



Perspectives on Modeling and Simulation and Human Systems Integration

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DMSO was established by Congressional initiative to overcome Service and “functional¹” “stovepiping.”

“... establish an Office of the Secretary of Defense level joint program office for simulation to coordinate simulation policy, to establish interoperability standards and protocols, to promote simulation within the military departments and to establish guidelines and objectives for [the] coordination [of] simulation, wargaming and training....” (SAC, SR101-521)

“... initiate the joint office and support the required studies and technical efforts to develop interoperability standards and protocols for existing and future war games, models, simulators, and training devices ...” (HASC/SASC Conference Report, 1991)

Modeling and Simulation is a key enabler to Transformation (SECDEF Transformation Planning Guidance, Apr 2003)



DMSO Reporting Chain

**Acting Under Secretary of Defense (Acquisition,
Technology & Logistics) (USD(AT&L))
Mr. Michael W. Wynne**

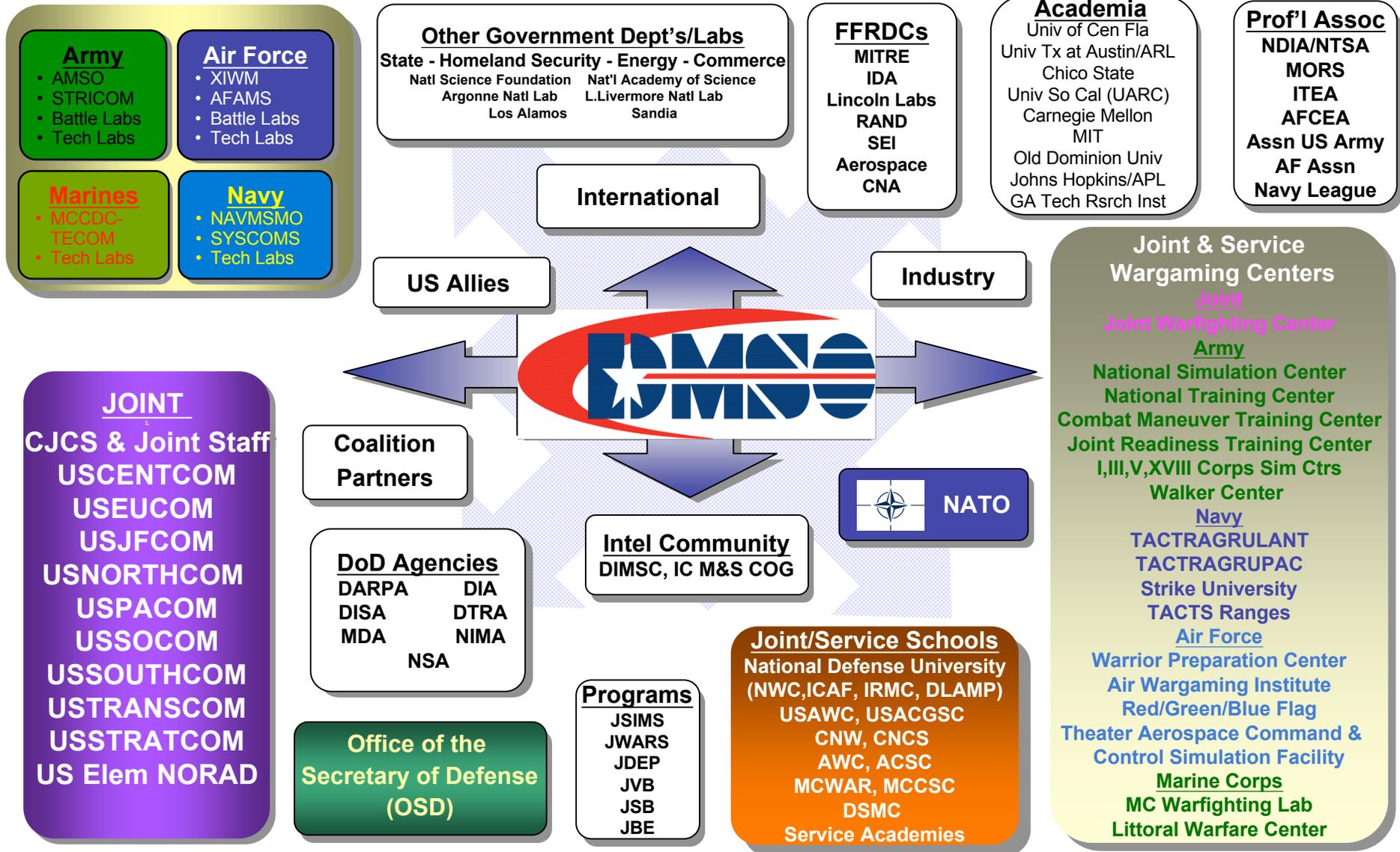
**Director, Defense Research & Engineering (DDR&E)
Dr. Ronald M. Segal**

**Deputy Under Secretary of Defense (Science & Technology)
(DUSD(S&T))
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The Arena





HSI and M&S

Three Perspectives

Manning the Equipment

Man in the Equipment

Equipping the Man



Manning the Equipment

- Accessibility  Resource Repositories, Intelligent Search Engines, Help Desk
- Confidence  Verification, Validation, Accreditation; M&S Standards
- Ergonomics – the fit
 - To the user -- usability  Human-Machine Interface, Interface Specifications
 - To other M&S -- interoperability  Lexical, Syntactic, Semantic; Standards
 - To the task – applicability  Systems Engineering (FEDEP), VV&A
- Data  Standards, Meta-Data Standards
- ...and the economy to make it happen.  Composability, Marketplace of Ideas, Governance, Management



