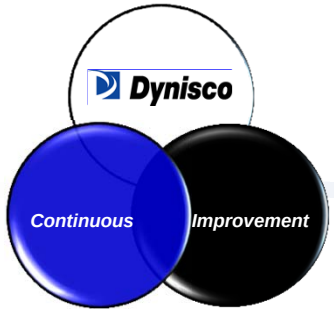

DFMA at Dynisco...
Sooner vs. Later

by

Kevin Dailida

Director of
Product and Process Improvement

Topics

- Influences on Product Release
- PDP Process..Dynisco's Transformation
- DFMA vs. Cost Reduction
  - Project 1
  - Project 2
- Additional Examples
- Closing Remarks

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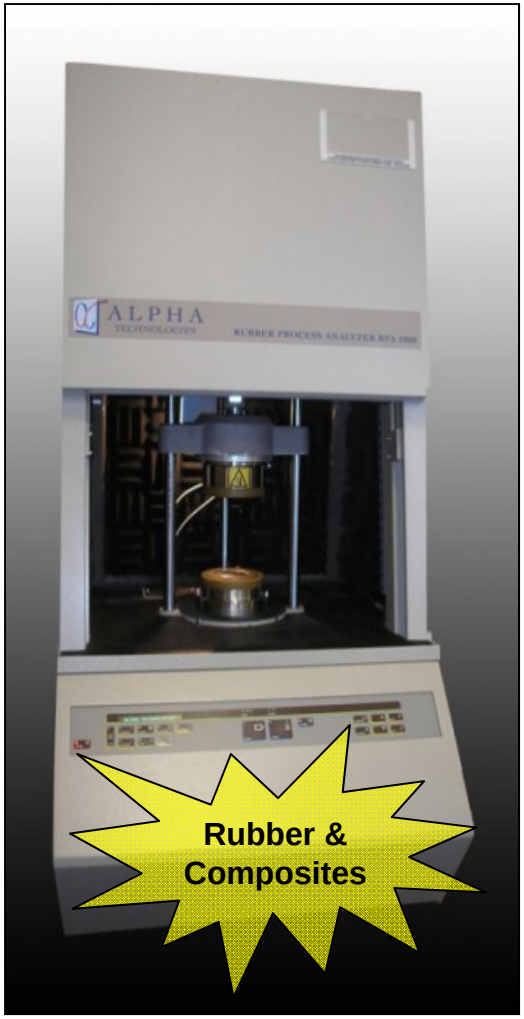
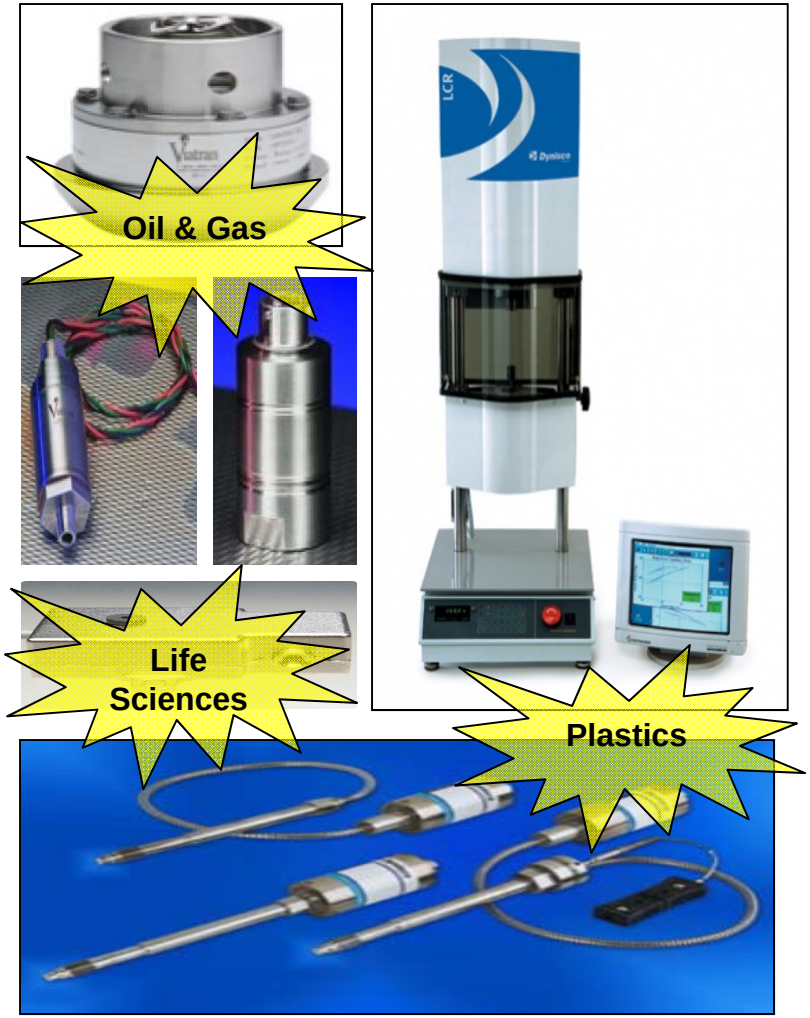
Our Products





