# How did we make this so much harder than it really should be?

or

# An Optimist's Outlook on the Impact of Specifications

**Thursday May 12, 2011**

FACTON
INNOVATIVE COSTING

# Agenda

- Introduction
- **What Happened?....a Nightmare**
- Product Development's role in total cost
- Examples
- Ideas to Think About

# The Result of Years and Years of a Failed Business Model…..

**Short Term Financial Focus**

- Trade Issues
- Regulations
- Fuel Prices
- Credit Crunch
- Volume Reduction
- Market Share Shift
- Inflexible Specifications
- Restructuring
- Workforce Reductions
- Major Talent Drain
- Supplier Rationalization

- Increased Number of Models
- Volume per Model Reduction
- Reduction in No. of Plants
- Product Complexity
- Shorter Lifecycles
- Flexibility

**Current Economic Environment**

**Global Industry Capacity in 2008= 85 Million Units**
**Global Industry Demand = 63-70 Million Units**

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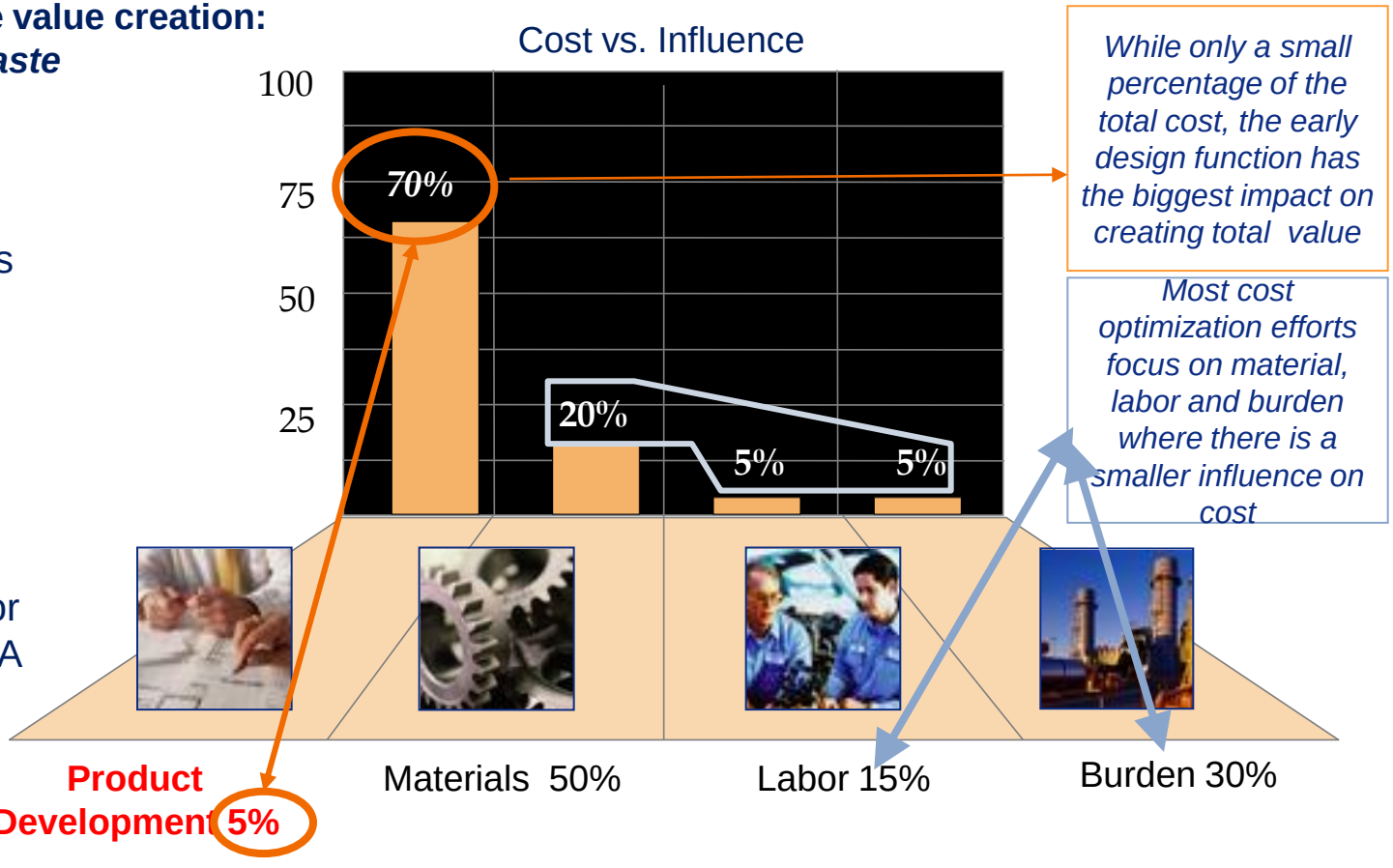
# Why is Product Costing Important?
## *Are you Designing to Cost or Costing a Design?*

