Six Sigma Solutions

Six Sigma Overview & CMM Implementation

RM SIG - 19 November 2002

Bob Jarvis

JPMorganChase

Has This Happened to You?

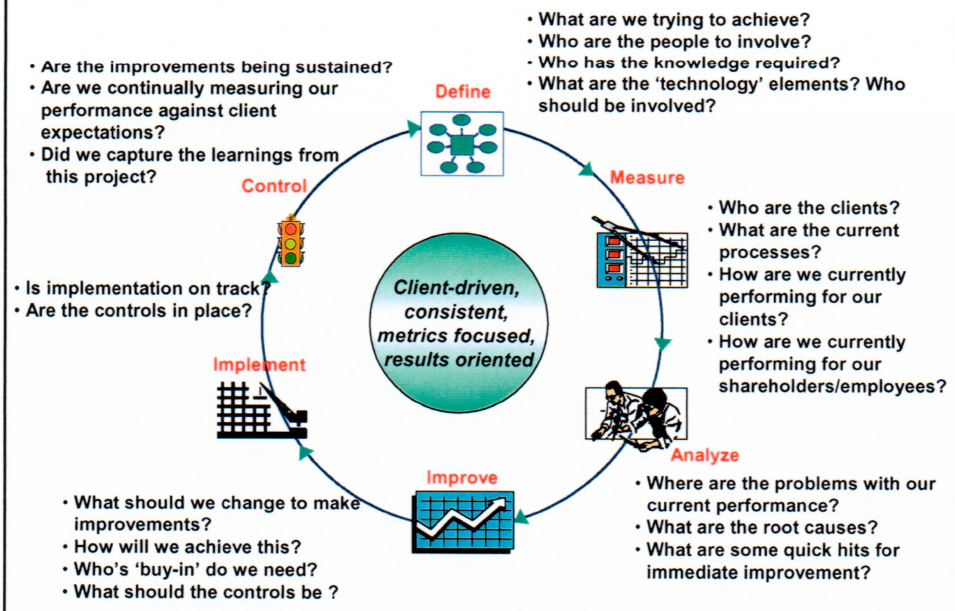
- You're pretty sure what the new process should look like, but you're not sure how to get there.
- You've implemented a terrific process improvement, and you're sure that there are quantifiable results, but you can't prove it.
- You want to have some way to ensure that the new process is followed after you move on to the next.
- You jump right to the "obvious" solution, but you're nor really sure it's the best answer.

➔ ***Six Sigma can solve these problems (and more)***

DMAIIC

- Define
- Measure
- Analyze
- Improve
- Implement
- Control

The DMAIIC Overview



DMAIIC provides...

- Common improvement framework and language across the firm
- Provides guidance for inexperienced teams / leaders (and a "Memory-Jogger" for experienced teams/leaders)
- Facilitates project planning (Provides a "standard" set of activities)
- Links tools and methods systematically
- Disciplined methodology which prevents "skipping" steps (i.e.,"*jumping to solution*" because "*we know what the answer is…*") Ensures that the *data* leads the improvement effort—not our gut feel or intuition
- Recognized best practice among business strategies

Note: The DMAIIC process is iterative---don't be fooled by the "linear, one-time through and we're done" depiction. *Expect* to revisit earlier phases as a natural result of discovering more about the process.

