Web-Enabled Modeling and Simulation

Johnny Garcia

Chief Technologist

General Dynamics AIS

"In one year – what's changed (for the better) as a result of WebSIM and its follow on actions?"

Multi-Consortium

- OMG
  - UML 2.0
  - MDA
  - MOF
- SISO
  - PDG's
    - BOM's
  - SG's
    - Coalition Battle Management Language (CBML)
    - Simulation Reference Markup Language (SRML)
    - Extensible Modeling and Simulation Framework (XMSF) Profiles
- OGC
  - EA SIG
  - Sensor Web
- WEB3D
  - X3D
    - ISO Standard 19775

Thank You to all the
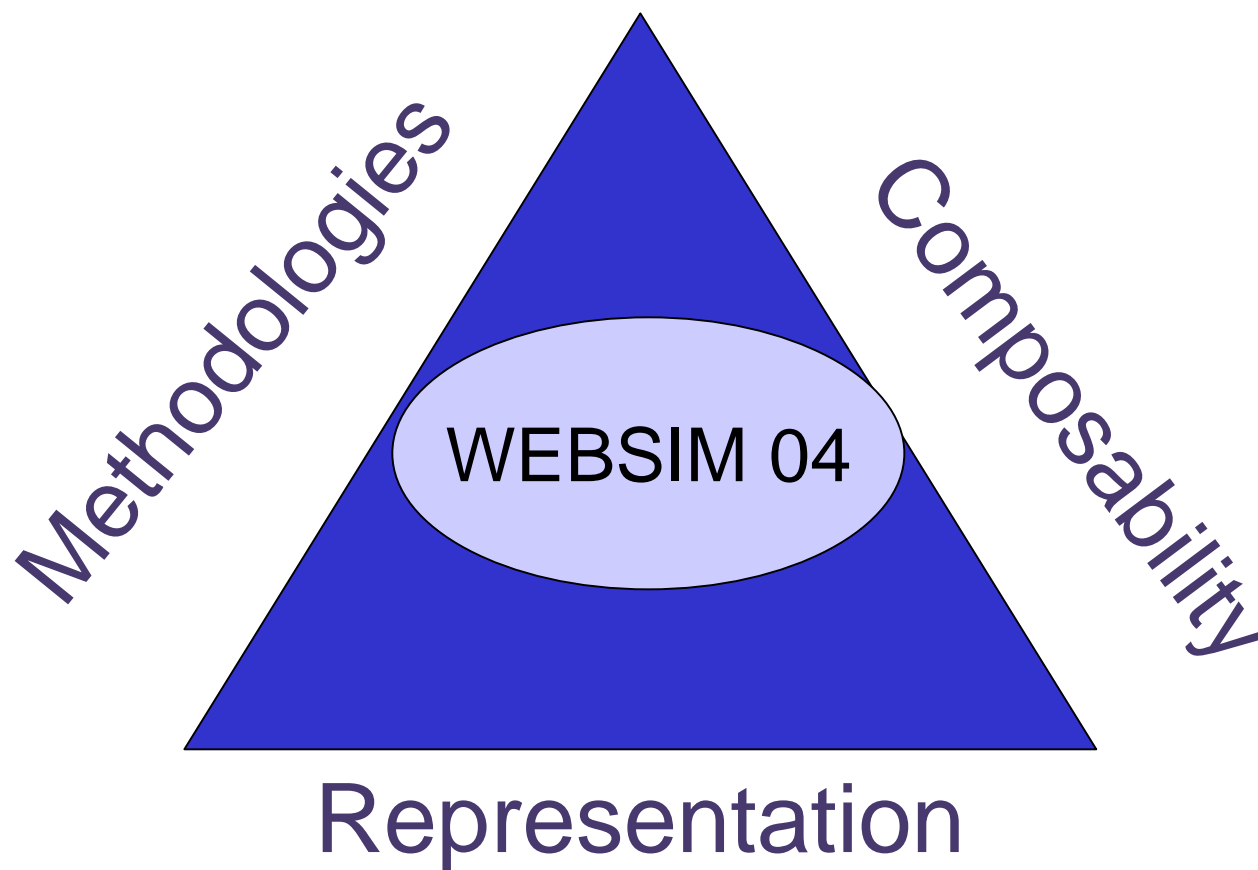Presenters and Demonstrations

