2015 International Forum on DFMA
Boothroyd Dewhurst
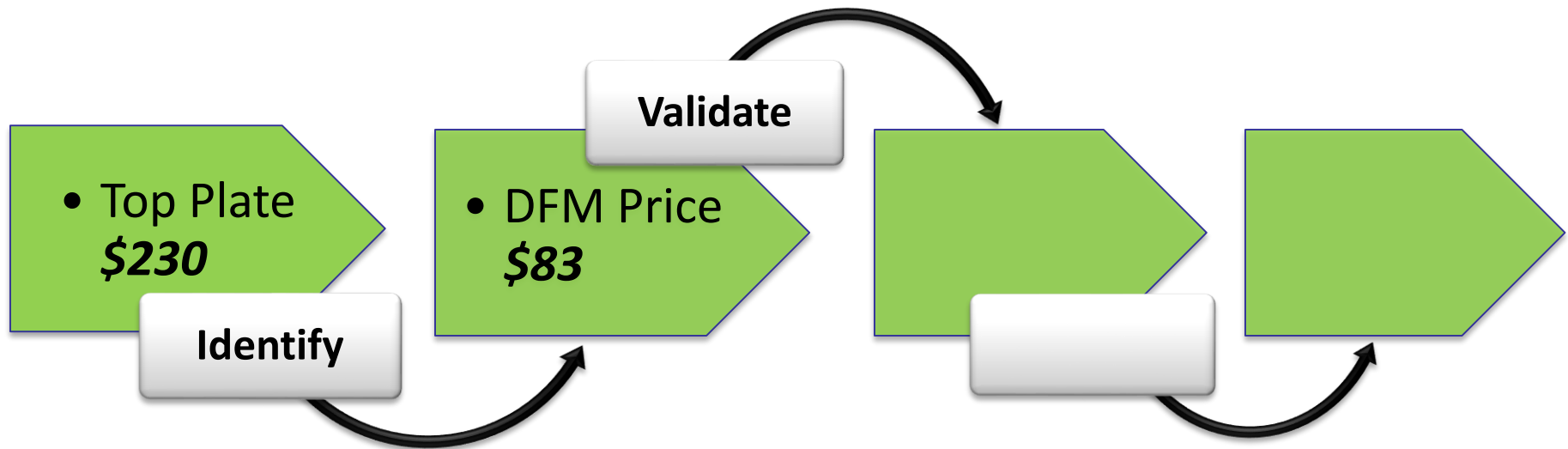
DFMA Integration into Supply Chain and Operations

June 3, 2015

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Sr. Director of Operations and Supply Chain

Agenda

- Supply Chain - Getting Started

- DFM Analysis

- Design For Manufacture – Cost Drivers

- Supply Chain Transformation

- Supplier Engagement

- Results

Supply Chain - DFM Process Model

Dynisco

Validate

- Top Plate **$230**
- DFM Price **$83**

Identify

- **Identify** – Size the opportunity, Price vs. DFM Price

- **Validate** – Accuracy of the DFM model & design cost drivers

The best opportunities originate in the design phase

Supply Chain – Getting Started

Dynisco

- Where to start?

  – Legacy designs

  – Existing / legacy parts managed by Supply Chain

  – Total Spend Opportunities - Volume X Price (Standard)

Identify (Parts):

- Dwg / Model

- Price (Standard)

- Yearly volume

- Batch / lot size

Validate (DFM Analysis):

- Identify cost drivers

- Suggestions to reduce cost

  – What else could perform function?

  – What would the alternative cost?

