

Modeling and Simulation

Educating the DoD Communities and Services



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Acquisition; Test and Evaluation

M&S Leadership Summit – 11 Feb 2008

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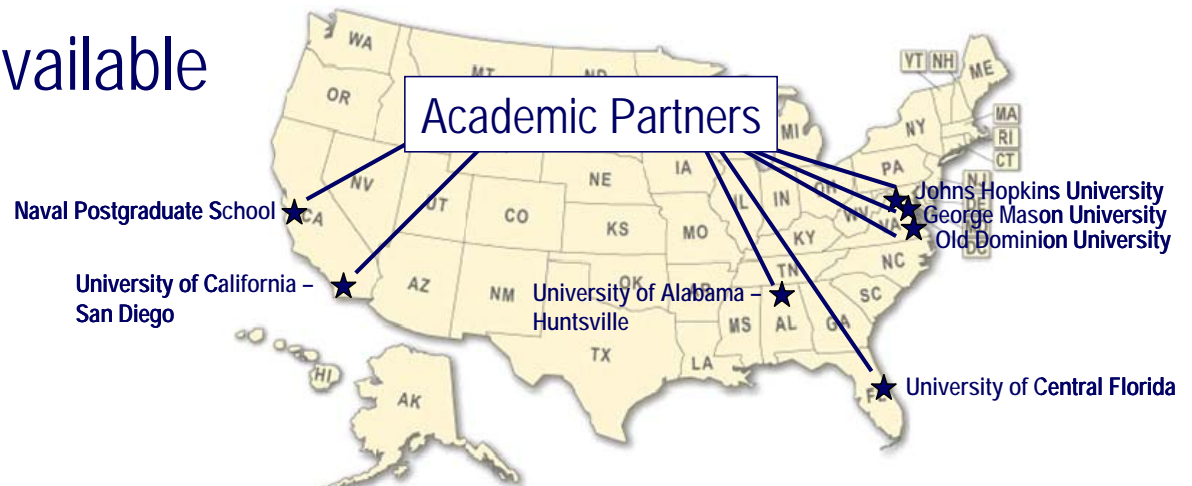
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The problem

- M&S is not realizing its potential for cost savings in DoD
 - Customers of M&S do not know how to employ M&S effectively
 - **Which** tools to use, **when** to use them, **how** to use them, **how** to get them.
 - Customers of M&S do not understand **risk** and **benefits** of using M&S
- Education can help drive wider acceptance and use

