



**A Roundtable on the Future of the
Modeling and Simulation
Profession, Industry,
and Marketplace**

**SCSC '07
Sierra 5
10:30-12:00**



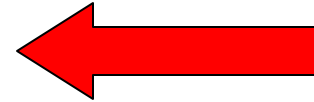
Observers welcome capacity permitting
(Interested observers contact
Bill Waite 256-527-9091
bwaite@aegistg.com)





Meeting Agenda

I. Introduction



A. Welcome and Introductions

B. SimSummit Review

C. Meeting Concept Review

II. Meeting Discussion Topics

III. ACTION



Welcome from the Executive Committee

- National Training Simulation Association (NTSA)
- Modeling and Simulation Society International (SCS)
- Simulation Interoperability Standards Organization (SISO)



Self-Introductions of Member and Observer Organizations

- Individual Name
- Organization Represented
- Organization 'stake' in M&S community-of-practice



SimSummit Concept

- What? - Round-table of preeminent M&S 'organizations'
- Who? – Interested organizations from Industry, Government and Academia ... facilitated by non-profit Societies
- When / Where? – Opportunistic overload of organized events
- Why? – Influence the future of the M&S Discipline, Profession, Industry, and Market
- How? – Collective, consensus-based discussion decision, and action



Power of a 'Topical Agenda'

TOPICAL AGENDAS:

- Sensitize communities to significant shared issues and opportunities
- Frame the domain of debate, decision, and action
- Provide 'hooks' to which organizations and constituencies can subscribe (common) interest
- Provide loci for programmatic commitment and coordination of cooperative effort



‘Discovering’ and Using the M&S COP Topical Agenda

- The rough outline of a topical agenda for the M&S COP emerged from the initial *SimSummit* discussions
- Topics have been ‘tested’ in various contexts ... and have been found useful
- *SimSummit* participants aspire to educate and publish, and use a (working) ‘canonical’ version of the M&S COP topical agenda to influence the M&S discipline, profession, industry, and marketplace.



Meeting Agenda

I. Introduction

II. Meeting Discussion Topics

A. TECHNOLOGY

1. Research Agenda

2. Standards

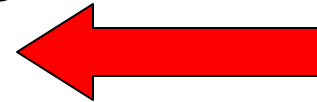
3. Conceptual Modeling

B. WORKFORCE DEVELOPMENT

C. INDUSTRIAL DEVELOPMENT

D. BUSINESS PRACTICE

III. ACTION





M&S Research Agenda

SumSummit/NSF Workshop Proposal

Future Directions in Modeling & Simulation Research

Richard Fujimoto

Computational Science and Engineering Division

Georgia Institute of Technology

Introduction

Computation has become accepted as the third mode of discovery, along with theory and experimentation, in the advancement of scientific knowledge and engineering practice. Modeling and simulation (M&S) is now used routinely in virtually all fields of science and engineering to better understand systems and phenomena as large as the universe, or as small as the tiniest microelectronic circuits and nanomaterials. It has become a fundamental enabling element in Defense in areas such as training, acquisition, test and evaluation, and analysis. M&S is essential in areas with great societal impact such as the sustainable growth of cities, the design of power-efficient buildings and aircraft, and the creation of novel biomedical devices, effective drugs, and efficient health care delivery systems, to mention a few. M&S routinely supplements and, in some cases, replaces experimentation. Its importance has been documented and elegantly articulated through recent national reports.^{[1],[2]} It is being recognized in the United States Congress through a developing resolution in the House of Representatives that recognizes “the contribution of modeling and simulation technology to the security and prosperity of the United States,” and goes on to recognize M&S as a “National Critical Technology.”^[3]

^[1] The National Academy of Sciences, The National Academy of Engineering, and the Institute of Medicine, “Rising Above the Gathering Storm, Energizing and Employing America for a Brighter Economic Future” February 2006.

^[2] National Science Foundation Blue Ribbon Panel, “Simulation-Based Engineering Science, Revolutionizing Engineering Science through Simulation,” May 2006.

