Attacking Material Quality Issues Head-on

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Learning Objectives

- In this session you will:
  - Learn to use the **Supply Improvement Program (SIP)** to attack and fix process, service, and material issues
  - Manage four business pillars – **Quality, Technology, Logistics, and Cost** – to achieve sustainable solutions
  - **Identify the most significant causes** of customer dissatisfaction
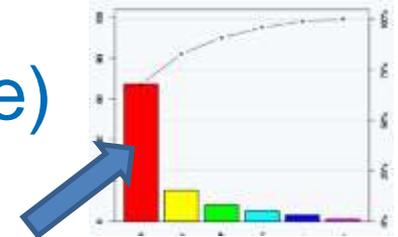 - **Win support** from your leadership and supplier to resolve issues

Painful Disruptions

Any unwelcome and harmful situation which needs to be dealt with and overcome – an added "tax" upon your profits.
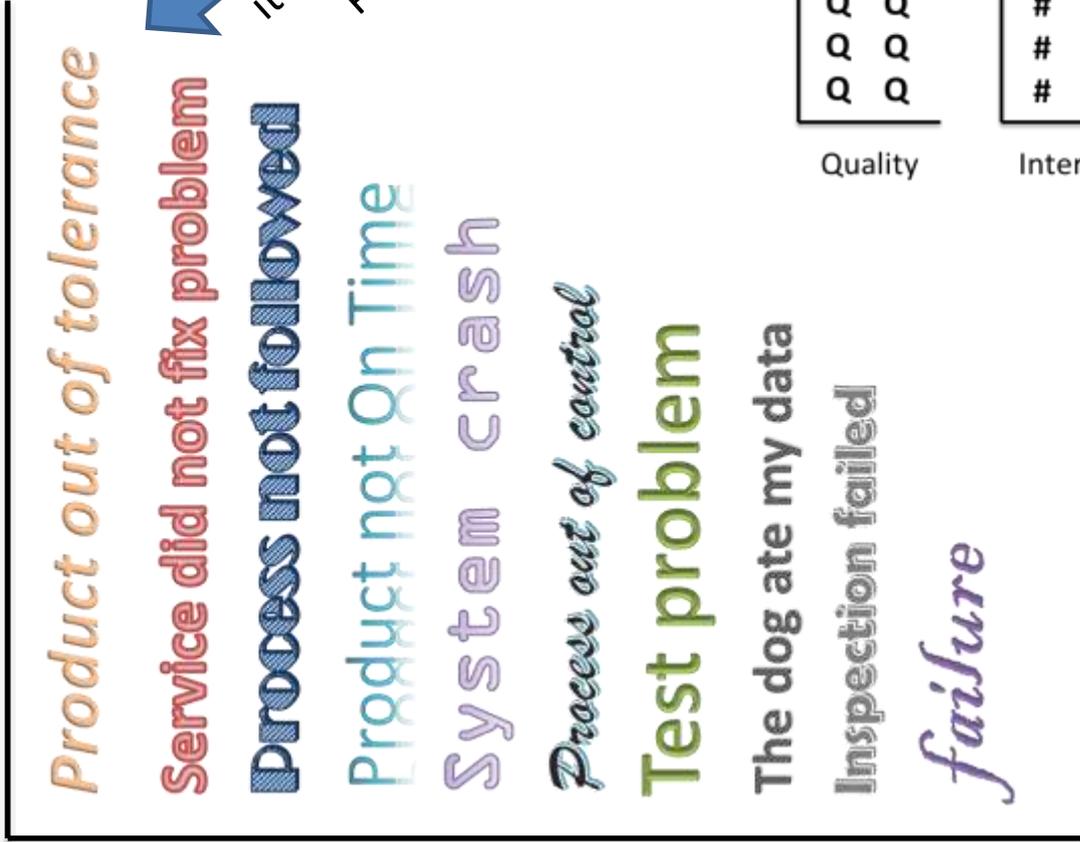
So Many Problems

