



# Increasing Your Value with Cost Management in Manufacturing





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**Increasing Your Value with  
Cost Management in Manufacturing**



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**Increasing Your Value with  
Cost Management in Manufacturing**



Increasing Your Value with  
Cost Management  
in Manufacturing



## Topics for Today's Meeting

Current state of costing in manufacturing

The shifting trend in costing

What costing skills are needed

Why certification is pertinent to you and your company

**Increasing Your Value with  
Cost Management in Manufacturing**

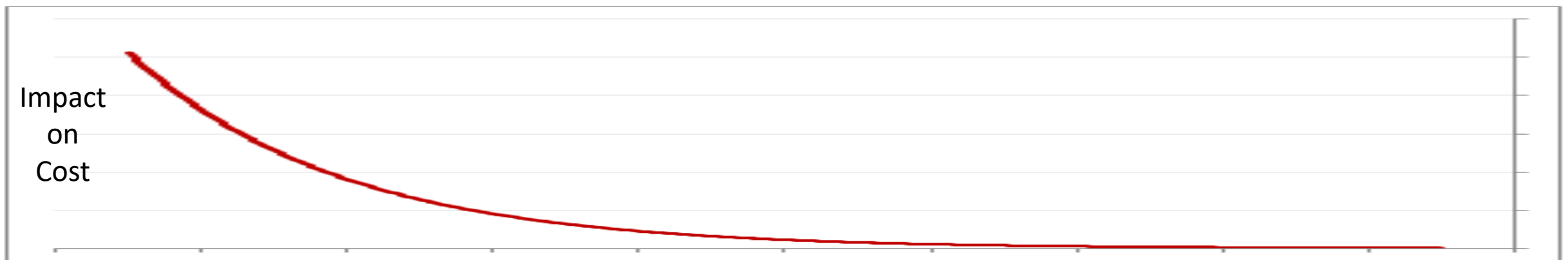
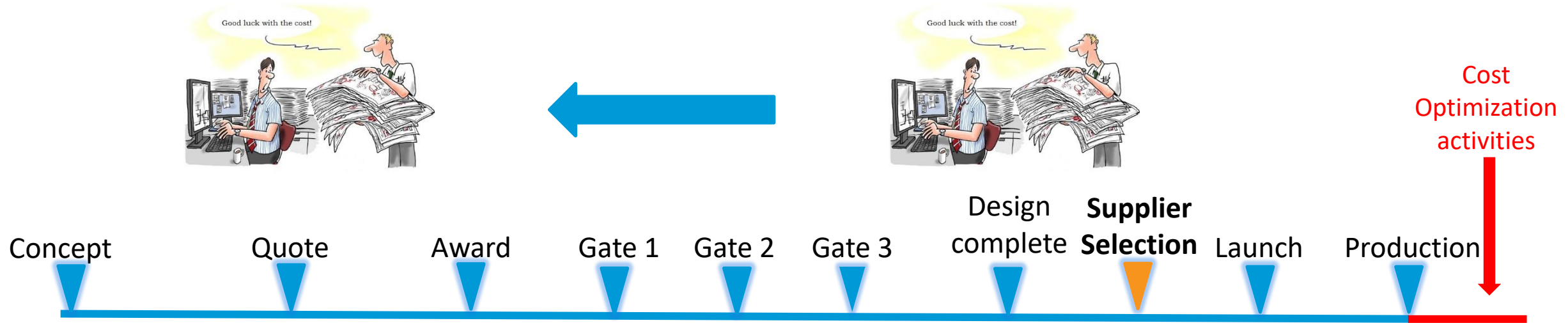
# The Importance of Cost in Manufacturing