^[3] Congressional Modeling & Simulation Caucus, Congressman J, Randy Forbes, Chairman, Draft Resolution to the 110th Congress, United States House of Representatives, May 24, 2007.



Standards (NTSA)

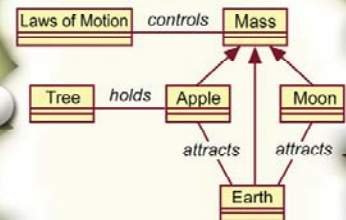
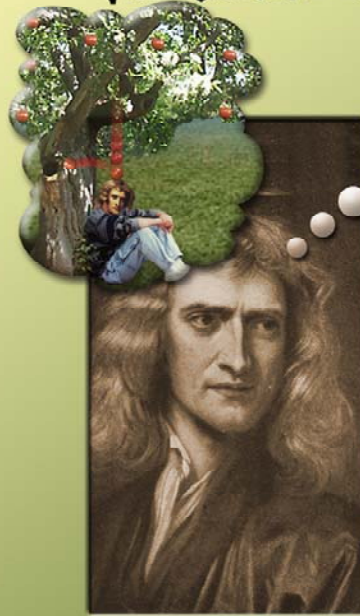
DRAFT of

Terms of Reference (TOR)
for the

NTSA Standing Committee on
“Standards” (SSC)

Conceptual Modeling

CONCEPTUAL MODELING PRACTICE



$$F = \frac{Gm_1m_2}{r^2} \quad \vec{F} = m\vec{a}$$
$$\vec{v} = \int \vec{a} dt + c_1$$
$$\vec{d} = \int \vec{v} dt + c_2$$

WEDNESDAY, JULY 18, 2007
1:30 – 3:00
SIERRA 5



Conceptual Modeling (SISO)

Terms of Reference (TOR) For the SISO Study Group on: “Simulation Conceptual Modeling”

Standing:

Proposed to SISO EXCOM on 5 Dec 2002

Rationale:

The Simulation Conceptual Modeling Study Group is to be formed in order to conduct a preliminary investigation on the best practices of simulation conceptual modeling and to establish recommendations for pursuit of the topic within the scope of the SISO, if appropriate. A simulation conceptual model is an abstraction from either the existing or a notional physical world that serves as a frame of reference for further simulation development by documenting simulation-independent views of important entities and their key actions and interactions. A simulation conceptual model describes what the simulation will represent, the assumptions limiting those representations, and other capabilities needed to satisfy the stakeholder's requirements. It bridges between these requirements, and simulation design.

Conceptual Modeling (NATO)



Activity	MSG-058	Conceptual Modelling for M&S										2007	
Activity REF. Number	RTG-038	Conceptual Modelling for M&S										June 2007 IS	
Principal Military Requirements	2											UU	May 2010
Military Functions				4									
Panel and Coordination	MSG					IST							
Location and Dates	Multiple										P-I		
Publication Data	TR			2010			50			UU			
Keywords	M&S			Interoperability			M&S Re-use			VV&A			

I. Background and Justification:

Current M&S standards have provided a first step to interoperability and a state-of-the-art way to interconnect simulations and tools to build distributed systems of simulation but it is recognized that existing standards are not meant for exchange of semantics and concepts. The final objective of the TG is to achieve a common understanding and use of information exchanged between simulations for better satisfying military requirements for education, training and operational support. Conceptual models are key to the transformation of user needs and requirements to M&S design, and eventually implementation. The purpose of this NMSG TG is to develop a guidance document on Conceptual Models, which can be used in the future by NATO to support M&S requirements.

