

Next-Generation Ground Systems Definition and Development Support

Barry Boehm, USC
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Outline

- **Future Ground Systems Development Support**
 - **Systems 2020 Context**
 - **Systems 2020 FY11 Startup Strategy**
 - **Aerospace-USC-AFOSR-AFIT Response**
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Future Ground Systems Development Support

- **Wideband virtual collaboration support**
- **Domain model-based system definition, generation**
 - Replacing most documentation
- **Metadata-based model interoperability**
 - Across domains, phases, timescales
- **Models on steroids via multicore processors**
 - Some used for parallelizing model execution
 - Some used for parallel tradeoff analysis, Monte Carlo analysis, assertion checking, multisided mission analysis
- **Support of rapid, concurrent, evidence-based systems engineering and management**



Systems 2020

Strategic Initiative Overview

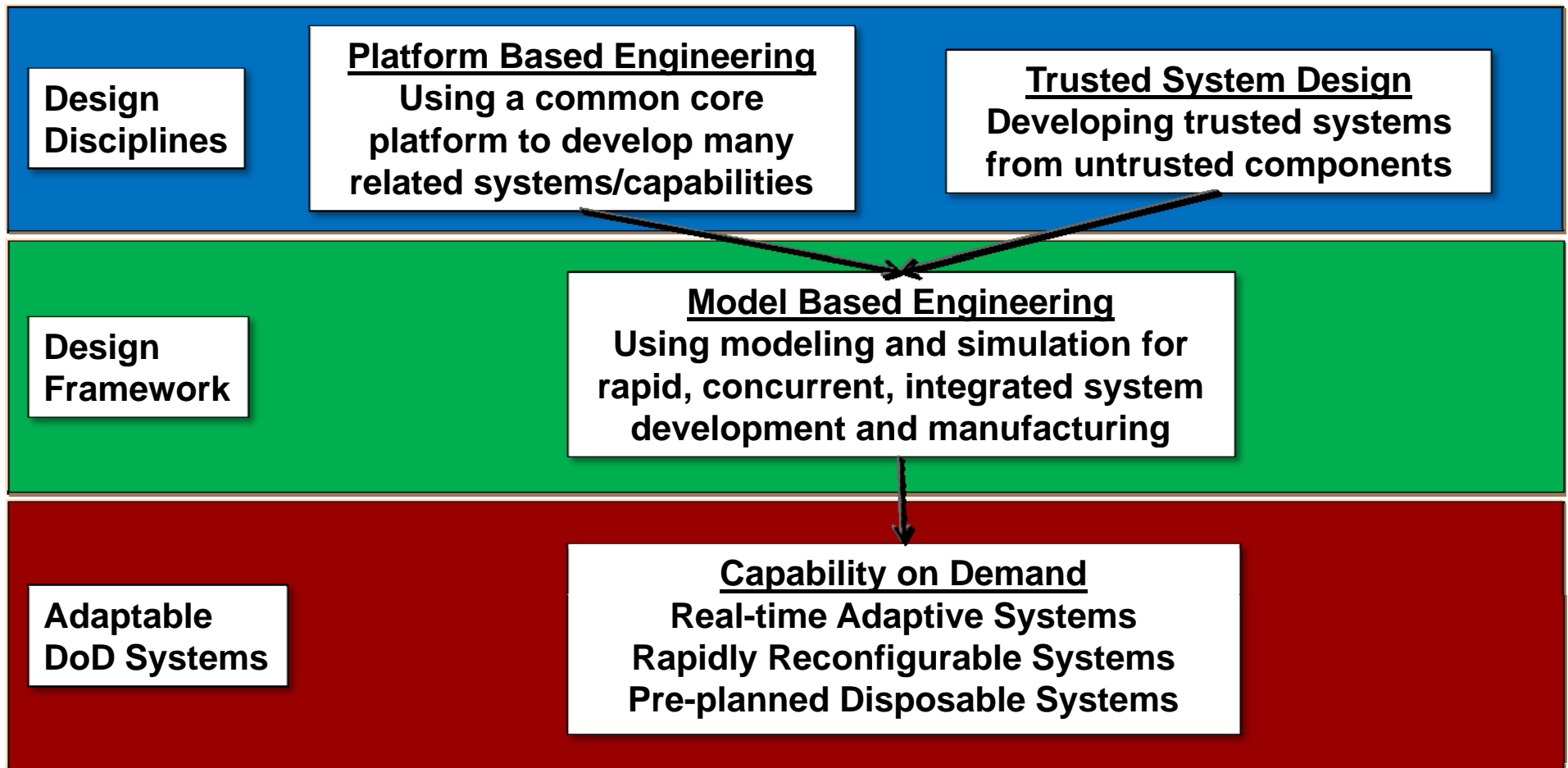
Kristen Baldwin
ODDR&E/Systems Engineering