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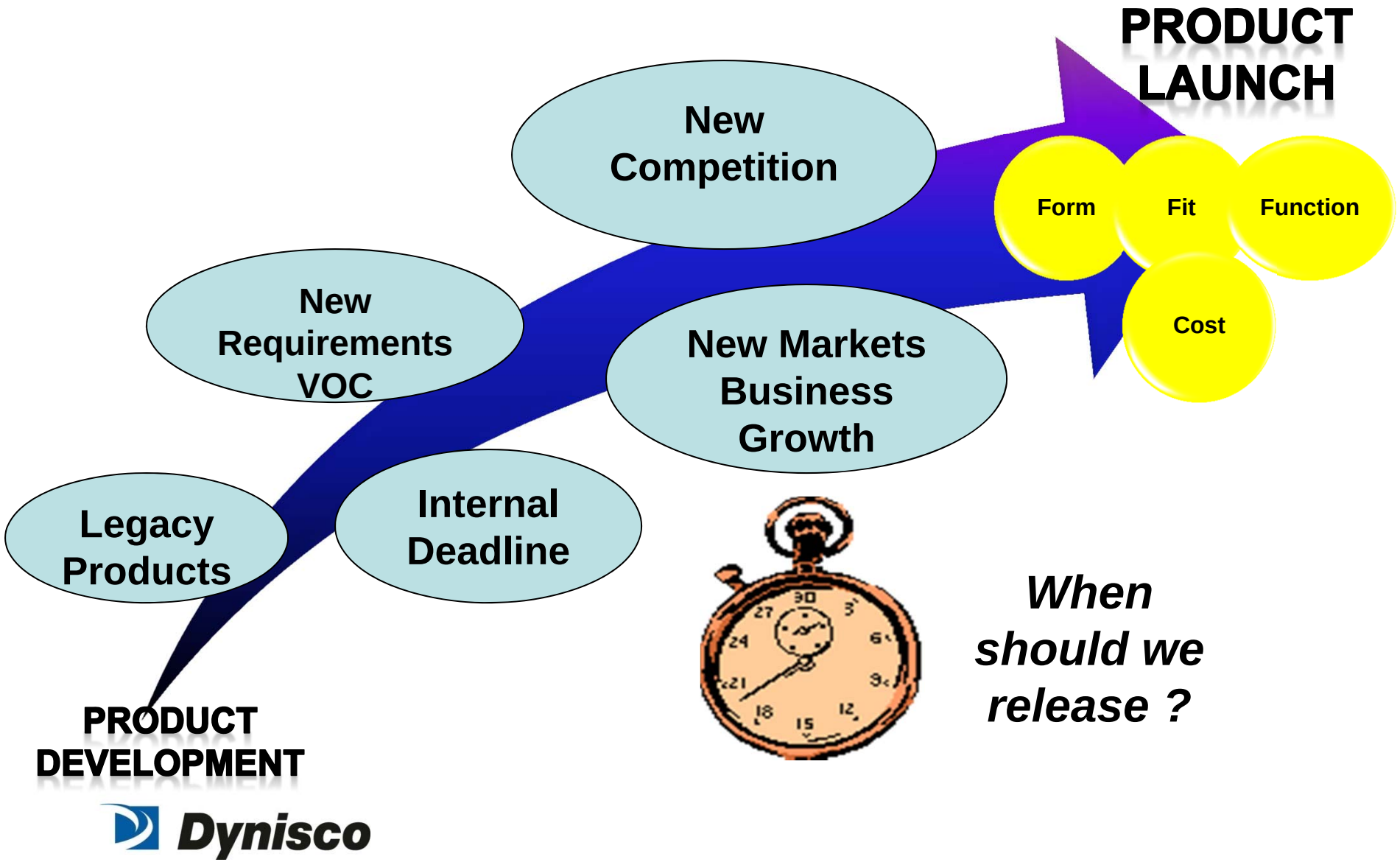
Influences on Product Release



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Product Development Process (PDP)