"You must choose, but choose wisely"
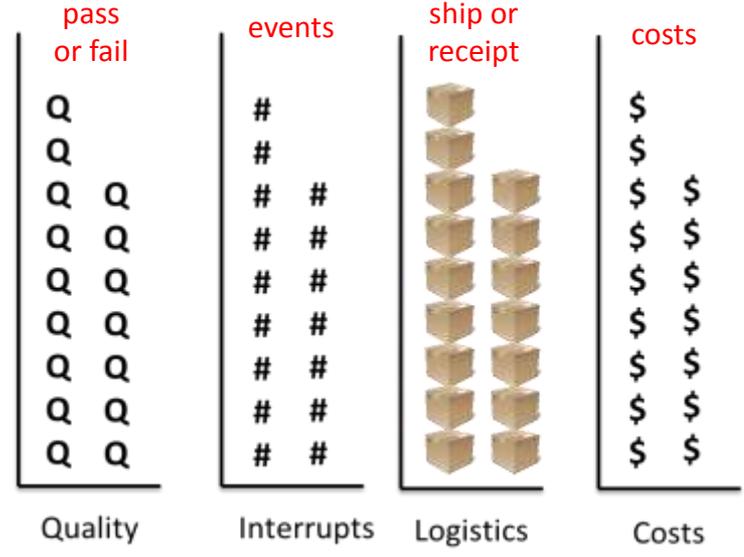
Indiana Jones and the Last Crusade

- Problem selection can be hazardous
- You will be asked to solve one problem over another to help one group or another; Sales, Purchasing, Production
- Let data be your guide to optimize
- Focus on your 80s (the 80/20 rule)

Use the 80/20 rule

The obvious choice; it's highest on Pareto

Product out of tolerance
Service did not fix problem
Process not followed
Product not On Time
System crash
Process out of control
Test problem
The dog ate my data
Inspection failed
failure

pass or fail	events	ship or receipt	costs
Quality	Interrupts	Logistics	Costs

Any one dimension sort criteria is sub-optimized.

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Collect & Review Information

Before deciding on what to resolve;

- Collect your **QTL**i**C** data
  - **Quality**: the acceptance percentage rate
  - **Technology**: the standards to meet/exceed
  - **Logistics**: the On Time Delivery rate
  - **Interruptions** (i): number of **Q** and **L** failures
  - **Cost**: amount spent on failure recovery

What's the Problem?

- Define the issue with data and facts
- Use these four pillars
  - **Quality**: what expectation was not met?
  - **Technology**: based on which specification, drawing, process, agreement?
  - **Logistics**: where, when, package?
  - **Cost**: actual labor/material to make it right.

Prioritize & Select

Which issue, when corrected, will add the most value? Use the **BRAIN** to chose:

- **B**est return on investment
- **R**esolves a customer issue
- **A** quick win to build confidence
- **I**mproves efficiency and effectiveness
- **N**o sub-optimization

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2 Key Performance Indicators

- Performance
  - A measure of how well the desired result is being achieved
  - Pillars: Quality, Technology and Logistics *(technology is used to know desired condition*)

- Pain
  - A measure of costly unintended outcomes while attempting to perform to expectation
  - Pillar: Cost

Performance

Performance is having the solution at the right place at the right time in the expected condition.

- Quality Acceptance Rate (QAR) is the % of material/service processed correctly

- On Time Delivery (OTD) rate is the % of receipts delivered on time.

Performance Indicator

Performance KPI

- Quality: Acceptance Rate (% QAR)
- Logistics: Delivery Rate (% OTD)

➢ Quality% * Logistic% = Performance%

  – Is what was expected done correctly? If not – we cannot give credit for being on time (OTD).

  – Was it completed/delivered on time? If not – we cannot give credit for being correct.

  – Acceptable is on time in the expected condition.