## Top Cost Management Issues in Manufacturing

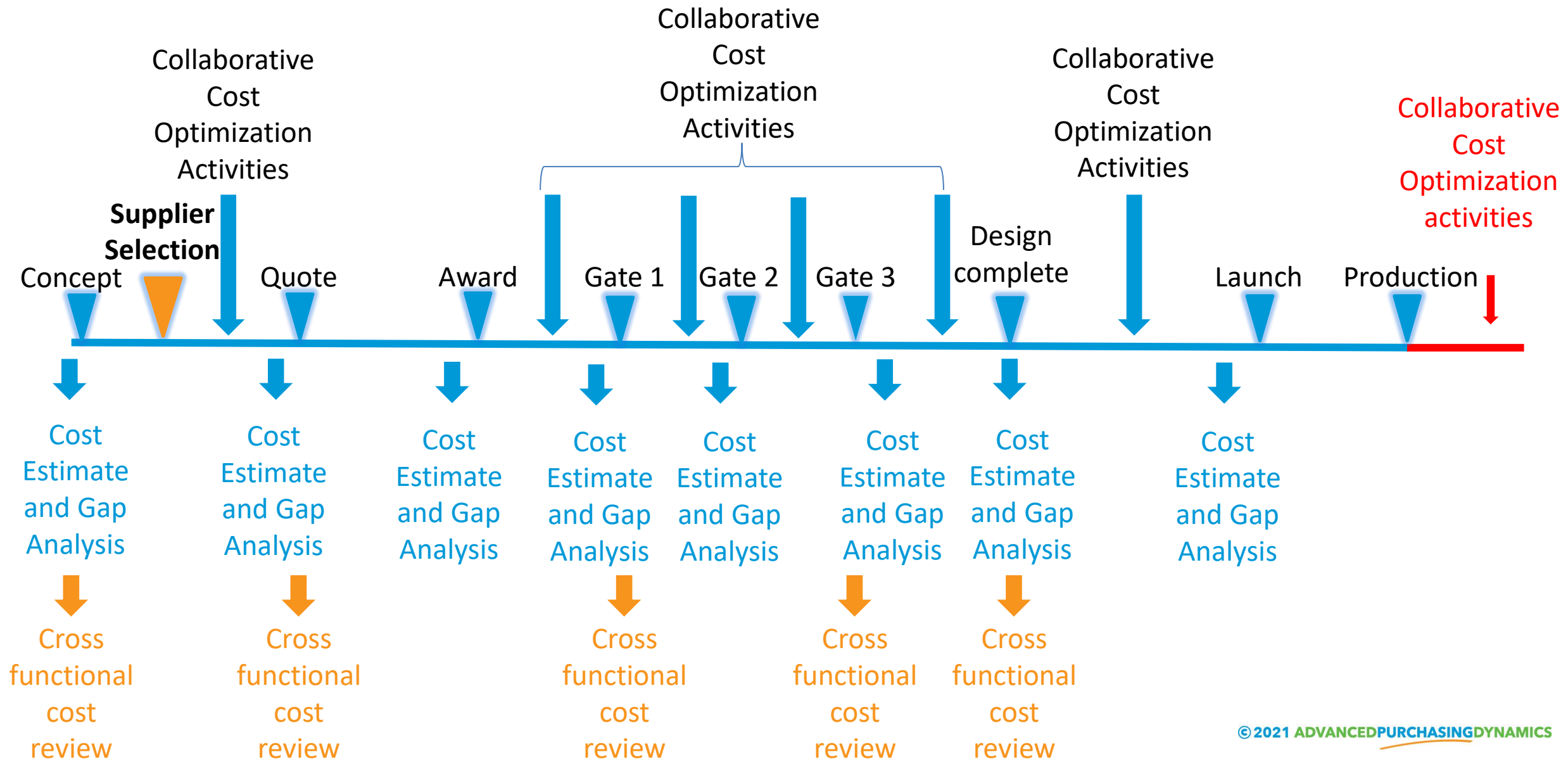


- ▶ Don't know how much things should cost
- ▶ Don't know how to allocate cost to products
- ▶ Don't know how to predict future costs
- ▶ Can't control cost during product development

# Continuous Cost Management Process



# Continuous Cost Management Process





**Your Dashboard**

**Parts**

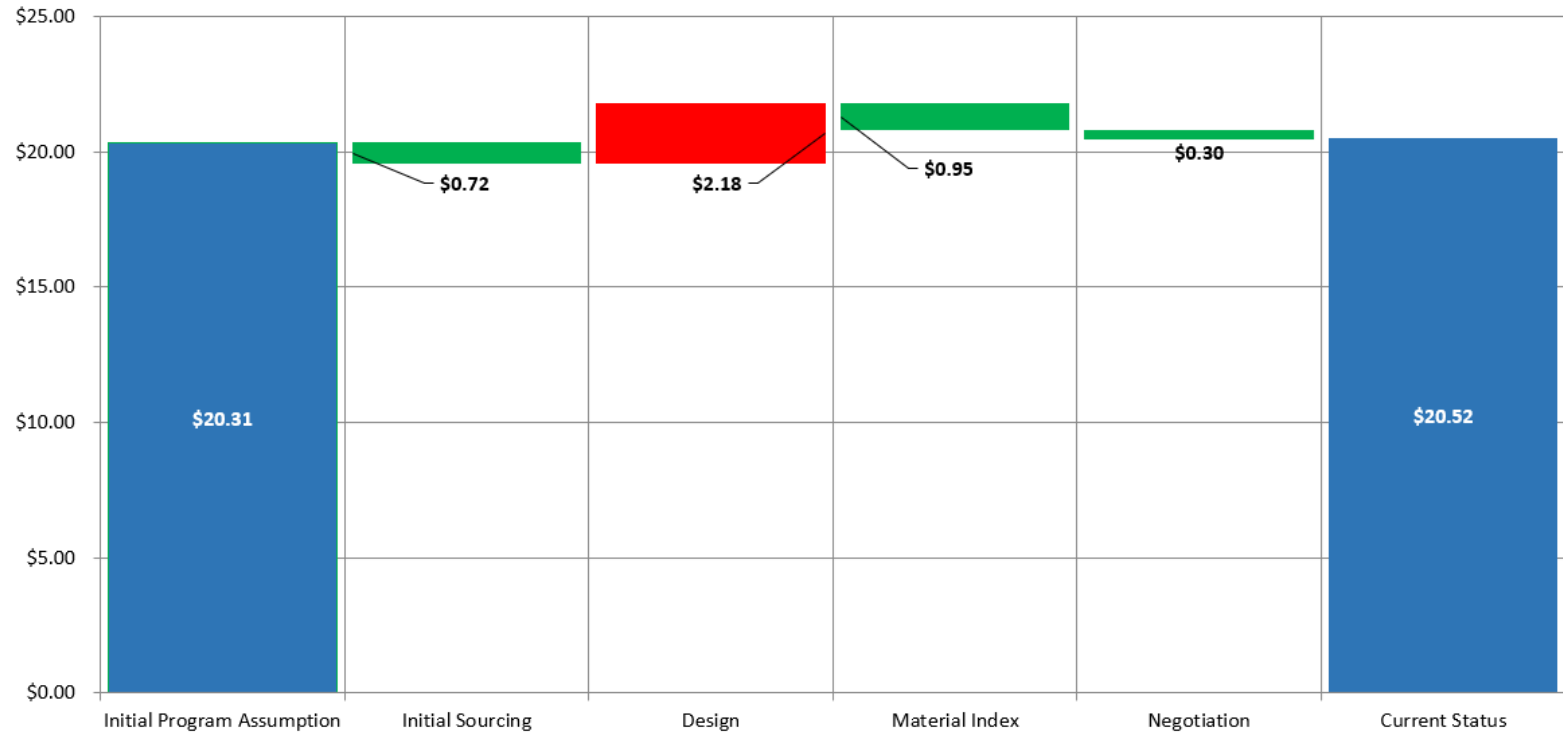
**RFQs**

**Financial Evaluation**

**Reporting**

**Administration**

### Program Impact Analysis - Purchased Material





Is your company managing cost using a Continuous Cost Management Process (at any point in time you know the cost of your products)?

- ▶ Yes
- ▶ No
- ▶ Somewhat or not sure

# Supplier Costing Methods Are Inaccurate, Inappropriate & Obsolete

From APICS press release regarding joint IMA/APICS survey:

*The issues identified by the report are: "an over-reliance on external financial reporting systems, using outdated costing models as traditional accounting practices can no longer meet the challenges of today's business environment, and accounting and finance's resistance to change," since neither department routinely experiences "pressure to promote new, more appropriate practices within their organizations."*