DMAIIC and the Tools

Define	Measure	Analyze	Improve	Implement	Control
How do I launch a project and set it on the right track?	*How big is the problem (as defined by customer requirements and data)?*	*What are the root causes of the problem?*	*How can we make the process better?*	*Let's execute the Improvements*	*How do we "sustain the gains" and identify leverage opportunities*
• Launch the project using "One Day Launch Process" • Define project objectives/ outcomes • Develop Project Charter • Identify sponsor and key stakeholders • Select team, define responsibilities and launch • Create high-level project plan	• Create current high-level process map (As Is) • Obtain customer input, priorities and CTQ's • Gather initial metrics – Historical Performance – Current performance • Understand current process performance • Calculate Baseline sigma	• Identify sources of variation in the process by analyzing data and the process • Use benchmarking data to size the performance gap • Develop initial value proposition: opportunities & targets • Use problem solving tools to get to the root causes	• Identify improvement breakthroughs • Identify high gain alternatives, select preferred approach • Design "To Be" process & targets • Perform C/B analysis • Utilize FMEA • Develop storyboard • Create high-level implementation approach	• Conduct Risk Assessment • Develop detailed implementation plan – Execute – Train – Communicate • Pilot • Manage Change • Develop Control Methods	• Sustain the improvement • Implement continuous measurement systems • Document new process and procedures • Report Dashboard & Scorecard Data • Transfer Best Practices • Reward & Recognition
Key Tools:					
• Business Case • Project Objective • Project Scope • Project Team Roles and Responsibilities • Project Plan • Communication Plan • Project Charter • Launch	• SIPOC • Process Maps "As Is" • Quick Wins • VOC/VOB/VOE • CTQs • Data Collection Plan • Data Analysis: - Histogram, Run Chart • Variation • Baseline Sigma Calculation	• Value Added Analysis • Data Stratification: - Pareto Chart - Scatter Diagrams • Activity Prioritization Matrix • Cause-Effect (Fishbone) • Cost of Poor Quality (COPQ) • Benchmarking	• Brainstorming • Decision Matrix • Process Maps "To Be" • Force Field Analysis • FMEA • Cost/Benefit Analysis • Dashboards • Storyboards	• Risk Assessment • Detailed Implementation Plan • Pilot Testing • Change Management	• Control Charts • Process Control System • Dashboard • Best Practices • Team Closure

Define - The project for success

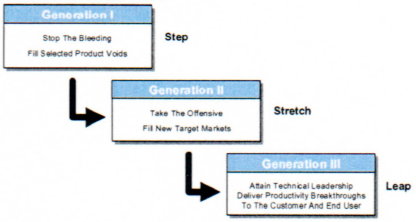
DMAIIC

1: Initiate the project

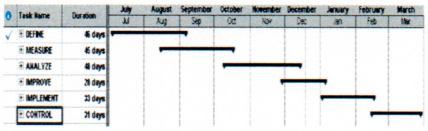
- Business Case
- Problem/Goal Statement
- Product/ Service Description
- Project Team
- Stakeholders

Original Problem Statement	Hedge Fund Objective
Is it SPECIFIC?	To increase hedge fund client base
Is it MEASURABLE?	revenues by 25% over 1999 plan
Is it AGGRESSIVE?	(from $290mm to $360mm) with
Is it REALISTIC?	no increase in unit cost while
Is it TIME BOUND?	continuing to manage risk to the
Revised Problem Statement	industry.
Improvement goal	

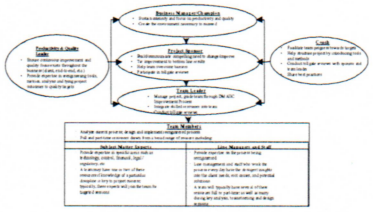
2: Scope The Effort



3: Plan Project & Assess Risks



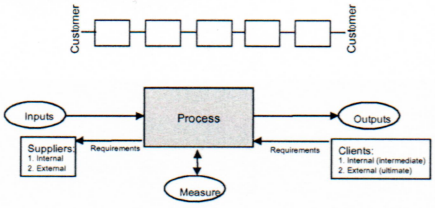
4: Identify Team members roles & responsibilities



Measure - Measure the Current Performance

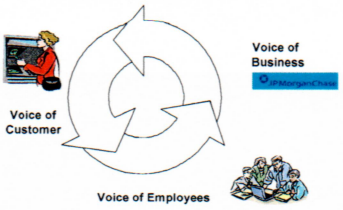
DMAIIC

5. Define the Process



How do we serve the customer today?

6. Capture VOC/VOB/VOE



What do our customers want from us?