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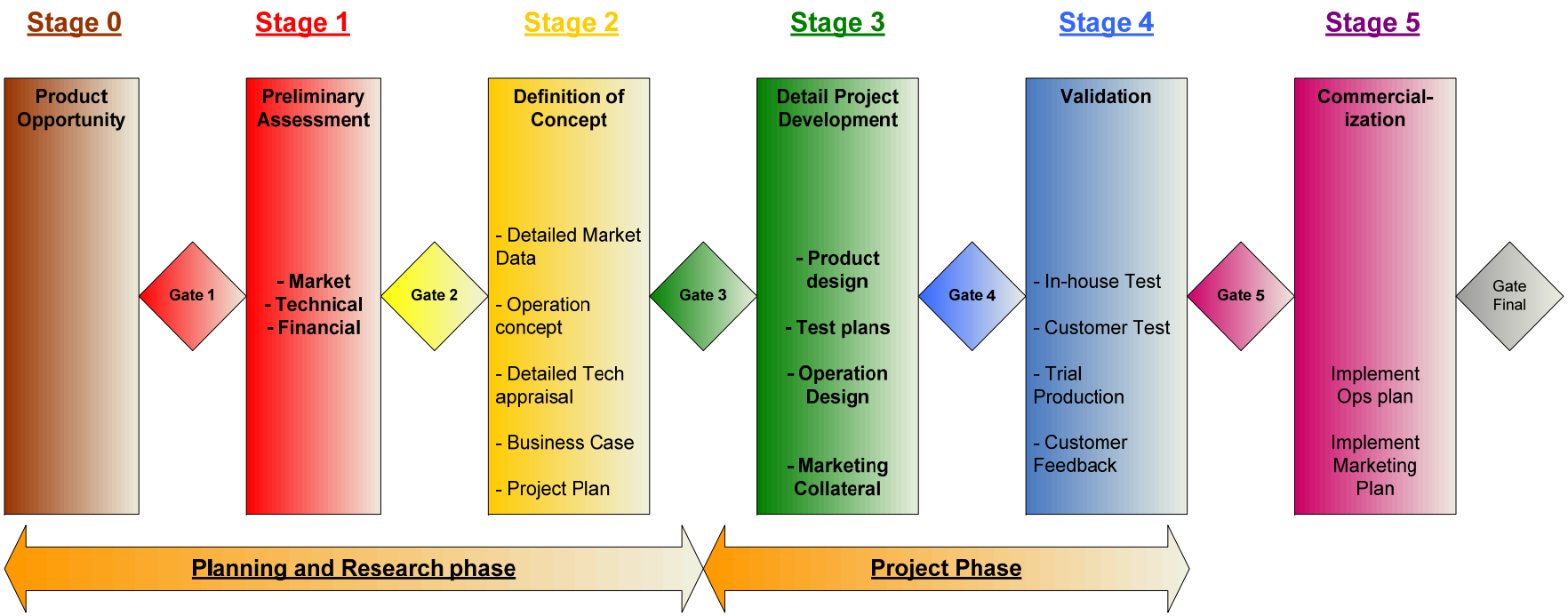
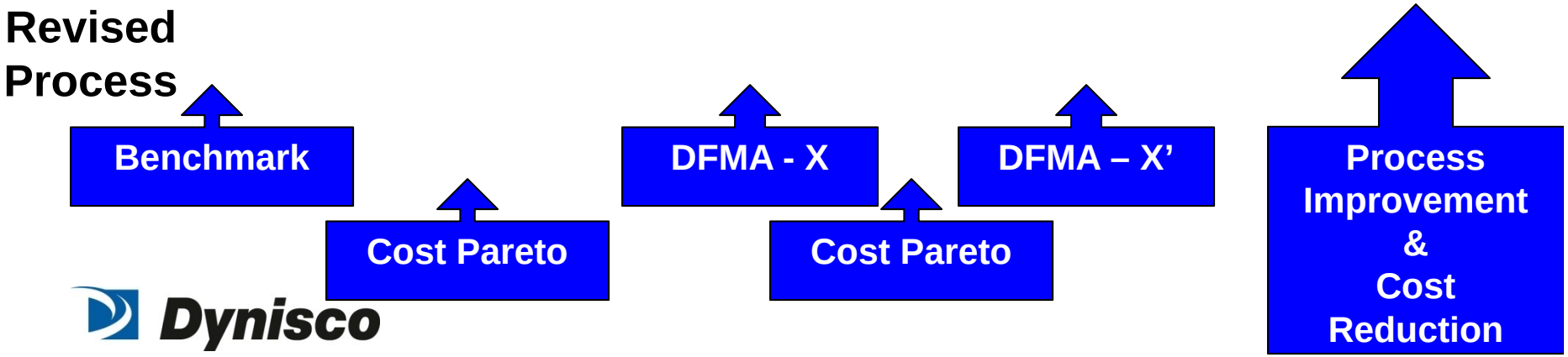
Decouple Function and Part Count Early

PDP Transformed



Revised Process



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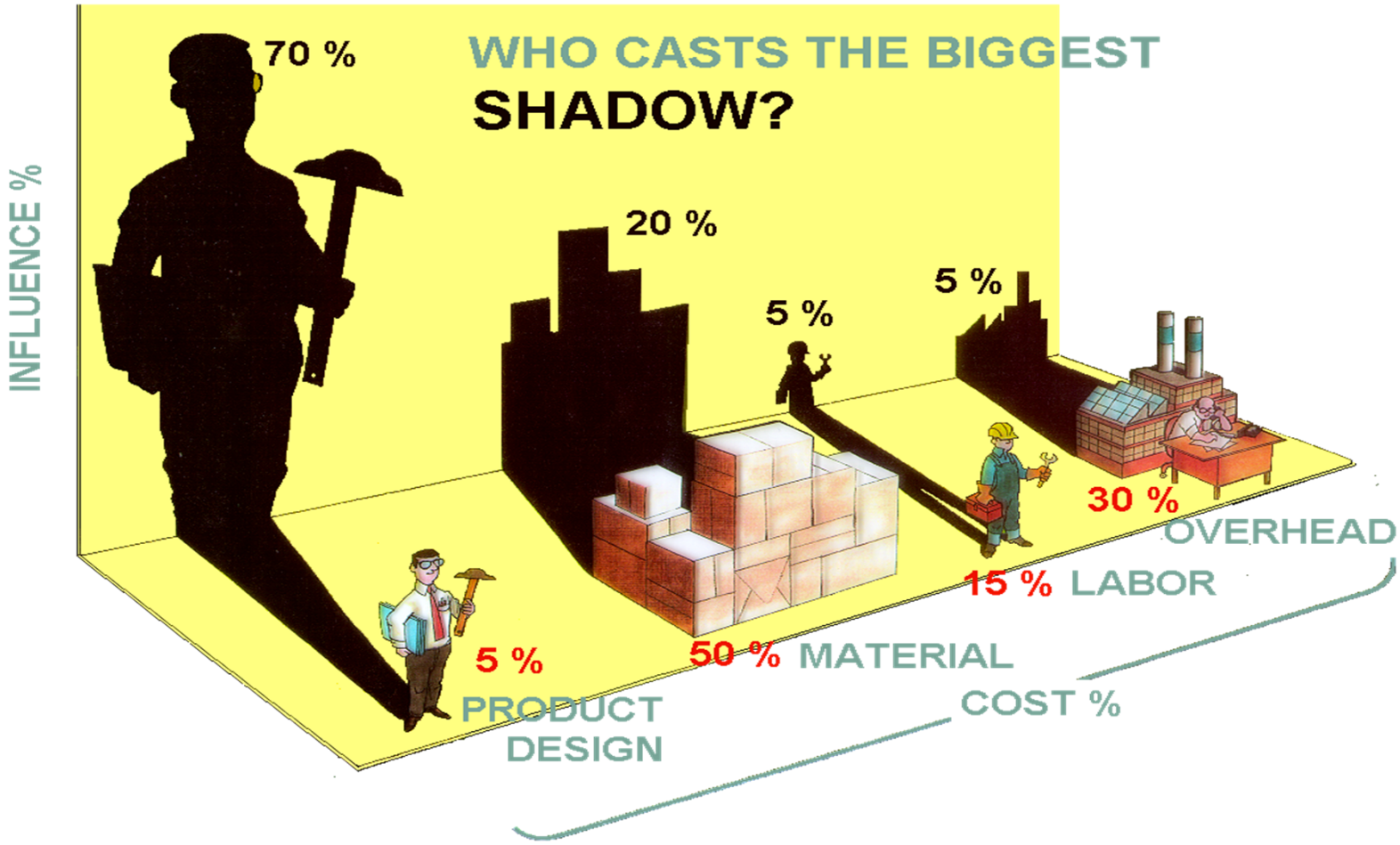
Product Costs