Performance In Two Dimensions

Combines

Quality Acceptance Rate (QAR%)

with

Logistics On Time Delivery Rate (OTD%)
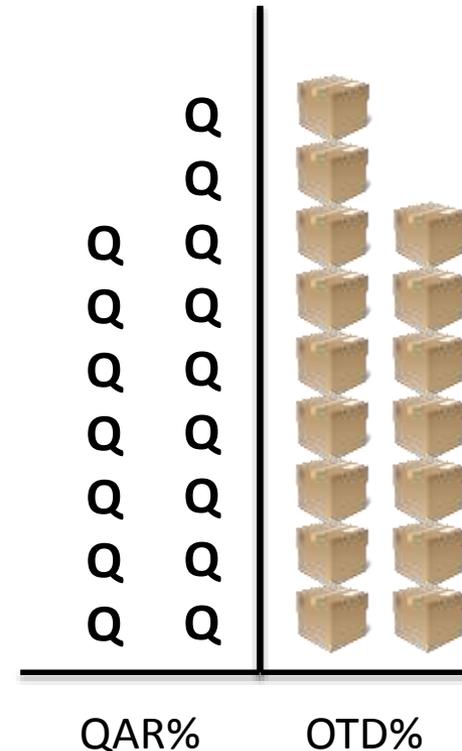
Performance Rate & Rank

Performance =

QAR *x* OTD

At the right place,
at the right time,
in the expected condition.

Performance	OTD rate	Quality rate
0.5	25.0	25.0
	>95%	>98%
At the right place in the expected condition	% of receipts delivered on time	% good material accepted / processed
Performance	OTD rate	Quality rate
0.4%	3.	13.0%
5.7%	11.0%	51.9%
15.0%	29.5%	50.7%
5.0%	73.3%	6.8%
8.8%	14.3%	61.1%
9.0%	97.8%	9.2%
12.1%	50.3%	24.1%
13.6%	95.8%	14.2%
25.4%	59.9%	42.4%
30.9%	86.6%	35.7%
18.1%	35.9%	50.5%
100.0%	100.0%	100.0%
3.5%	4.8%	73.0%
35.2%	38.9%	90.5%
79.9%	94.6%	84.5%
94.1%	95.7%	98.3%

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Pain

Pain is the unexpected burden and tax of correcting an undesired condition.

- **Cost of Pain** (CoP) are the expenses incurred in labor and materials to correct the issue and return to standard

- **Interruption** (i) are the number of events when QAR or OTD were not achieved

Pain Indicator

Pain KPI

- Cost: Labor / Material drain in dollar$
- Interruptions: Occurrence count #
- ➢ Cost *x* Interruptions = Pain$
  - Interruptions are not created equal.
  - 1,000 interrupts @ $10 cost or 1 interrupt @ $10,000 will show as equal.
  - Weighting is applied to what is more important to your business.

Pain in Two Dimensions

Combines
Cost ($)
with
Interrupts (#)

Interrupts   Costs

Pain Rate & Rank

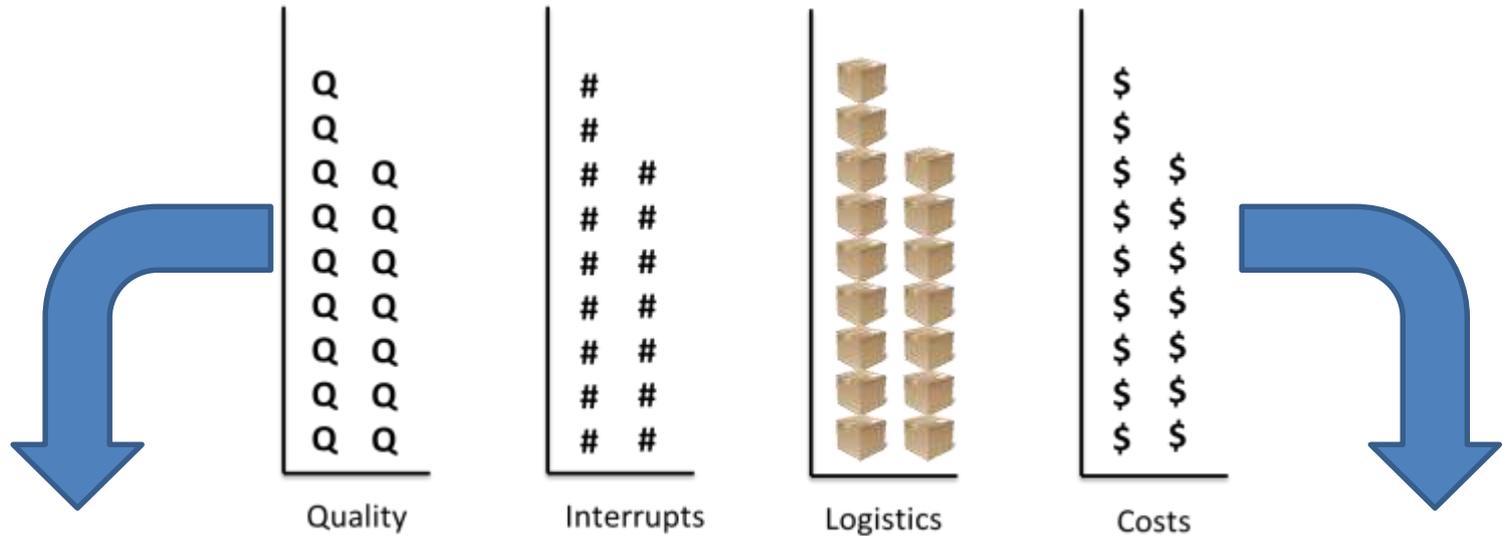$$\text{Pain} = \frac{\text{COP} \times i}{(\text{*factor})}$$

