infrastructure software
- The fundamental framework or glue that provides inter-process communication and extensibility
- The integrator’s toolkit and information bus

The most:
- Overlooked/underestimated
- Complex
- Expensive!

Conflicting directives can drive costs up
- Not just buy vs. build, but re-use/rebuild vs. buy
COTS Best Practices and Benefits

- Reduce lifecycle costs and system complexity by relying on native features of COTS products.

- Reduce lifecycle costs by:
  - Relying on vendor/supplier maintenance support for COTS products.
  - Adhering to applicable (and sensible) design and implementation standards
    - POSIX, ANSI, IEEE, OMG, etc.
  - Provide abstractions for replaceable components (i.e. “wrappers”)
  - Small, specialized, loosely coupled components
  - Focus on your team’s core competencies, not problems that have been solved by experts outside your domain (e.g. middleware)

- Distributed Systems
  - Model the architecture on events, not the GUI/HMI
  - Distributed message- and event-driven processing
Most Commonly Heard COTS Software Observations

- Inter-product/platform version incompatibility
  - (Too) frequent version releases
  - Changing COTS vendor priorities

- 50% of features go unused
  - V&V concerns
  - “Build the piece you need vs. buying more than you need”

- Some integrations too tightly coupled with COTS
Top Issues We See: Resistance to COTS Software

- General: “Space is really hard”
  - Integration issues are riskier and more complex in aerospace than in most other industries
  - COTS? We don’t need no stinkin’ COTS! 😊

- Engineering: “Programmers like to program”
  - Using COTS is not an intuitive choice for anyone educated prior to the 1990s

- Management: Conflict of Interest
  - Reduction of programmer hours is almost anathema to program managers
Top Issues We See:
Vendor-Client Communication

- Polarized Attitudes
  - One extreme: Customers believe that vendors are looking to make you dependent on them, while turning a quick buck in the short term
  - The other: Vendors believe that customers want to pay next to nothing, develop in a vacuum, and leave a bullseye on the vendor’s back

- How do you ensure success?
  - Open, honest, and early discussion and agreement of requirements between vendor and client
  - Pick vendors that will be your partners

- Success is a two-way street
  - If the customer isn’t successful, the vendor has a short lifespan
  - No one wins, least of all the vendor, if the vendor sells you something you don’t need
Summary and Suggestions

- “Don’t worry, be happy!”
  - Despite discussion to the contrary, using COTS is still cheaper and more effective than building
  - A large percentage of home-grown software projects that re-invent complex COTS functionality will fail.
    - Analyst studies (Tower, Gartner) of real world projects have confirmed this notion time and again

- Understand the risks and weight them by probability of occurrence
  - Again, communication of lifecycle issues w/vendor is key

- Pick vendors who understand the issues and be willing to make commitments up front in return for commitments from the vendor
  - Training, premium support
Q&A

No tomatoes, please!