Thanks to the Program Committee

- Program Chair: Katherine L. Morse, SAIC, morsek@saic.com

- Don Brutzman, NPS MOVES Institute, brutzman@nps.edu

- Sharon Hardy, Gray Research, Sharon.Hardy@gray-research.com

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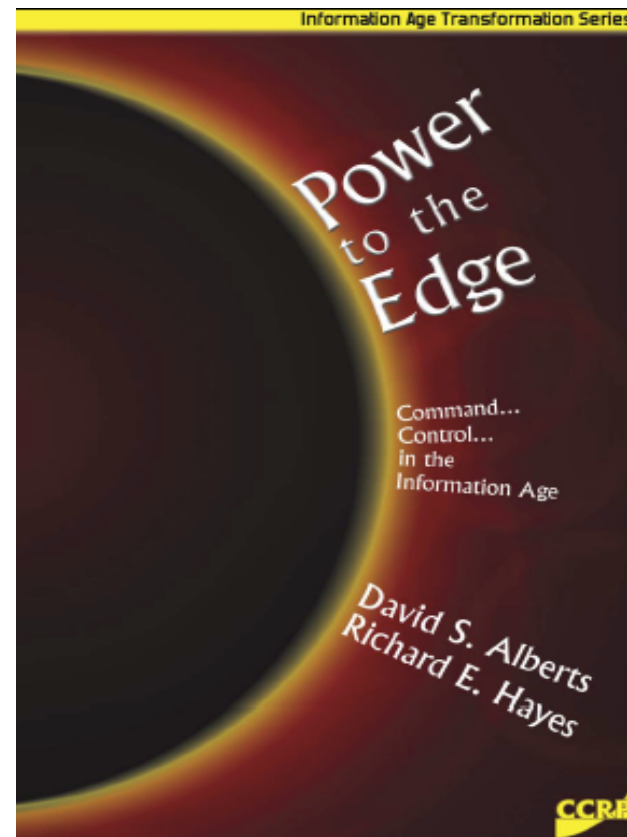
- Fred Waskiewicz, OMG, wask@omg.org

Joint First: The New Operational and Technical Paradigm

• "Power to the edge is about changing the way individuals, organizations, and systems relate to one another and work.

• Power to the edge involves the empowerment of individuals at the edge of an organization (where the organization interacts with its operating environment to have an impact or effect on that environment) or, in the case of systems, edge devices.

• Empowerment involves expanding access to information and the elimination of unnecessary constraints."

• *D. Alberts, R. Hayes, Power to the Edge*

Information Age Transformation Series

Power to the Edge

Command...
Control...
in the
Information Age

David S. Alberts
Richard E. Hayes

CCRP

OMG
OBJECT MANAGEMENT GROUP

OGC™
Open GIS Consortium, Inc.

SISO
Simulation Interoperability
Standards Organization
www.sisostds.org

web 3D
CONSORTIUM

Transformational Military

Structuring M&S to Respond to Transformational Concepts

Responding to increased demands for rapid, reconfigurable, adaptive M&S capability

- – HLA: necessary, but not sufficient
- – Composable Frameworks: next step
- – Standards: critical enablers
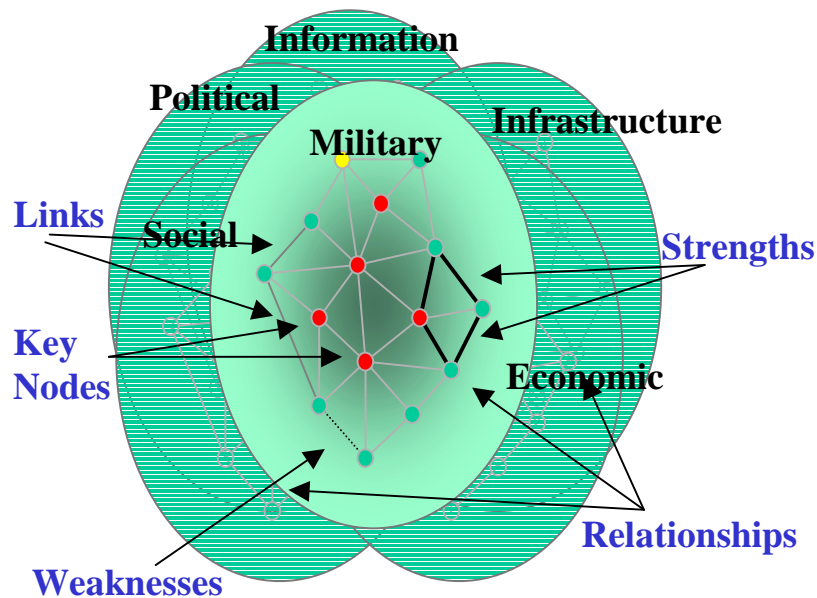- – Policy: only effective when backed by technical capability

Representing today's complex relationships

- – Full complexity of today's physical environment: including civil infrastructures
- – Sensors and information systems and their dependencies, vulnerabilities
- – Adversaries: political, information, economic and military capabilities
- – Non-governmental bodies: influence of culture, religion, family alliances
- – Link military operations with capability architectures for planning, assessment and acquisition