13th Annual NDIA Systems Engineering Conference
San Diego, CA | October 28, 2010



Systems 2020

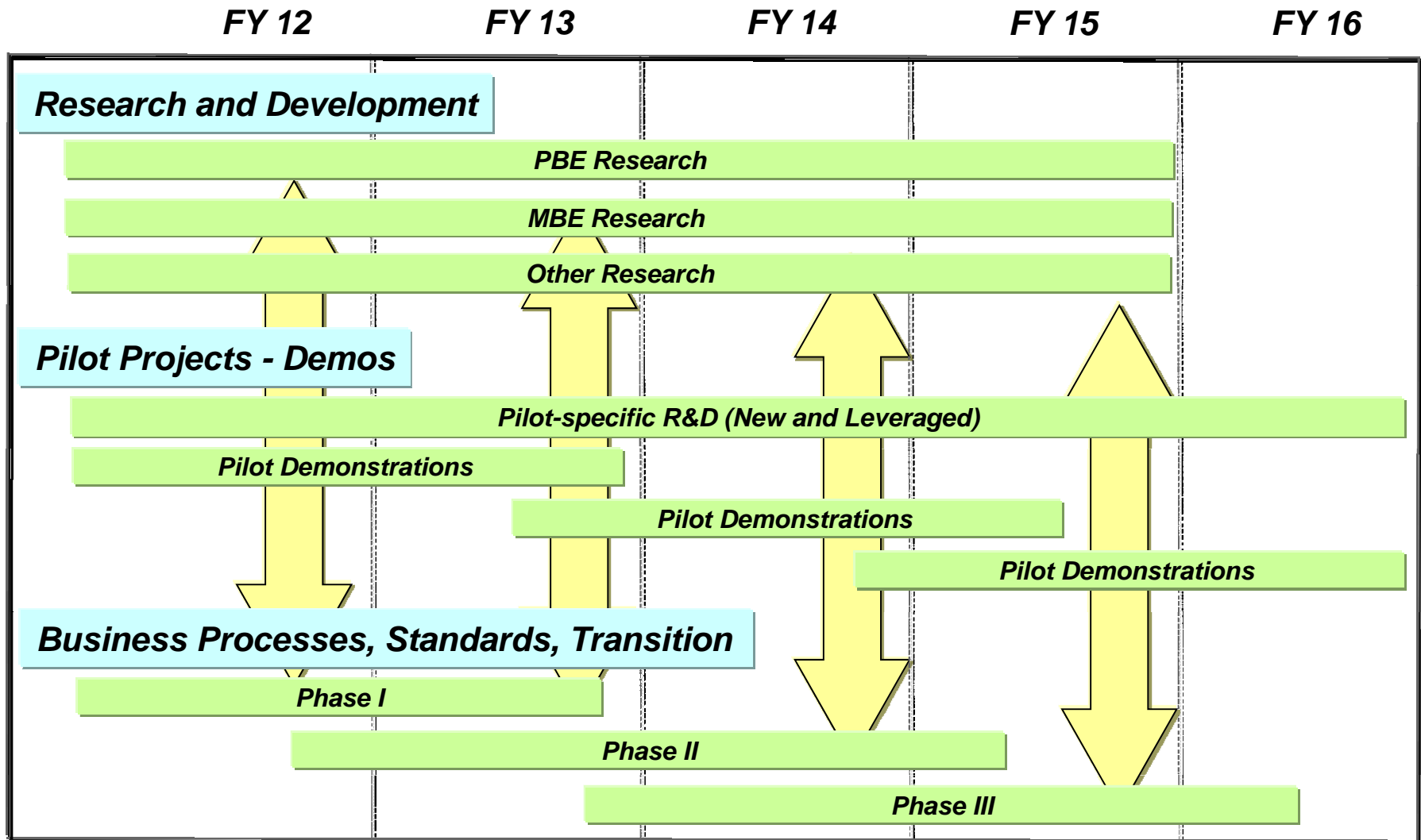
Designing DoD Systems for Adaptability





Overview of S-2020 Path Ahead

POM12 5-year budget over \$100M



S2020 FY11 Startup Strategy

- **RFI Objective: Identify best Symposium participants**
 - **Criteria: Key areas, good ideas, track record**
- **Symposium Objective: ID best BAA sponsors, topics**
 - **Criteria: Key areas, paths to pilots, commitment**
- **BAA Objectives: ID best performer teams**
 - **Criteria: R&D capability, technology impact, paths to pilots**

