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Less Is More:
Getting More From The Same Resources

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ENGINEERED FOR LIFE

How do you get more
out of the same resources?

Courtesy of Accenture Corporation

Economy and Industry

2008 - PRESENT

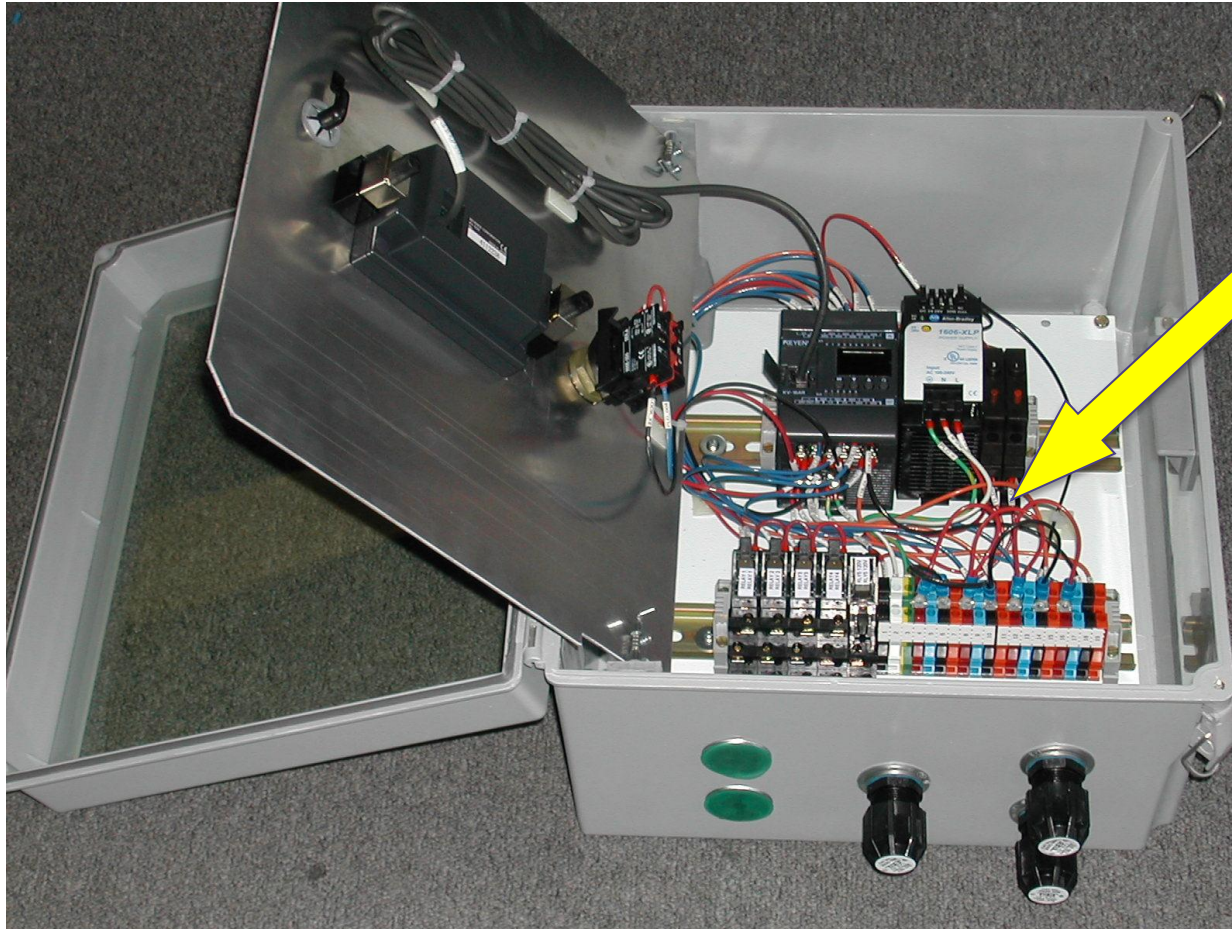FORECLOSURE

Hire Me!

