



United States

Naval Research Laboratory

**DATA TO DECISIONS:
CHALLENGES TO ANALYTICAL
INTEROPERABILITY TO MEET
THE NEEDS OF NATIONAL
SECURITY**

4/29/2011

Report Documentation Page

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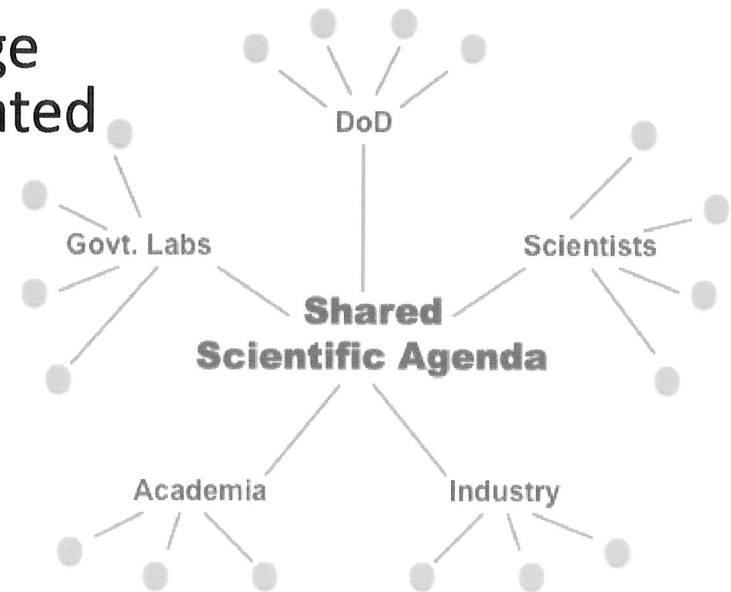
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D2D Consortium Goals

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- *JASON recommendation*: Create consortium focused on each challenge problem, where success is defined at the consortium level, not at the individual contractor level
- Consortium should be an integrated team conducting translational research
- Consortium addresses the challenge problems in a coherent and integrated team approach
- Consortium openly shares and documents modules within the consortium
- New modifications to modules are evaluated and managed by the consortium

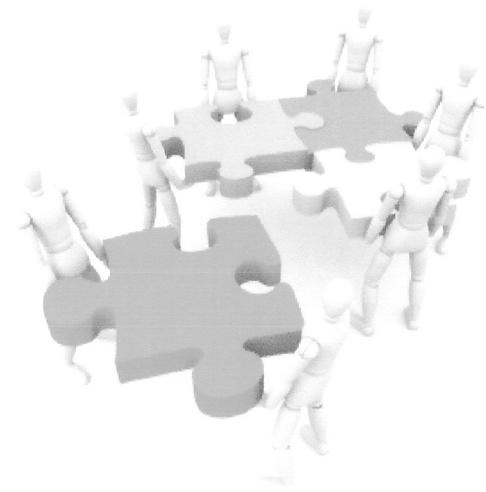
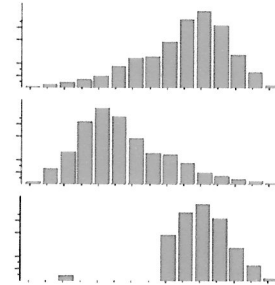




Consortium Challenges

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- Consortium should be an integrated team conducting translational research
 - BAA response may:
 - Be skewed towards parts of the problem/challenge
 - Have a mix of complete and partial solutions
 - Have diversity in performer capability
- Consortium addresses the challenge problems in a coherent and integrated team approach
 - Team dynamics complicated by performance diversity (geo/temporal, organizational culture/capability, etc.) and individual incentives/agendas
 - Proprietary approaches may need integration with non-proprietary solutions in build
 - This is the reality of the field

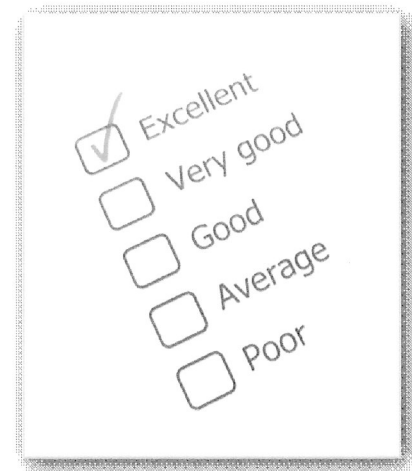
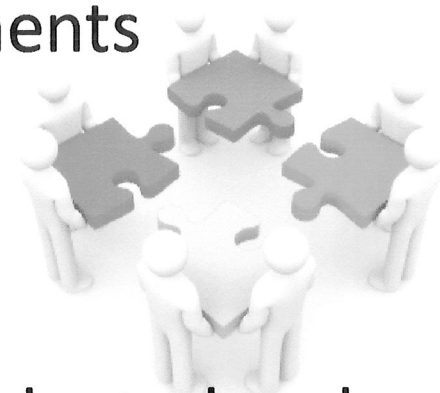