Next-Generation Support for Engineering Resilient Systems

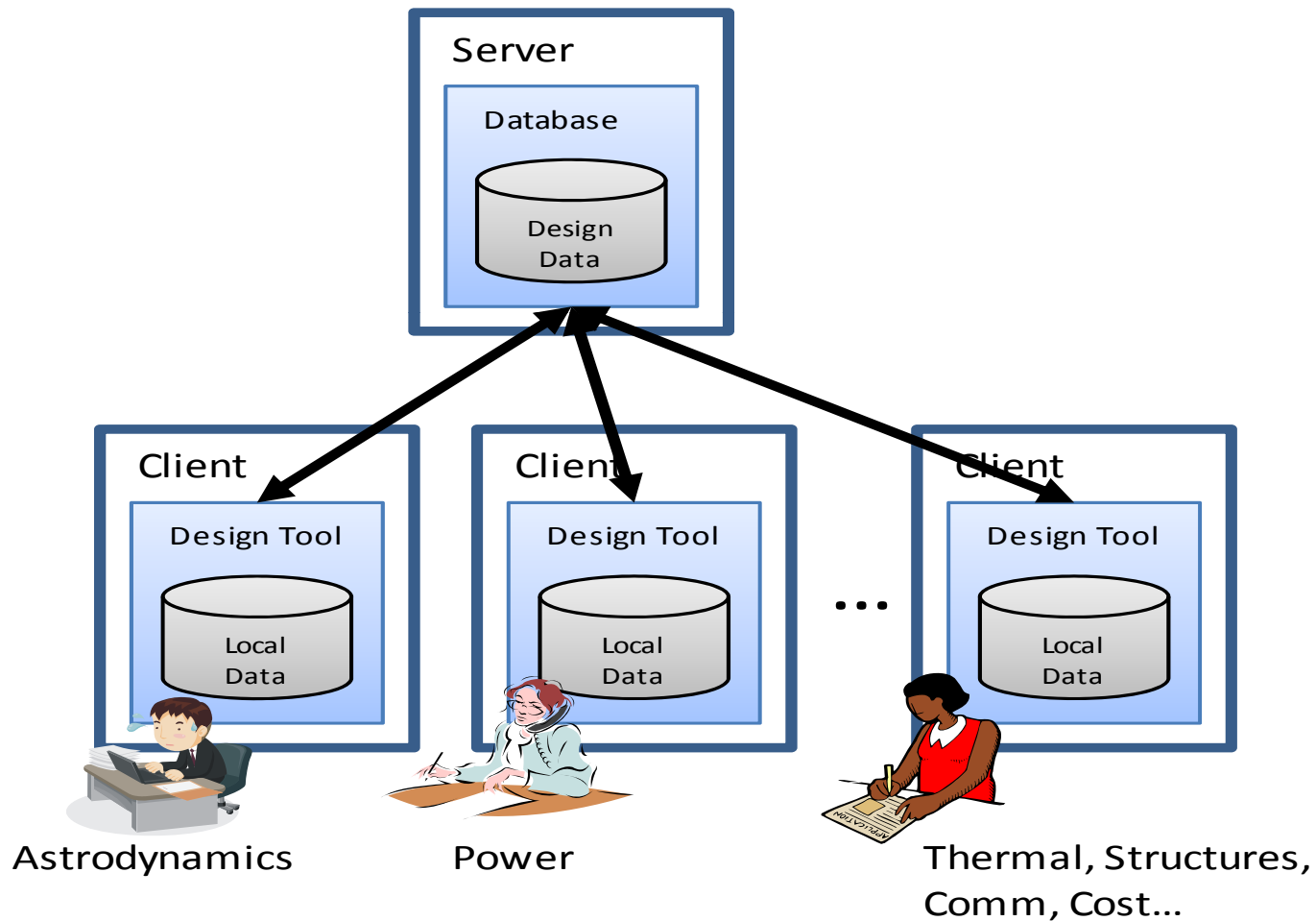
An Aerospace Corp.-USC-AFOSR-Systems 2020 Win-Win Approach