**The long term goal for sustainable value creation:**
***Design out the cost and reduce waste***

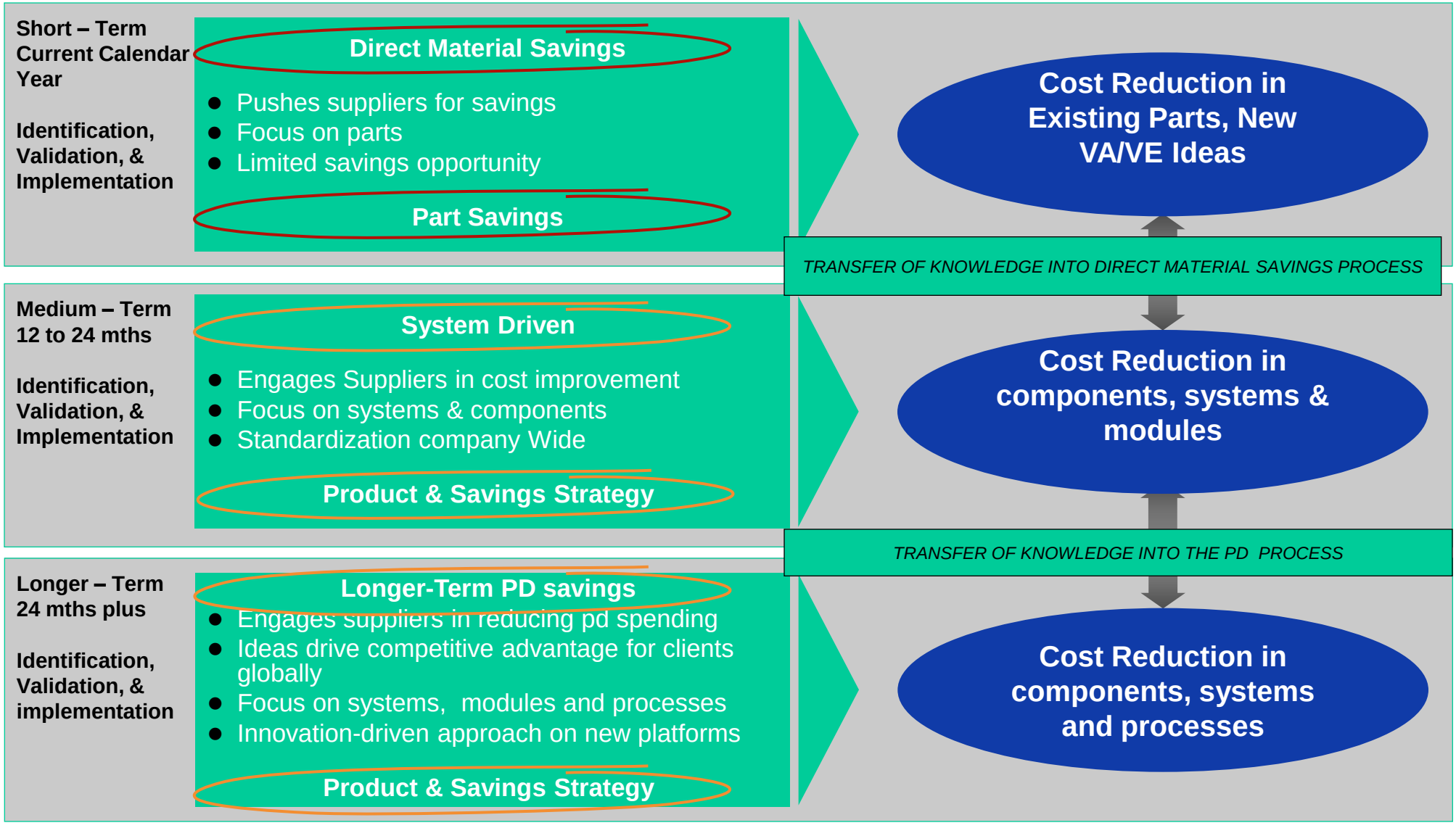
- Design out complexity
- Target Costing
- Specification, Part and Process commonality are key to cost optimization
- Constant review of the Bill of Material and Bill of Process integration
- Common theme: combine functions, reduce complexity or eliminate non-value add: MUDA