Supply Chain - Getting Started
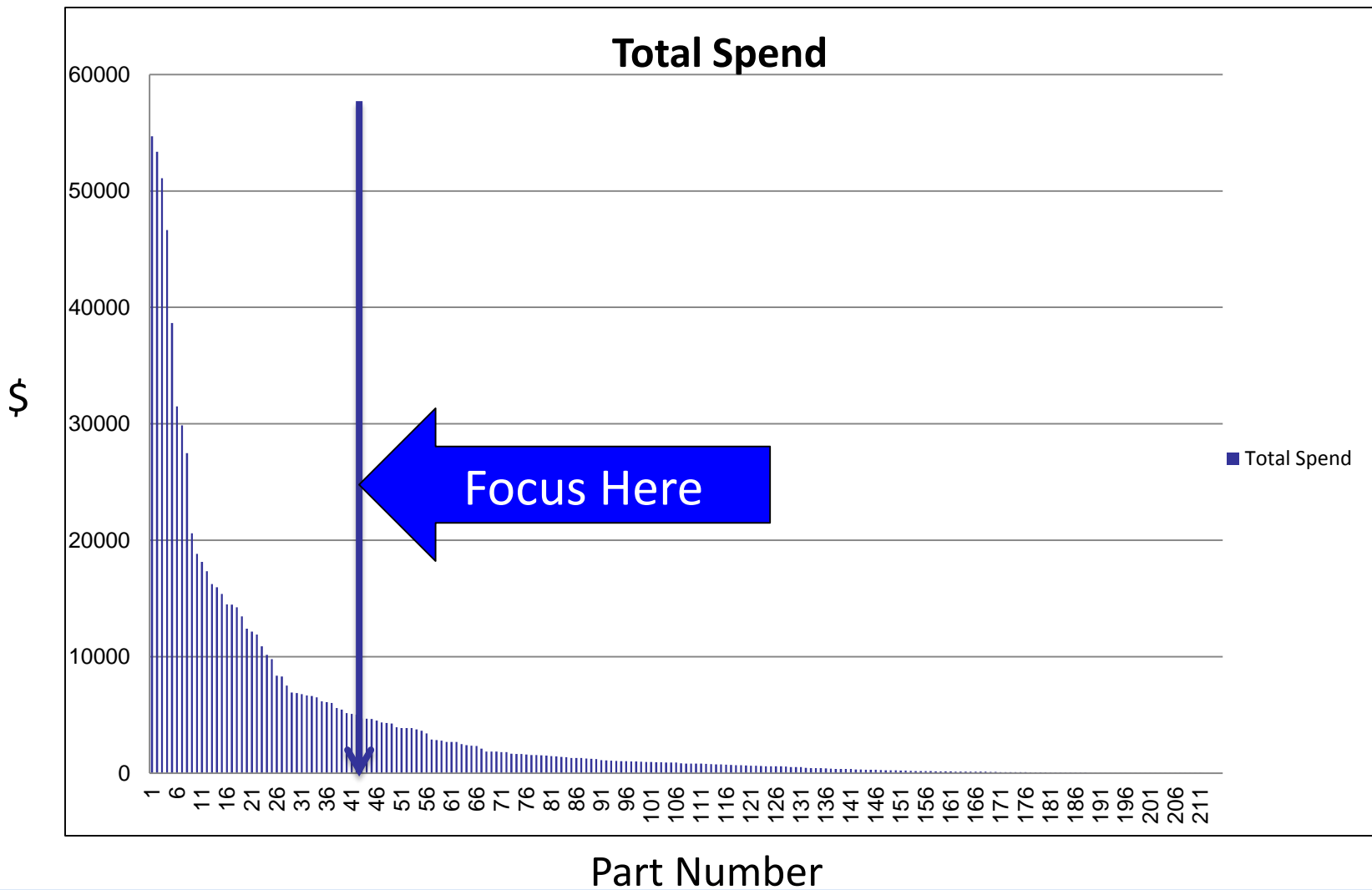
Top 80% of spend is reflected in 20% of parts

DFM Analysis – Material

DFM Analysis – Material

DFM Analysis - Setup

DFM Analysis - Processing

DFM Software - Extras

Design for Manufacture – Cost Drivers

- Modeling makes things easy....too easy?
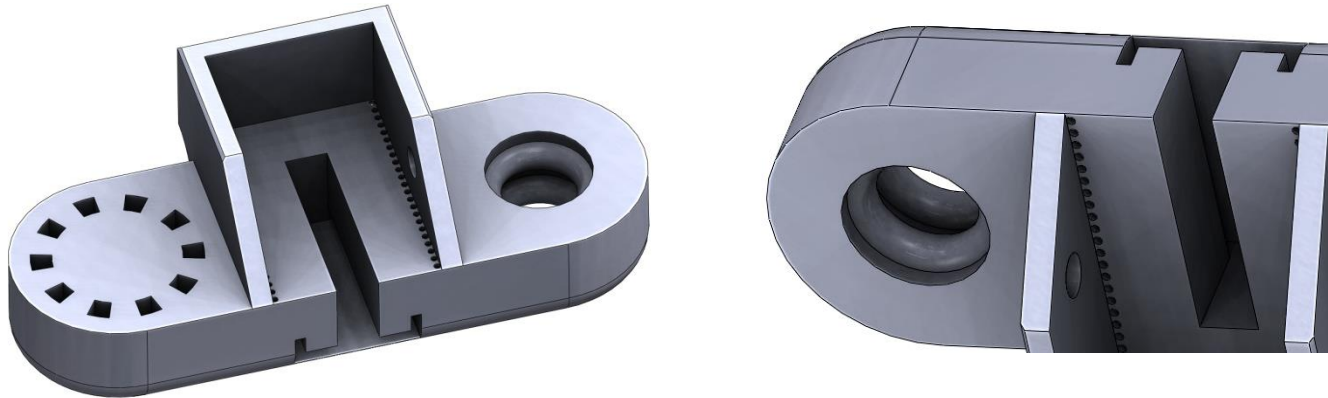
- *Just because you can model it, doesn't mean you can machine it.... And be cost effective*