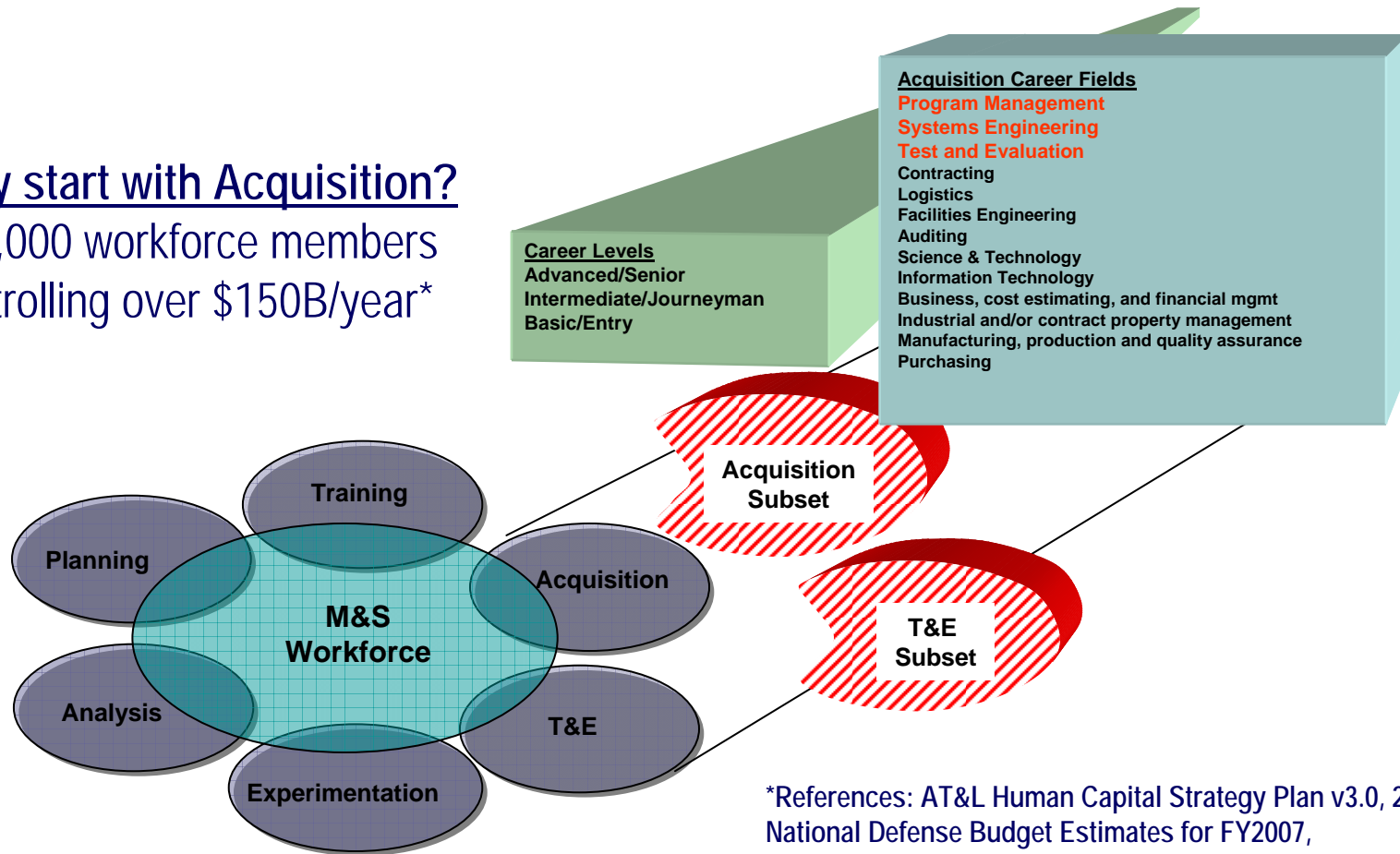
The approach

- Identify requirements using a wide set of stakeholders for focused initial audience
- Develop educational offerings using the best US university programs
- Make them widely available
 - Web
 - DAU CLMs
 - University Courses
 - Short courses
 - Public domain
- Track return on investment longitudinally



Our initial audience

Why start with Acquisition?
128,000 workforce members
controlling over \$150B/year*



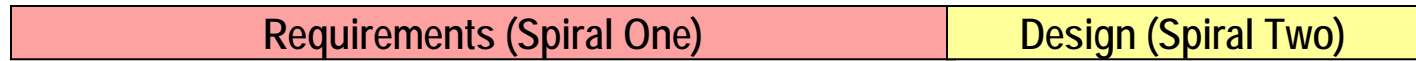
*References: AT&L Human Capital Strategy Plan v3.0, 2007;
National Defense Budget Estimates for FY2007,
<http://www.defenselink.mil/comptroller/defbudget/fy2007/>

Results to date

- Requirements identified and vetted
- Module and course syllabi developed and distributed
- Both requirements and syllabi available at <https://diana.nps.edu/MSAcq>
- Case studies to support courses developed and web-enabled
 - [Ship Shock Case Study](#)



2007 graphic



Stakeholder Group:
All Services represented
Program Offices
T&E agencies

Educational Skill Requirements

P14.1 Define the different methods by which a model, data set, or simulation is reused in various applications under different reuse methods.
P14.2 Given a model and a proposed reuse application, determine the level of effort required to reuse a model, data set, or simulation, and determine how those assumptions constrain appropriate reuse applications.
P14.3 Determine the level of effort required to reuse a model, data set, or simulation, and determine how those assumptions constrain appropriate reuse applications.
P14.4 Classify proposed reuse applications of a model, data set, or simulation as appropriate or inappropriate based on modeling paradigm, level of resolution, and bounds of validity.
P14.5 Identify the assumptions behind a model, data set, or simulation, and determine how those assumptions constrain appropriate reuse applications.
P14.6 List current simulation interoperability protocol standards, interoperability frameworks and middleware libraries, and composability approaches that support reuse, and describe the advantages and disadvantages of each.
P14.7 List existing resources available for reuse, including model repositories, implemented federations, standalone simulations, standard object models, and accredited data sets, and describe the procedures for searching for resources within repositories of them.
P14.8 Assess the incremental level of effort required to make a model, data set, or simulation reusable, beyond that required to create it for single use.
P14.9 Identify the levels of conceptual interoperability possible between federated simulations, and describe the extent of functionality and reusability associated with each level.
P14.10 Describe case studies of successful reuse applications of commonly used models, data sets, and simulations, and the characteristics of those applications that made the reuse successful.