The Association of  
Accountants and  
Financial Professionals  
in Business



# Costing Skills are Needed in Manufacturing



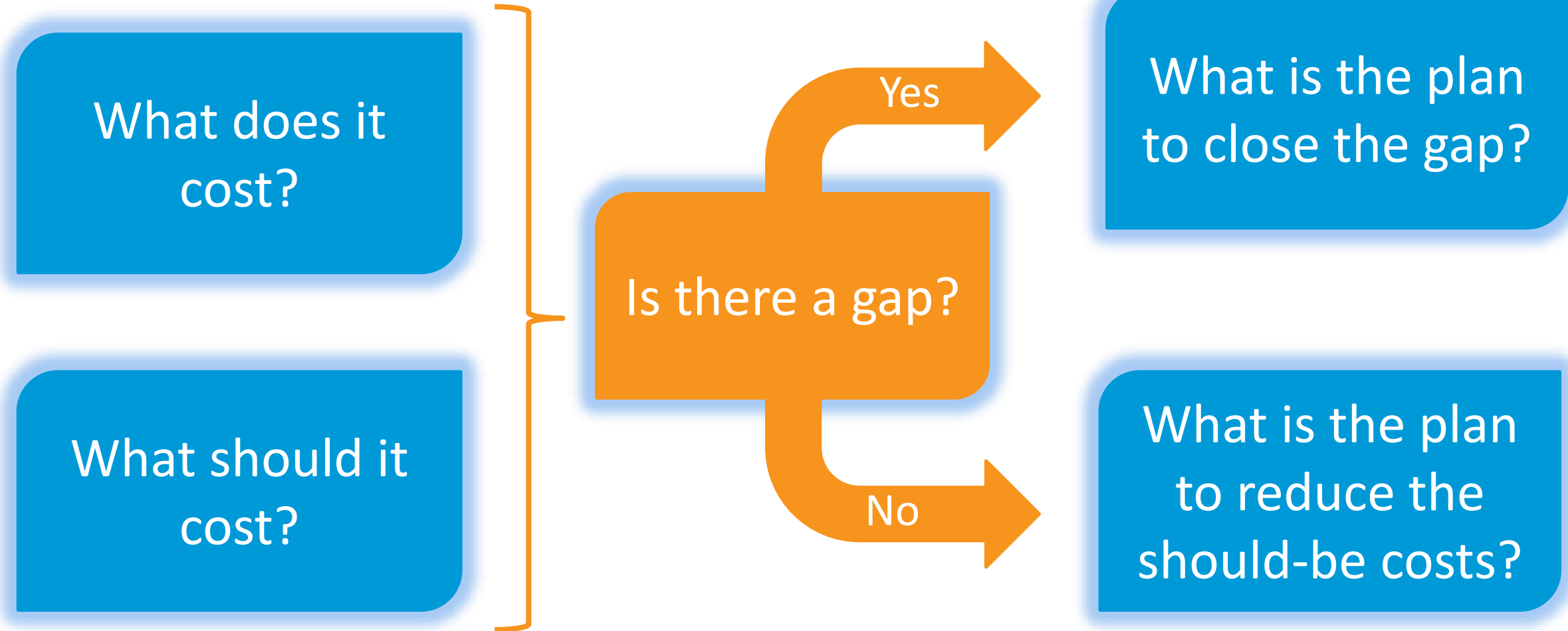
## Enhance Your Career

*Now more than ever manufacturing companies are focusing on cost*

*They will look to people who understand proper cost management techniques in a manufacturing environment to lead the way*



# Strategic Cost Questions



# How to Get The Answers

## Does Cost

- ▶ e-RFQ
- ▶ Spend analytics
- ▶ Total Acquisition Cost
- ▶ Total Relationship Cost

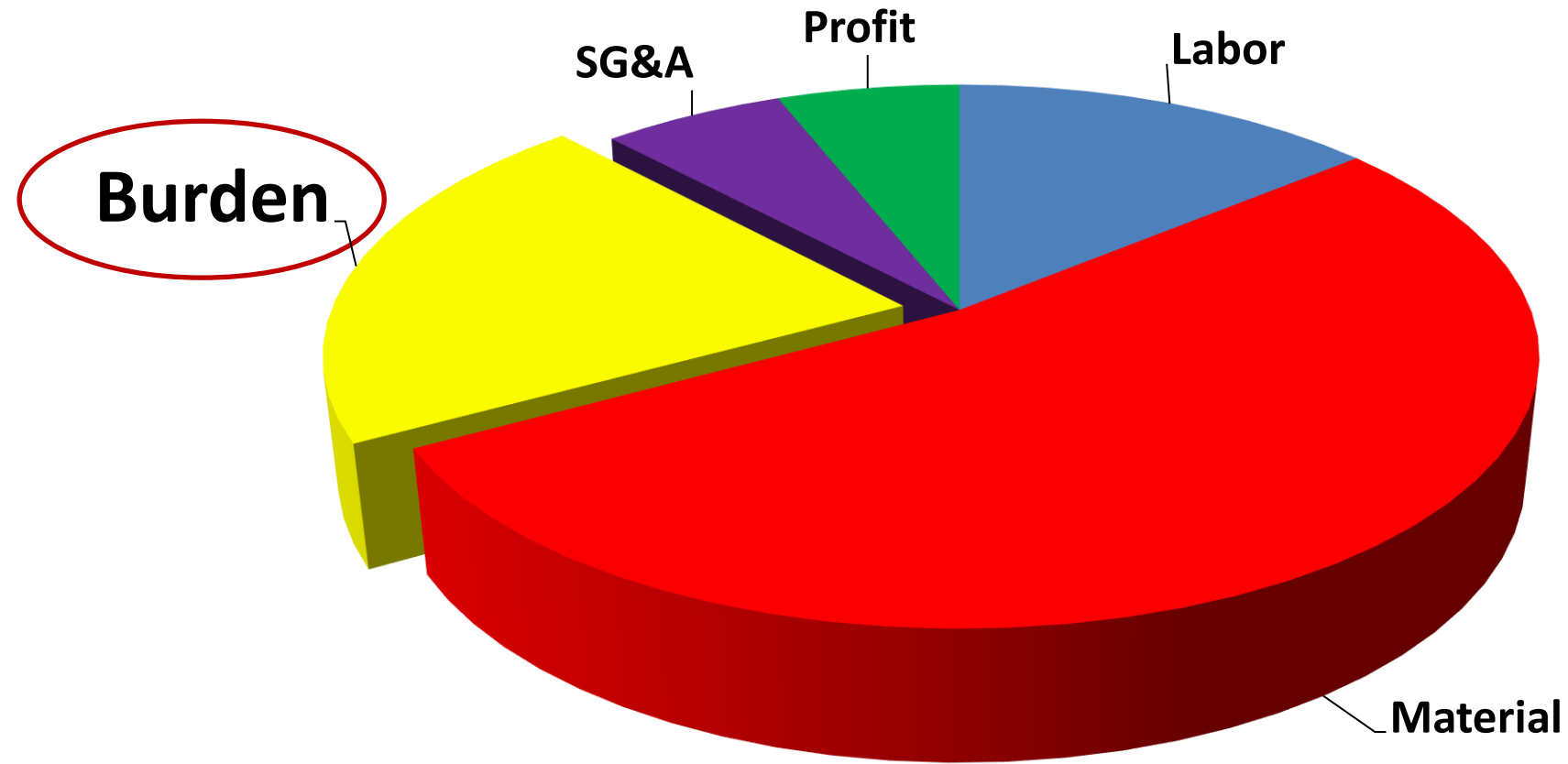
## Should Cost

- ▶ Multivariate models
- ▶ Linear models
- ▶ Cost estimation models
- ▶ Benchmark data