The unexpected burden and "tax" of correcting an undesired condition

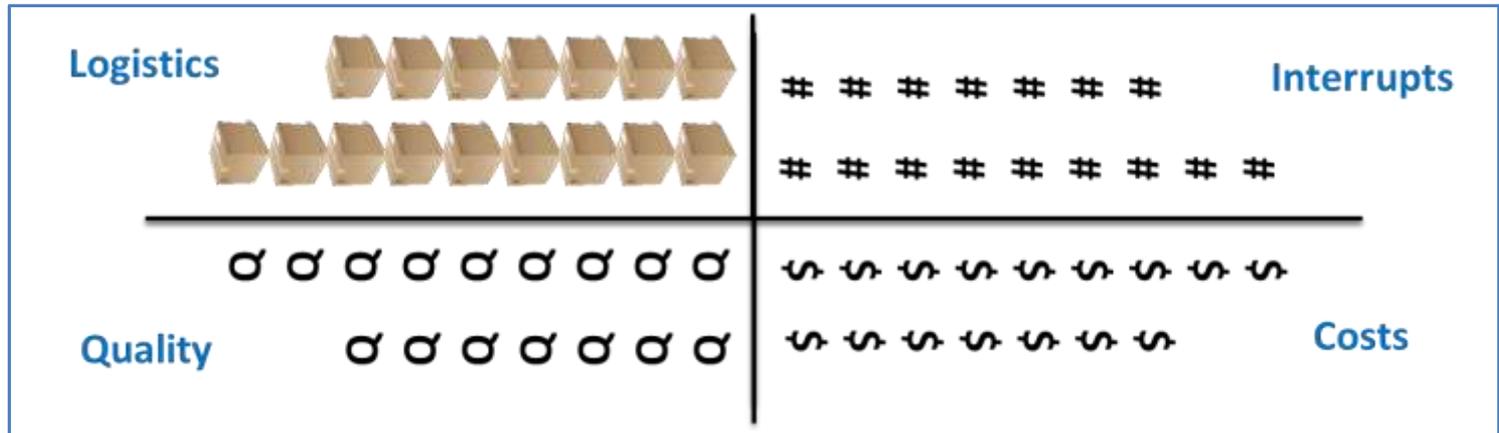*In this case the factor is 1,000; adjust to keep value legible

Pain	Interuption	COP
0.5	25.0	25.0
	<2	<$5,000
Cost of Disruptions	Count of all supplier issues	Direct labor hours and materials cost to resolve issue
Pain	Interuption	COP
1231	93	$13,238
982	80	$12,269
609	90	$6,763
565	60	$9,468
550	59	$9,247
480	47	$10,125
473	65	$7,247
440	40	$10,917
421	46	$9,234
368	36	$10,120
316	26	$12,325
176	37	$4,728
132	17	$7,663
18	4	$4,279
16	2	$6,761
8	3	$2,574