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Source: Ford Motor Company

Design Drives Cost !!!

DFMA vs. Cost Reduction: Project 1

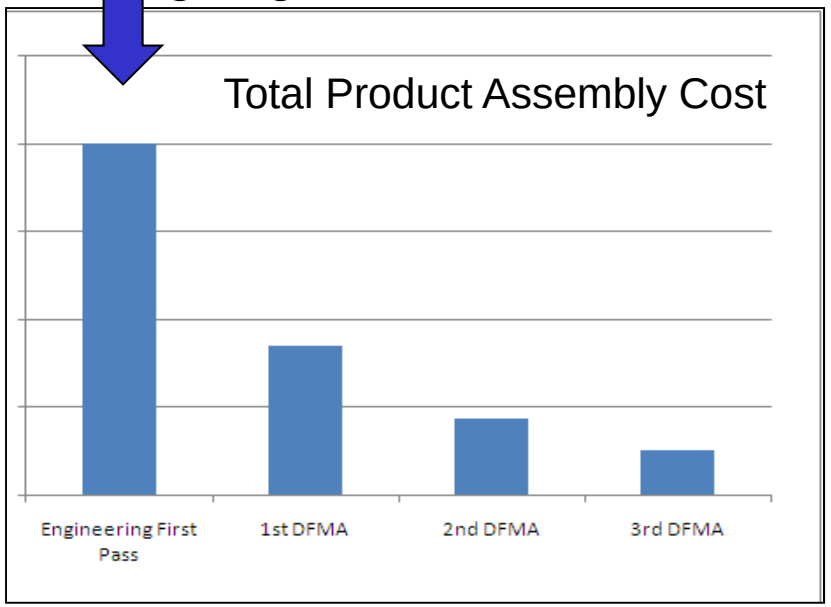
Project team performed DFA & DFM during the course of development. Part count and cost were reduced while increasing assembly efficiency.

Concepts Analyzed		
Design	Part Count	DFA Index
Concept 1	43	1.6
Concept 2	16	3.7
Concept 3	39	0.7
Concept 4	32	2.6

Selected Design		
DFMA	Part Count	DFA Index
#1	150	2.1
#2	87	7.1
#3	65	8.6

Improved Assembly Efficiency

Reducing Cost BEFORE going to Production!



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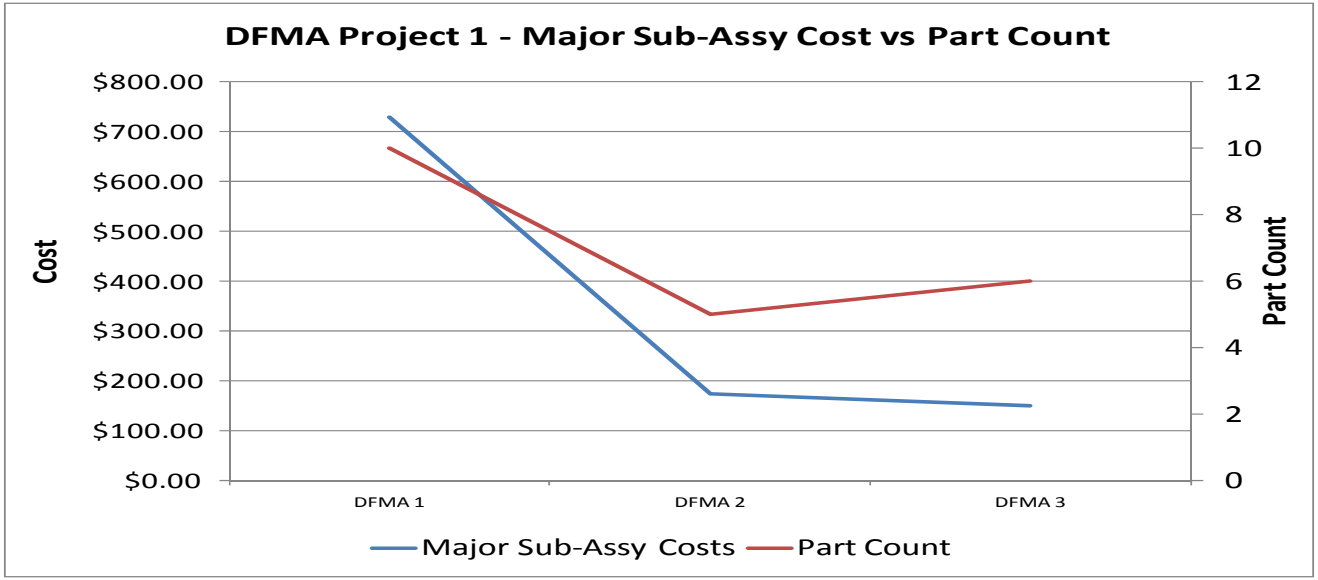
DFMA vs. Cost Reduction: Project 1



