Model Based Manufacturing – Predicting Future Performance

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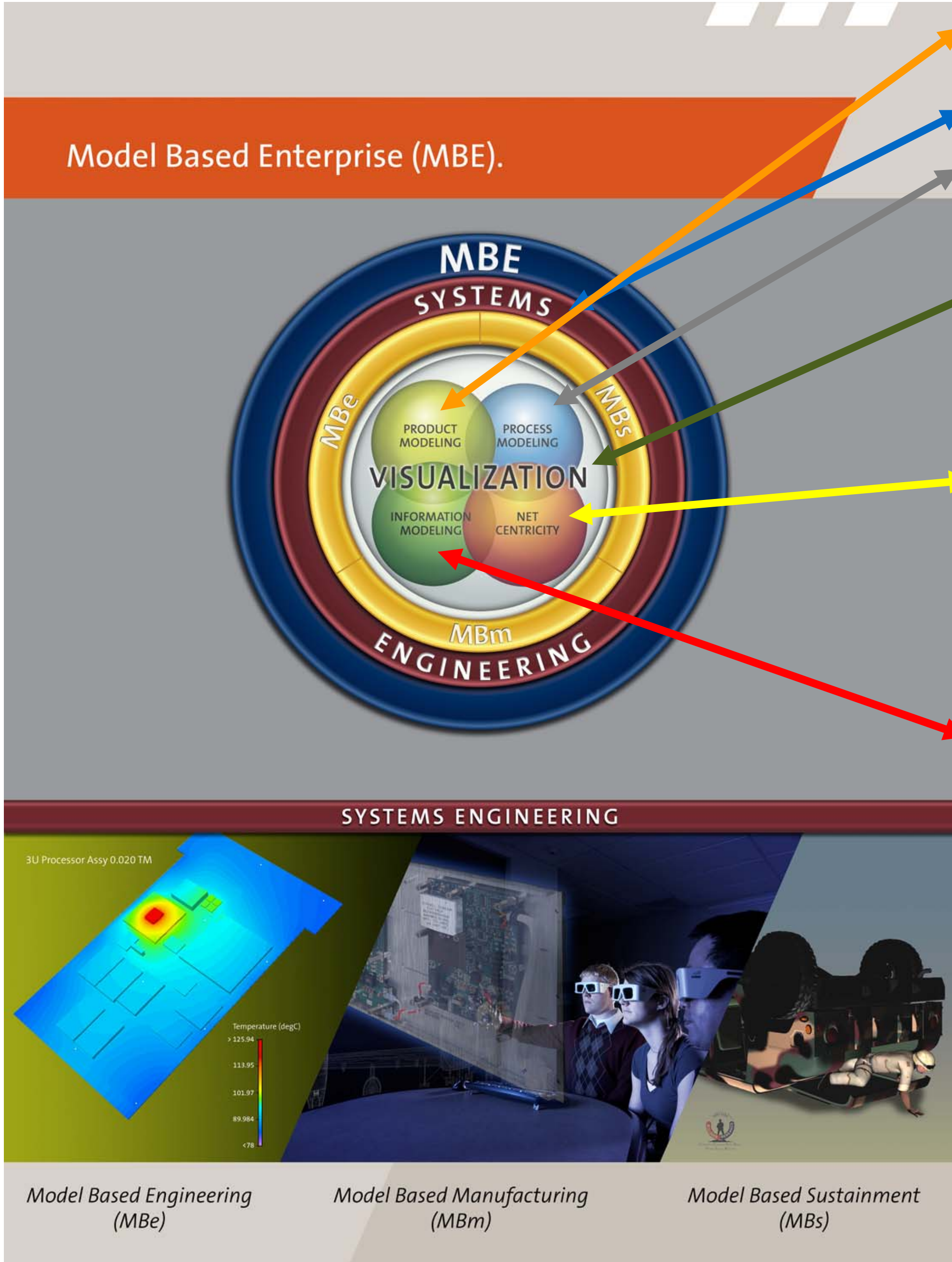
Agenda

- MBE Overview
- MBm Projects
- MBm/MRL Relationship
- Summary

What is the Model Based Enterprise?



Model Based Enterprise: An integrated environment which allows prediction of future performance, facilitates efficient use of tools and processes and enables multi-disciplinary decision making throughout the entire life cycle

Product modeling assesses end item performance against life cycle requirements

Systems Engineering ... throughout the life cycle, spanning MBe, MBm and MBs

Process modeling manages processes ... quality ...