Supply Chain needs to match supplier capability to design

Design for Manufacture – Cos Drivers

TOLERANCES UNLESS OTHERWISE SPECIFIED;

1. 2 PLACE DECIMAL ±.01
   3 PLACE DECIMAL ±.005
2. FRACTIONS ± 1/32
3. DRILLS   < 0.5 DIA   > 0.5 DIA   +.008 -.003
4. ANGLES ± 0.5 °
5. FILLETS R .005 MAX
6. EDGES R .005 OR CHAMFER MAX
7. PART TO BE FREE OF BURRS
8. ALL DIMENSIONS ARE IN INCHES.
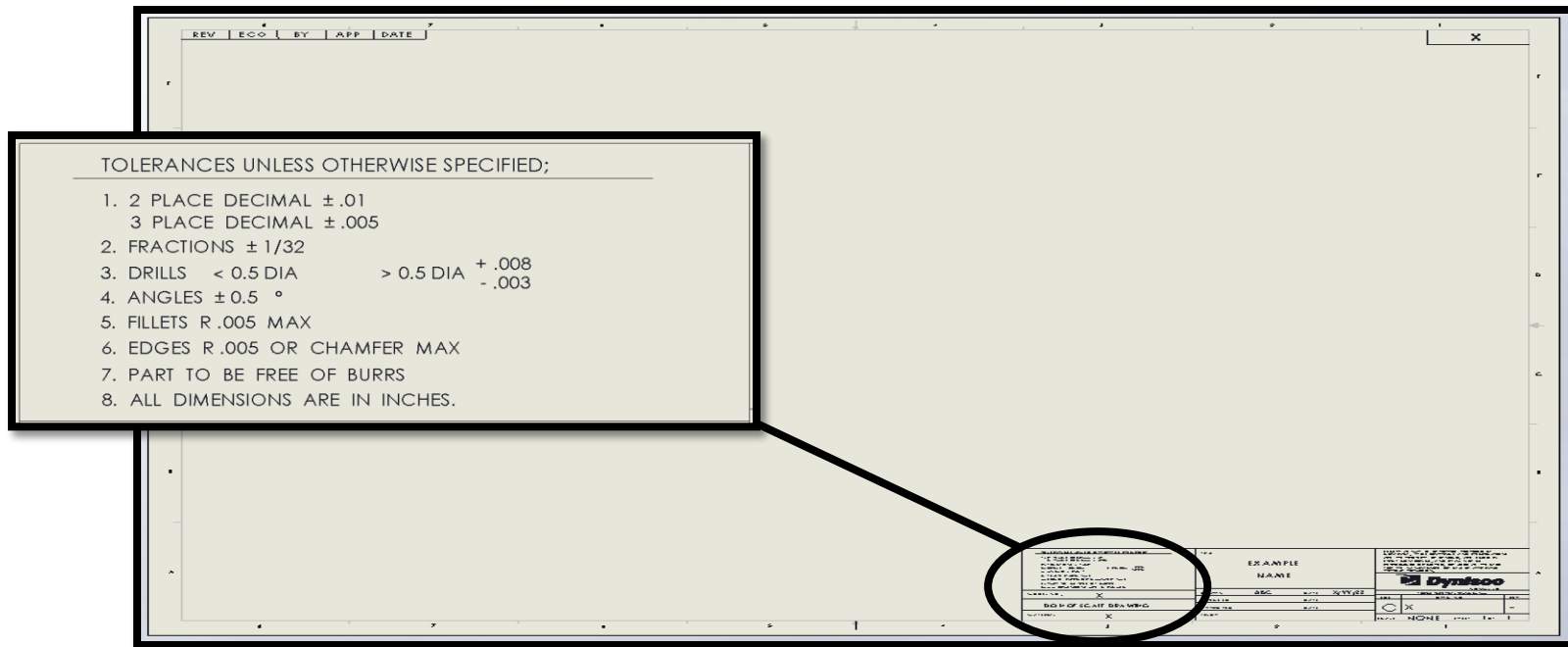
- Specified vendors (Engineering designated)