In collaboration with AFIT response: An Interoperable Construct for SE

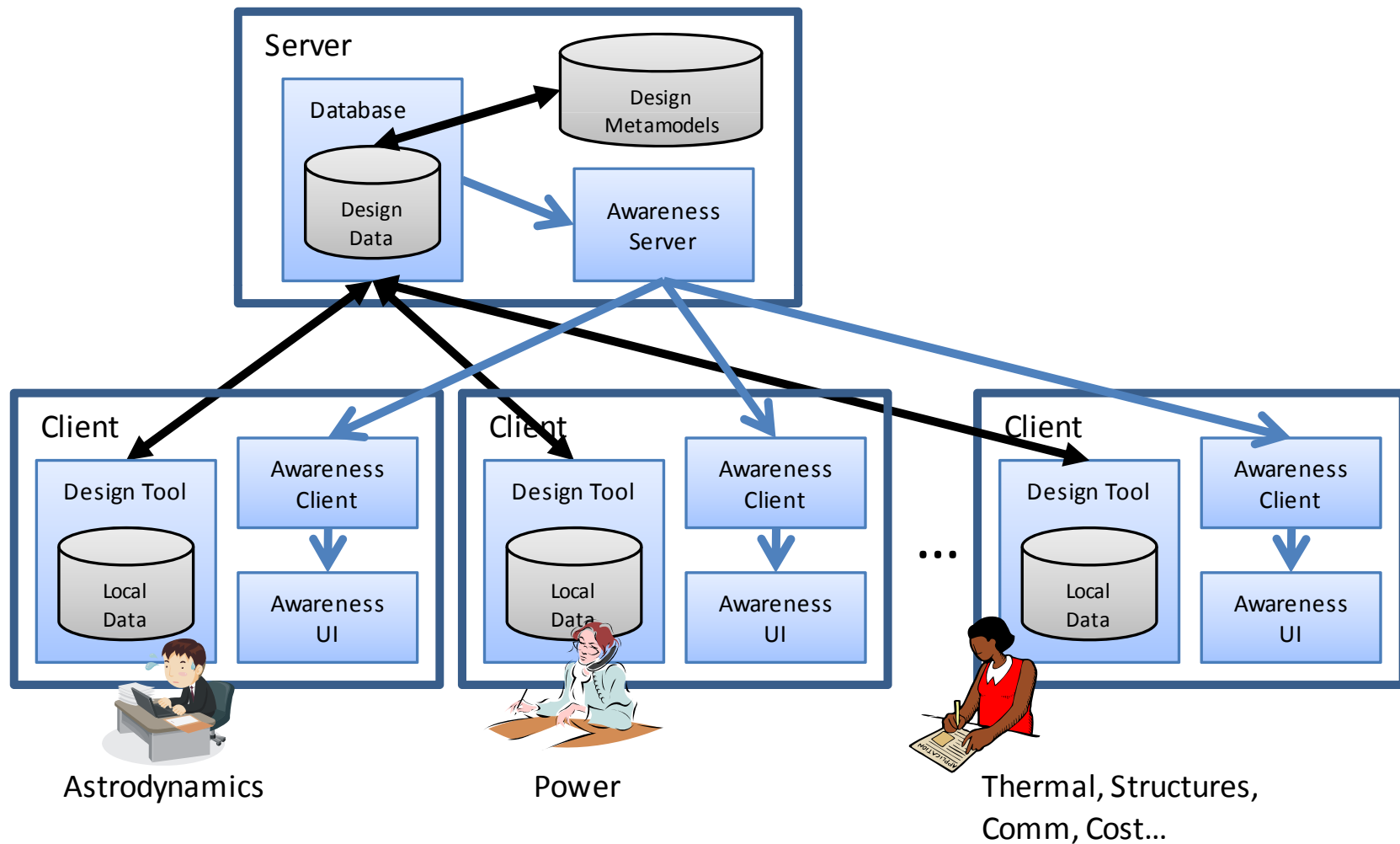
- Perform Joint Aerospace-USC research** in model-based engineering (MBE), platform-based engineering (PBE), cyber assurance, and adaptive systems, in the context of the Aerospace CDC, to address future needs for:
 - **Increased space systems resilience** via advanced cyber security and adaptive satellite self-defense research and technology
 - **More rapid diverse-stakeholder collaboration** via empirical research in advanced collaboration technology and human collaboration effectiveness
 - **More rapid and accurate multi-model analysis** via metadata-enabled model interoperability
 - **More powerful models** via innovative use of multicore processors
 - **Smart-system-based satellite and ground-system architectures**
 - **Next-generation-systems affordability** via autonomous systems research and next-generation system cost and schedule estimation models
- Apply research results** on pilot projects via extensions and integration of the Aerospace CDC and AFIT Integrated Modeling Environments
- Generalize the CDC capabilities for use in other domains**
- Capture and analyze usage experience for continuing capability improvements**

Current Aerospace CDC Architecture

Concept Design Center



Proposed Next-Gen CDC Architecture



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