II. Objective(s):



Meeting Agenda

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A. TECHNOLOGY

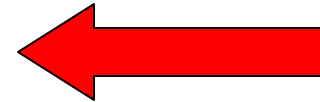
B. WORKFORCE DEVELOPMENT

1. BOK

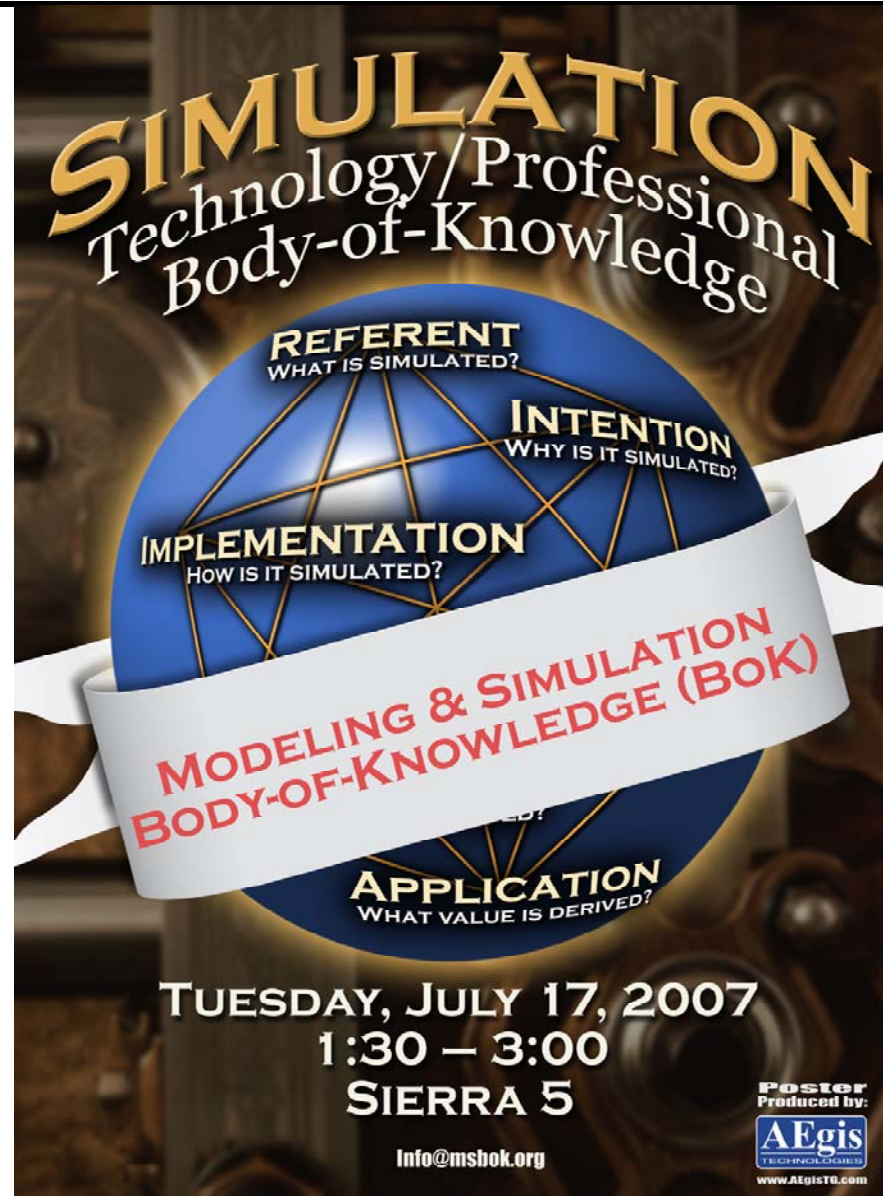
2. CMSP Revision

C. INDUSTRIAL DEVELOPMENT

D. BUSINESS PRACTICE



III. ACTION



SIMULATION
Technology/Professional
Body-of-Knowledge

REFERENT
WHAT IS SIMULATED?

INTENTION
WHY IS IT SIMULATED?

IMPLEMENTATION
HOW IS IT SIMULATED?

**MODELING & SIMULATION
BODY-OF-KNOWLEDGE (BOK)**

APPLICATION
WHAT VALUE IS DERIVED?