- Units of measure: Inch vs. Metric

- Metal standards based on geography

Be aware of design specifications that can drive cost

Design for Manufacture – Cost Drivers
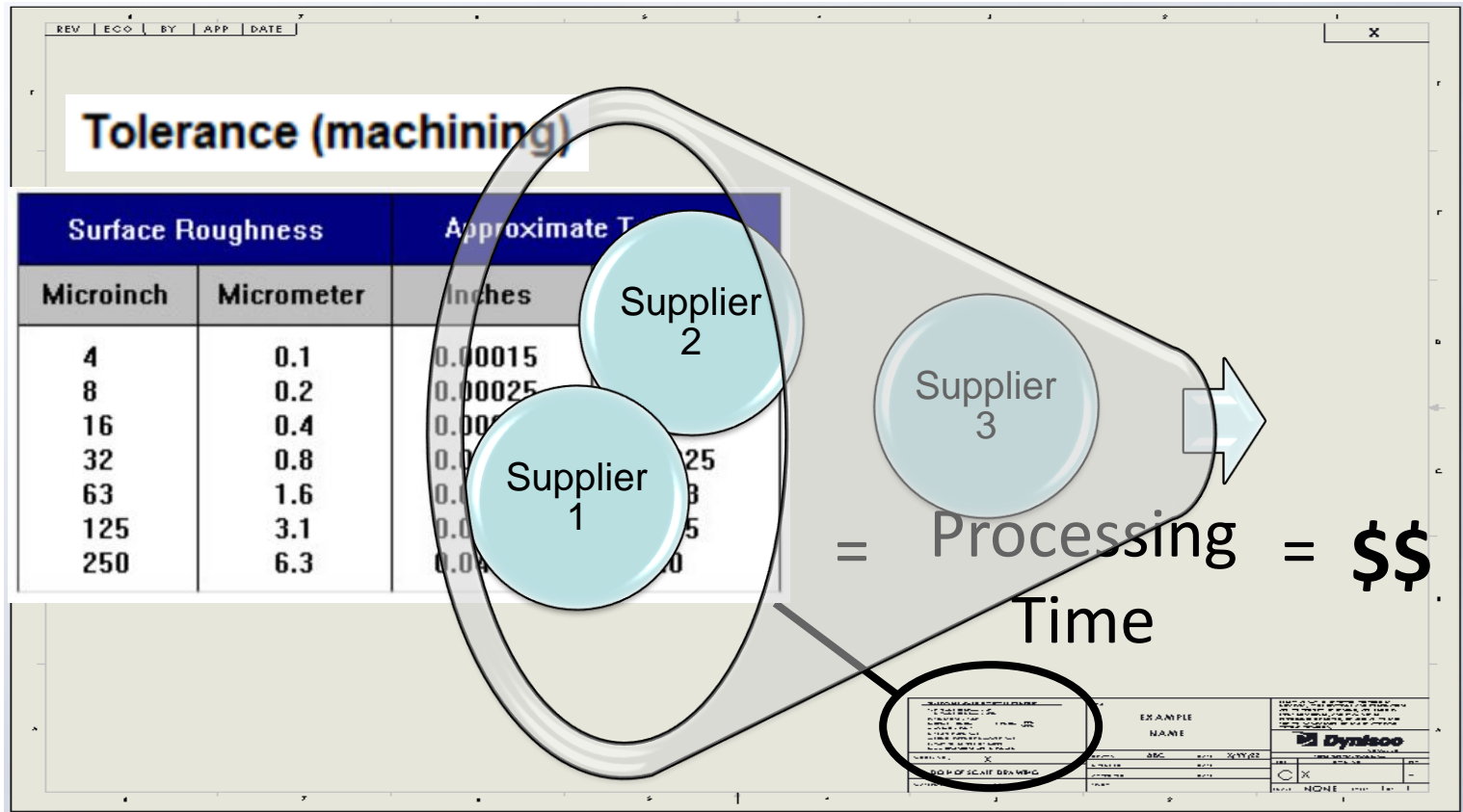
Limited Supply Base Funnel

Ensure finishes are aligned to function

Supply Chain - Transformation

Vertically Integrated

Supplier Dependent

Today's businesses are heavily dependent on supply chains

Supply Chain - Transformation

- Companies are seeking a new / different range of skill sets to support supply chain activities