Typical Perceived Cost Driver

# The Impact Issue:

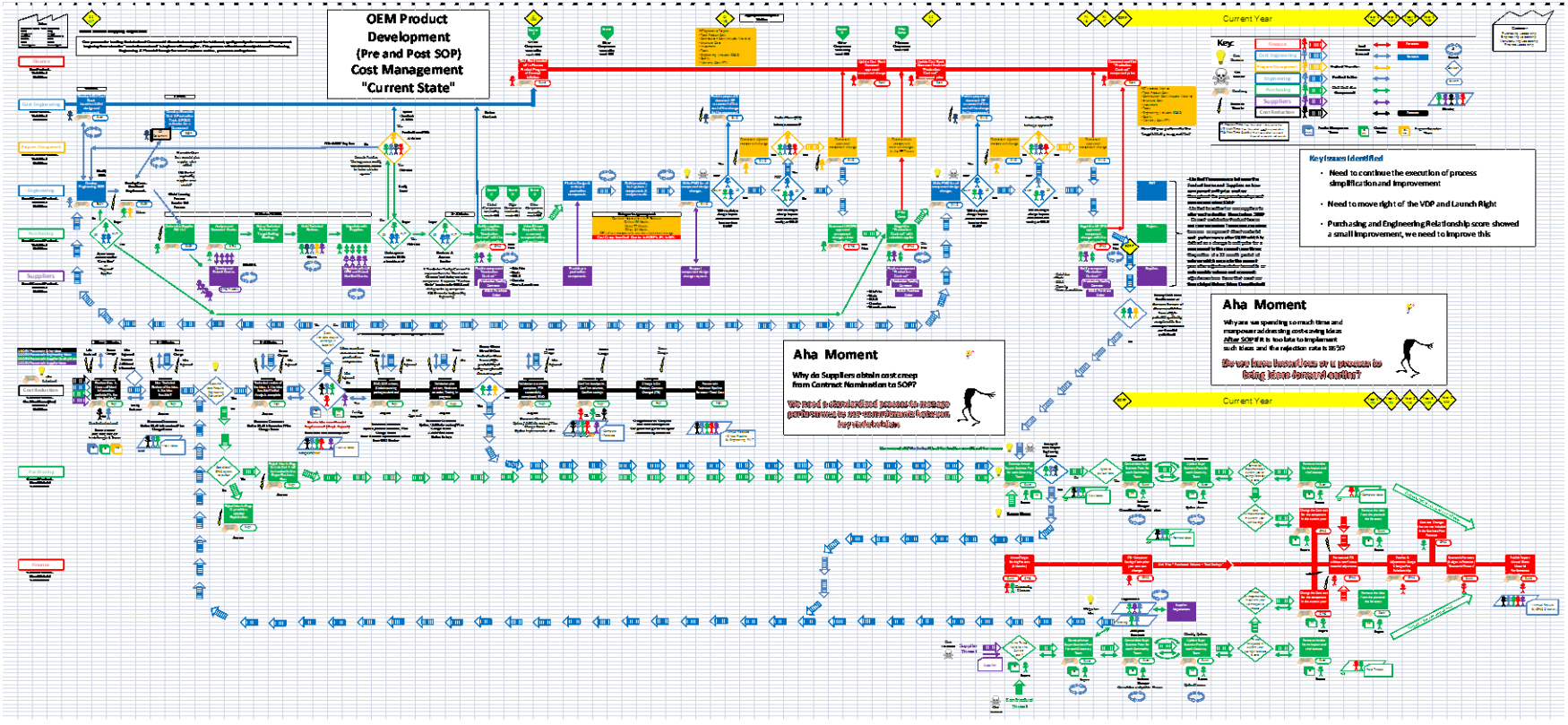
## Most firms have a 12 Month Window on Cost Reductions, not a Long Term View on Value Creation