Man in the Equipment

Cognitive Science Research Developing

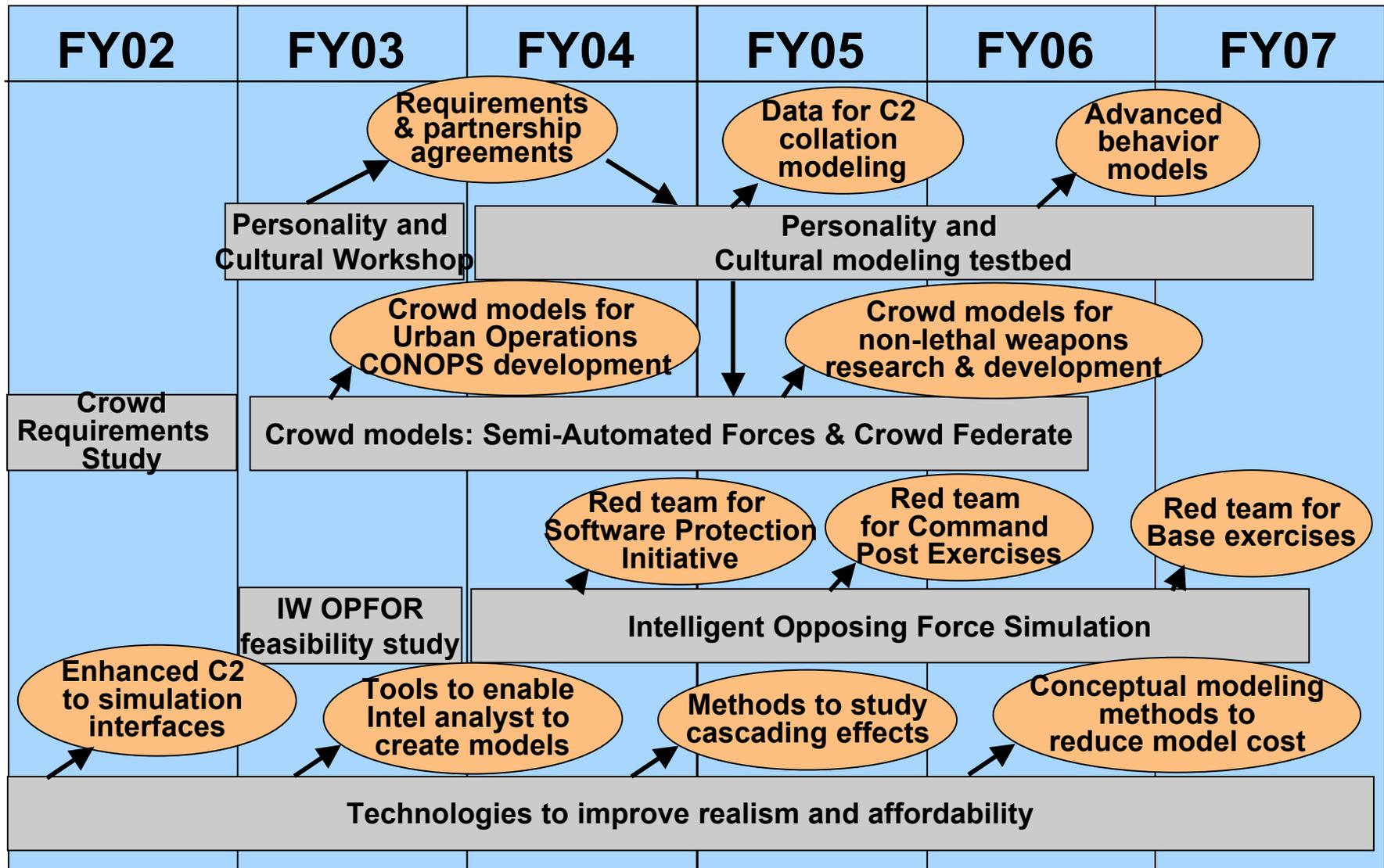
- Authoritative behavioral models of individuals, organizations and societal groups
- New types of computational techniques

Cognitive Science Research Goals

- Enabling military transformation
 - New analytic capabilities
 - Methods to explore alternative concepts of operations for futuristic warfare scenarios
- Improving wargame realism while reducing exercise cost
 - Integration of command and control (C2) systems and simulations
 - Reduced support staff (technical controllers and role players)



Human Performance Roadmap





Equipping the Man

- Sensors are about *extending the limits of human perception*
- *SPACE*
- Provides the
 - Alert – detection
 - What – classification
 - Where -- localization
- Models, Simulations are about *prediction; cause and effect*
- *TIME and PERFORMANCE*
- Provides the
 - What can it see
 - What can it do
 - Where will it be



Equipping the Man

- Simulation as Sensor: So what?
 - Now-Dating the Common Operational Picture (COP)
 - Futures Prediction, Futures Planning
- Not a Totally New Idea
 - Computer Chess
 - Weather Prediction Models (Hurricane Landfall Prediction)
 - Mission Planning Tools, Tactical Decision Aids
- It Might Look Like:
 - Probability Tracks
 - Futures – Like Interacting with Genetic Algorithms
 - Moves and Counter-Moves
 - Or...



Equipping the Man

- Simulation-to-C4ISR Interfaces
- Robust Representations
 - Blue-Force, OpForce Systems
 - Environment (Weather, Propagation, Human Influences)
 - Blue-Force, OpForce Humans
- Next Generation Human-Machine Interfaces
- Ubiquitous, Portable Computing
- Ubiquitous M&S
- “On the Grid”



Summary

Three Perspectives

- Manning the Equipment
 - Using Modeling and Simulation Effectively
- Man in the Equipment
 - Modeling Human Behavior
- Equipping the Man
 - Simulation as Sensor