- Placing more emphasis on supply chain analytics and less on keystrokes

Achieving more value through data analysis and decisions

Supply Chain – Transformation

Find ways to automate repetitive purchasing transactions

Supply Chain - Transformation

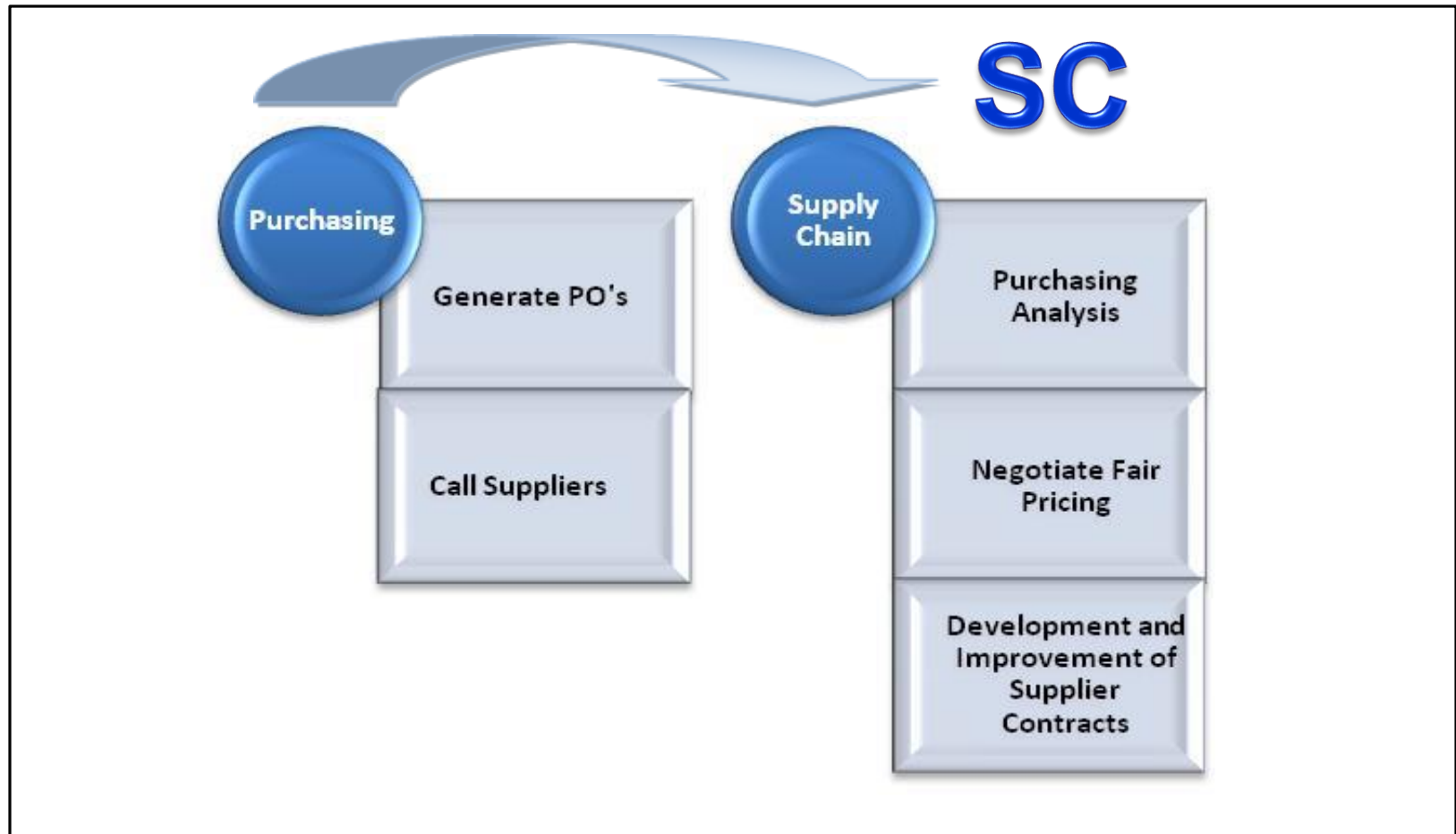- Discussion driven by historical information and cost reduction targets

- Very little information regarding mfg processes shared or discussed

- Primary communication – RFQs

- Value Add Value Engineering group supplies additional process information & DFM models

- Primary communication – Supplier Discussion
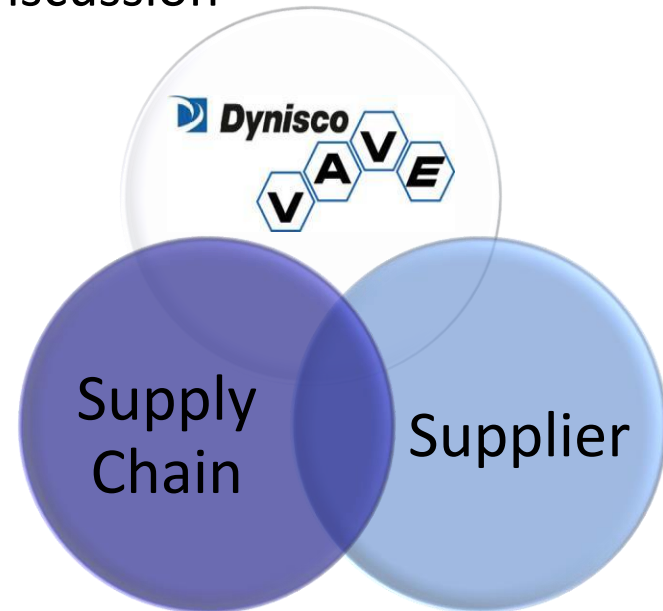
DFM data stimulates improved communications

Supply Chain - Transformation

Did I get a fair price ???