Scenario	Cost at Release		Final Results
1) **Sub assembly released without DFMA effort**	Approximate Sub assembly cost at release - $700	Cost Reduction effort undertaken – 20% savings achieved **within 6 months of product release**	Final Cost Achieved - $560 ***$140 – to bottom line profits of product***
2) **Sub assembly released utilizing DFMA**	Approximate Sub Assembly cost at release - $170		Final cost achieved - $170 ***$530 – to bottom line profits of product***
		Profit Delta	**$390 per unit**

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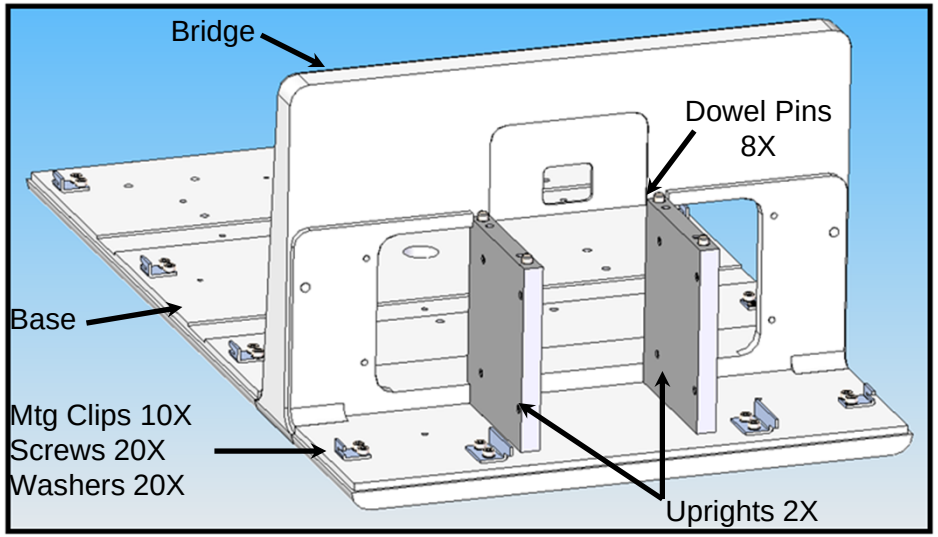
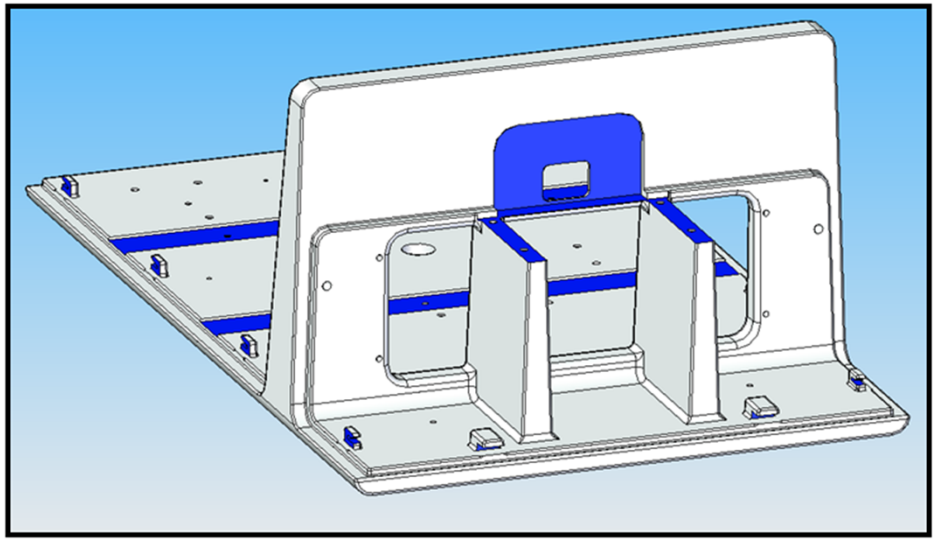
DFMA vs. Cost Reduction: Project 2

Base Assembly (Later)



Machined Base Casting (Sooner)