## Gap Closure

- ▶ Commodity Strategies
- ▶ Supply base consolidation
- ▶ Kaizen
- ▶ VA/VE

# 5 Main Areas of Cost





# One Rate Doesn't Fit All



*What's the Problem with  
Spreading Peanut Butter  
Across the Organization?*

# What's Included in Burden

## ▶ Variable Burden

- ▶ Indirect Labor
  - ▶ Material handlers
  - ▶ Team Leaders
  - ▶ Training
  - ▶ Maintenance
- ▶ Fringe Benefits
  - ▶ Vacation Pay
  - ▶ Workers Comp
  - ▶ Pension
- ▶ Services & Supplies
  - ▶ Operation Supplies
  - ▶ Tools
- ▶ Utilities
  - ▶ Gas
  - ▶ Electricity
  - ▶ Water

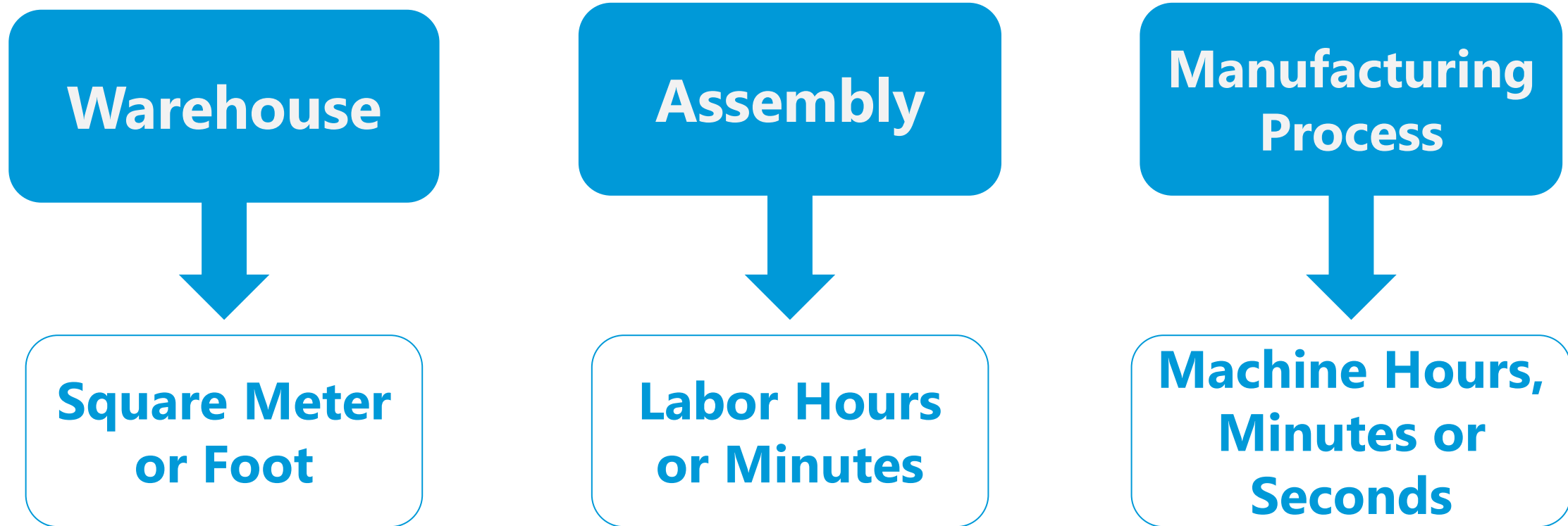
## ▶ Fixed Burden

- ▶ Salaried Labor
  - ▶ Operation Supervisors
  - ▶ Engineering
  - ▶ Materials Management
- ▶ Fringe Benefits
  - ▶ Health Care
  - ▶ Insurance
- ▶ Services and Supplies
  - ▶ Rent/Mortgage
  - ▶ Building/Capital Insurance
  - ▶ Depreciation

## ▶ Variable & Fixed Burden

- ▶ Salaried Labor
  - ▶ Supervisors
- ▶ Fringe Benefits
  - ▶ Workers Comp
  - ▶ Health Care
  - ▶ Insurance
  - ▶ Pension
- ▶ Services and Supplies
  - ▶ Telephone & Communications

# Burden is Assigned by Cost Determining Factor





# Allocating Burden

Burden/Overhead Cost by Department	Total Cost	Total Machine Hours Available	Cost per Hour
Inj. Molding	\$4,500,000	45,000	\$100.00
Welding	\$2,000,000	30,000	\$66.67
Assembly	\$2,400,000	100,000	\$24.00



# Allocating Burden

Burden/Overhead Cost by Department	Total Cost	Total Machine Hours Available	Cost per Hour
Inj. Molding 50 ton	\$500,000	10,000	\$50
Inj. Molding 100 ton	\$1,500,000	15,000	\$100
Inj. Molding 200 ton	\$2,500,000	20,000	\$125
Welding	\$2,000,000	30,000	\$66.67
Assembly	\$2,400,000	100,000	\$24.00

**Burden costs should vary by machine size**

**Suppliers who do not recognize this will:**

- **Be uncompetitive on small machines**
- **Lose money on large machines**

# Using Best In Class Cost Breakdowns to Capture Attributes

Cost Breakdown Worksheet											
Supplier Name: Castings Inc						Date: 6/10/2019		Annual Volume Quoted: 400,000		Supplier Address:	
Program(s):						PCRN #: 255		Mfg. Location - Country: USA		Supplier Contact:	
Model Yr Start:						RFQ: A		Mfg. Location - State: MO		Title:	
Part Number: H-47782						REV LEVEL: A		Mfg. Location - City/Province: Kansas City		Phone Number:	
Part Description: Header Bracket								Supplier Shipping Location: Kansas City, MO, USA		Email Address:	
Prepared by:						Note: BEIGE CELLS are automatically calculated; GREY CELLS are inputted by supplier.		Customer Ship To Location: Warren, MI, USA			
Currency: USD Exchange Rate: 1								Tooling Capacity: 500,000			

### PART DIMENSIONS AND SUMMARY:

List the Finished Part Dimensions for each individual Cast Part. For Assemblies with multiple Cast components enter the information for each Casted component in the assembly.