7. Translate VOC/VOB/VOE into Measurable CTQs

VOC → Drivers → CTQ (Critical to Quality)

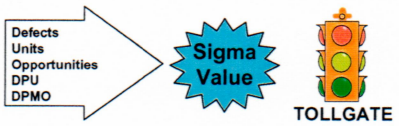
Good Customer Service → Knowledgeable reps → Reps can correctly answer questions asked by customer without further research

General ⟷ Specific

Hard to measure ⟷ Easy to measure

How do we measure our performance?

8. Baseline the Process

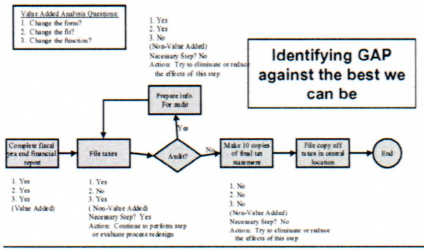


How are we doing?

Analyze - The Current Performance

DMAIIC

9. Conduct Value-Added Analysis



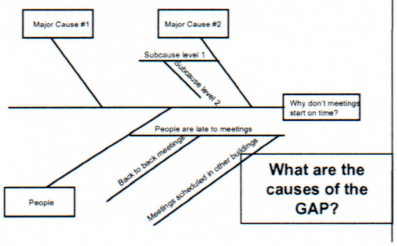
10. Conduct Process Benchmarking

as of 3Q 99

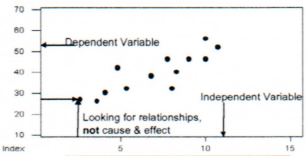
	RRM	Opportunities	Exceptions (Defects)	Yield	DPMO	Sigma
1	PIMCO	87	2	98%	22,989	3.5
2	TCW GROUP	51	2	96%	39,216	3.3
3	WESTERN ASSET	87	5	94%	57,471	3.1
4	DODGE & COX	87	7	92%	80,460	3.0
5	MILLER ANDERSON	81	8	90%	98,765	2.8
6	MORGAN GREN US/FI	81	8	90%	98,765	2.8
7	BLACKROCK	63	9	86%	142,857	2.6
8	STANDISH AYER	87	13	85%	149,425	2.6
9	MORGAN GREN ENHAN	63	10	84%	158,730	2.5
10	J.P. MORGAN FLCORE	93	17	82%	182,796	2.5
11	WELLINGTON MGMT	87	17	80%	195,402	2.4
12	CAPITAL GUARDIAN	87	20	77%	229,885	2.3
13	BRINSON PARTNERS	87	21	76%	241,379	2.3
14	GOLDMAN SACHS	72	21	71%	291,667	2.1
15	BERNSTEIN & CO	87	34	61%	390,805	1.8
16	PUTNAM INVT	63	25	60%	396,825	1.8
17	FISCHER FRANCIS	84	36	57%	428,571	1.7

Identifying GAP against the best in class

11. Conduct Root Cause Analysis



12. Correlate Root Causes to Output



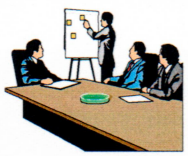
What impact can we have?

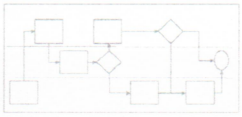
TOLLGATE

Improve - Process Efficiency

DMAIIC

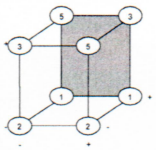
13. Brainstorm the "To-Be" Process

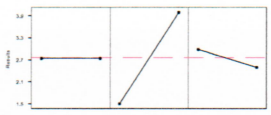




Identifying the Solution

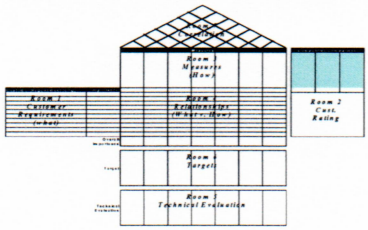
14. Test Potential Solutions





Evaluate the Solution

15. Determine measures for the New Process



Measure the Solution

16. Verify the Relationship to Customer Needs

$X_1 \rightarrow X_2 \rightarrow X_3 \rightarrow X_4 = Y$

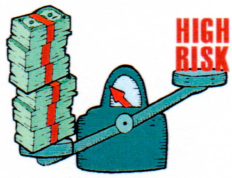
What are the costs/benefits of the improvement?