# Engineering's Role in Designing in Cost

## Example of a Automotive OEM process today

Material Specs
Defined here




Material Specs Changes
in the Cost Out Process Here

**Results: lack of cost transparency from contact award to SOP. Leading to significant cost creep that only a small portion will ever be recovered in production**

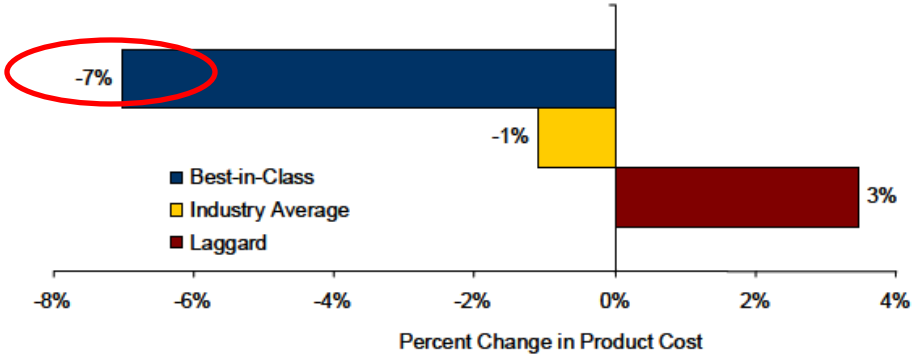
# What Impact Do Requirements have on design?… Aberdeen Report December 2010

**Table 1: Top Design Strategies Companies Are Attempting to Implement, Without Success**

| Rank | Design Strategy | All Respondents |
|---|---|---|
| 1 | Design for cost | 43% |
| 2 | Requirements driven design | 41% |
| 3 | Design for manufacturability | 35% |
| 4 | Design for quality | 34% |
| 5 | Design for usability | 34% |

Source: Aberdeen Group, November 2010

**Figure 3: The Best-in-Class Enjoy Significant Cost Reductions**




## How to Successfully Increase Visibility into Cost Drivers

To successfully execute the strategy to increase visibility into cost drivers, the Best-in-Class possess the capabilities seen in Figure 5.

**Figure 5: Best-in-Class Processes for Better Decision Making**

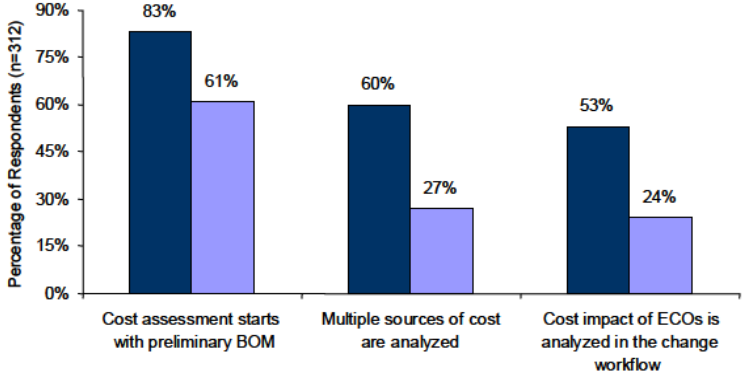
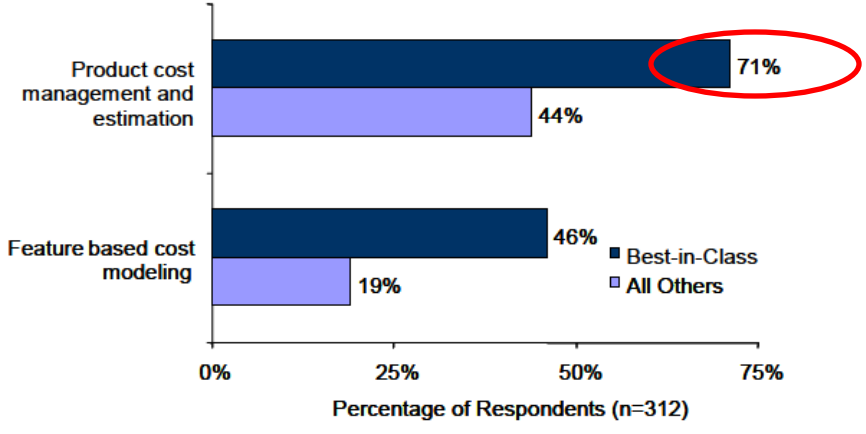



**Figure 6: Best-in-Class Technology Enablers**




Source: Aberdeen Group, November 2010

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# Example of How Inflated Volume Projections Act as a Specification Cost Driver