Supply Chain - Transformation

Better Information … Better Negotiations

Supply Chain – Transformation

Historical   Information   Present

Part Cost History

Standard Cost /
Current Cost

Vendor History

- **Material Cost**
- **Set up costs**
- **Process Options**
- **Quality**
- **Tooling**
- **Profit**

DFM brings discussion from the past to present

Supply Chain - Transformation

- In the early stages of DFM implementation, there are initial barriers to overcome
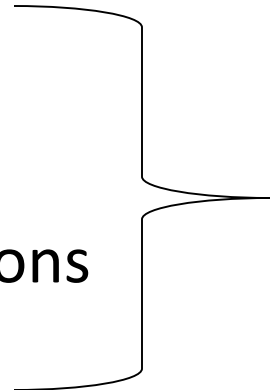
Minimizing negative perceptions is key

Supply Chain - DFM Process Model
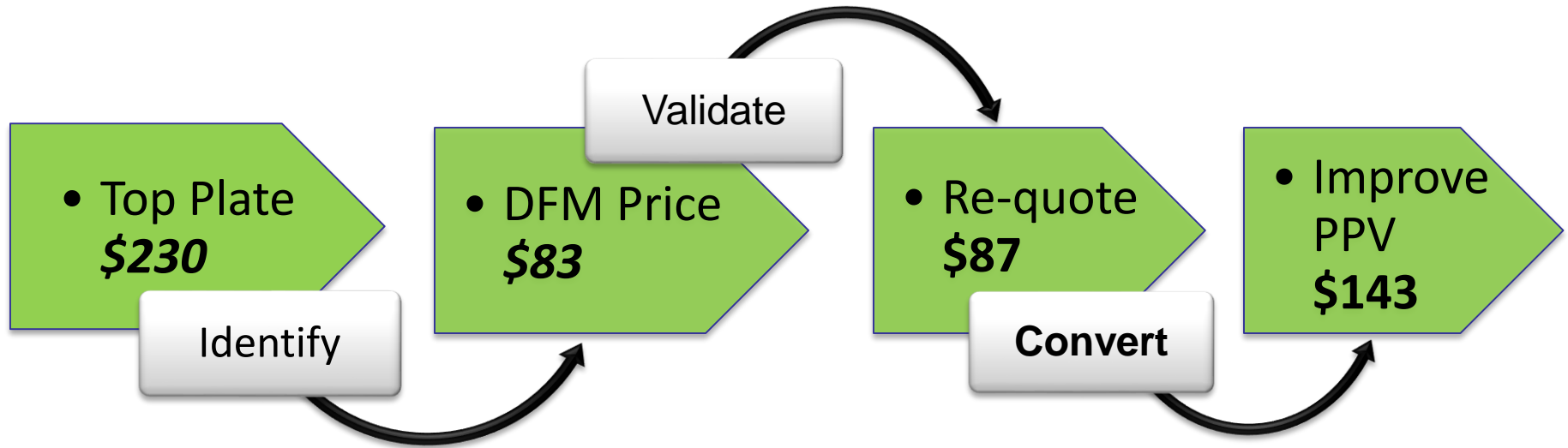
Convert – Engage suppliers

Move the focus from internal to external

Supply Chain – Supplier Engagement

Dynisco

- Start with a parts list

- Performed DFM analysis

- Review design and print specifications

- Obtain understanding on pricing

Supply Chain Homework

Suppliers (Initial responses)

- "Material price went up"

- We have held the price for "X" amount of time

- Analysis apprehension…validity   ($$$)

- **Red Flag**: Quote / Price is a "nice, round number" (**$230**) and a large gap exists when compared to DFM price

