TDP360 LLC

Barriers to Implementing MBD and MBE

Welcome!

Barriers to Implementing MBD and MBE

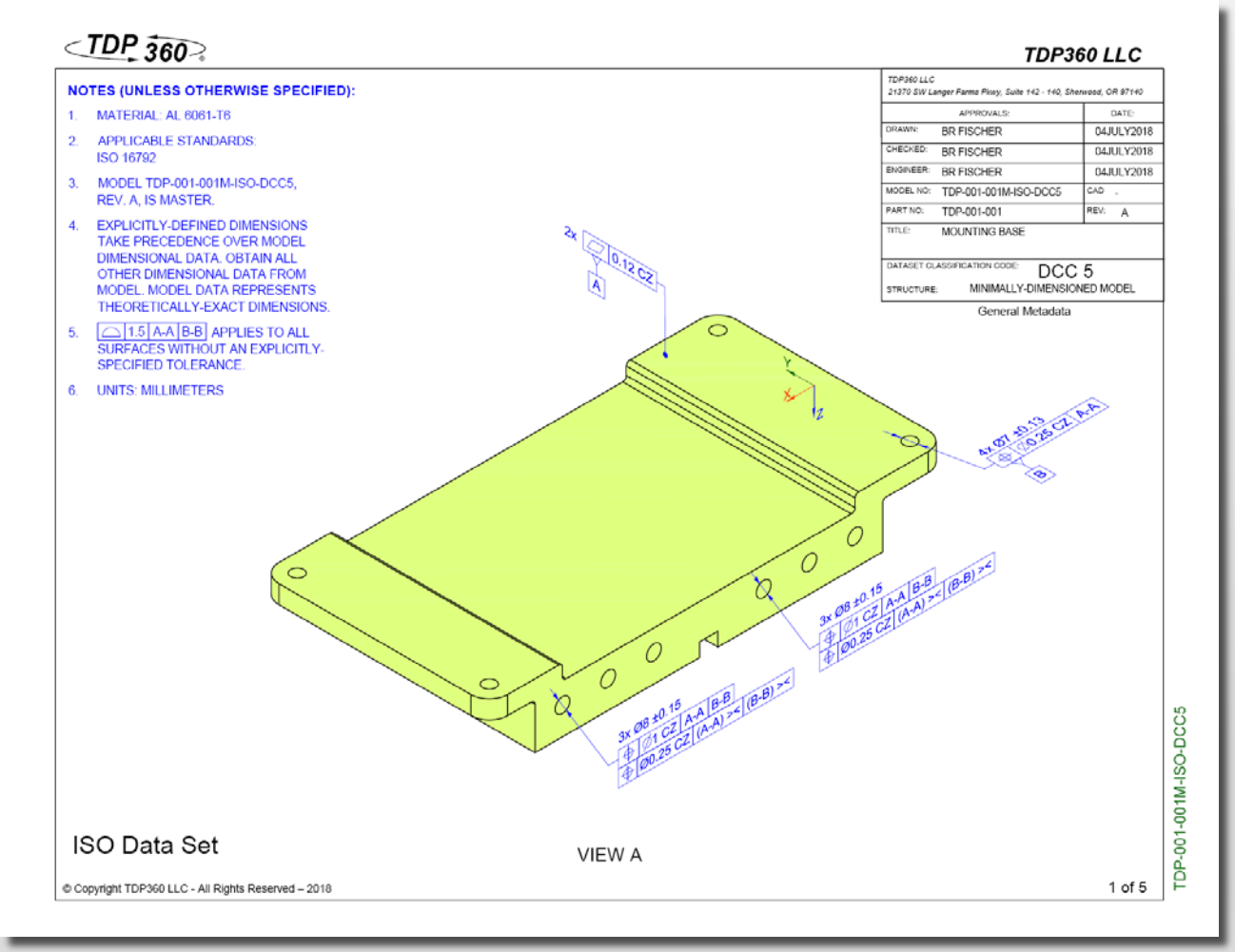
- MBD and MBE are hot topics
- Many implementations have been undertaken
  - Some may succeed
  - Some have failed
  - Some were abandoned
  - Most have underperformed
- To succeed,
  we must understand
  what MBD and MBE are,
  the benefits they offer,
  and the reasons to use them

Why MBD and MBE?

