The Model Based Enterprise and Its Impact on Small Business

Presented by:
Mitzi Whittenburg, CPCM, Fellow

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• **Mitzi Whittenburg, CPCM, Fellow**
  – Project Manager, UTRS
  – Government Support Contractor

• **Experience:**
  30 years of procurement experience

• **Education:**
  Holds a MBA in Acquisition & Government Contracts and a master’s degree in Financial Planning from the University of Dallas and an undergraduate degree from Texas Christian University

• **Accomplishments:**
  Recipient of a 2010 DoD Nunn-Perry at BAE Systems award for managing an excellent Mentor-Protégé agreement with a small disadvantaged Native American 8(a) woman-owned business
  Specializes in small business mentoring, procurement analysis and supply chain best practices including leading strategic sourcing teams
  Member of the NCMA Picatinny Chapter Executive Committee and recently published an article in the NCMA *Contract Management Magazine* entitled Acquisition Strategy: Technology is the Key
Transforming the DoD

From This

To This
Drawing Based
Master 2D Drawing

Model Centric
3D CAD Model with Master 2D Drawing

Model Based Definition
Master 3D CAD Model with 3D Drawing, 2D Drawings by exception

Model Based Enterprise
Master 3D CAD Model with 3D Drawing fully leveraged by the Supply Chain

The Journey
There are many problems centered around the Technical Data Package (TDP), here are some examples:

- **Legacy Systems**
  - 2D TDP, if any
  - Outdated
  - Hard to manufacture from

- **No TDP**
  - Never Purchased
  - Deemed too expensive
  - Resides at the OEM

- **No Current OEM**
  - Original OEM out of business
  - TDPs, if available are incomplete

- **Sustainment**
  - TDP may, or may not, exist
  - Must reverse engineer
  - Late in the lifecycle

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What are we talking about today?

- The DoD is modernizing how it receives technical data for weapons systems.
- MIL-STD-31000A defines a Technical Data Package (TDP) and has been modified to support this modernization.
- The effort is the cornerstone of moving the DoD to a Model Based Enterprise that can enable substantial efficiency gains, thus cost reductions in this fiscally challenging environment.
What is the TDP?

- 3D Geometry
- Associated Product Manufacturing Information (PMI), Annotations, and Notes
- Product Meta Data (i.e. Revision, Used On, Legal Noticed)
- Other Associated Documents
- Configuration Management
- Security
A 3D TDP enables the reuse of data throughout the lifecycle, without it the data must be reverse engineered or re-mastered.
Why are we doing this?
The main purpose of the 3D TDP is to provide all Downstream users a 3D data set that they can reuse without re-mastering the data. For suppliers this means they will have the ability to drive their CAM software straight from the model along with numerous other processes. All of this reduces the time to mission for the Warfighter.
Why Should You Care...

- It reduces errors and cost by limiting the number of times an object is remastered
- It dramatically cuts the time to mission
- It allows for increased collaboration and less ambiguity
- It is the direction the DoD is heading for TDPs

**Traditional Approach**

**MBE Approach**

The design is created in a 3D CAD Modeler

But requires a drawing to provide the product definition

It is then re-keyed for use by downstream users

A 3D “drawing” is created as the model is made

It is then used by downstream customers streamlining the time needed to access the product definition
Studies show that 50% of an engineer’s time is lost due to dealing with “bad” data.
A Changing Culture...

- Over the past 7 years the DoD has been making a concentrated effort to update not only its infrastructure but its process to be more on par with industry
- MBE has been a focus of many ManTech projects aimed at changing the culture from a Drawing based one to a true MBE environment
- Standards and Policies have been released in many areas to not only certify the model as the master but to procure a complete Technical Design Package whenever possible for reuse in sustainment
- To this end MIL-STD-31000 (the TDP standard) has been updated to be compatible with a 3D MBD
The 3D TDP

We have developed a process that allows for not only the standard creation of 3D TDP but also their delivery via a PDF package allowing for a true “CAD Agnostic” and free format.
Why a Schema? Enabling Reuse Through Organization

From This

To This

From This

To This

From This

To This
• The DoD is making the switch to a MBD based 3D TDP
• It will be CAD Agnostic
• It will facilitate re-use of the data
• It will contain the complete product definition
• It will help reduce the time to mission
• It will revolutionize the industry
• It is ready
## MBE Capability Index

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<th>Level</th>
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| Level 6 | MBD With Automated TDP and On Demand Enterprise Access  
Primary Deliverables: Digital Product Definition Package and TDP via the web |
| Level 5 | Model Based Definition With Automated Technical Data Package  
Primary Deliverables: Digital Product Definition Package and TDP |
| Level 4 | Model Based Definition With Data Management  
Primary Deliverable: 3D Annotated Model and Light Weight viewable via PLM |
| Level 3 | Model Based Definition  
Primary Deliverables: 3D Annotated Model and Light Weight viewable |
| Level 2 | Native CAD Based Manufacturing  
Primary Deliverables: 2D drawing and Native CAD Model |
| Level 1 | Model Based Manufacturing  
Primary Deliverables: 2D Drawing and Neutral CAD Model |
| Level 0 | Model Centric Drawings for Design and Manufacturing  
Primary Deliverable: 2D Drawing |
Thank you for your time and consideration.

For more information go to www.model-based-enterprise.com.