PART II & III

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Outline

- **Chapter 5-** Implementing a Formal Six Sigma Program
- **Chapter 6-** "Ultimate" Six Sigma
- **Chapter 7-** Applying Six Sigma to Project Management
- **Chapter 8-** Organizing for Six Sigma

Chapter 5

Implementing a Formal Six Sigma Program

Implementing a Formal Six Sigma Program:

Introduction:

1) **This Chapter prescribes the organizational structure, tools and methods needed to implement Six Sigma and achieve higher level of quality.**

2) **Implementing six sigma involves a considerable amount of training and coaching as well as many organic changes to the organization and how it operates.**

Implementing Six Sigma Program:

Six Sigma incorporates six themes to guide an organization as part of implementation

- Focus on the customer
- Data-and fact-driven management
- Process focus on management and improvement
- Proactive Management
- Boundary less collaboration
- Drive for perfection, tolerance for failure

Implementing Six Sigma Program:

1) Focus on the customer

❑ In Six Sigma, the activity focuses toward the satisfaction of customer instead of traditional "Measurements of Performance"

❑ The definition of defect should not be limited to those things inherent to products or services we deliver.

❑ From customer's perspective if the product does not meet their needs, the absence of defect is of no consequence.

Implementing Six Sigma Program:

2) Data & Fact Driven Management:

❑ Six Sigma is quantitative method.

❑ It is supported by use of data and facts derived from data.

❑ Many programs fail not because they fail to embrace the future, but because they fail to abandon the past.

❑ Success of six sigma lies with insistence by leaders that decisions are to be made based on data and facts.

Implementing Six Sigma Program:

3) Process Focus on Management and improvement:

❑ Six Sigma is built on the foundation of statistical process control.

❑ Six Sigma tools are applied to recognize and mange the similarities between current projects and past or future projects.

❑ Process improvement is achieved in performance and quality by recognizing the similarities, by improving the performance of current and future iterations of a process

Implementing Six Sigma Program:

4) Proactive Management:

- **Proactive is opposite of reactive management.**

- **It insists on management's "Autonomy" and "Empowerment".**

- **As per Deming's theory "Management must not fear making a decision or a mistake".**

- **The Six Sigma methods provide a clear indication of where a mistake has been made, so its correction can be identified as easily as it was to make the mistake in the first place.**

- **Big improvements almost require big changes.**

Implementing Six Sigma Program:

5) Boundary less collaboration:

❑ Six Sigma focus on "Cross Functional Integration". Eliminate Boundaries between internal department to achieve the common goals.

❑ Project Managers are most likely to provide required data since they involve cross functional activities within the internal departments.

❑ Eliminate politics within the internal departments to accomplish project goals.

❑ In addition to addressing the Boundaries among the internal departments, six sigma focuses on the boundaries that can also exist between supplier and customer.

❑ Six Sigma provides the tools for working effectively across those boundaries as well.

Implementing Six Sigma Program:

6) Drive for perfection, tolerance for failure:

❑ **Achieving Six Sigma requires significant changes not just in process, but in the organization's culture, in the people, inside the plant and in any other areas.**

❑**Fear of failure must be driven out if the courage to take the risks that will yield significant improvements.**

❑**DMAIC: Define, Measure, Analyze, Improve and Control.**

Implementing Six Sigma Program:

6) Drive for perfection, tolerance for failure:

- ❑ **DMAIC:**
- ❑ **Define: The Process for Improvement**
- ❑ **Measure: Benchmarking**
- ❑ **Analyze: Plan the Changes**
- ❑ **Improve: Execution the changes**
- ❑ **Control: Validate against Benchmarking.**

Implementing Six Sigma Program:

Conclusion:

☐ **The key to successful implementation lies with management commitment.**

☐ **Management should commit to adopt radical changes while ceasing to do things in the old ways.**

Chapter 6

Ultimate Six Sigma

Ultimate Six Sigma

Introduction:

1) This Chapter prescribes the "Ultimate Six Sigma" as one of many versions of six sigma.

2) the "Ultimate Six Sigma" goes beyond quality excellence to total business excellence (Keki Bhote).