- The purpose of MBD is to support MBE
- The purpose of MBE is to
    - Increase productivity
    - Increase quality
    - increase throughput
    - Increase profit
    - Increase benefit to society
    - Through automation
      It's all about automation

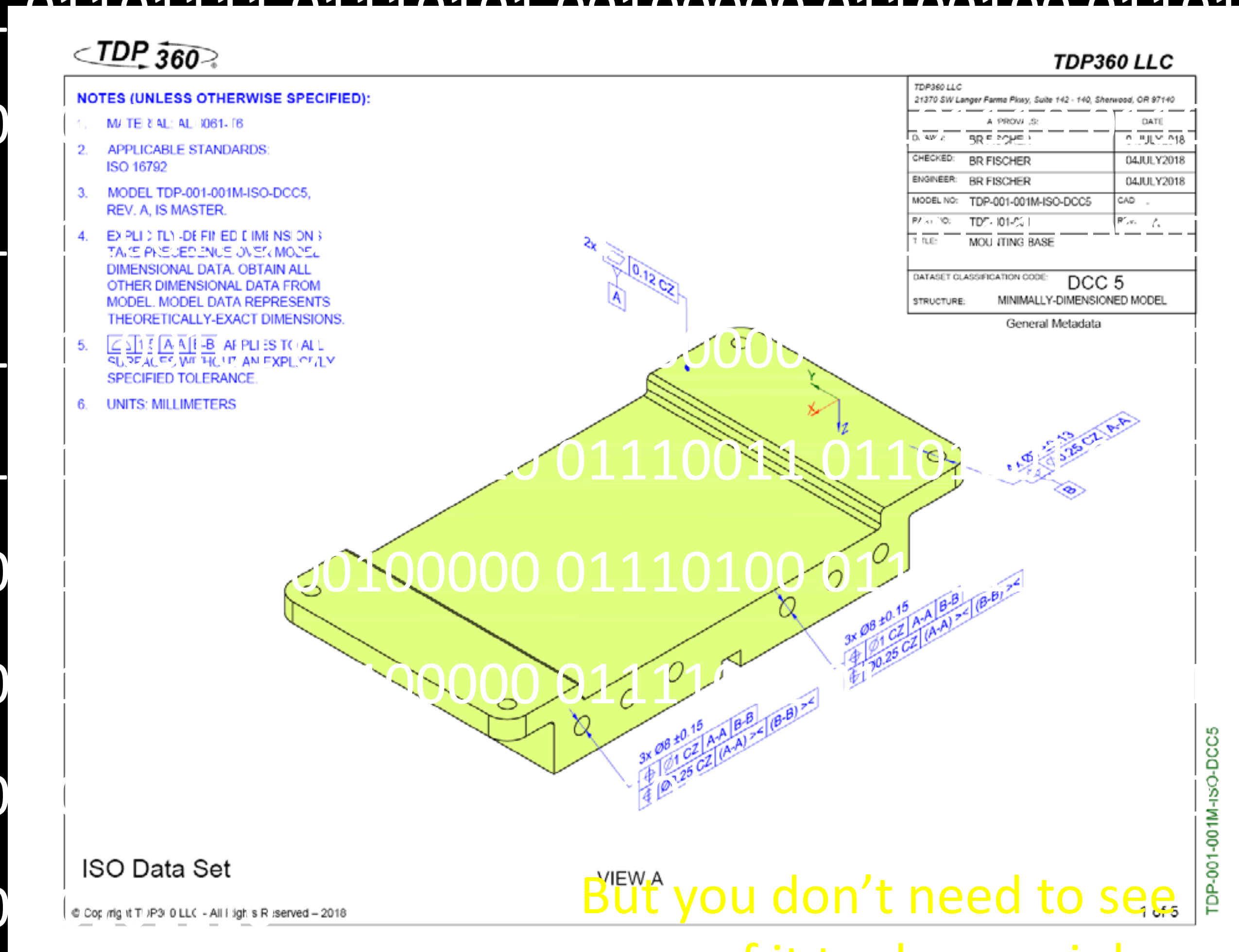
What Do MBD and MBE Look Like?

Dataset…?