CLOSED Out of Business

BANK

Economy and Industry

- **Businesses <u>learned to compensate</u> for the loss of resources**

- **Advanced manufacturing technology:**
  - **Played major roll**
  - **Technology businesses boomed**

Trying to utilize technology to compensate for "inefficient-to-manufacture" products:

CHAOS!

Effects of product design and business

Find where the waste is located

Effects of product design and business
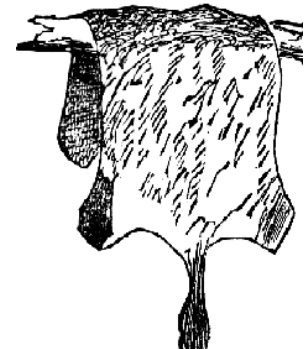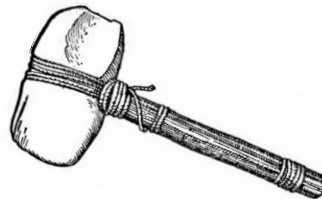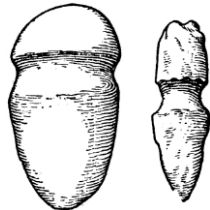
You don't need to do it!

- No don't need to redesign the whole product to make a difference

- Run DFA analysis to find where the biggest hurt is

- Small chunks can mean significant results

Efficiency impacted by design

Manufacturing:

1. Acquire materials

2. Add value

3. Trade results

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Product cost distribution

MATERIALS 72%

LABOR 4%

OVERHEAD 24%

Typical at Final Assembly
Data Source: Boothroyd Dewhurst, Inc., Wakefield, RI

Overhead and the *hidden* costs

- Some hidden costs:

  - Material planning
  - Material procurement and expediting
  - Supplier support
  - Material receiving
  - Quality assurance / inspection

  - Material handling
  - Stockroom & material staging
  - Work order material fulfillment (kitting)
  - Fabrication tooling