Casting #	Length (inch)	Width (inch)	Height (inch)	Net Part Weight	Weight Unit of Measure	Raw Material Cost	Total Melt & Cast Cost	Total Casting Cost
1	14	5	0.5	1.0200	Lbs	\$1.96672	\$1.16436	\$3.13107

### RAW MATERIAL:

Casting #	Material Description	Material Spec	Melting Shot Weight	# of Cavities	Net Part Weight	Weight Unit of Measure	Raw Material Cost/Unit	Raw Material Price Effective Date	Melt Loss % (from Net Weight)	Melt/Dross Loss Weight	Melt/Dross Loss Cost	Raw Material Cost	Unrecoverable Process Scrap %	Unrecoverable Process Scrap	Raw Mat'l SG&A Markup %	Raw Mat'l Profit Markup %	Markup Total \$	Total Raw Material Cost
1		Aluminum - AL230	8.0000	4.0000	1.1000	Lbs	\$1.4900	6/1/2019	3%	0.0330	\$0.04917	\$1.68817	0.5%	\$0.00844	8%	8%	\$0.27011	\$1.96672
											\$0.04917	\$1.68817		\$0.00844			\$0.27011	\$1.96672

### MELTING PROCESSING

Casting #	Melting Shot Weight	# of Cavities	Weight Unit of Measure	Melting Cost per UoM	Melting Cost:	Melt SG&A Markup %	Melt Profit Markup %	Markup Total \$	Total Melting Cost
1	8.0000	4.0000	Lbs	\$0.1000	\$0.20000	8%	8%	\$0.03200	\$0.23200
					\$0.20000			\$0.03200	\$0.23200

### CASTING PROCESSING

Casting #	Operation/Process Description	Press Manufacturer	Processing Time			# of Cavities	No. Of Operators	Direct Labor Cost		Manufacturing Burden/Overhead Cost				Total Labor & Burden Cost	Process Scrap %	Process Scrap \$	Processing SG&A Markup %	Processing Profit Markup %	Markup Total \$	Total Processing Cost
			Pure Cycle Time (secs.)	Ineff. (%)	Net Cycle Time (secs.)			Direct Labor Rate (\$/hr)	Labor Fringe Rate (\$/hr)	Burden Rate	Burden Overhead Cost									
1	Die Casting		70.00	18.0%	85.37	4	0.5	\$22.00	\$8.00	\$0.08892	1000	\$120.00	\$0.71138	\$0.80030	0.5%	\$0.00400	8%	8%	\$0.12805	\$0.93236
										\$0.08892			\$0.71138	\$0.80030		\$0.00400			\$0.12805	\$0.93236

### PURCHASED COMPONENTS & MATERIAL:

Item Description	Supplier Name	Number of Unit(s)	Unit of Measure	Cost/Unit	Purchase Material Cost	Process Scrap %	Process Scrap \$	Purch. Comp. SG&A Markup %	Purch. Comp. Profit Markup-%	Markup Total \$	Total Purchase Material Cost
					\$0.00000		\$0.00000			\$0.00000	\$0.00000
					\$0.00000		\$0.00000			\$0.00000	\$0.00000

### SECONDARY PROCESSING:

Operation/Process Description	Type of Crack Detection Required?				Processing Time				Direct Labor Cost				Manufacturing Burden/Overhead Cost				Process Scrap %	Process Scrap	Processing SG&A Markup %	Processing Profit Markup %	Markup Total	Total Secondary Processing Cost
	Pure Cycle Time (secs.)	Ineff. (%)	Net Cycle Time (secs.)	Pieces Out Per Cycle	No. Of Operators	Direct Labor Rate (\$/hr)	Labor Fringe Rate (\$/hr)	Labor Cost	Equipment Type	Burden Rate	Burden Overhead Cost	Total Labor & Burden Cost										
Machining	20.00	25.0%	26.67	1	1	\$18.00	\$8.00	\$0.19259	CNC	\$30.00	\$0.22222	\$0.41481	0.5%	\$0.00207	8%	8%	\$0.06637	\$0.48326				
Testing	25.00	25.0%	33.33	1	1	\$18.00	\$8.00	\$0.24074		\$20.00	\$0.18519	\$0.42593	0.5%	\$0.00213	8%	8%	\$0.06815	\$0.49620				
								\$0.00000			\$0.00000	\$0.00000		\$0.00000			\$0.00000	\$0.00000				
								\$0.00000			\$0.00000	\$0.00000		\$0.00000			\$0.00000	\$0.00000				
								\$0.00000			\$0.00000	\$0.00000		\$0.00000			\$0.00000	\$0.00000				
TOTAL COST								\$0.43333														

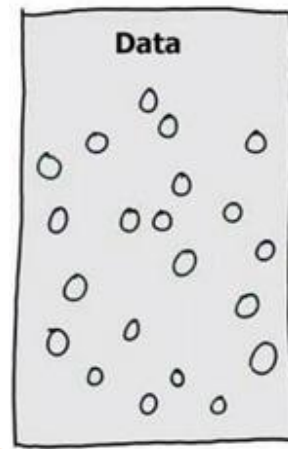


Do you have a feeling your company is using outdated cost models?

