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CUST300 - How to Transition to a Model Based Culture

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Raytheon Missile Systems

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PTC Live Global
Nashville, TN

Biography

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William Cockrell

- MBD Champion for Mechanical Engineering at Raytheon Missile Systems (RMS) in Tucson, Arizona

- Enterprise Activities
  - Common PDM (Windchill)
  - Model Based Enterprise (MBE)
  - National Modeling Team

Biography

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Margi Korch

- Mechanical Engineering Solutions (MES) at Raytheon Missile Systems (RMS) in Tucson, Arizona

- Enterprise Activities
  - Model Based Enterprise (MBE)
  - National Modeling Team

Biography

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Lance Lie

- IT at Global Business Services(GBS) in Fullerton, California

- Enterprise Activities
  - Common PDM (Windchill)
  - Model Based Enterprise (MBE)
  - National Modeling Team

Why make the Jump to Model Based?

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The Future is Now

- Engineering Design Already Done in 3D
- Machine Shops Use 3D Models to Program Tools
- Additive Manufacturing Requires 3D Models
- Young employees are used to rapid changes in technology
  - Retention is partially based on the companies apparent level of innovation
- PTC Creo Parametric supports MBD
- ***Possibility for drawing and model to not match when sent to suppliers or customer***

What Isn't Becoming Model Based?

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Models Are The Master

Model Based Definition

Model Based Manufacturing

Model Based Enterprise

Model Based Life Cycle Engineering

Model Based Supply Chain

What are Your Customer Deliverables?

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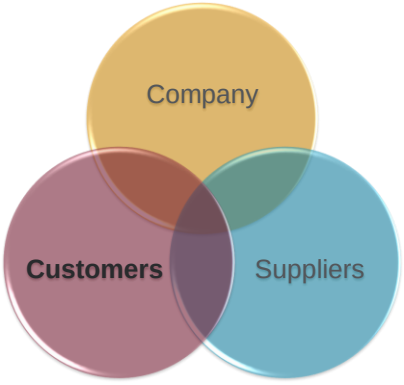
Help Your Existing Programs Make the Switch to Model Based

- Our customers are mandating a TDP deliverable of STEP files and 3D PDFs
  - Both are neutral formats that are ISO standards
- 3D PDFs readable with Adobe Reader
  - Ubiquitous and free
- Provide a transition from legacy drawings to MBD
  - Create MBD models and then use combined states to create drawing views quickly
  - Additionally provide 3D PDFs to customers to illustrate readiness to move forward with



Be A Champion … Not an Evangelist

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Actions Speak Louder Than Words

- Evangelists prepare leaders for the future, but the technology is often not mature enough for implementation
  - Lack of tangible capabilities hurts evangelists credibility if unable to move to champion role
- Champions drive innovation by combining creativity and design with tools that are much closer to full maturity
  - Pilots can be run on early adopter programs to identify gaps in processes and tool capabilities
  - Must have the foundation substantially completed

Company Sponsorship

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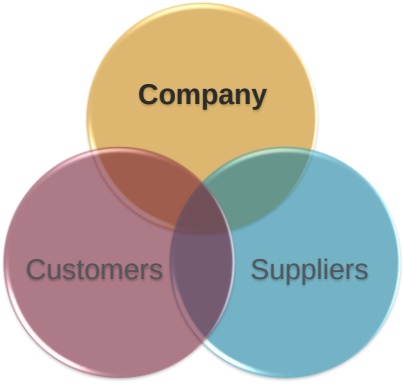
Eat the Elephant One Bite at a Time

1. Build investment up by receiving funding for initiatives that grow the foundation
   - Improvements that improve the entire companies capabilities
2. Get backing from anyone in the enterprise
   - Engineering, supply chain, operations, quality, or test equipment
   - Run pilots on small efforts
3. As foundation is nearly complete seek VP level sponsorship
   - Have success stories to drive and support funding requests
   - Make it an easy win for the executives



Create the Foundation with Standards

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A Solid Foundation is Necessary to Build Anything That Lasts

- Standards - Drive accountability
  - Set the foundation all other Model Based initiatives are built off
  - Team with other disciplines and businesses to create enterprise standards
  - Provides managers with a tangible position when dealing with programs and user

Roadshows and Demonstrations

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Build a Following

- The single best marketing for MBD
- Give them to any group that is interested
  - Tailor the message to show them how MBD will positively affect them
  - Encourage attendees to report back to their managers
  - ***Start a movement because followers transform the lone nut into a champion!!***

Always End Your Demonstration with a 3D PDF

Prepare the User Base

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Improve the Skill Set of All Users