Redefining War
Changing the Way We Think
USSTRATCOM March 2004

Behavior & capability of adversary linked to an integrated PMESII systems environment, each with Key Nodes, Links and Vulnerabilities

Today's **adversary is a** *dynamic, adaptive* **foe who operates within a** *complex, interconnected* **operational environment.**
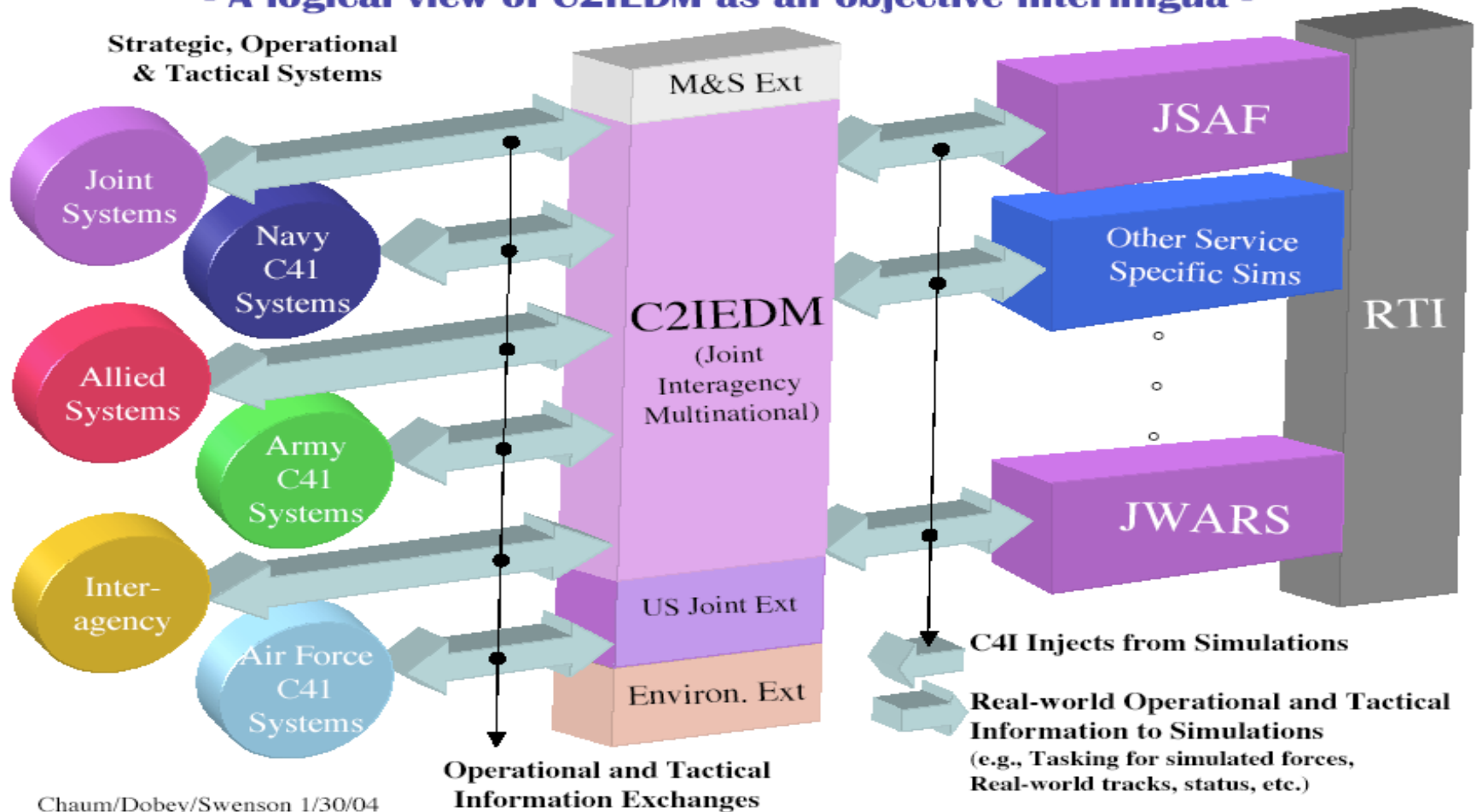
Methodologies

- DoD Architecture Framework (DoDAF)
- C2IEDM
- SIMCI
- UML
- MDA
- Systems Dynamics
- Business Dynamics

GENERAL DYNAMICS
Advanced Information Systems

WebSim

- A logical view of C2IEDM as an objective interlingua -

Strategic, Operational & Tactical Systems

M&S Ext

JSAF

Joint Systems

Navy C41 Systems

Other Service Specific Sims

RTI

C2IEDM
(Joint Interagency Multinational)

Allied Systems

Army C41 Systems

Inter-agency

JWARS

Air Force C41 Systems

US Joint Ext

C4I Injects from Simulations

Environ. Ext

Real-world Operational and Tactical Information to Simulations (e.g., Tasking for simulated forces, Real-world tracks, status, etc.)