TUESDAY, JULY 17, 2007
1:30 – 3:00
SIERRA 5

Poster
Produced by:
AEgis
TECHNOLOGIES
www.AEgisTO.com



CMSP

See Handout



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I. Introduction

II. Meeting Discussion Topics

A. TECHNOLOGY

B. WORKFORCE DEVELOPMENT

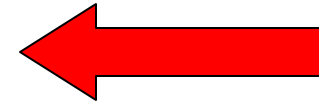
C. INDUSTRIAL DEVELOPMENT

1. US Congressional Caucus

2. M&S Publicity

3. Organizational Relations

D. BUSINESS PRACTICE



III. ACTION



US M&S Congressional Caucus

**Second Annual Modeling & Simulation Leadership Summit
26 February, 2007 – Chesapeake Conference Center, Chesapeake, VA**

Agenda

Monday, 26 February

- 0700 Registration & Continental Breakfast
- 0800 Welcome and Opening Comments
- 0830 Issues: Industrial Development – Status, Proposed Actions
- 0915 Issues: Business Practice – Status and Proposed Actions
- 1015 Issues: Professional Development – Status and Proposed Actions
- 1100 Issues: Technology – Status and Proposed Action
- 1145 Highlight on Issues: DoD Leadership in Modeling and Simulation
- 1330 Highlight on Issues: Modeling and Simulation as a Critical Technology
- 1415 Highlight on Issues: Modeling & Simulation: A National Enterprise
- 1545 Out Brief to Caucus on Proposed Congressional Agenda Items
- 1700 Caucus Commentary
- 1715 Closing Remarks and Next Steps



Summary of H. Res 487

Summary of H. Res 487, Recognizing Modeling & Simulation as a National Critical Technology

**Rep. J. Randy Forbes (VA-04) and Rep. Solomon Ortiz
(TX-27)**

Update June 19, 2007

Overview

Recognizing the contribution of modeling and simulation (M&S) technology to the security and prosperity of the United States, and recognizing modeling and simulation as a National Critical Technology.