Learning Matrix

		P14) Manage and reuse existing models, data, and simulations appropriately and assure that new products developed are designed and prepared for reuse.									
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		P14.1	P14.2	P14.3	P14.4	P14.5	P14.6	P14.7	P14.8	P14.9	P14.10
PM	PM										
Adm	PM	Basic	General Awareness	General Awareness	General Awareness	General Awareness	General Awareness	General Awareness	General Awareness	General Awareness	General Awareness
SE	Adm	Intermediate	Application	Application	Application	Application	Application	Application	Application	Application	Application
SE	SE	Advanced	Understand	Understand	Application	Understand	Understand	Application	Understand	Application	General Awareness
Inform	SE	Basic	Understand	Understand	Understand	Understand	Understand	Understand	Understand	Understand	Understand
Adv	SE	Intermediate	Application	Mastery	Application	Application	Application	Application	Application	Application	Application
TAE	Adv	Advanced	Application	Application	Mastery	Application	Application	Application	Mastery	Application	General Awareness
Inform	TAE	Basic	Understand	Understand	Understand	Understand	Understand	Understand	Understand	Understand	Understand
Adm	TAE	Intermediate	Application	Application	App	Understand	Understand	Understand	Understand	Understand	Understand
Adv	TAE	Advanced	Understand	Understand	Understand	Understand	Understand	Understand	Understand	Understand	Understand

Learning Architecture

1) 2) 3) 4) 5) 6) 7) 8)

Module description: This module comprises topics to provide training to a 'Application' level of competence for program managers, systems engineers, and test and evaluation workforce members for ESR P15: Manage the data strategy for an M&S effort including estimating the resources necessary to obtain sufficient data to populate the model. ESRs that the module supports and the corresponding level of competence: P15, Application.
Prerequisites assumed and the corresponding level of competence: Module P15-U.
Module maturity: Portions of the material have been taught by the module coordinator in both Old Dominion University's MSW 601 course and in Certified Modeling and Simulation Professional examination preparation courses.
Number of hours estimated to deliver/teach module: 13
Proposed delivery modalities: Face-to-face lecture, synchronous distance learning (live audio/video connection), asynchronous distance learning (web or CD).

Academic Partners:
George Mason University
Johns Hopkins University
Old Dominion University
University of Alabama at Huntsville
University of Central Florida
University of California – San Diego

For a complete set of 2007 deliverables, please see: <https://diana.nps.edu/MSAcq/>.

M&S Education for Acquisition/T&E
M&S Leadership Summit

This year

- Develop and test the courses
- Develop web-delivered summary versions
- Develop CLMs for DAU
- Develop short course versions
- Develop assessment plan
- Publish "Program Manager's Guide to M&S" Details

Details

15 Courses planned for development
 M&S in the Acquisition Life Cycle, Parts One and Two
 M&S Strategy and Support Plans
 M&S Requirements and Evaluating M&S Proposals
 Contracting for M&S
 M&S In Decision Risk Analysis and Mitigation
 Best Practices in M&S
 M&S Environments
 M&S Data Strategies
 M&S for Test and Evaluation, Introduction and Advanced
 Physics-based M&S
 Basic Engineering Concepts in M&S, parts 1 & 2
 Topics in the Application of Engineering M&S

Four Certificate programs:

- M&S Management
 - Intro to DoD M&S
 - Modeling and Simulation in the Acquisition Life Cycle, Parts 1 & 2
 - Best Practices in M&S
- M&S Acquisition
 - M&S Strategy and Support Plans
 - M&S Requirements & Evaluating Proposals
 - Contracting for M&S
 - M&S in Decision Risk Analysis
- M&S Test and Evaluation
 - M&S for Test and Evaluation. Introduction and Advanced
 - M&S Environments
 - M&S Data Strategies
- M&S Engineering Integration
 - Physics-based M&S
 - Basic Engineering Concepts in M&S, Parts 1 and 2
 - Selected Topics in the Application of Engineering M&S

**Planned NPS
Implementation**

Certificates can be credited toward resident and non-resident NPS degree programs

Issues

- Incentivizing workforce
- Funding tuition
- Embedding content into DAU core courses
- Extending to other communities
- Scaling
- Documenting cost avoidance and cost savings

Program Benefits

- Comprehensive educational program focused on *consumers* of M&S. Significant step towards satisfying DoD M&S educational needs.
- Partnership of government and academia - opportunity to influence the culture of M&S education.
- Improved workforce capabilities across all Services, activities and programs that utilize M&S.
- Increased use of M&S in acquisition to realize potential savings from simulation based acquisition in the DoD not being realized today.
- All learning materials created from this project will be public domain – the nation will not have to pay for this work again.
- 80% of course materials will support all 6 communities, and the program is constructed in a way to facilitate reuse.

Conclusion

Current path will result in products that provide the education and training that acquisition and T&E professionals need to use M&S effectively in their jobs.

