Future Manufacturing Enterprise

Breakout Session Overview

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Defining the Topic

Scope of the Manufacturing Enterprise

Macro
Globally Networked Organizations

Meso
Multi-function Facilities and Organizations

Micro
Manufacturing Processes
Why is This Important?

“Because that’s where the money is …”

--- Willie Sutton

Leverage on:
- Cost
- Delivery Time
- Quality
- Agility
- Environmental Impacts
- Energy Efficiency
- Global Competitiveness
- ...

![Costs in Supply Chains]

Typical for tactical missile recurring production costs
(Source: DARPA AM3)
The Challenge Now

**Value Creation**
- Need Variation to Develop New Technologies and Approaches
- Creativity, Imagination
- Think “out of the box” – provide Customers with solutions before they even know they have a problem

**Value Delivery**
- Reduce Variation at all Cost
- Efficiency, Productivity
- Process Discipline

Need Both Creation and Delivery of Value to assure Customer Success
Enterprise Visions and Enablers

Many Common Denominators

• DoD Advanced Manufacturing Enterprise (AME)
  – Connect the enterprise
  – Build the digital thread
  – Create an agile factory floor
  – Ensure a robust infrastructure

• Smart Manufacturing*  (* = Issue paper)
  – Data for manufacturing intelligence – sense, collect, manage, share
  – Data analysis and M&S accessible to small, medium and large enterprises
  – Community-source IT platform with plug and play capability
  – Meaningful use in agile supply chains, enterprise optimization, sustainable production
  – Skilled workforce

• Other ideas from issue papers and presentations
  – Personal Manufacturing* and DARPA Adaptive Vehicle Make
  – Systems Approach to Future Manufacturing Enterprise*
  – DoD Systems 2020 and NDIA SE Producibility M&S*
  – Digital Manufacturing – National Innovation Network*

• Enablers – Service Oriented Mfg, Clean Energy Mfg*, Flexible Aircraft Production*
Pushing Toward the Extremes

Distinguishing the Ends from the Means

- What are the axes on which we seek to advance?
- What goals and objectives will move us, and why?
- Where are the gaps (technology, infrastructure, stds)?
- What are the roles for gov’t, industry, academia?
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Some thoughts for the breakout session

• Our scope is enormous
  – Suggest we focus on macro and meso level ideas that take advantage of anticipated advances at micro level

• Some concepts are general, others are domain specific
  – Even general concepts need to be developed in a domain
  – Suggest we have a couple of use cases in mind

• Enterprise visions are lofty
  – Suggest we dive down to meaningful enablers and gaps

• Infrastructure and Standards are important
  – Suggest we drive toward identifying needs and opportunities