**Our Observations**

- Lack of transparency/consistency into the following:
  - Lack of expectation setting with supplier is to understand cost structure and process
  - Significant difficulty in locating the most current information pertaining to costed BOMs
  - Unrealistic volume drove requirements for 2 plants and doubled the program tooling and gage requirements
  - Supplier had to validate 2 locations
  - Supplier had mix and workload balancing issues
  - Supplier had training and FTQ issues due to inaccurate forecasts and demand planning/release schedules
  - Due to the recent reductions in force, engineering has little experience in cost, purchasing has little experience and lack of cost data in specific commodities and the suppliers have the competitive edge in knowing their costs vs. OEMs
- Suppliers are adding hidden cost burdens based upon inflated volume estimates

  - Facton found a minimum of 3% penalty to this OEM, per harnesses, based upon the inflated volumes presented to Suppliers during the Quoting Phase to the POS Process
  - Issues around forecasting Accuracy/Quality
  - By moving production to 1 supplier plant, not the 2 in the POS, netted over 3% in total costs savings

| Example of Volume Discrepancies driving up Total Costs up Total Costs | CY:2012 | Notes |
|---|---|---|
| OEM | 135,000 | RFQ forecast, original 2008 program was estimated at 160K/year at 160K/year including China |
| Forecast A | 0 | Assumption: Platform was cancelled |
| Forecast B | 95,500 | Assumption is that the program stays and the program is converted to a program is converted to a global platform or new D segment in segment in 2013/14 timeframe |

# Example of a Total Landed Cost Analysis
# Ductile Iron Cast Part

| | Cost per Part | | |
|---|---|---|---|
| | Best | Likely | Worst |
| **SUPPLIER COSTS** | | | |
| Material | $3.42 | $3.48 | $3.87 |
| Setup costs | 0.14 | 0.21 | 0.22 |
| Direct labor costs | 1.83 | 4.48 | 4.97 |
| Indirect labor costs | 0.62 | 1.32 | 1.77 |
| Processing costs | 1.10 | 1.62 | 1.91 |
| Scrap cost | 0.65 | 0.49 | 0.75 |
| Tooling | 0.11 | 0.14 | 0.20 |
| Total Manufacturing Costs | 7.87 | 11.75 | 13.69 |
| Operating | 0.44 | 0.77 | 1.01 |
| Warranty & Customer Service | 0.82 | 0.50 | 0.66 |
| Logistics | 1.27 | 0.13 | 0.17 |
| Total Supplier Costs | 10.40 | 13.15 | 15.52 |
| Profit | 0.90 | 1.10 | 1.10 |
| Total Supplier Cost & Profit | 11.30 | 14.25 | 16.62 |
| **BUYER COSTS** | | | |
| Operating | 0.78 | 0.41 | 0.53 |
| Warranty & Customer Service | 0.28 | 0.16 | 0.14 |
| Logistics | 0.21 | 0.08 | 0.12 |
| Total Buyer Costs | 1.27 | 0.65 | 0.79 |
| Total Supplier and Buyer Costs | 12.57 | 14.90 | 17.41 |
| Risk Poterntial | 2.05 | 0.22 | 0.12 |
| Total Cost & Risk | $14.62 | $15.12 | $17.53 |

## Life Cycle Costs

- Potential Warranty Cost
- Customer Support
- Interaction with downstream process

## Logistics Costs

- Duty & Freight
- Compliance
- Dunnage & Packaging
- Alternatives

**Manufacturing Cost**

- BOM & BOP based
- Value chain analysis supports costs
- Built on Production data
- Manufacturing processes, process steps, and material data used to develop model and identify cost out opportunities

**Operating Cost**

- Engineering support
- Financing costs
- Regulatory and compliance
- Quality
- Management and control
- Working capital / inventory costs
- Other costs used to support the process

**Sample Risk Factors Evaluated**

- Expedited shipping
- Regulatory & Compliance
- Opportunity costs
- Duty & taxes
- Labor risk
- *Material Availability*
- Sales forecast
- *Ability to mfg to specs*
- Process control
- Disruptive technology

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# The Impact of Customer Specifications to Cost, It is not just and Automotive Problem: Consumer Electroincs

Background;