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Multi-Dimensional Process Thinking

Quality   Interrupts   Logistics   Costs

Performance   **Pain**

Logistics   Interrupts

Quality   Costs
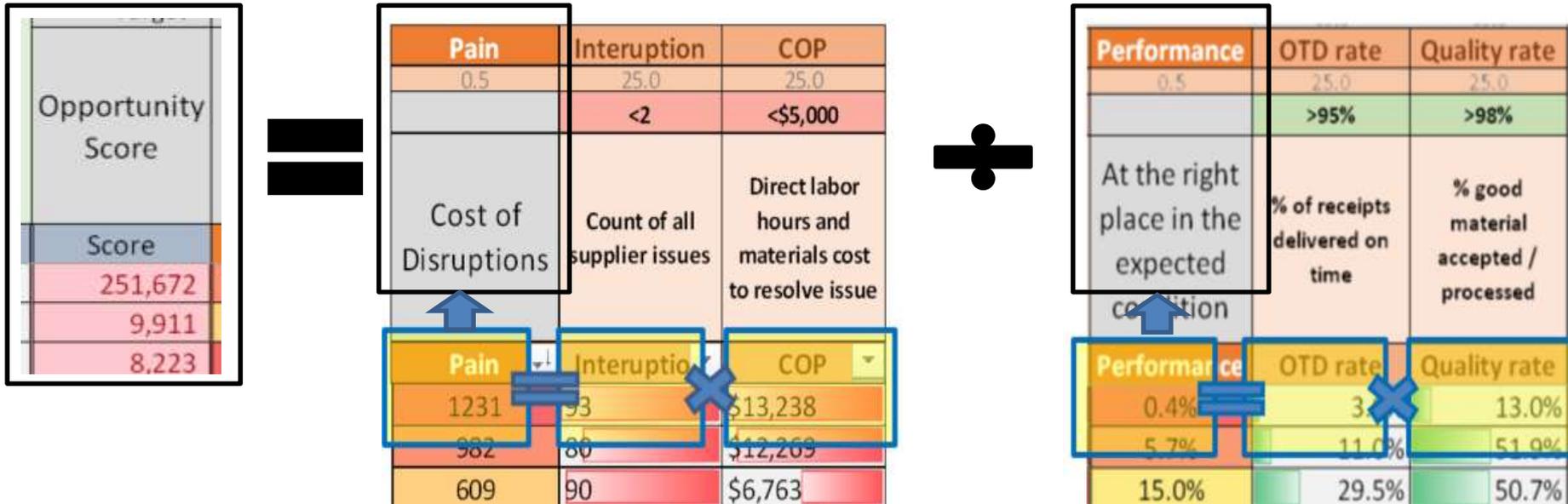
Putting It All Together…

… to quickly identify the best *opportunity* for improvement and knowing the negative affects upon your business. **Enables gaining support**.

Problem Statement

- Use QTLC data to define the problem
- Be SMART with your definition
- Include in your statement a 'from' what condition and a 'to' desired condition
- Use qualitative and/or quantitative measure in the condition

Identifying the Best Opportunity

Program Manager: **Carl Douglas**

Course of Action

Data Range | Total Items Received: 468,537

Jan-Oct 2017

Range of Total Scores: 8 to 251672

Highlight Opportunity Scores above: 6000

The higher the score the greater the opportunity

Key Performance Indicators & Weighting

KPI	Pain	Interuption	COP	Performance	OTD rate	Quality rate
weight (100)	0.5	25.0	25.0	0.5	25.0	25.0
Target		<2	<$5,000		>95%	>98%
Opportunity Score	Cost of Disruptions	Count of all supplier issues	Direct labor hours and materials cost to resolve issue	At the right place in the expected condition	% of receipts delivered on time	% good material accepted / processed