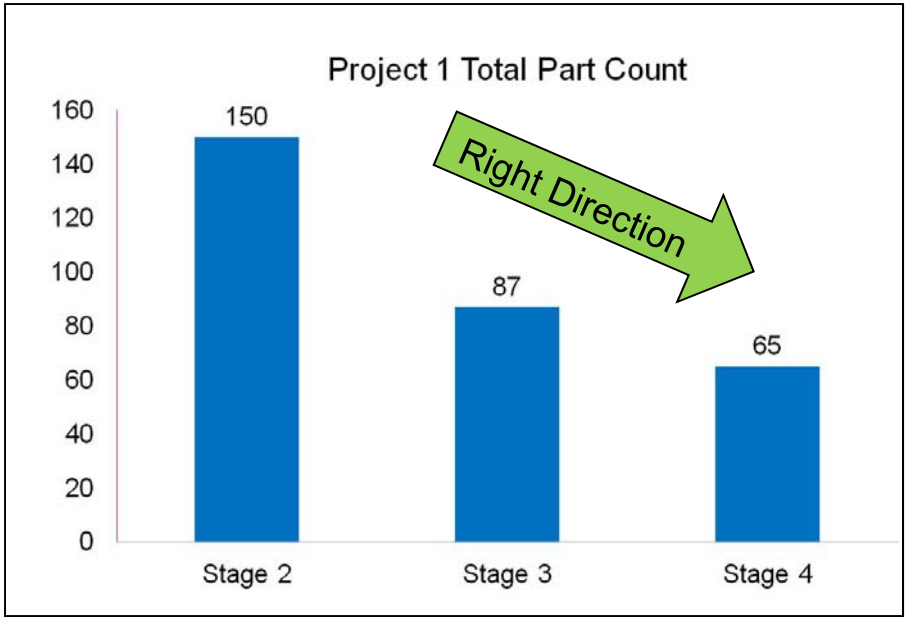


	Base Assembly	**Machined Base Casting**
Part Count, 7 PN's:	62	**1**
Material:	MIC-6 Alum. Plate	**A356-T6 Alum.**
Material Cost:	$5.00/lb	**$2.50/lb**
Tolerances (63 Finish):	+/-.005	**As required**
Assembly Time:	14 minutes	**0 minutes**
Assembly Cost:	$26.74	**$0**
Total Cost:	$567.68	**$186.10**
Production Life Cost: (10 years, 50 units/year)	$283,840	**$93,050**

DFMA: Sooner vs. Later

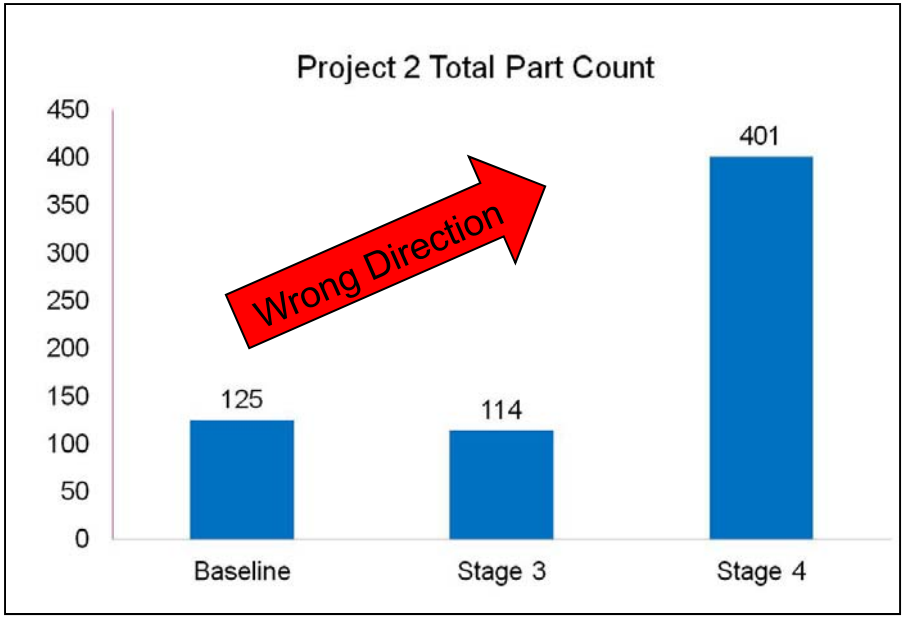
Project 1

- Designed In-house
- With DFMA applied



Project 2

- Outside Design House
- Without DFMA



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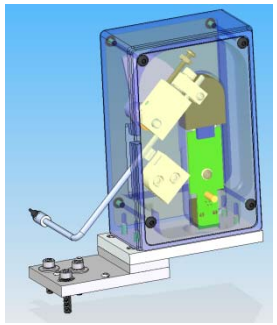
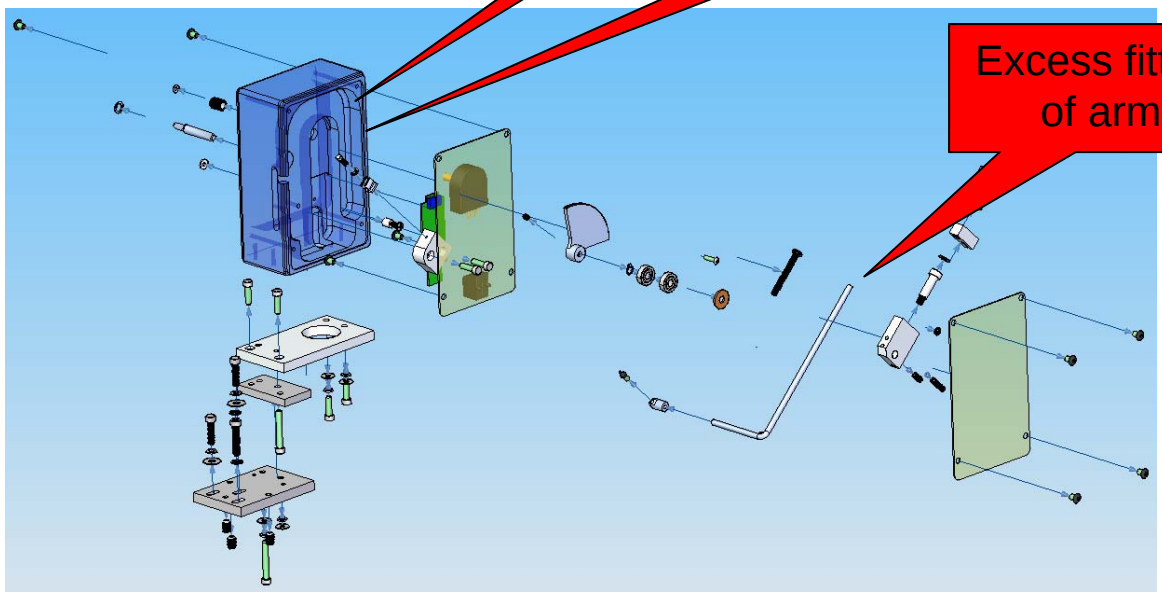
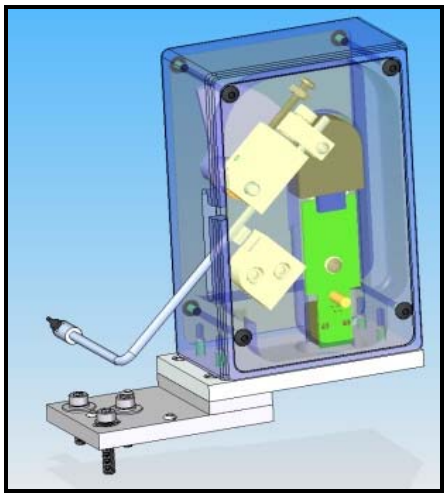
Alpha Example: Encoder "Existing"