- Public injection molding company; wh$800M organization with plants throughout the world; produce for the silicone wafer industry (i.e. Intel, Compaq, etc.)
- Rather than putting out a spec for the type of material they indicated who the supplier needed to be for the resin;
  - THIS GIVES THE RESIN PROVIDER THE UPPER HAND IN COST (+20%) AND DELIVERY
- How did it impact design, mfg, or final delivery:
  NO MAJOR IMPACT HERE ON DESIGN BUT DELIVERY IS FREQUENTLY IMPACTED BECAUSE THE RESIN PROVIDER HAS THEM HOSTAGE AND THEY RUN OUT OF MATERIAL FREQUENTLY
- Did other OEM customers have a better way to resolve this issue?
  - MANY OTHER RESIN PROVIDERS CAN PROVIDE THE EXACT SAME MATERIAL AND IN THE TIMING REQUIRED FOR 20% LESS COST
- Was this reviewed with customer?
  - CUSTOMER WILL NOT CONSIDER A CHANGE; SILICONE WAFERS ARE HAVE TIGHT SPECS AND THEY COMMAND WHAT THEY HAVE PUT IN THE SPEC
- What was the final result in cost burden and potential savings not relieazed?
  - THIS COMPANY MEETS DEMAND BUT FREQUENTLY HAS RESIN SHORTAGES AND PAYS APPROXIMATELY 20% HIGHER; THEY ARE ABLE TO PASS SOME OF THE COST TO THE CUSTOMER BUT NOT ALL AND IT DRIVES OPERATIONAL ISSUES IF RESIN NOT AVAILABLE.

# Outline of The Toyota Target Costing Approach
# Common Material Specifications:
## Why add costs when there is no real need?

- The **target price** is set based on the expected features, specifications, and volume three years in advance of a model's launch. This process requires dynamic coordination with Sales, Marketing, Manufacturing, R&D, and the Supply Base.
- The **target profit** is set by management based on corporate requirements, historical data, market trends, and competitive pressures.
- The **cost estimates** (not the target cost) are developed using one of two approaches:
  - New product based on an existing model: The costs of different features and specifications between the old and new models are calculated and added to the cost of the existing model.
  - Distinctly new product: The cost estimate is developed from related models, historical cost data, supplier data, and cost models.
- The **target cost** is set using the formula "Profit = Price – Cost" as a guide. The target cost is the cost that returns the required profit at the price the market will bear.
- The **cost reduction goal** is the difference between the cost estimate and the target cost. Cost reduction goals are achieved through the cost planning process before production begins. "The purpose of cost planning is to determine the amount by which costs can be reduced through better design or specifications of the new model."
- The **cost structure** for each part and feature are identified using the cost planning process.
- The **cost planning process** identifies goals for each group based on the cost manager and each group leader's assessment of its ability to reduce costs. This approach places responsibility for achieving the goal on each group. (Inter-group cooperation is necessary for each individual group to achieve its cost reduction goal.)
- *The **cost reductions** are obtained primarily through changes in design prior to the start of production. While the drive is to reduce costs, quality and performance are also enhanced as demonstrated by Toyota's success. The same cost reduction approach is also aggressively applied to existing parts, but the focus eliminating unnecessary cost from the design prior to production.*

Tanaka, T. Target Costing at Toyota. *Journal of Cost Management* (Spring): 4-11-1993

# The Toyota Target Costing Approach In Practice to Reduce Total Program Costs




Every component attached to firewall is common across models.

TOYOTA

- Supplier of sound deadening insulation for firewall
- Products for 7 key Toyota models on some different platforms
- Firewall design is consistent across all platforms
  - Shape of the part
  - All attaching points
  - Stamped cutouts
  - Same material specification- Globally
- ONLY difference is the scale of the part depending for each vehicle application

Source: Harbour Results

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# Big Ideas and Issues

- **The Death of the Internal Combustion Engine is Greatly Exaggerated**
  - A Domestic Three has developed a 32 Miles per gallon CUV/Mini Van
  - Lot's of little gains in improved efficiencies; cooling, aerodynamics, electrical loads, rolling resistance, transmissions, material substitutions, etc have to result in more common specifications
  - A Best Practice is that once a material has been certified through one OEM process, that should qualify for other OEM Specification Approval

- **Sustainability has two very different definitions:**
  - Consumers are demanding products with less of a environmental impact
  - Financial Sustainability through next quarter and into 2012