Part#, Description, Supplier	Status	Prj Manager	Score	Pain	Interuption	COP	Performance	OTD rate	Quality rate
123456; Plate, Mounting; ACME Global	Active	J. Croche	251,672	982	80	$12,269	0.4%	3.0%	13.0%
147963; Bearing, Linear, 1.25; Bearings R-US	Active	JP Getty	9,911	565	60	$9,468	5.7%	11.0%	51.9%
847629; Top Plate, AL; ACME Global	Initiated	A. Palmer	8,223	1231	93	$13,238	15.0%	29.5%	50.7%
53454, Trans., Pwr.; Discrete Electronics gmbh	Initiated	P. Revere	7,399	368	36	$10,120	5.0%	73.3%	6.8%
456981; Body, SST; ACME Global			6,941	609	90	$6,763	8.8%	14.3%	61.1%
147845; Bearing, Linear, 0.5; Bearings R-US	Active	R. Starr	6,107	550	59	$9,247	9.0%	97.8%	9.2%
M-9259; Base, F/T, Ti; Casting Call Foundry			3,472	421	46	$9,234	12.1%	50.3%	24.1%
P-752; Motor, 24v,Rev.;Black Box Discount Store			3,238	440	40	$10,917	13.6%	95.8%	14.2%
P-753; Motor, 12v,Rev.;Black Box Discount Store			1,865	473	65	$7,247	25.4%	59.9%	42.4%
L-8732.4; Part, Critical; NWAP foundry Company			1,020	316	26	$12,325	30.9%	86.6%	35.7%
L-7328.7; Part, Important; NWAP foundry Co.			969	176	37	$4,728	18.1%	35.9%	50.5%
M-1874.5; Feed-Thru, SST; New Age Machine			480	480	47	$10,125	100.0%	100.0%	100.0%
0872346; RES, small; Discrete Electronics gmbh			462	16	2	$6,761	3.5%	4.8%	73.0%
M-1893.5; Feed-Thru, Ti; New Age Maching			376	132	17	$7,663	35.2%	38.9%	90.5%
P-1234.5; Seal, Al; New Age Machining	Closed	A. Palmer	23	18	4	$4,279	79.9%	94.6%	84.5%
XR47G; Arm, Robot; iRobot manufacturing	Closed	P. Revere	8	8	3	$2,574	94.1%	95.7%	98.3%

Opportunity =**Pain** / **Performance**   **Pain = i x COP**   **Performance = OTD x QAR**
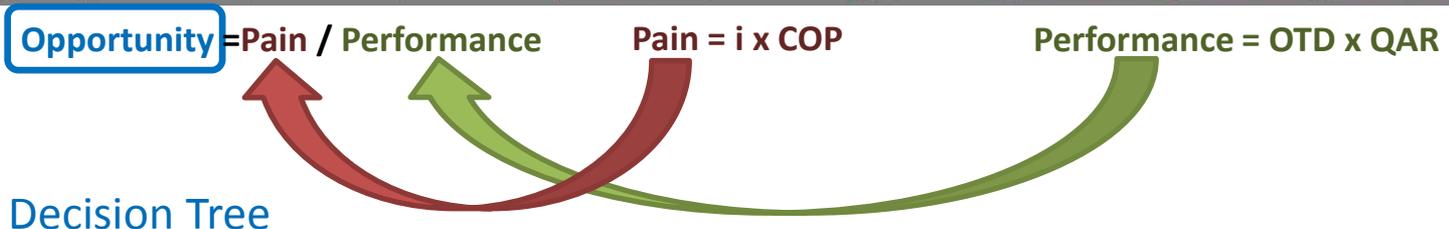
A Good Decision Tree

Win Support

- Use the **Performance** and **Pain** KPIs
- Rate and rank the issues
- Use the '***Course of Action***' for comparison of issues to define and easily win support
- Highlights the worst performers and the cost impact (tax) on the business
- Effective whether internal or external issue – undesired rework or dissatisfied customers