Visualization improves effectiveness of ... Whether MBe, MBm or Mbs, through use of state of the art visualization

Net Centricity ensures the availability of managed information at the right place and time, supporting multi functional decision making and execution across the extended enterprise

Information modeling incorporates standard formats to ensure interoperability of like and cross domain decision making tools and processes

Process Modeling:

Improve process efficiency

MODEL BASED MANUFACTURING

Enhances performance through integrated simulation and visualization environments.

Product Modeling
- Optimize design implementation
- Reduce prototype investment
- Improve manufacturing yield

Process Modeling
- Improve process efficiency
- Reduce manufacturing variation
- Enhance inventory management

Information Modeling
- Interoperability of like domain tools
- Interoperability of cross domain tools
- Reduce life cycle costs

Net Centric Manufacturing
- Improve supply chain management
- Increase effectiveness of manufacturing execution within the enterprise
- Enhance customer communication

MBE Active Industry Projects and Opportunities

PDES, Inc.

MBe – Model Based Engineering

MBm – Model Based Manufacturing

MBs – Model Based Sustainment

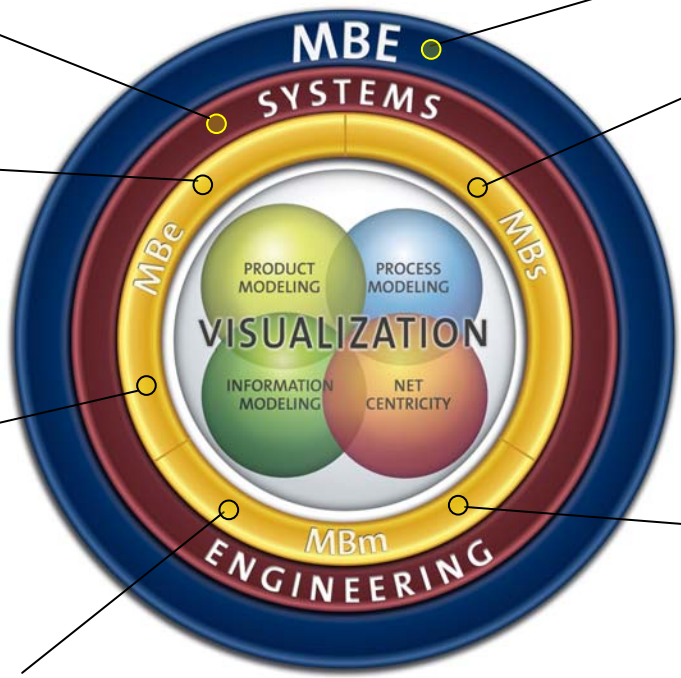
NEXT GENERATION MANUFACTURING TECHNOLOGY INITIATIVE℠

Systems Engineering (AP233)

MBE-IF Testing

System Life Cycle Support

Engineering Analysis - STEP Composites and CAE Visualization in Adobe Acrobat



Potential MBs Project:

Long Term Data Retention

EM Pilot – Warpage Simulation

Potential MBe Project:

ECAD/MCAD Integration

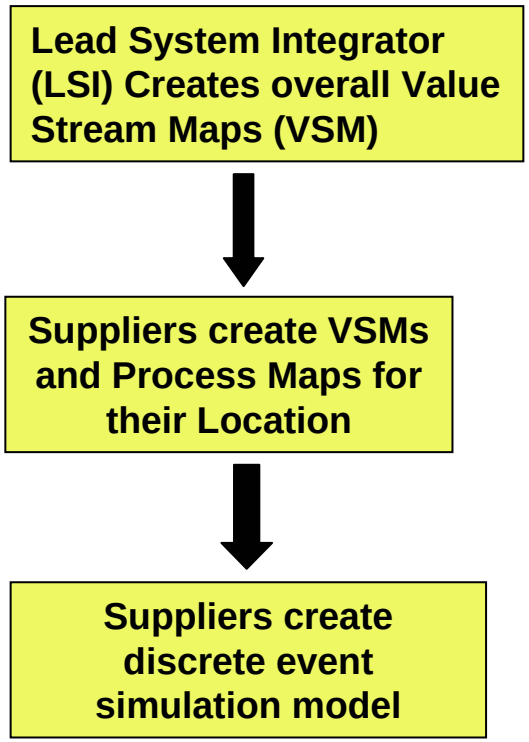
Value Stream Mapping

Flow Equivalent Servers

Potential MBm Projects:

- **Next Generation Supply Chain Modeling**
- **Integrated Flow Modeling and Physical Layout**
- **Design For Ergonomics**
- **Cognitive Virtual Environment**

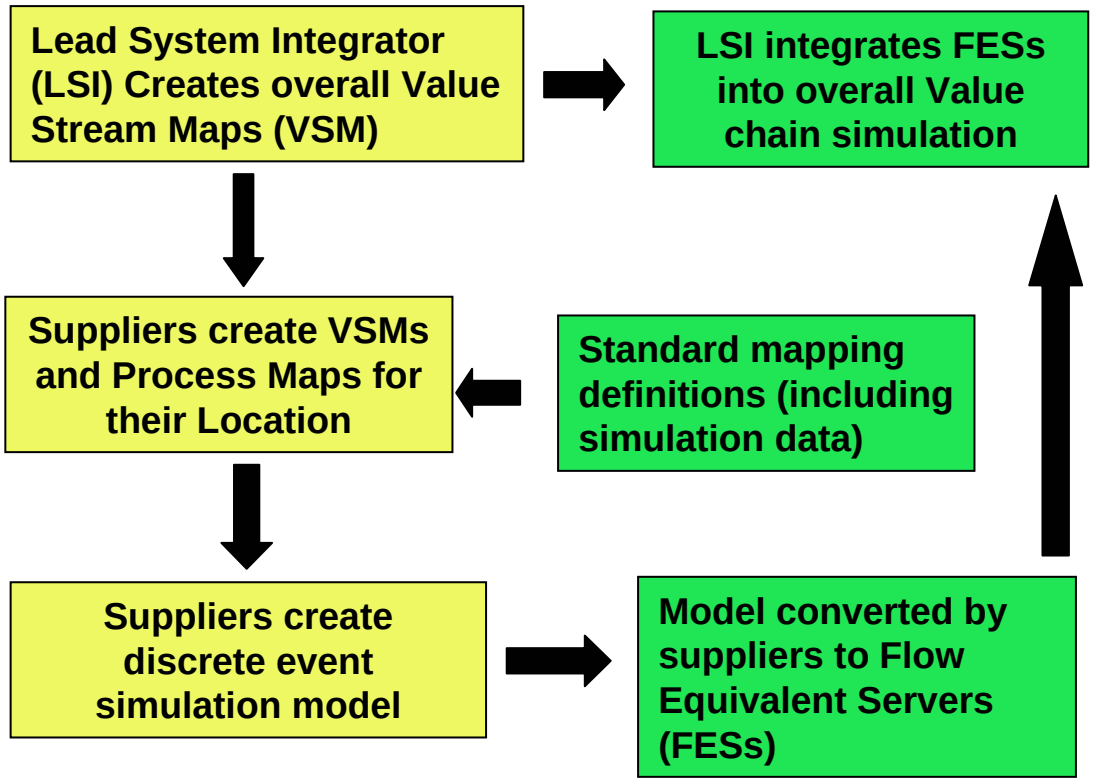
Process Modeling: VSM to Simulation (Current State)



Issues with Current State:

- Discrete event simulations are time consuming to create and duplicate much of the effort to generate the VSM
- Suppliers are hesitant to share simulation data because it can include intellectual property
- Inconsistencies in how simulations are done make it difficult to gather information from a large supply chain

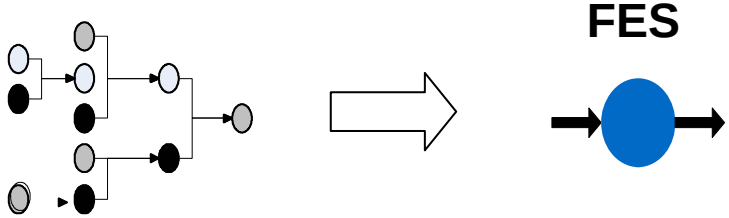
Process Modeling: VSM to Simulation (Future State)



Benefits of Future State:

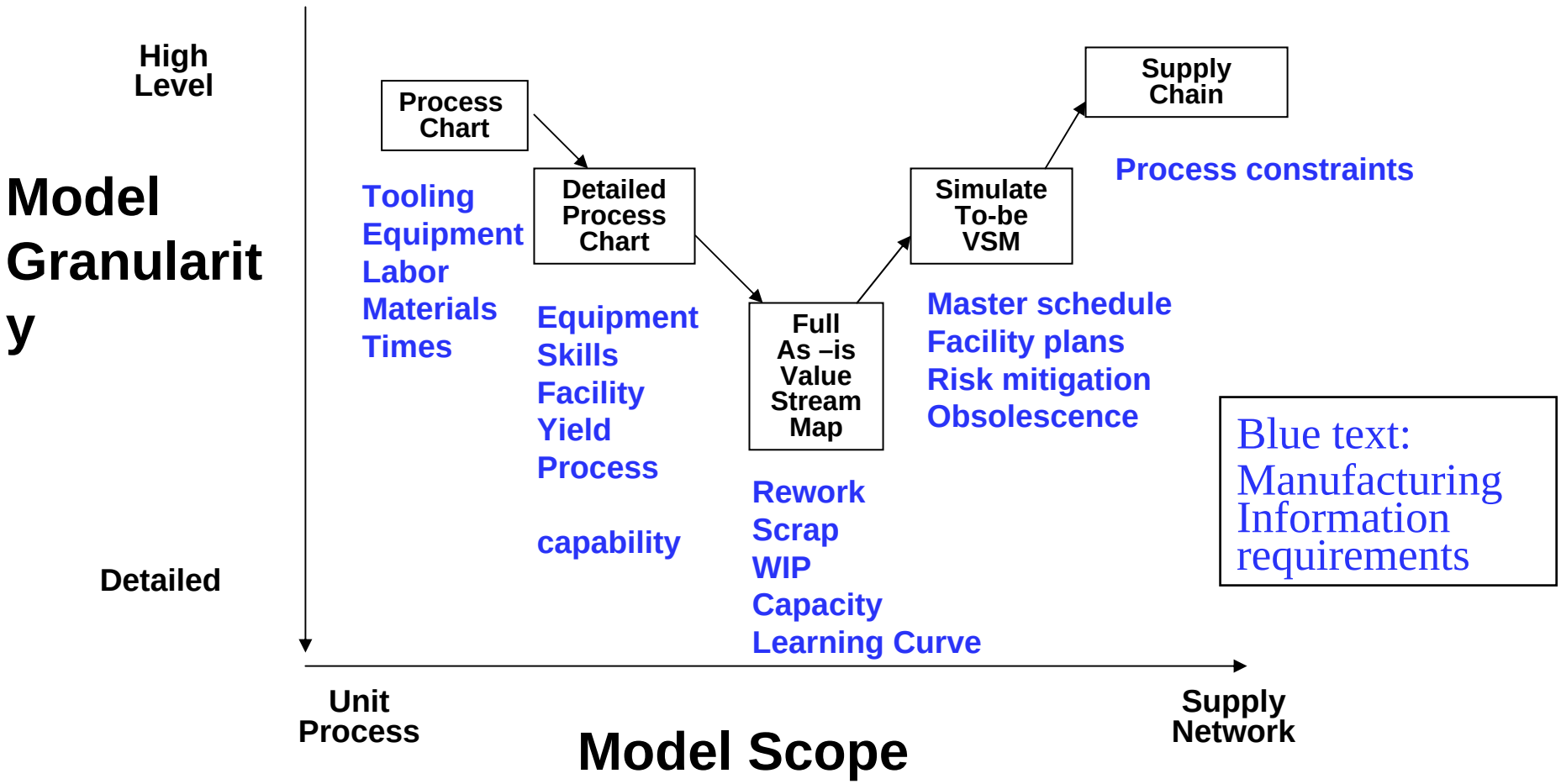
- DESs are easier to generate and more standard
- Enhanced communication between customer and LSI
- Predictive supply chain modeling
- Reduced intellectual property concerns

Complex Network



Process Modeling within the MRL Structure

MRL 3 4 5 6 7



Summary

- Manufacturing Readiness Levels assesses whether or not a design will be successful in production
- Model Based Manufacturing provides the ability to predict the performance of products and processes
- Information flow across boundaries requires standard data definition

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