Consortium Challenges

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- Consortium openly shares and documents modules within the consortium
 - What will be the incentive to share as much or as genuinely as possible?
- New modifications to modules are evaluated and managed by the consortium
 - This implies consensus across the consortium and may present threats to new performers over time





FY11 Broad Opportunity

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- Opportunity to take advantage of testbed “process” information
 - Early ad hoc consortium support mechanisms and processes will establish practices that set precedent for FY12+
 - Changes to program operations will be more difficult to implement without the necessary methods and infrastructure in place to control and manipulate the testbed and spiral development process over time
 - Some research is necessary to determine appropriate architecture, methods and metrics for FY12+

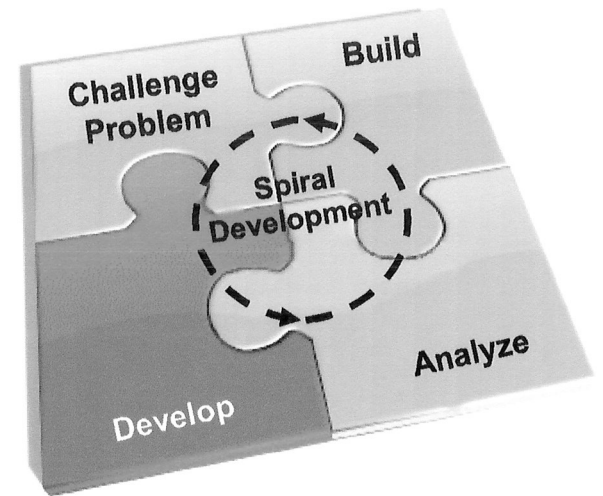




What Can be Done in FY11 to Support D2D Consortium Infrastructure Elements?

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- FY11 represents an opportunity to evaluate mechanisms to enable the defined D2D Program Organization (Spiral Development)
 - Tri-service Data-to-Decisions Collaborative Working Group (D2D-CWG)
 - Establish requirements and practices for consortium support
 - Testbed (FY11 variant, FY12 final)
 - Evaluation and development of test harnesses and gatekeeping infrastructure for access

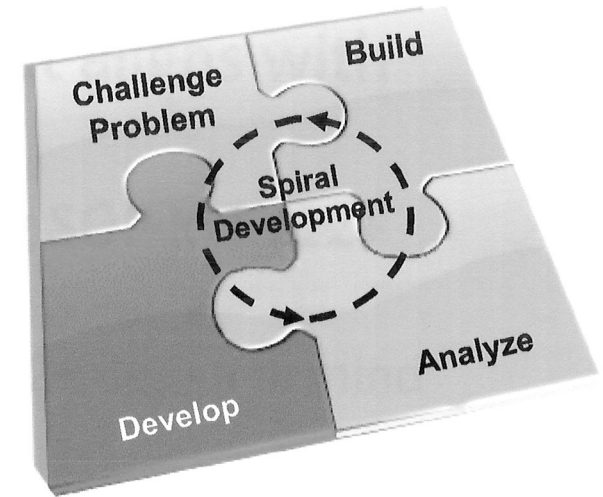




What Can be Done in FY11 to Support D2D Consortium Infrastructure Elements?

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- Data Analysis Center (FY12)
 - Development of metrics management infrastructure and innovative multidimensional visualization techniques
 - Investigate ATR WG and other prior-work/techniques for challenge problem development, metrics, and ongoing management
- Data Coordination Center (FY12)
 - Develop solutions for administrative management (core services) and their impact on extended core services and analytics (R. Avent Data Management Layer SOA)
 - Assess Data management layer reliability/sustainability requirements





Near Term (FY11 & Early FY12) Strategy

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- Capabilities to service enabling solutions
 - View the BAA products' performance data as data to be managed
 - Performance dashboards and visualizations
 - Directory service for descriptive registration of performers' approaches
 - Structure the end-to-end testing process as an orchestration
 - Algorithm revision control and annotation
 - Develop documented testing metrics and orchestration
 - Formalize challenge problem metrics process
 - Test harnesses
 - Open-source test suites and orchestrations
 - Attention to integration and transition to/from "build" (beyond evaluation)
 - Develop an administrative collaboration workspace
 - Example: Discussion blog/wiki/document management



Long Term Vision Ideas

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- Exploit the D2D Program Organization (Spiral Development) and testbed meta process information space
 - Capture intra-algorithm/module metrics, share trends and identify gaps
 - Develop *technical transition metrics*
 - Technical transition metrics: ideas of semantic consistency, tri-service interoperability, data format supportability, etc.
 - Use information from the meta process to drive performer motivations (collaboration, disclosure, FY12+ consortium policy)
 - Provide a quantitative framework to manipulate FY 12+ consortium management functions and program/testbed CONOPS
 - Adapt and extend prior work from ATR WG (Westerkamp et al. 2002; Ashby, Blasch, et al. 2002), DISA FDCE (Federated Development and Certification Environment), and others



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