	Existing Design
Assembly /Calibration Time	2 hours
Part Count	82
Theoretical Min. Part Count	16
DFA Index	5.5





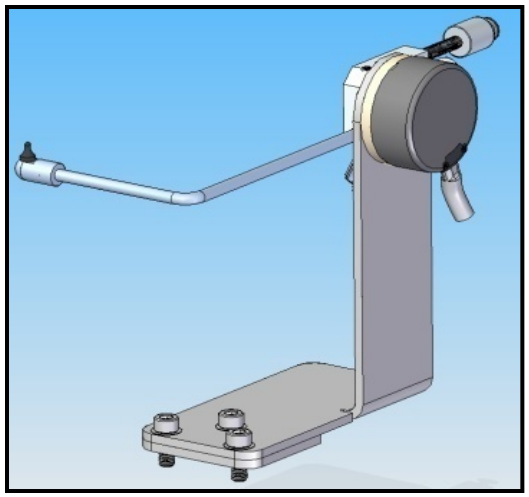
Encoder Assembly



2 hrs Assy/Calib.

82 parts

5.5 DFA Index

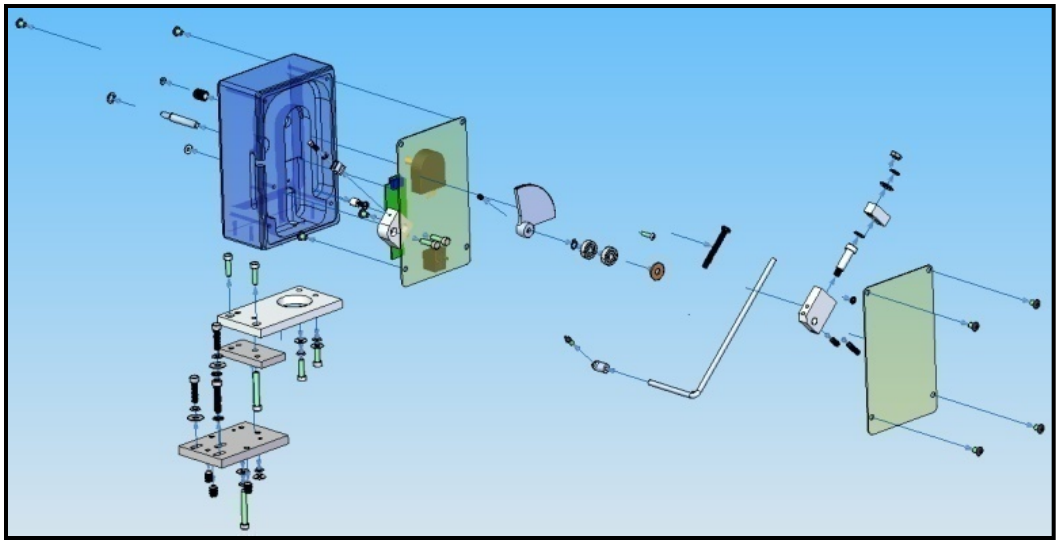


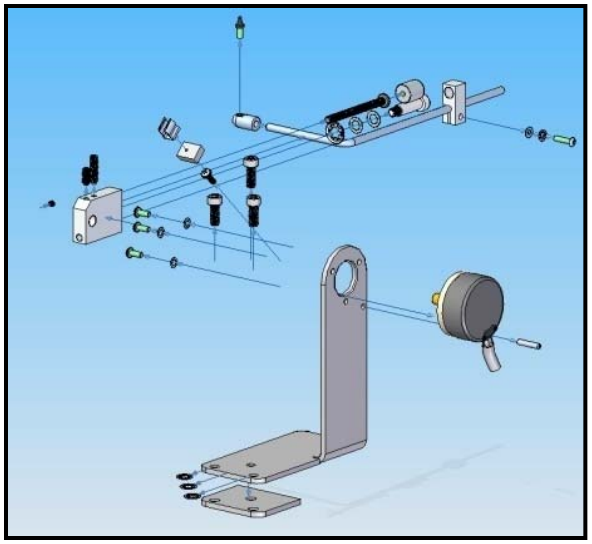
15 min. Assy/Calib.