For more information about this project, please see <https://diana.nps.edu/MSAcq>, or contact:

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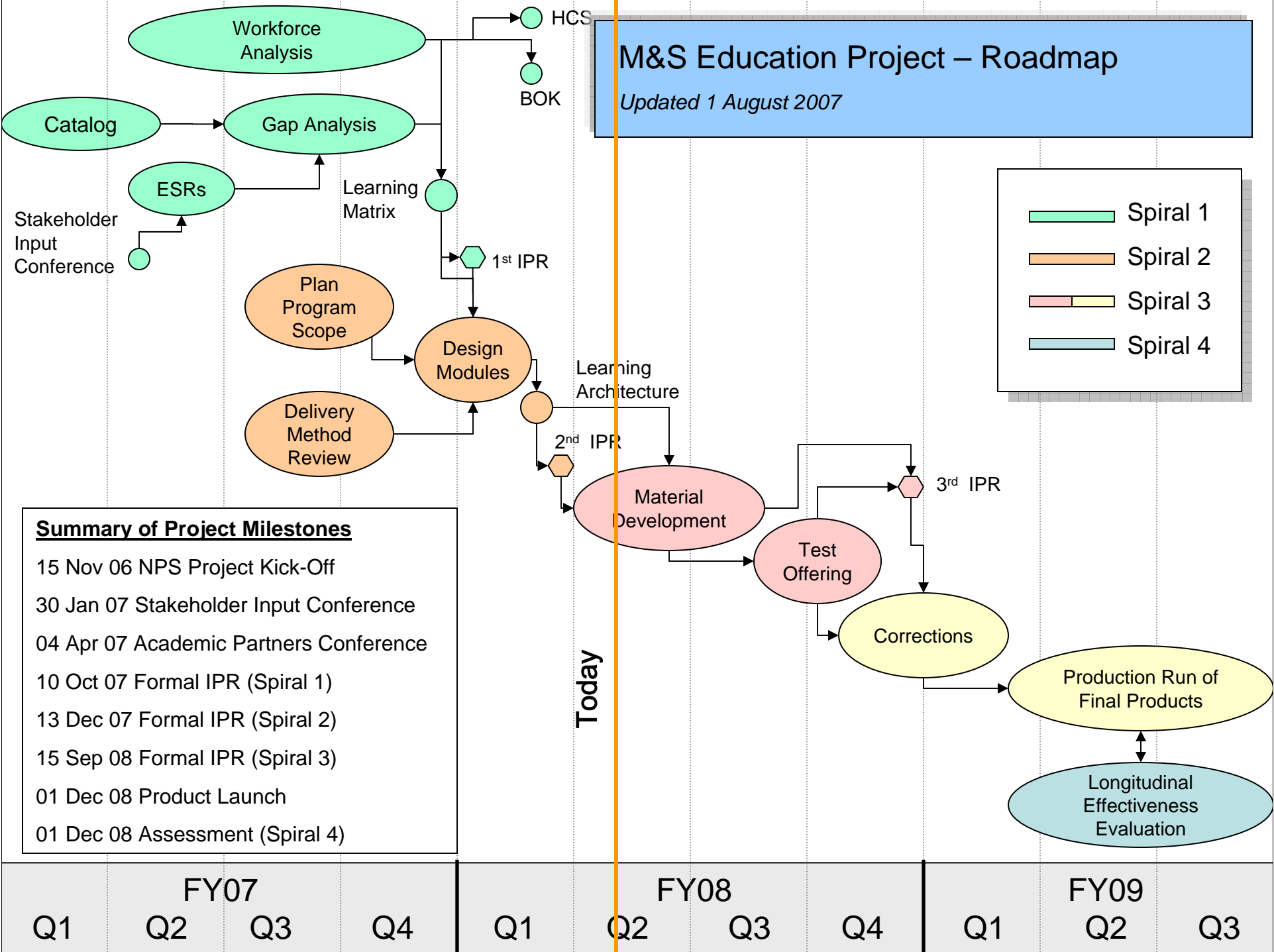
Questions?



Backup

M&S Education Project – Roadmap

Updated 1 August 2007



Legend for Spirals:

- Spiral 1 (Green)
- Spiral 2 (Orange)
- Spiral 3 (Pink)
- Spiral 4 (Light Blue)

Summary of Project Milestones

15 Nov 06	NPS Project Kick-Off
30 Jan 07	Stakeholder Input Conference
04 Apr 07	Academic Partners Conference
10 Oct 07	Formal IPR (Spiral 1)
13 Dec 07	Formal IPR (Spiral 2)
15 Sep 08	Formal IPR (Spiral 3)
01 Dec 08	Product Launch
01 Dec 08	Assessment (Spiral 4)

FY07				FY08				FY09		
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3