- ▶ Yes
- ▶ No
- ▶ Somewhat or not sure

# Data is not Wisdom

**Our business processes generate lots of data**



Supplier Quote Data:  
Machine parameters  
Manning  
Cost elements  
Location  
Index commodity agreements

ERP Data:  
Receipts  
PO Pricing  
Future requirements

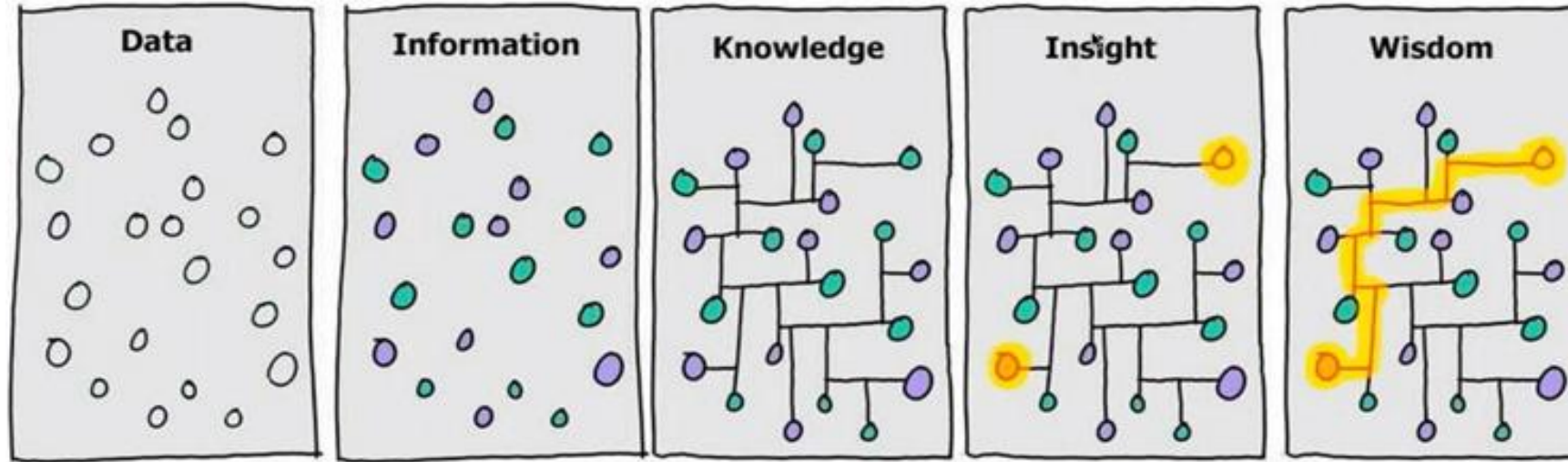
Market data:  
Currency forecasts  
Commodity pricing forecast  
Current commodity transaction pricing

Supplier capacity data:  
Shift patterns  
Capacity utilization  
Sales growth

APQP Data:  
Process flow  
Manning  
Machine parameters

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# 4.0 Transforming Data into Wisdom



Enables Quick / Smart Analytical Decisions

- Diagnostic, Predictive, Prescriptive
- Root Cause Analysis
- Simulation
- Optimization

# Why Build Cost Models?

## Cost Validation

- ▶ New sourcing
- ▶ Design changes
- ▶ Economics requests
- ▶ Cost reduction efforts: VA/VE/Kaizen
- ▶ Identify savings potential

## Cost Estimation

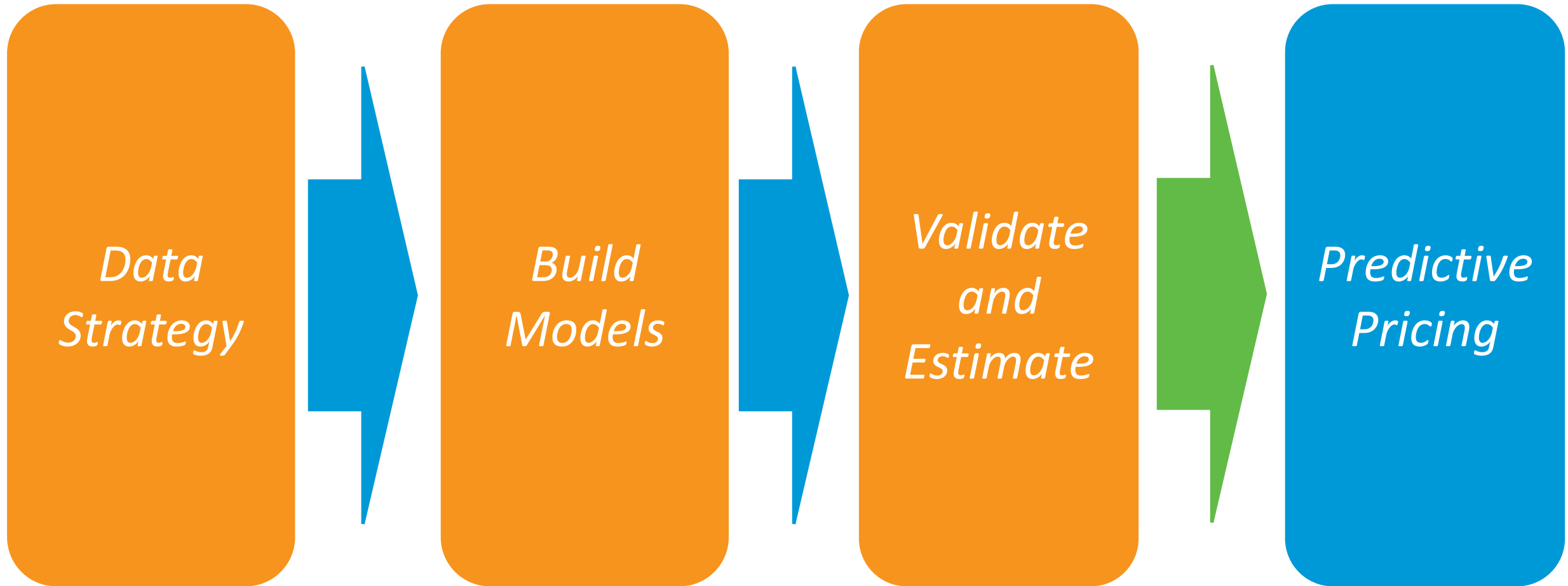
- ▶ New business pursuit
- ▶ Guide engineering
- ▶ Identify cost reduction opportunities



# Types of Company Cost Models

- ▶ Cost Catalogs
- ▶ Linear Regression Models
- ▶ Multi Variate Regression Models
- ▶ Statistical Models
- ▶ Manufacturing Process – Clean Sheet Estimation

# Predictive Pricing is the Goal



# Injection Mold Linear Models

Commodity	Characteristics			Linear Formula
Injection Mold	Parts with Volumes < 100,000	Parts with Regrind	Parts without Trim	Net Part Weight * \$.86
			Parts with Trim	Net Part Weight * \$.87
		Grained Parts		Net Part Weight * \$.97
	Parts with Volumes > 100,000	Parts without Regrind	Parts Without Trim	Net Part Weight * \$.46
			Parts with Trim	Net Part Weight * \$.47
		Un-Grained Parts		Net Part Weight * \$.77