39 Parts

9.8 DFA Index

76% Reduction to Mfg costs





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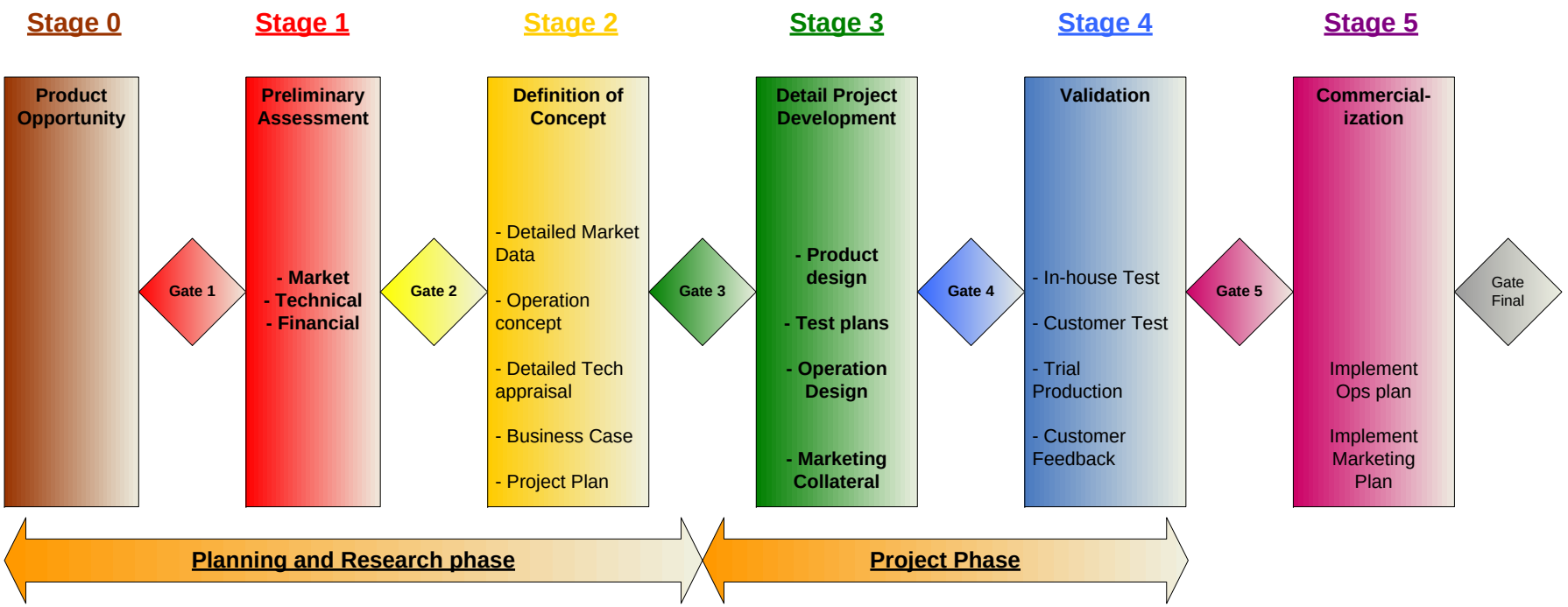
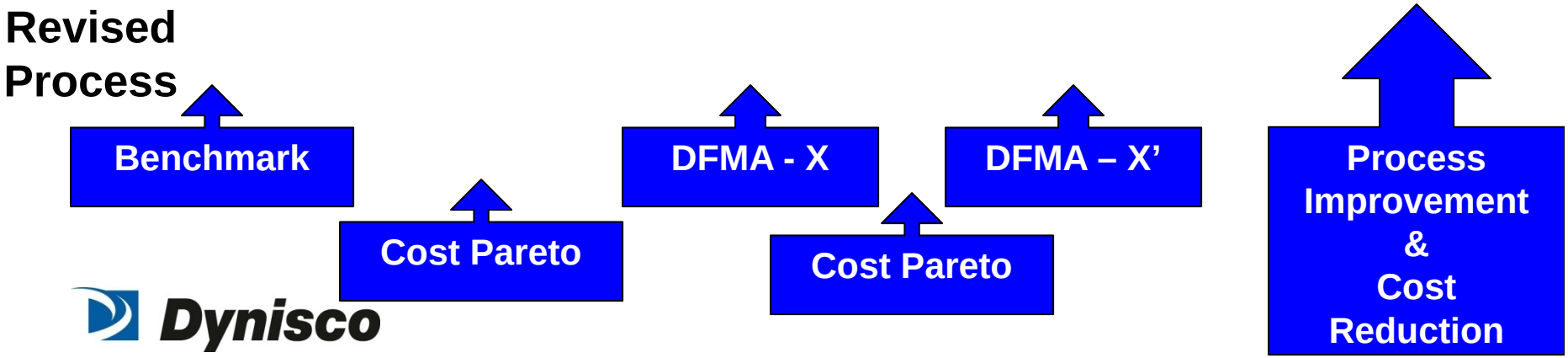
Less Parts, Less Cost, Better Quality

Product Development Process (PDP)



Revised Process



Closing Remarks

- Time to market is critical but understand your drivers for release and their impact on the product cost
- **Design Drives Cost**
- Part Count and Cost become more interdependent as the design moves further down the PDP
- Even the best supply chain managers will not drive the same profits as early DFMA
- DFMA deployment takes time and energy.. **but its worth it !!!**

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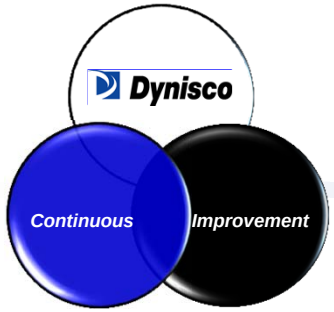

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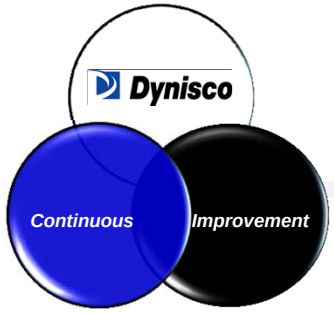

Thank you for your attention

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