

Six Sigma

Key Questions

- Are you *consistently* fulfilling customers' requirements?
- Do your improvement efforts continue to repay your investment?
- Are you satisfied with how quickly you see measurable bottom-line results from improvement efforts?

Six Sigma is the answer

Six Sigma is a disciplined business improvement method of using rigorous data gathering and statistical analysis to pin-point sources of errors and find ways to eliminate them.



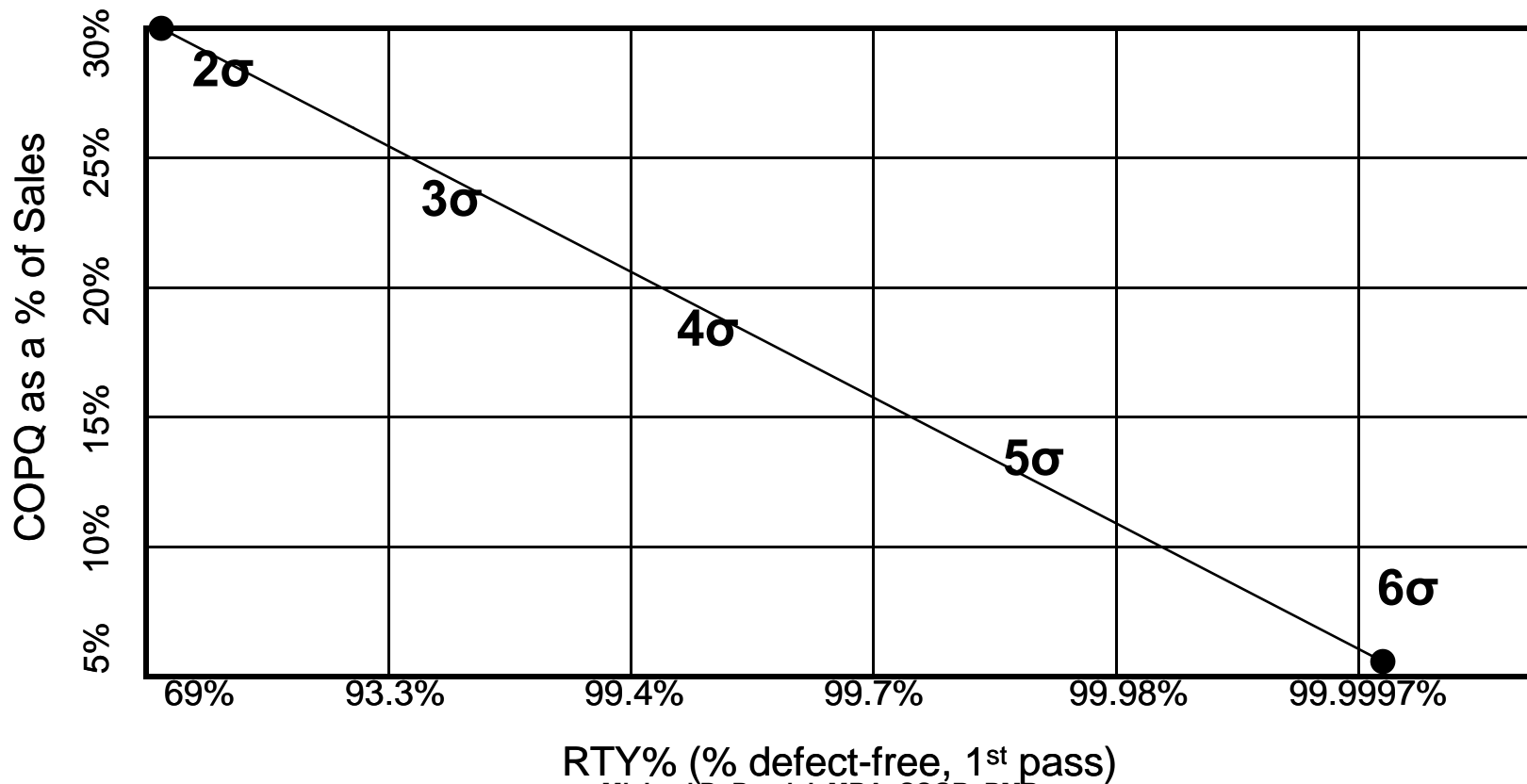
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Sigma vs. Cost of Poor Quality (COPQ)

