Model Based Manufacturing – Predicting Future Performance

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Agenda

• MBE Overview
• MBm Projects
• MBm/MRL Relationship
• Summary
Whether MBe, MBm or Mbs, Net Centricity ensures the availability of managed information at the right place and time, supporting multi-functional decision making across the extended enterprise.
Process Modeling:

Improve process efficiency

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

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

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

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**

- **Systems Engineering (AP233)**

- **Engineering Analysis - STEP Composites and CAE Visualization in Adobe Acrobat**

- **EM Pilot – Warpage Simulation**

- **Potential MBe Project:**
  - ECAD/MCAD Integration

- **Value Stream Mapping**

- **Flow Equivalent Servers**

- **MBE-IF Testing**

- **System Life Cycle Support**

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

- **Potential MBs Project:**
  - Long Term Data Retention
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)

Lead System Integrator (LSI) Creates overall Value Stream Maps (VSM)

Suppliers create VSMs and Process Maps for their Location

Suppliers create discrete event simulation model

LSI integrates FESs into overall Value chain simulation

Model converted by suppliers to Flow Equivalent Servers (FESs)

Standard mapping definitions (including simulation data)

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

FES
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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