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Problem Solving

- Review key points to problem solving
  1. Define problem *(Pillars: QTLC)*
  2. Contain issue / triage
  3. Risk analysis (RA) *(Opportunity Score)*
  4. Root cause analysis (RCA) Determine/implement countermeasures
  5. Confirmation of countermeasure results
  6. Evaluate and adjust
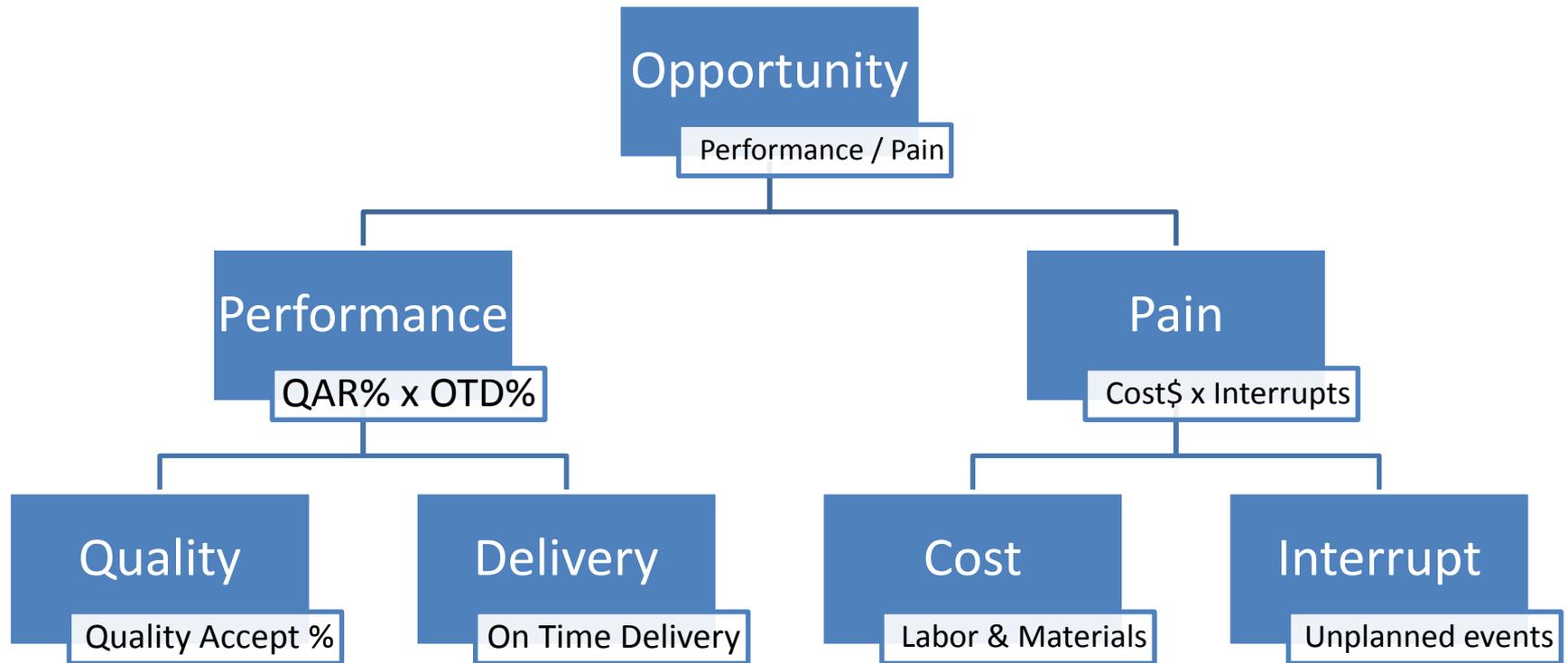 7. Close (after approver agrees resolved)

There are many problem solving processes; select one you are familiar and comfortable using

Take-Aways

- From this session, you know how to:
  - Use this SIP to fix process, service, and material issues
  - Manage four business pillars to achieve sustainable solutions; Quality, Technology, Logistics, and Cost
  - Identify the most significant causes of customer dissatisfaction with 2 key KPIs
  - Use the Performance and Pain KPIs to identify Opportunities and win support

Seize the Opportunity

Opportunity — Performance / Pain

Performance — QAR% x OTD%

Pain — Cost$ x Interrupts

Quality — Quality Accept %

Delivery — On Time Delivery

Cost — Labor & Materials

Interrupt — Unplanned events

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Use the **Supply Improvement Process** (SIP)
to attack issues head on

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