Waste and efficiency

(Manufacturing) Efficiency

ef·fi·cien·cy   *noun*   \i-ˈfi-shən-sē\

" … the ability to produce a product using the fewest resources possible … "
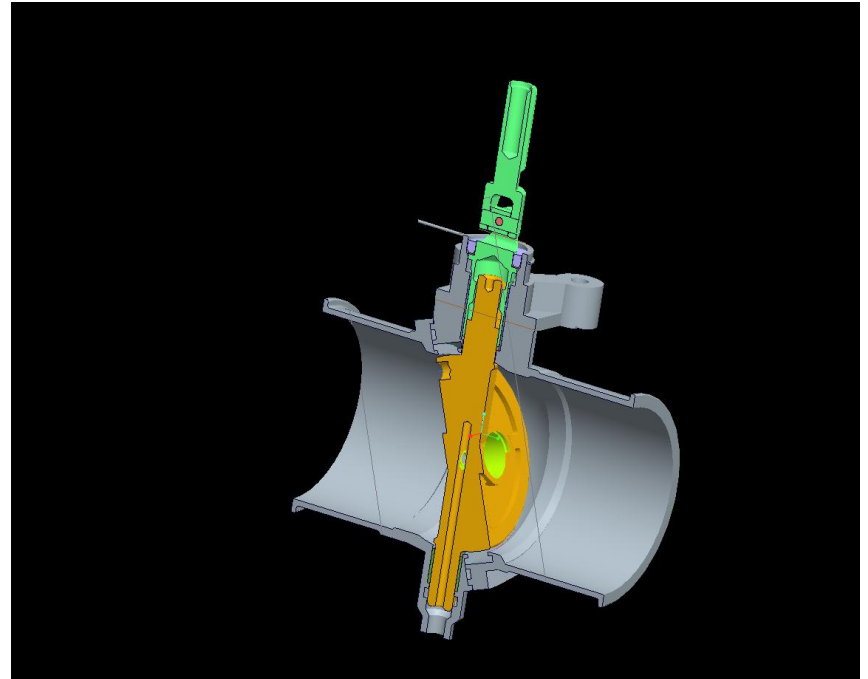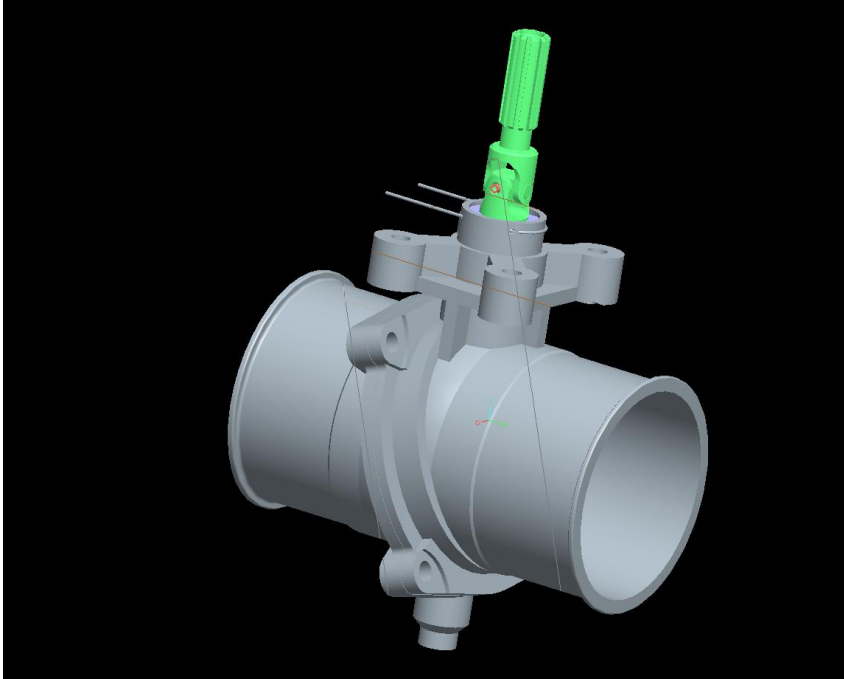
Waste and efficiency