Okay, it’s really something like this…

01011001 … 111
01101110 … 101
01100101 … 000
01110011 … 001
01101101 … 111
01101110 … 000
01100100 … 101
01110010 … 110
00101110



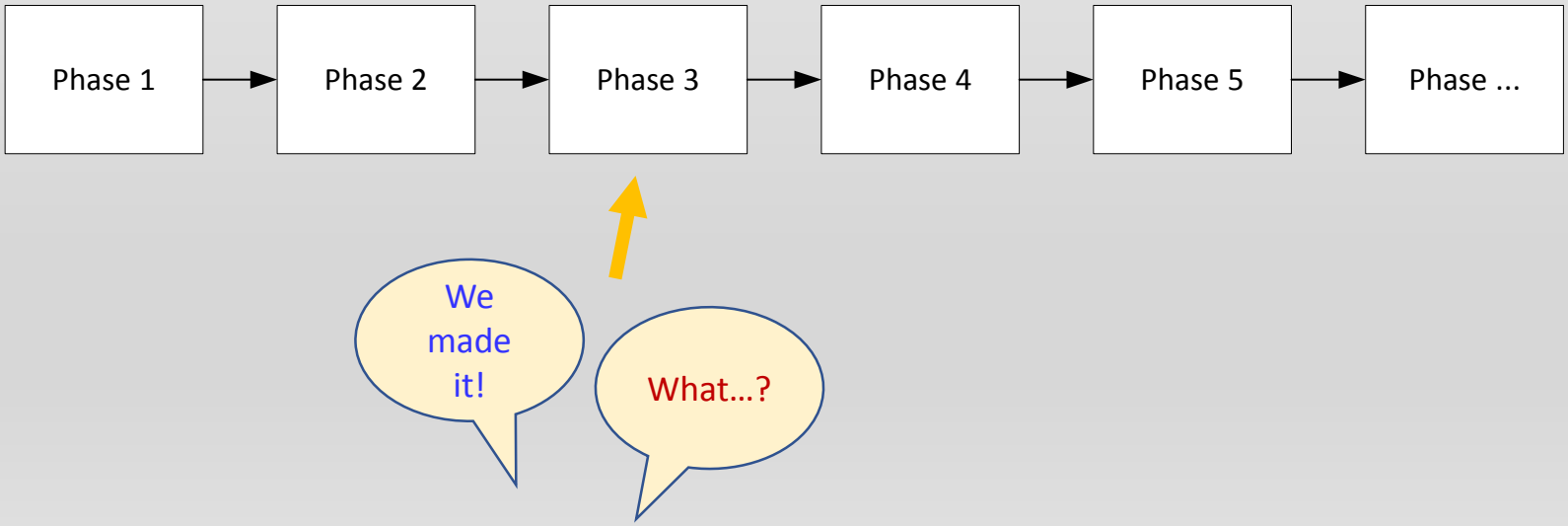
But you don’t need to see any of it to do your job

The Path Forward

- Future state
  - Data only
  - Finely-tuned, highly-automated processes
  - Bidirectional data flow & feedback
  - Very high productivity
  - People only do high-value-adding tasks
  - No persistent presentation
  - Represented data only presented temporarily
  - Anything less is incremental and falls short
  - Automation, Optimization, Productivity

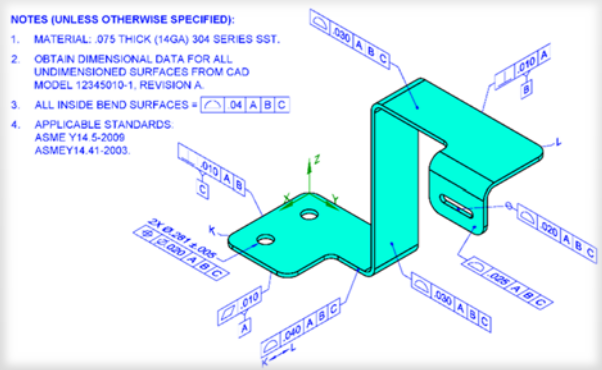
The Path Forward

- Stepwise and incremental transition from drawing- to model-based is appealing and makes sense,
- But, small steps are often mistaken for the goal and hinder progress
- Without the correct overall view, incremental steps are potential barriers



The Path Forward

- Recognize inefficiencies of presentation-based use cases and eliminate them from workflow ASAP
  - Presentation-based 3D use cases are incremental steps
  - All presentation-based use is a barrier
- The only use for presentation data
  - To be manually acted upon
  - To recreate data in a disconnected process
- Increased chance of error
- Drives derivative data, duplicate data, discrepancies, etc.