\$ - a compelling reason

Example:

- a 12 step process
- each process yields 97% (or 3% defects)
- accumulated Rolled Throughput Yield (RTY%) is 69%
- **COPQ (from AlliedSignal study) is 30% of COGS (1st pass only)**



RTY% (% defect-free, 1st pass)

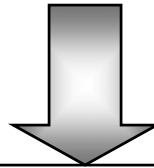
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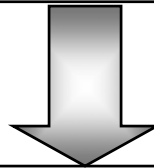


A **Lean** organization is not possible without un-interruptible process flow to respond quickly to your customers. **NO DEFECTS**



Six Sigma a vehicle for strategic change ... an organizational approach to performance excellence.

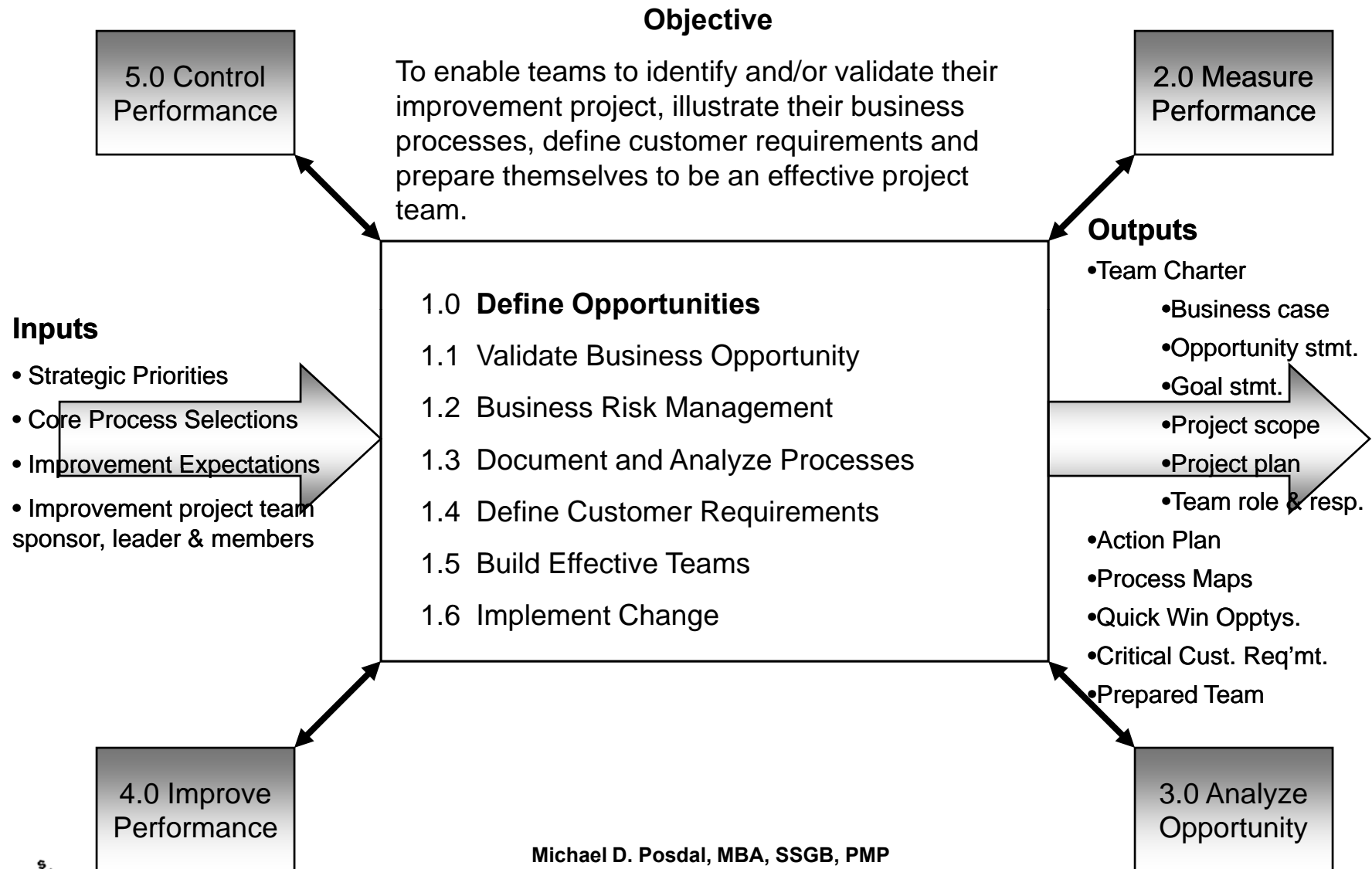
Tools and methodologies targeted at reducing variation and defects.