Supply Chain – Supplier Engagement

- 150+ parts

- DFM's completed

- Meeting Established

- Approach:
  - Non-adversarial
  - Discuss cost drivers / processes
  - Review DFM of "their" part(s)
  - Solicit supplier suggestions
  - Convey our message
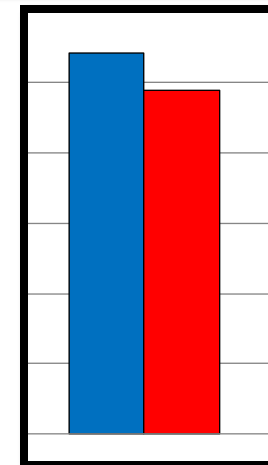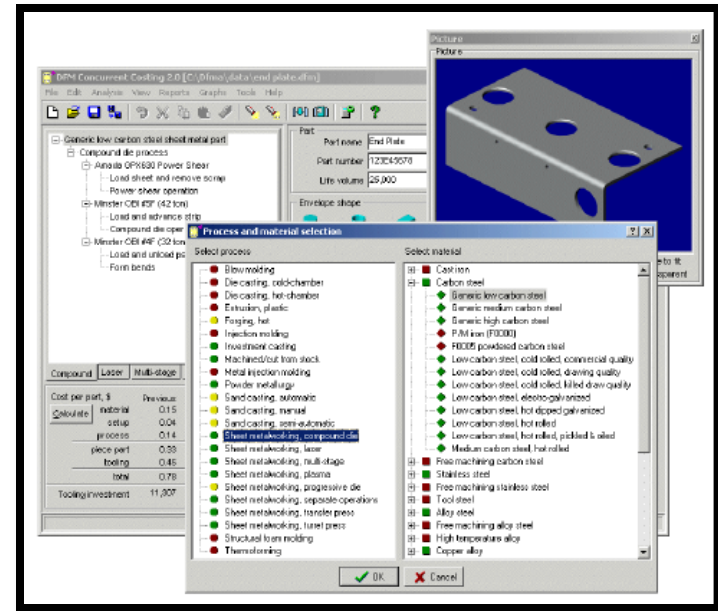
Std. vs. DFM $

Supply Chain - Results

- Over last few year's VMAS businesses have identified, modeled and evaluated over **$4.1M** in spend

- Over **$685K** or 17% of the spend was highlighted as savings opportunities

- Opportunities included modifications to designs, potential material substitutions, process changes and strait forward cost reductions *(being charged to much)*

Supply Chain - Results

Dynisco

Identified $925K of spend to review

Generated DFM models for comparison

Actual pricing 2% better than DFM cost models
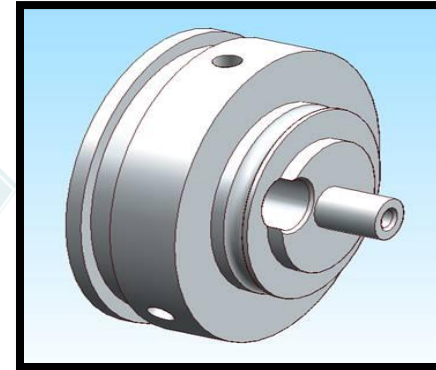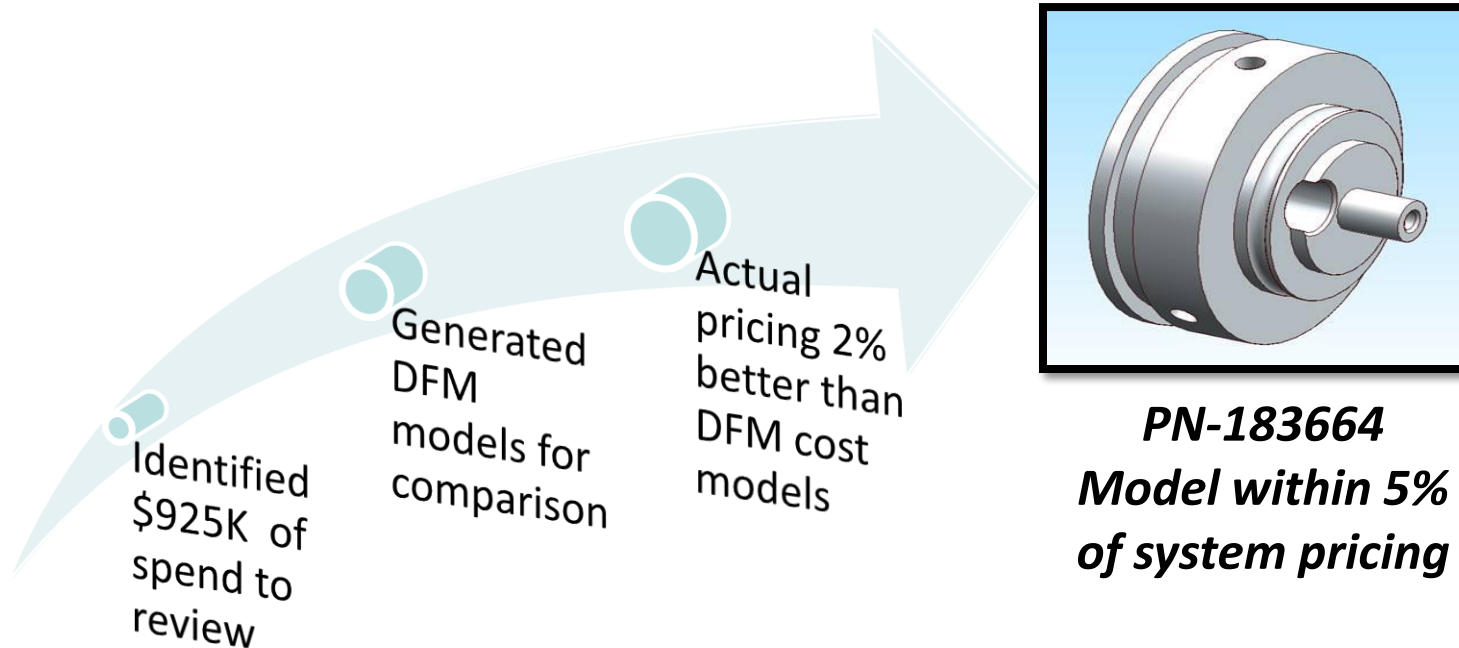
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Model within 5% of system pricing