Use of DFA Analysis

- Best practice: eliminate production **waste** BEFORE a design is released
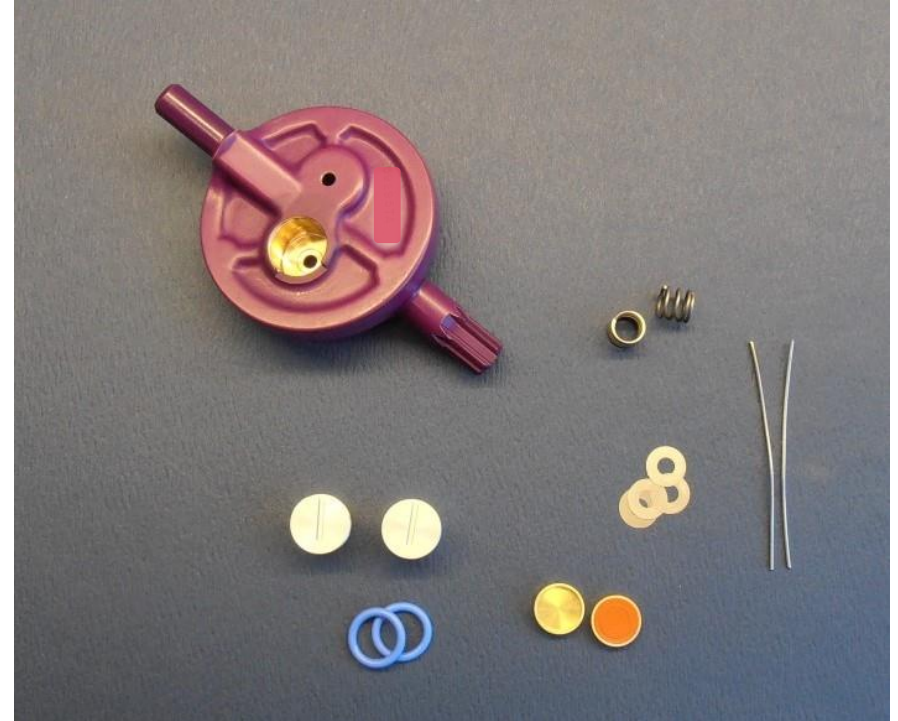
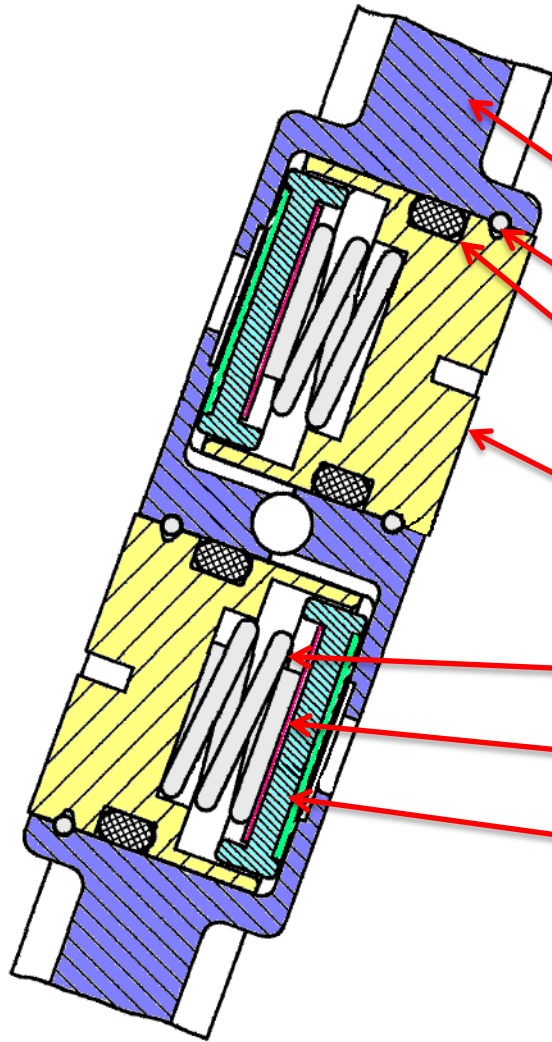# Example