Congressional Caucus

SEE: video



M&S Publicity

SEE Handout

Domain

Standing

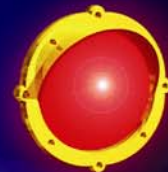
International



National



Inter-regional

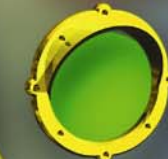


Regional

- Florida
- Virginia
- Alabama

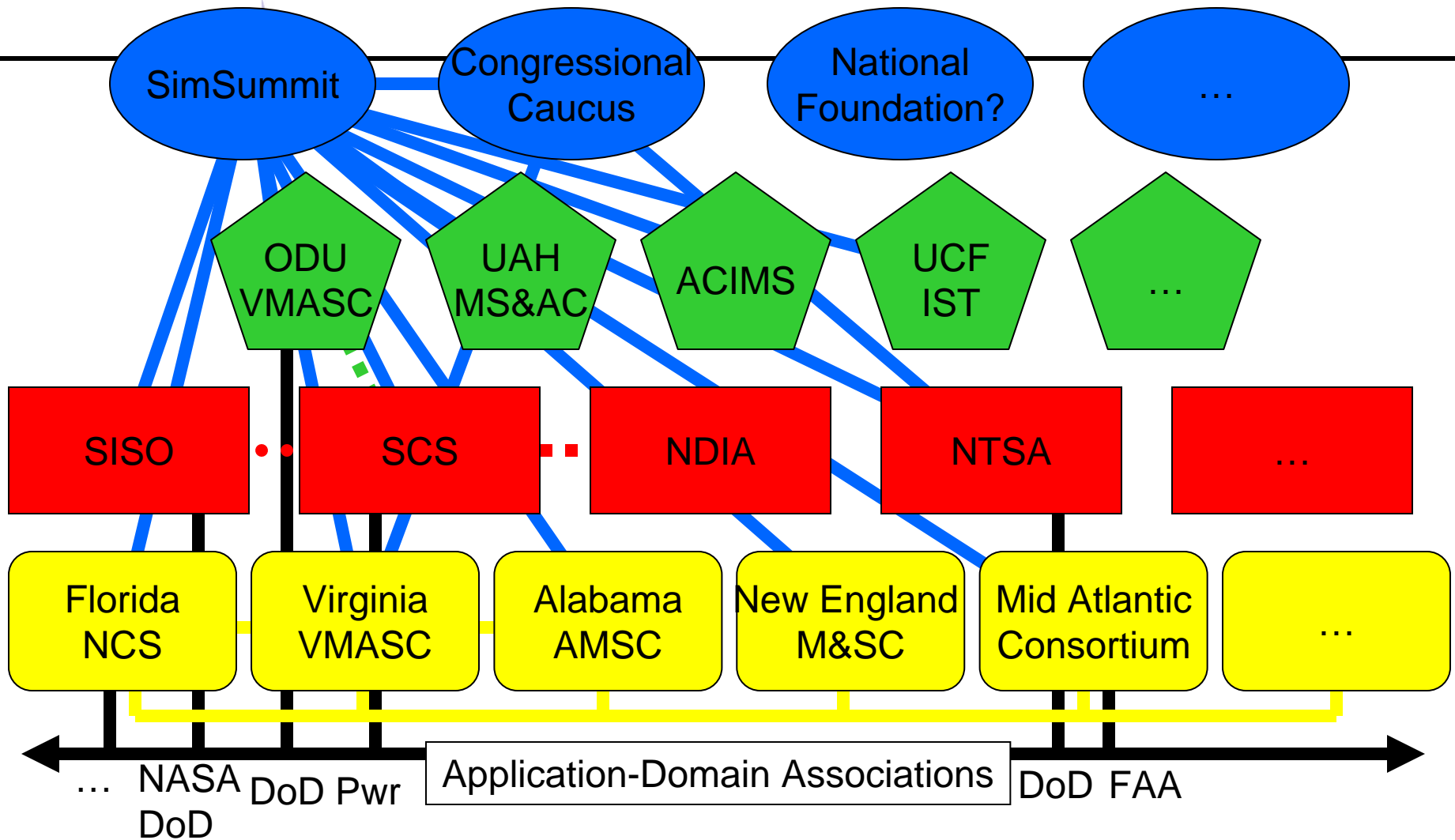









Organizational



M&S Industrial Development Environment

Institutional Environment



- | | | | | | |
|--|------------------------|---|-----------------------------------|---|-----------------------|
|  | Academic |  | Professional Society |  | Existing Binary/n-ary |
|  | Industrial Development |  | National / International Advocacy |  | Considered |
| | | | |  | Aborted |



e.g. Organizational Relations

United States National Modeling and Simulation Foundation Concept Paper

I. Preface

In the exposition that follows, a concept is delineated for a meta-organization that can serve to coordinate and facilitate relationships and activities among the several existing and emergent organizations addressing the evolution of the modeling and simulation technology, discipline, community-of-practice, industry and economic market within the United States. The subject organization designated herein as the "National Modeling and Simulation Foundation" (NMSF), is intentionally conceived to serve the needs of the existing national M&S community of practice and to fit gracefully within the emerging National and international M&S organizational infrastructure.



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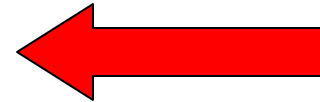
B. WORKFORCE DEVELOPMENT

C. INDUSTRIAL DEVELOPMENT

D. BUSINESS PRACTICE

1. Economics of M&S

2. US DoD M&S Management



III. ACTION



Economics of M&S (SISO)

**[Terms of Reference (TOR)
for the
SISO Standing Study Group
on
Economics of Modeling and Simulation (M&S)**

- Analysis of Cost-Benefit (CB) and Return-on-Investment (ROI) -

Standing:

The original Economics of Simulation Study Group completed its tenure in accordance with the Terms of Reference (TOR) submitted for that group. A revised TOR was submitted in 2002, and the Study Group completed its extended tenure, satisfying the revised TOR. The original Study Group members continue to receive requests for data and analysis results, and decision makers continue to ask for Economics of M&S information. This new TOR document is a request for approval of a new Standing Study Group for the Economics of M&S to update the data call, establish terminology and standards, advertise the need for new data, and post findings on a “permanent”, accessible web site.