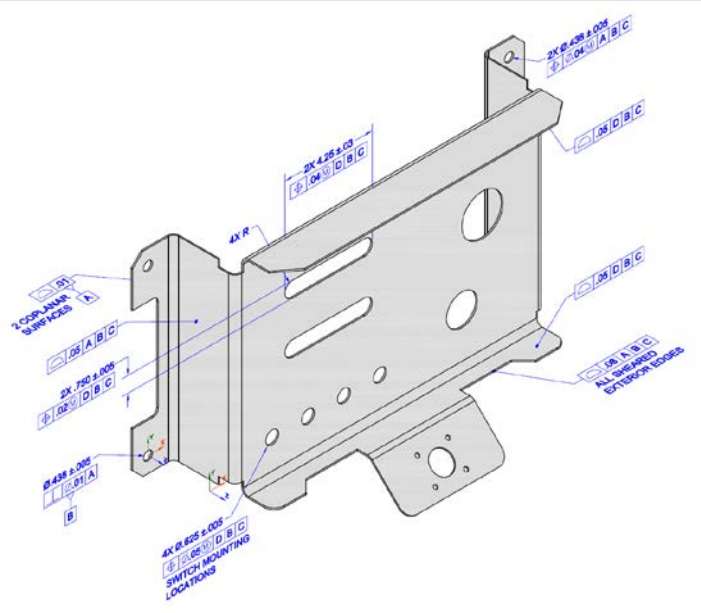


The Path Forward

- Many people have moved beyond thinking they need a drawing and now trust model geometry,

  But few people are willing to trust machine-readable specifications without presentation

- Why?



Necessary?

01011001 01101111 01110101 00100000 01100100
01101111 01101110 00100111 01110100 00100000
01101110 01100101 01100101 01100100 00100000
01110100 01101111 00100000 01110011 01100101
01100101 00100000 01100100 01101001 01101101
01100101 01101110 01110011 01101001 01101111
01101110 01110011 00100000 01110100 01101111
00100000 01100100 01101111 00100000 01111001
01101111 01110101 01110010 00100000 01101010
01101111 01100010 00101110 00101110 00101110

Okay?

Real and Perceived Barriers

- Software limitations
  - Current software optimized or configured for drawing-based workflow
  - Inadequate tools to semantically represent specifications
  - Inadequate tools to convert semantically-modeled specifications into other systems and formats
  - Inadequate tools to reuse semantically-modeled specifications
  - Inadequate tools to define model-based processes
  - Data reuse and interoperability issues
  - These are temporary issues and improving all the time

Real and Perceived Barriers

- Structural issues
  - Supply-chain complexities and rollout
- Regulatory hurdles
  - Work in progress
- Standardization issues
  - Current product definition standards are optimized for 2D drawings
    - Long history behind this
  - Many current 3D product definition standards are more aligned with presentation data – 3D drawings
    - Work is underway to rectify this

Real and Perceived Barriers

- Personnel and management issues
  - Inertia within an organization
    - Resistance to change
      - Preservation of presentation-based methods
        - “I can’t do my job unless I see dimensions”
        - “I can’t do my job differently.”
  - Ignoring productivity & quality losses in current methods
  - Difficult to see inefficiencies in the way we do things
  - Status quo inefficiencies are accepted, taken for granted

Real and Perceived Barriers

- Personnel and management issues (cont.)
  - Entrenched workforce, labor relations, etc.
  - Lack of leadership
  - Departmental MBx champions
  - Mid-level and upper-level management
  - True commitment at the highest level
  - Lack of authority
    - Changemakers must have authority
    - Cross-functional authority
    - To overcome trivial and short-lifespan objections

Real and Perceived Barriers

- Personnel and management issues (cont.)
  - Rewarding management and staff for the wrong metrics
    - Design: e.g. sheets/datasets released per month
    - Design: time spent per drawing/dataset
    - MB metric for design managers and staff is to measure the ability to reuse design data downstream
  - Design should be rewarded for the savings their deliverable enables throughout the product lifecycle
  - Downstream process managers should be rewarded for data reuse and useful feedback sent back upstream
  - Silos must be broken down for MBE to succeed…

Real and Perceived Barriers

- Misconceptions about the goals and benefits of MBx
  - Confusing short-term goals with long-term goals
  - Thinking benefits of interim steps are *the* benefits
- Confusing MBD and MBE
- Misunderstanding what MBD is and its purpose
- Inadequate benefits, savings, and ROI from pilot projects
  - Ties into misconceptions above

Understanding Barrier Timeframes

- How long will barrier last?
- Can we affect the timeframe?
- Mitigation and planning

Planning for MBD and MBD

- Plan path forward by starting at the future state and working backward
- Determine minimum steps to get there
- Work with staff, suppliers, solutions providers, customers to get them to the right place with the right vision
- Set expectations
- Identify barriers and plan for their removal

Discussion

Barriers to Implementing MBD and MBE

Thank You!