# Linear Cost Models and Probability Pricing

## Linear Regression

Net Weight	Material Cost	Estimate (Net Weight * \$.69230 + \$.34273) + Material Cost	50% Probability Price (Estimate * (1 + Average Variance) * (1 + 0 Standard Deviations))	84% Probability Price (Estimated Value Add + 1 Standard Deviation)
6.657269	\$2.18	\$7.1315	\$7.317	\$7.352

Enter Net Weight

Enter Material Cost

Cost Model Calculates Probability Pricing for Securing Part in Supply Chain



# Linear Cost Models

## Linear Regression

Enter Part Weight

Commodity	Characteristics			Linear Formula	Part Weight	Price
Stamping	Parts with Volumes < 100,000	Parts without Paint	Parts without Washing	Net Part Weight * \$.86		\$ -
			Parts with Washing	Net Part Weight * \$.87	2.223	\$ -
		Painted Parts		Net Part Weight * \$.97		\$ -
	Parts with Volumes > 100,000	Parts without Paint	Parts Without Washing	Net Part Weight * \$.46		\$ -
			Parts with Washing	Net Part Weight * \$.47		\$ -
		Painted Parts		Net Part Weight * \$.77		\$ -

# Linear Cost Models

## Linear Regression

Get the Price



Commodity	Characteristics			Linear Formula	Part Weight	Price
Stamping	Parts with Volumes < 100,000	Parts without Paint	Parts without Washing	Net Part Weight * \$.86		\$ -
			Parts with Washing	Net Part Weight * \$.87	2.223	\$ 1.934
		Painted Parts		Net Part Weight * \$.97		\$ -
	Parts with Volumes > 100,000	Parts without Paint	Parts Without Washing	Net Part Weight * \$.46		\$ -
			Parts with Washing	Net Part Weight * \$.47		\$ -
		Painted Parts		Net Part Weight * \$.77		\$ -

# Multivariate Cost Models and Probability Pricing

## Multivariate Regression

### Tube Estimation

Length of Tube (ft)	<input type="text" value="0.35"/>
Diameter of Tube (mm)	<input type="text" value="0.07"/>
mm of MIG Weld	<input type="text" value="0.20"/>
# of Attachments	<input type="text" value="1"/>
# of Critical Characteristics	<input type="text" value="0"/>
Contains Fixed Label (0=No or 1=Yes)	<input type="text" value="0"/>

Enter  
Part Characteristics

<b>Regression Estimate 50% Confidence</b>	<b>2.3317</b>
<b>Regression Estimate 84% Confidence</b>	<b>2.4716</b>
<b>Regression Estimate 97.5% Confidence</b>	<b>2.6115</b>

Cost Model Calculates  
Probability Pricing  
for Securing Part in Supply Chain

Buyer Estimate Submission	<input type="text" value="2.4500"/>
Buyer Tooling Submission	<input type="text" value="10,000"/>

# Multivariate Cost Models

## Multivariate Regression

Length of Tube (ft)	Diameter of Tube (mm)	mm of MIG	# of Attachments	# of Critical Characteristics	Contains Fixed Label	Estimated Piece Price	Actual Piece Price	Variance	% Variance
3.250	8.75	2	0	4	1				

**Enter the Physical Part Attributes**



# Multivariate Cost Models

## Multivariate Regression

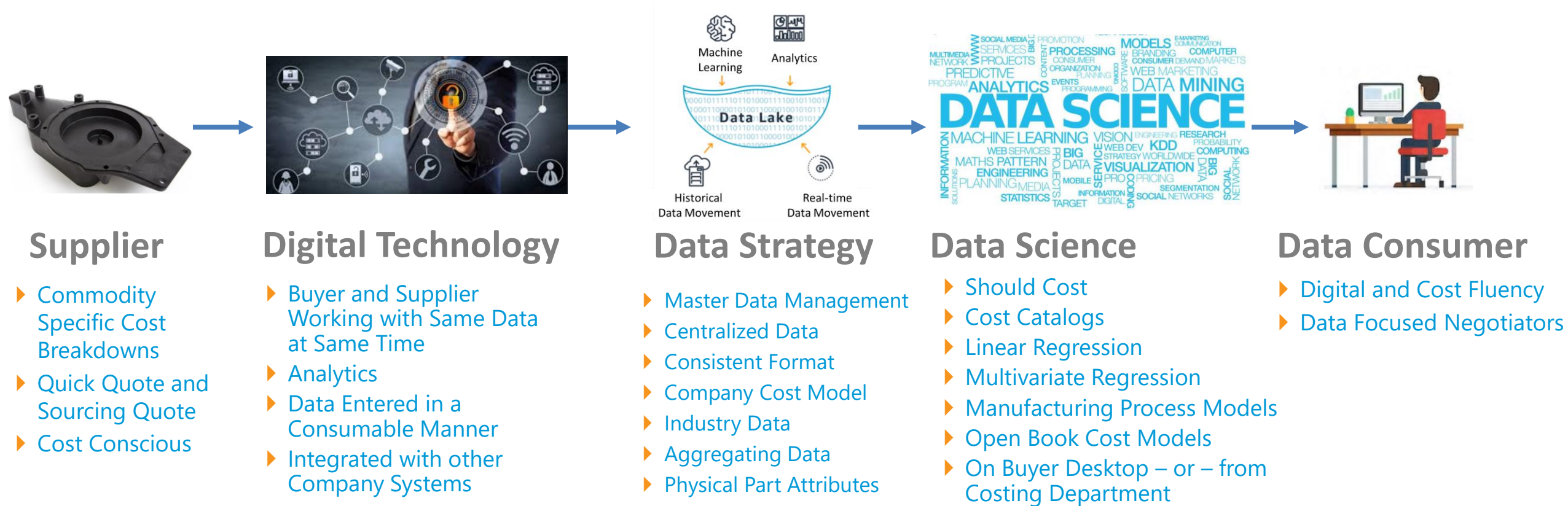
Length of Tube (ft)	Diameter of Tube (mm)	mm of MIG	# of Attachments	# of Critical Characteristics	Contains Fixed Label	Estimated Piece Price	Actual Piece Price	Variance	% Variance
3.250	8.75	2	0	4	1	\$3.49	4.25	\$0.76	17.97%