Chaum/Dobey/Swenson 1/30/04

Operational and Tactical Information Exchanges

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web3D
CONSORTIUM

Composability

- ## Theory of Composability
  - – Real World concerns

- ## Agent Based Architecture
  - – Establishments of common Ontologies

- ## Reusable Simulation Object
  - – Good example of extensible framework

Applications of WEBSIM

- M&S COI – under construction
- Simulation Based Acquisition (SBA)
- Experimental Command and Control Interface (XC2I)
- OGC Web Services
- XMSF
  – Profiles
- Extensible Battle Management Language (XBML)
- JNTC RD3
  – ACTD NGA GIDM process

M&S Ph. D Program ODU

Dr. ANDREAS TOLK

Ph. D student

Ideas of a Ph. D Student

Life

Ph. D Committee Meeting

Dissertation Proposal

Wir haben die Sicherheit neu erfunden .
Die neue A-Klasse.

Writing a Dissertation

Chapters of Dissertation

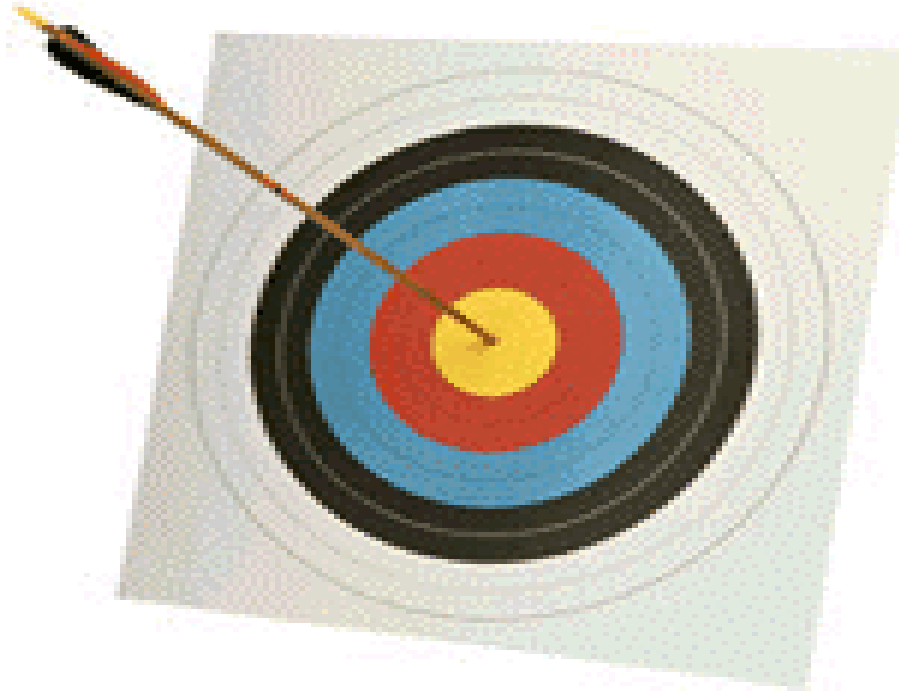# Writing a Dissertation, not enough time

If the Ph.D does not kill me the liquor will

Hit the Target to make a difference in M&S

Never Drop the Ball

Where do we go from here

- WEBSIM 2005
- CO-OP with other conferences/workshops
- Program Committee
- Industry partners
- Academic Partners

WEBSIM importance to Industry

- Common standards foster interoperable solutions

- Common methodologies foster interoperable solutions

- Common frameworks foster common solutions

Recommendations

- Develop Prototypes to Demonstrate M&S Services for the GIG
- Define a Set of M&S Web-based Services for GIG Architecture
- We need to shift from developing standards to Implementing standards
- Using open standards we can;
  - Bring together enterprise architecture, simulation and solutions architectures
  - open and flexible enterprises
- Simulate before design
- Evaluation of proposed solution for M&S
  - Model Driven Architecture (OMG)
  - UML
  - Global Information Grid (COI M&S)
  - Semantic Web, Ontologies
  - Next Generation Web Services and Grid Services
  - Common Data Models
  - XMSF etc.

Active Participation is needed

WEBSIM 2005

- General Dynamics will sponsor WEBSIM 3