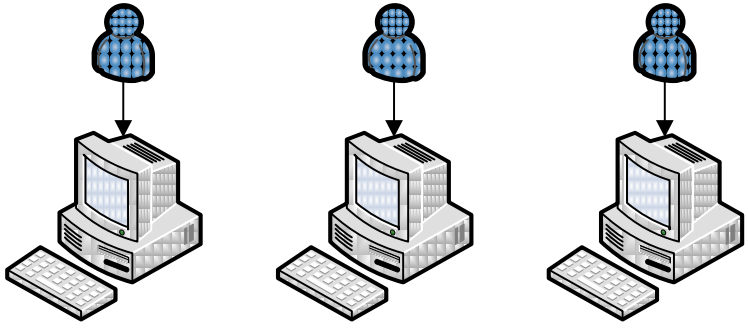
- **Good News in:**
  1. Common Architecture and Global Components standards
  2. Early Supplier Involvement in Part and Tool Design
  3. Engineering Resource Loading in Design and Development Process
  4. Completeness of Product and Tool Design at Tooling Kick-off
  5. A Systems Approach to Supplier Selection
  6. A Design to Cost Process vs. Price the Design

# The Facton Vision:
# Transforming Data Generation into Information Required for Innovation

## Current Work Process

Input from multiple, local data sources

Cost Engineer | Sales & Purchasing | Engineering

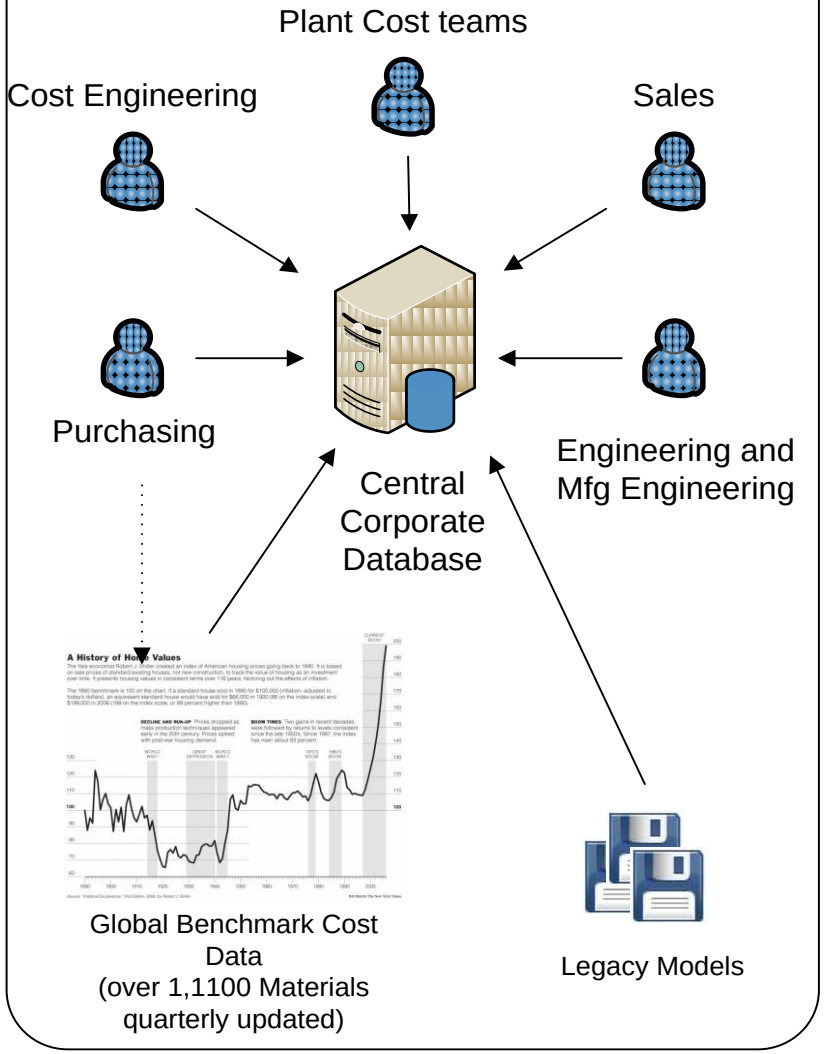


Other | Other | Other

Synthesized by Cost Engineering team

10,000's of individual Excel files on file server

## Future Work Process with FACTON




Recently Named as one of Gartner's 2011 "Cool Venders"

**Thank you for your patience and time today**

**I look forward to your questions**

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