Get the Price

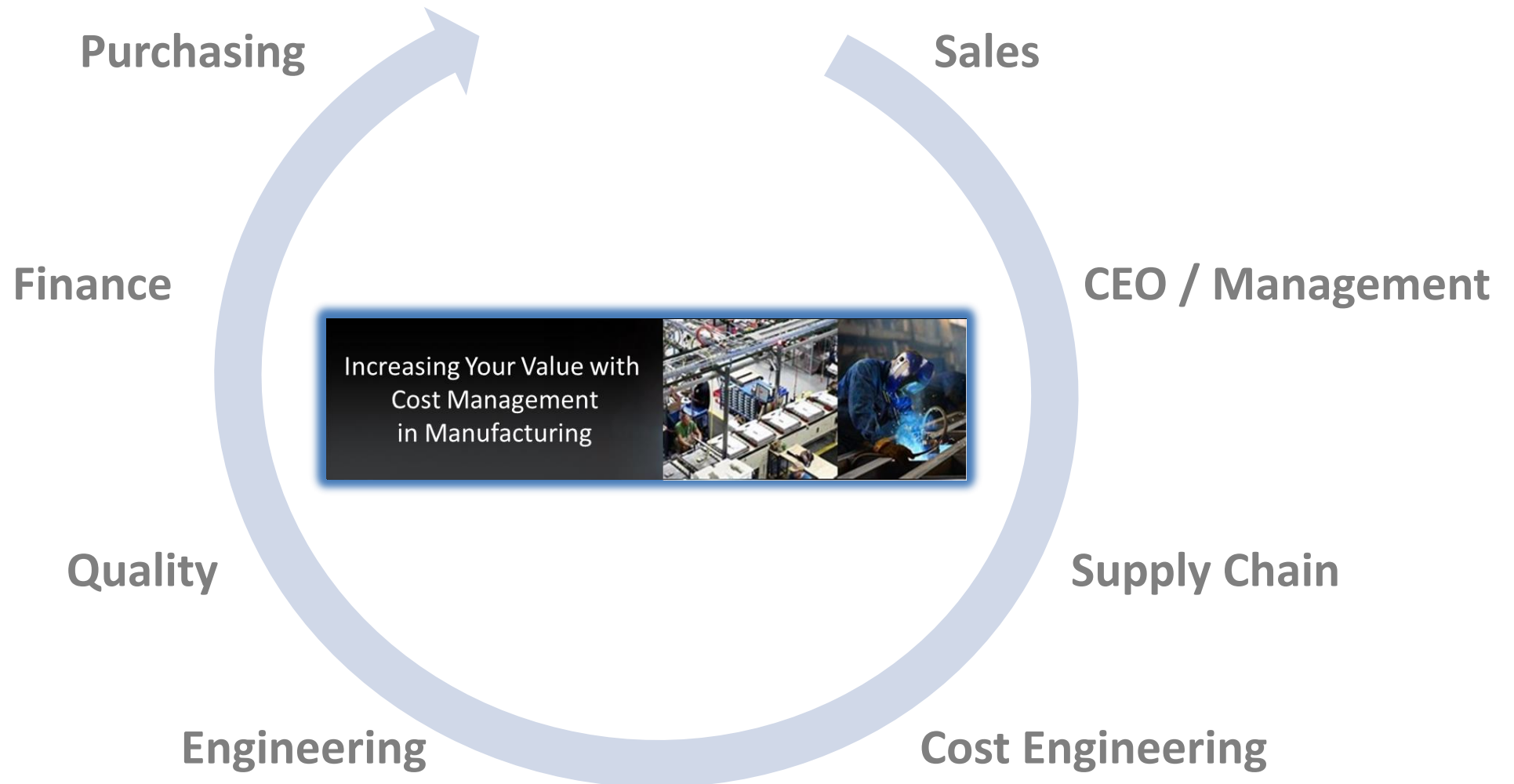
# Cost Management in the Supply Chain

The Path for Doing More with Less

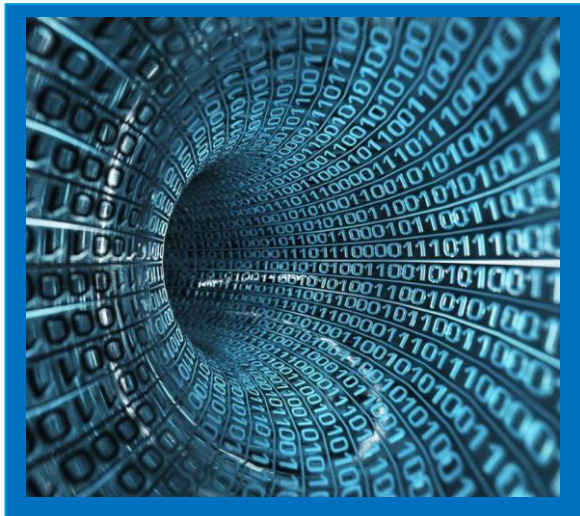


# Cost Management

## Why is it Important to the Data Consumers?



# Benefits of Cost Management in Manufacturing



- ▶ Faster Sourcing Process
- ▶ Faster to Market
- ▶ Typical cost improvements are 5-15%
- ▶ Reduces Costs, Weight, Quality & Warranty Problems
- ▶ Increases Leverage for customer
- ▶ Transition from Market to Actual Costs
- ▶ Generates Savings Road Maps
- ▶ Identify Low-Cost Producers
- ▶ Supports Strategic Supplier Programs
- ▶ Technology Sharing - Collaboration in the Product Development Process
- ▶ Supplier can become the “Go To” Supplier for the customer
- ▶ Supplier can be awarded up front, early in the program

# Cost Management Certification

## Cost Management Certification



### Module 1

Constructing Market Tests - Understanding Costs & Use of Cost Breakdowns



### Module 2

Building and Using Price and Cost Models



### Module 3

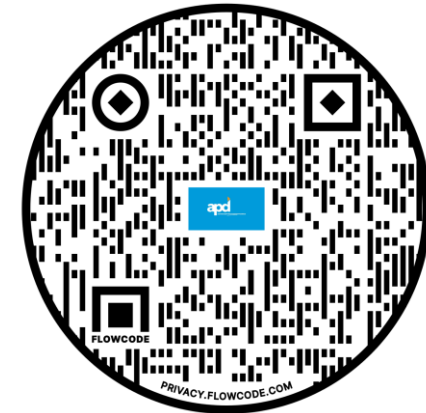
Validating Optimal Costs



### Module 4

Total Acquisition and Relationship Costs

## To Register or Download the Cost Management Certification Brochure



1. Open the camera on your phone
2. Aim at the QR Code
3. Tap the banner that appears

-OR-

Visit: [www.apurchasingd.com/events](http://www.apurchasingd.com/events)



# Questions and Answers





# THANK YOU



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