e.g. Economic Impact Study

National Center for Simulation
3280 Progress Drive
Orlando, Florida 32826
407-384-6111
www.simulationinformation.com

Discussion Paper

Title: The Need for a National Economic Impact Study/Market Analysis for the Modeling & Simulation Industry Sector

Background: The M&S industry is growing rapidly, fueled by: acceleration in development of relevant technologies; convergence with the digital media industry; explosion in new applications for M&S; and substantial expansion of military requirements resulting from the global war on terrorism. Because M&S is a relatively young and diverse industry that has grown up regionally and in application or domain “stovepipes,” we do not have good information on the size, scope, and significance of the industry sector – especially outside of defense applications. The case has been made by industry leaders and by the Congressional M&S Caucus Chairman that M&S is a “critical national technology.” If that is true, then we should have better information on this industrial sector and operation of the marketplace.



US DoD M&S Management

SEE: Briefing presented to US DoD M&S
Steering Committee Tri-Chairs...
DRAFT REPORT





Meeting Agenda

- I. Introduction**
- II. Meeting Discussion Topics**
- III. ACTION** 



ACTIONS

- Executive Committee will open revised Web site and ftp [Due: 4 August 06]
- Topical 'community coordinator(s)' will submit Topic specification to ftp [Due: 7 August 06]
- Executive committee will compile and publish topical specifications as RDBMS report to web site Due 11 August 06]



ACTIONS

- Topical Community coordinators will provide DRAFT Program Plans to ftp [Due: 11 August 2006]
- Executive committee will publish to ftp and web site(s) [Due 14 August 2006]
- Executive Committee will compile TPPs and publish to ftp / web Due: 18 August 2006



ACTIONS

- Topical Community coordinators will facilitate discussion, review, and revision of topic specifications and DRAFT Program Plans across *SimSummit* community of interest (including at least 'P'articipating organizations) [Due 31 August, 2006]
- Coordinators will provide second DRAFT 'consensus' versions Plan to ftp [Due: 1 September 2006]
- Executive committee will publish to ftp and web site(s) [Due: 4 September 2006]



ACTIONS

- Executive Committee will compile Topical Program TPPs and post to ftp web site and [Due 8 September, 2006]



ACTIONS

- Telecon among topical coordinators and Executive committee to gauge progress, process and lessons learned [Due: week 11-14 September 2006]



ACTIONS

- Coordinators will provide second DRAFT 'consensus' versions of program plans to ftp [Due: 20 October 2006]
- Executive committee will compile Topical Program TPPs and post to ftp web site and [Due 27 October, 2006]



Power of a 'Topical Agenda'

- Defines the scope of concerns of a community
- Identifies perspectives especially significant to stakeholder constituencies
- Facilitates common understanding and consensus-building
- Constitutes 'condensation nuclei' to which other members may subscribe to the community
- Serves as a set of loci upon which attention may be confidently focused, decisions made, and action taken



Results of *SimSummit* Member-Interest Survey

- Poll for comments additions and revisions
- Declare commitment
- ACT to Establish and support component communities
 - Planning
 - Execution
- Report and publish progress

SEE HANDOUT



Community-of-Practice

“Communities of practice” are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.



Community-of-Practice Roles

- ‘Community Sponsor’ - provides high-level sponsorship ... champion for the community
- ‘Community Leader’ - active member of the community, ... guide[s] the community's purpose and strategic intent,
- ‘Subject Matter Experts’ - knowledgeable and experienced members judge what is important, ... enrich information
- ‘Content Editor’ - Provides shared [information]
- ‘Facilitator’ - fosters member interaction....
- ‘Members’ - are self-organizing ... and participate because they get value



ACTION: Establishing Visibility - Cultivating the COP -

Root Level

Executive Committee will provide:

- Web collaborative environment template pages,
- Population support.
- Wiki pages upon request and ftp site

First Tier



Second Tier