DMAIC: The Road to Improvement

D	Define
M	Measure
A	Analyze
I	Improve
C	Control

Define Opportunities



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Measure Performance

Objective

Identify critical measures that are necessary to evaluate success of meeting critical customer requirements & begin developing a methodology to effectively collect data to measure process performance. Establish baseline Sigma for processes the team is analyzing.

1.0 Define Opportunity

3.0 Analyze Opportunity

Inputs

- Team Charter
 - Business case
 - Opportunity statement
 - Goal statement
 - Project scope
 - Project plan
 - Team role & resp.
- Action Plan
- Process Maps
- Quick Win Opportunities
- Critical Customer Req'mt.
- Prepared Team

2.0 Measure Performance

- 2.1 Determine What to Measure
- 2.2 Manage Measurement
- 2.3 Understand Variation
- 2.4 Determine Sigma Performance
- 2.5 Managing the Measurement Systems

Outputs

- Input, output & process indicators
- Operational Definitions
- Data collection formats and plans
- Baseline performance
 - Sigma
 - Cost
 - Time
 - Other
- Problem Statement
- Productive team atmosphere

5.0 Control Performance

4.0 Improve Performance



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Analyze Opportunity

Objective

Stratify and analyze opportunity to identify a specific problem and define an easily understood problem statement. Identify and validate root causes that assure elimination of 'real' root causes as this is the problem on which the team is focused.

1.0 Define Opportunity

2.0 Measure Performance

Inputs

- Operational Definitions
- Input, output & process indicators
- Data collection formats and plans
- Baseline performance
 - Sigma
 - Cost
 - Time
 - Other
- Problem Statement
- Productive team atmosphere

3.0 Analyze Opportunity

- 3.1 Process Stratification and Analysis
- 3.2 Determine Potential Root Causes
- 3.3 Hypothesis Testing *
- 3.4 Experimental Design *
- 3.5 Manage Creativity

* *Validate root causes*

Outputs

- Data analysis
- Process maps
- Validated root causes
- Problem statement

5.0 Control Performance

4.0 Improve Performance



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Improve Performance

Objective

To enable teams to effectively identify, evaluate and select right improvement solutions. Introduce change management methods and enable team to develop an approach that prepares organization to adapt to changes that will be introduced when solutions are implemented.

1.0 Define Opportunity

2.0 Measure Performance

Inputs

- Data analysis
- Process maps
- Validated root causes
- Problem statement
- Project goals
- Improvement targets
- Potential solutions

4.0 Improve Performance

- 4.1 Generate Improvement Ideas
- 4.2 Evaluate and Select Solutions
- 4.3 Present Recommendations

Outputs

- Solutions
- Process maps & docs.
- Implementation milestones
- Improvement benefits & impacts
- Story board
- Change maps

5.0 Control Performance

3.0 Analyze Opportunity



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Control Performance

Objective – Staying on track (maintaining perspective)

- Is team operating within context of team charter?
 - Project scope
 - Project plan
 - Goal statement
- Has fact-based decision making been consistent?.
- Are team’s assumptions continuously validated?

1.0 Define Opportunity

4.0 Improve Performance

Inputs

- Solutions *
- Project goals
- Indicators
- Improvement targets
- Process maps & docs. *
- Implementation milestones *
- Improvement benefits & impacts *
- * *Story board*

5.0 Control Performance

5.1 Develop and Execute Pilot Plan

5.2 Plan and Implement Solution

5.3 Process Integration

5.4 Closure and Recognition

Outputs

- Solutions
- Process maps & docs.
- Implementation milestones
- Improvement benefits & impacts
- Story board
- Change maps

2.0 Measure Performance

3.0 Analyze Opportunity

- Is leadership “on board” with team’s findings?
- Is team performing effectively?
- Can likelihood of success be improved by revisiting previous conclusions or analysis?

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