Valve top assembly level

Example

Valve Disc
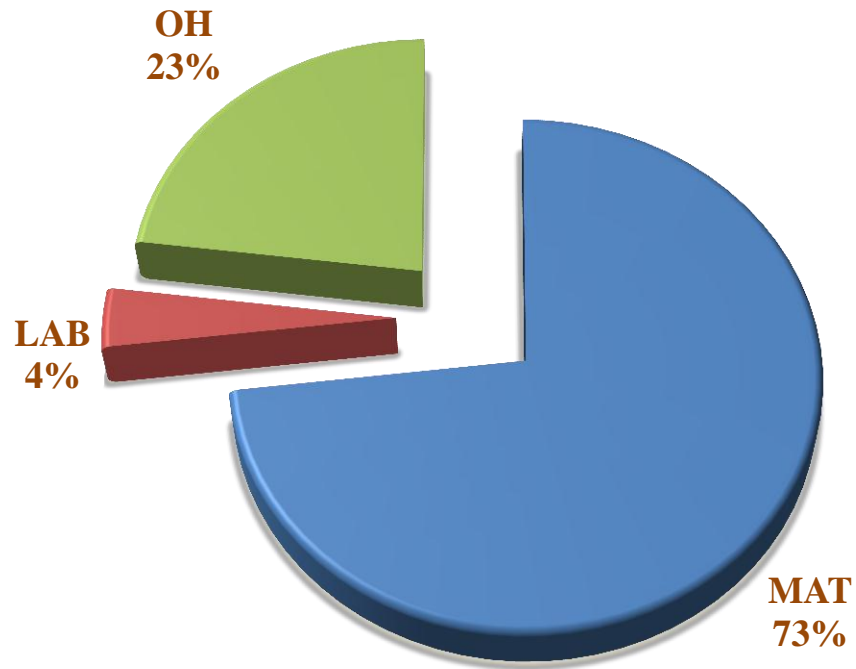assembled

Valve Disc
part count = 15

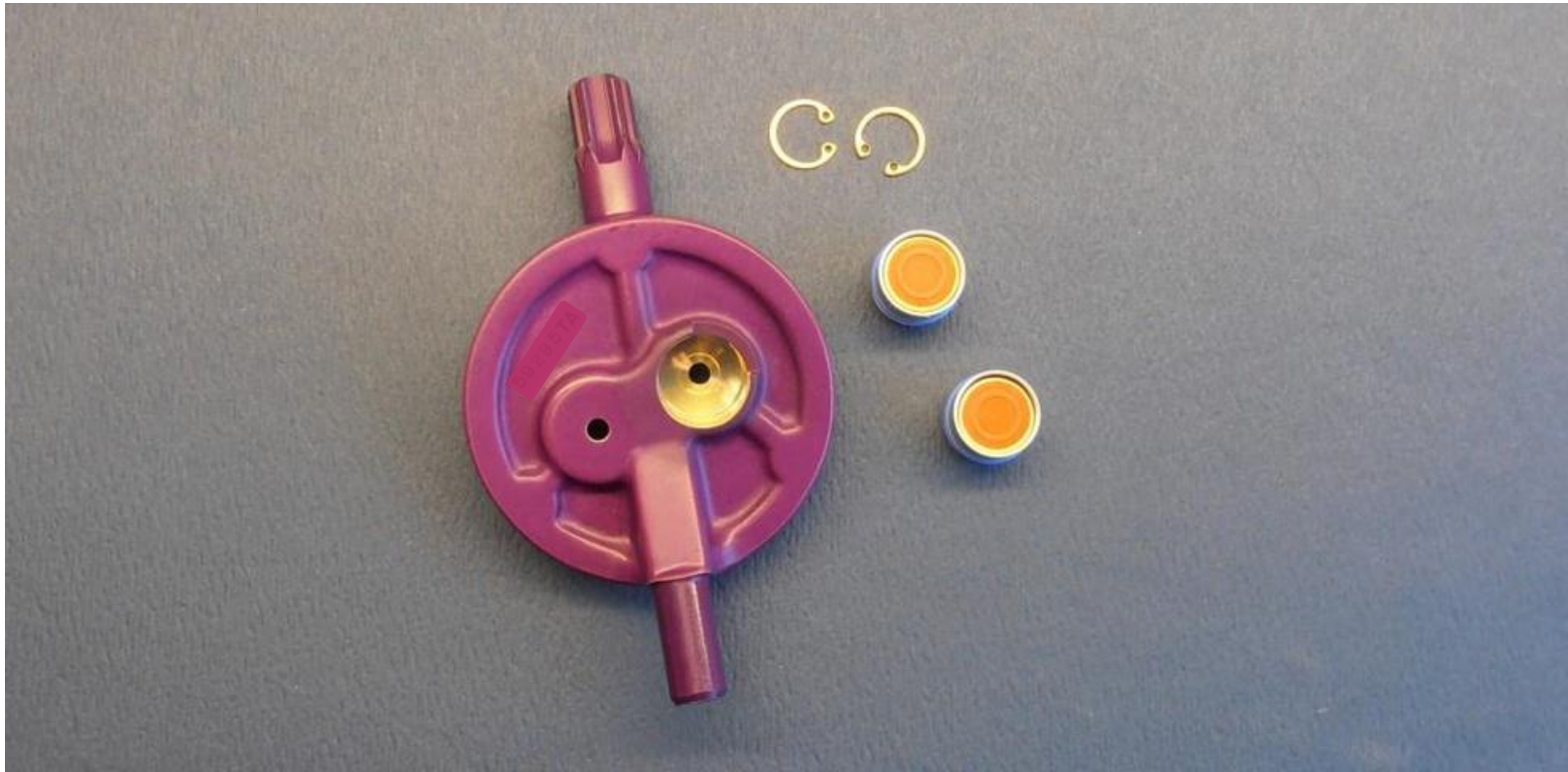# Example

Cross section drawing

- Valve Disc
- Retaining wire
- O-ring seal
- Body / Retainer
- Spring
- Washers (shims)
- Poppet assembly

Example

Valve Disc Assembly Cost distribution
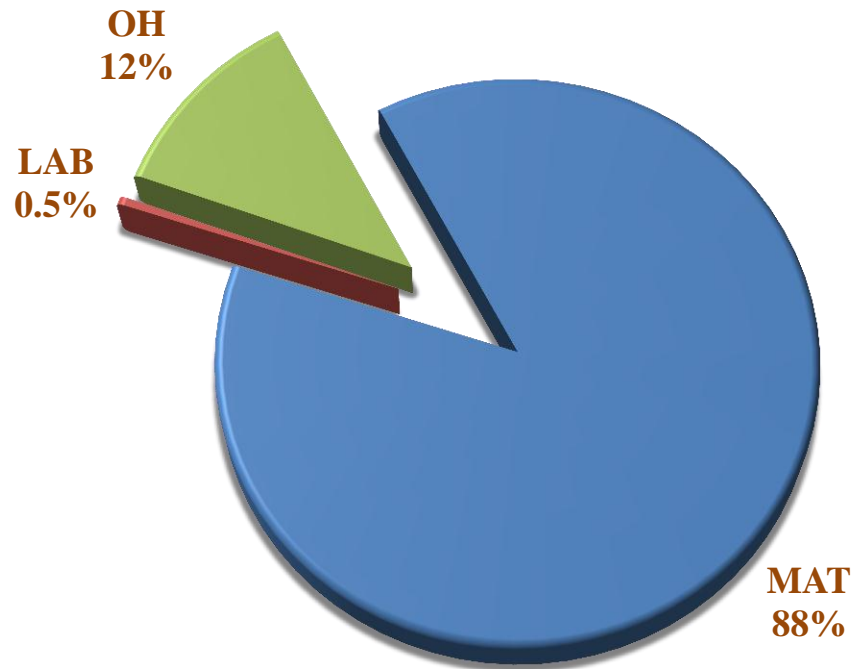at final assembly level

Example

Redesigned subassembly and it's parts

Part count was 15 ~ now 5

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Example

Valve disc subassembly redesign
cost distribution at final assembly

Example

Subassembly improvements resulting from the DFA analysis and redesign:

- **67%** Subassembly part count reduction
- **90%+** Subassembly time reduction
- **50%** Indirect enterprise support reduction
- **22%** Subassembly cost reduction

Efficiency & hidden cost

DFA analysis and redesign

- <u>Material</u>
  - Part count reduction
  - Cost growth ~ $10
  - Material velocity increase - HUGE

- <u>Labor</u>
  - Touch labor reduction – HUGE
  - Use of labor is much more efficient

- <u>Overhead</u>
  - Operations support cut in half
  - Worth ~ $55K annually

Efficiency & hidden cost

DFA analysis and redesign

- 1 or 2 projects per month

- Less chaos and stress

- Better utilization of resources

Doing more with less resources

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