Validated that SC was achieving fair pricing

Supply Chain - Results

Dynisco

Burst plug Configuration	Usage	Lot size	Std	DFM Pricing	Actual Pricing
1	875	100	$	-30%	-26%
2	6	6	$	-81%	-79%
3	1	1	$	-41%	-46%

Burst Plug Bookings (units)

18% increase in Q1 Bookings

2014
2015

Jan   Feb   Mar
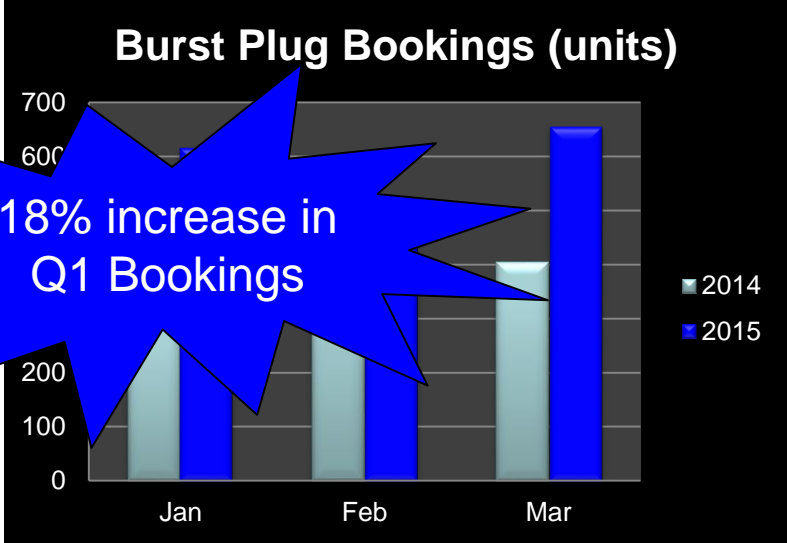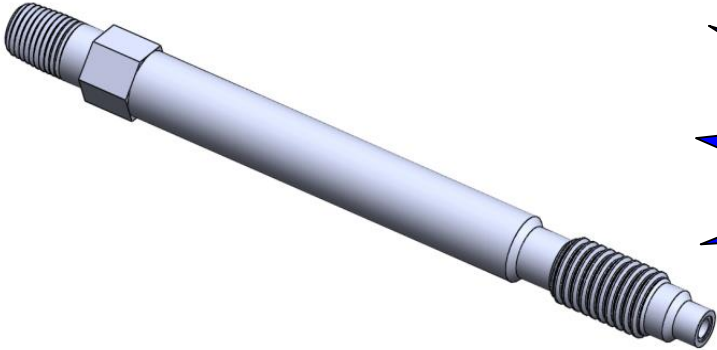
DFM played key role in increased bookings

Supply Chain - Closing Remarks

- DFM is not specifically designed for cost reduction alone

- It can be utilized to validate pricing in addition to negotiating better pricing based on manufacturing analytics

- DFM helps supply chain organizations move forward and improves the value that individuals can bring to the business

- DFM has been a key tool within Dynisco to help develop better supplier relations and weed out suppliers whom we don't want to do business with.

Suppliers participating in process have seen more business

Questions on DFMA Integration into Supply Chain and Operations?

Thank you