TOLLGATE

Implement - The Improvements

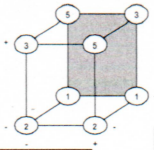
DMAIIC

17. Document the Process Risks



Probability of Occurrence X Severity of Impact

18. Conduct and Validate Pilot

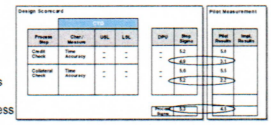


Products

- Test Markets
- Product Mock-ups, Scale Models
- Focus Groups Use Products
- Offer To "Favored" Customers

Processes

- Pilot Facilities
- Walk-Throughs, Dry Runs
- Test Locations
- Subset Of Items To Process
- Particular Customers

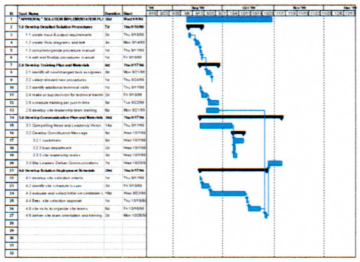


- Analyze "Gaps" Between Predicted Performance And Pilot Results
- Analyze "Gaps" Between Pilot Results And Actual Requirements

Minimize Risks and Exposure with a small scale pilot

TOLLGATE

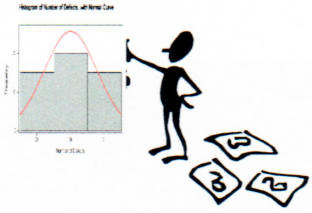
19. Implement Production Process



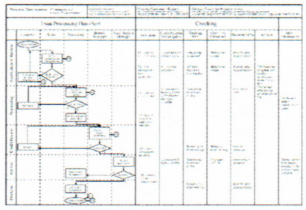
Control - And Adjust New Processes

DMAIIC

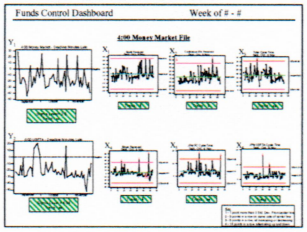
20. Validate the Results



21. Establish Process Controls

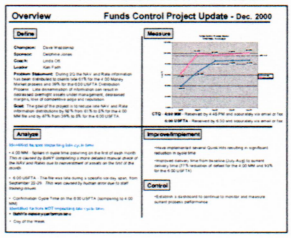


22. Monitor the Process



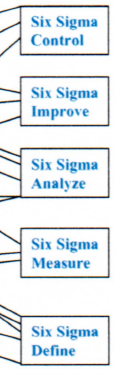
TOLLGATE

23. Communicate the Results



Elements of Six Sigma throughout CMM

Level	Focus	Process Area
5 Optimizing	Continuous Process Improvement	Defect Prevention Technology Change Management Process Change Management
4 Managed	Quantitative Management	Quantitative Process Management Software Quality Management
3 Defined	Process Standardization	Organization Process Focus Organization Process Definition Integrated Software Management Software Product Engineering Intergroup Coordination Peer Reviews Training Program
2 Repeatable	Basic Project Management	Requirements Management Software Project Planning Project Tracking & Oversight Software Subcontract Management Software Configuration Management Software Quality Assurance
1 Initial		



Mini Case Study

Requirements Management KPA

Mini Case Study

➔ *Subset of six sigma steps*

Define

- Charter
  - Business Case
  - Project Scope
  - Project Team
  - Problem and Goal Statement
  - Project Schedule
- Scope

Mini Case Study

Measure

- Define the Process - SIPOC
- VOC / VOB / VOE
  - Who?
- Calculate baseline sigma
  - What's a defect?
  - What's an opportunity?