- User base must be prepared for transition to MBD
  - Certification courses
  - Independent study groups
    - Support reduce training budgets
    - User differentiation based on individual initiative
  - ***Guarantees a minimum level of competency across user base for those who pass certification***

Piloting Model Based Tools and Processes

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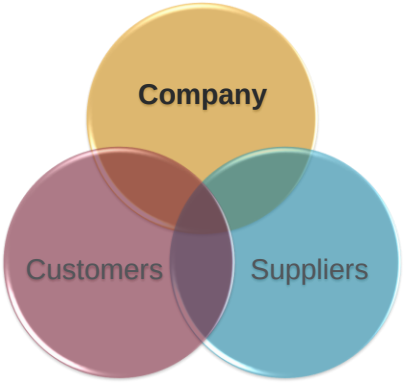
You Learn By Doing

- Identify a program or group willing to pilot MBD
  - This should be undertaken after the foundation is ready for production environment
  - **Going too early can result in negative feedback that can impact long-term success**
- Processes should be adjusted based on feedback and user experience from pilot
  - Use this as opportunity to drive towards finalizing production readiness
  - Continuously test updates to processes and tool configurations



Drive Intra-Company Collaboration

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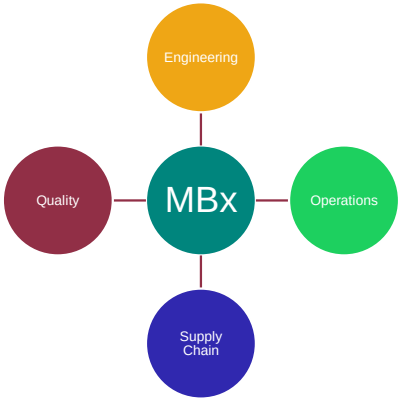
Build Networks Across Groups

- Involvement by all groups is critical to success
  - Create new processes and identify gaps in existing process to prepare for model based transition
  - Look for areas where model based can provide savings as it goes through workflow
- Provide training documents to ease acceptance and increase productivity



Internal & External Stakeholders

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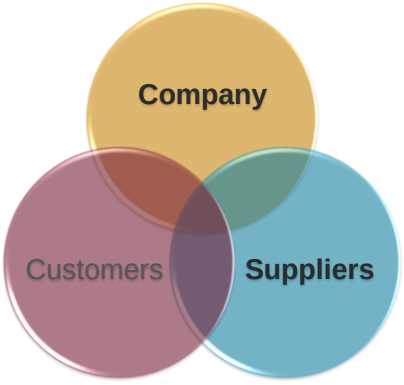
Model Based Drives Collaboration Downstream

- Colleagues from non-engineering disciplines can easily use 3D PDFs
  - Simple one-stop document with all the information needed
  - Allows for easy commenting and collaboration
- Reduces ambiguity for suppliers
  - Reduces calls to engineers
    - Minimizes production stoppages mandated by clarification calls to engineers



Improve Model Quality Across the Business

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Model Quality is Key to Success

- Mandate improvements in model quality by holding users accountable
  - Big selling point with management
  - Provide managers with metrics at program, functional, and individual levels
  - Significant reductions in costs associated with modeling changes

Model Based Effects on Support Organizations

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Engage to Ensure Downstream Support

- Check
  - MBD can appear threatening
  - Involve in model comparisons and metrics collection
- CM
  - Setup configuration management to handle neutral files to match native models

Automation Efforts

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Don't Let Automation Derail the Initiative

- Worry about automation only after proving out capabilities to get MBD off the ground
- Identify tools with greatest ROI and push these first
  - Fast return with big capabilities jump
- Invest in automation slowly
  - Keep costs manageable
  - Reduce barriers to entry

Real World Success Story at RMS

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One Small Step Leads to a Giant Leap

- Test Equipment drove to pilot MBD on multi-level assembly
- Trained three individual for 3.5 hours each
  - Occurred over three days and allowed them to use MBD and build skills
- Created 39 3D PDFs in Three Days
  - Faster than creating drawings
  - Identified improvements needed in start parts, 3D PDF template, and training documentation
    - All future programs across the enterprise will benefit from this one pilot
- Chief Engineer, CM, Supply Chain Loved 3D PDFs
- Test Equipment has mandated all MBD within 18 months

Why Aren't You Model Based?

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What is Keeping You from Taking the Leap?

Important Take Aways

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- Model Based is here and you are already using the basic tools
- Be a Champion by garnering support and providing tangible outputs
- Grow sponsorship at the same rate as model based tools and processes mature
- Build excitement for model based by giving demonstrations
  - As capabilities increase provide updates to previous groups
- Build program support to push model based into production

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- Your feedback is valuable
- Don’t miss out on the chance to provide your feedback
- Gain a chance to win an instant prize!
- Complete your session evaluation now


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