Ultimate Six Sigma

The objectives of Ultimate Six Sigma are to:

- Develop a comprehensive infrastructure
- Maximize loyalty
- Maximize business results
- Minimize turnover and bring joy to workplace
- Go beyond modest quality to devise an ideal practical quality system
- Go beyond problem solving tool to powerful new tools for 21st century
- Go beyond the propaganda to usher in ultimate six sigma
- Provide keys to critical success factors

Ultimate Six Sigma

Keys to critical success factors

1. Customer loyalty and long-term retention
2. Quality of leadership
3. Quality of organization
4. Quality of employees
5. Quality of metrics
6. Quality of tools
7. Quality of design
8. Quality of supplier partnership
9. Quality of manufacturing
10. Quality of field reliability
11. Quality of support service
12. Quality of results

Ultimate Six Sigma
Benefits of Ultimate Six Sigma

❑ **The Ultimate Six Sigma will enable a company to create metrics for business, customer loyalty, and quality.**

1. **Business metrics**
   - Enhance the business's long-term profits
   - Enhance return on investment
   - Enhance asset turns
   - Increase inventory turns
   - Reduce people turnover
   - Increase productivity

Ultimate Six Sigma

2. **Customer loyalty metrics**
   - Improve customer loyalty and retention levels
   - Increase customer retention longevity
   - Increase stakeholders satisfaction rating
   - Increase market share position

3. **Quality/Reliability/Cycle time metrics**
   - Reduce outgoing defects
   - Reduce total defects per unit
   - Increase Cpk of critical parameters
   - Reduce field failure
   - Reduce the cost of poor quality
   - Reduce cycle times in production and business processes

Ultimate Six Sigma

Ultimate Six Sigma self assessment chart and scoring system

Area	Key Characteristics	Importance (Points)
1. Customer	1.1 Importance of Customer Loyalty 1.2 Inviolate Principles of Customer Loyalty 1.3 Customer Differentiation 1.4 Customer Requirement 1.5 Company Structure for Customer Loyalty 1.6 Defection Management Control 1.7 Public as Customer	125 20 25 30 15 20 5 10
2. Leadership	2.1 Personal Philosophies and Values 2.2 Corporate Principles 2.3 The Corporate Role of Leadership	125 60 30 35
3. Organization	3.1 Dismantling Taylorism 3.2 Revolutionizing the Organizational Culture	75 10 65
4. Employees	4.1 Motivation: From "How to" to "Want to" 4.2 Job Security 4.3 Empowerment Readiness 4.4 Team Competition 4.5 Empowerment Systems 4.6 Empowerment Stage	75 20 5 5 5 35 5
5. Measurement	5.1 Measurement Axioms 5.2 Measurement Principles 5.3 Financial Statements 5.4 Core Customers 5.5 Generic Measurements 5.6 Team/Department Measurements	75 5 30 5 10 20 5
6. Tools for the 21st Century	6.1 Design of Experiments 6.2 Multiple Environment Over Stress Test 6.3 Mass Customization/Quality Function Deployment 6.4 Total Productive Maintenance 6.5 Benchmarking 6.6 Poka-Yoke 6.7 Business Process Reengineering and Next Operation as Customer 6.8 Total Value Engineering 6.9 Supply Chain Management 6.10 Lean Manufacturing/Inventory/Cycle Time Reduction	75 15 10 10 5 5 5 10 5 5 5

FIGURE 6-1   Ultimate Six Sigma Self-Assessment Chart

Ultimate Six Sigma

Area	Key Characteristics	Importance (Points)
7. Design		75
	7.1 Organization for New Product Introduction	5
	7.2 Management Guidelines	5
	7.3 Voice of the Customer	10
	7.4 Design Quality/Reliability	25
	7.5 Design for Cost Reduction	15
	7.6 Design for Cycle Time Reduction	15
8. Supply Chain Management		75
	8.1 Importance of Supply Chain Management	15
	8.2 Supply Partnership Principles	10
	8.3 Types of Mutual Help	5
	8.4 Selection of Partnership Suppliers	15
	8.5 Infrastructure	15
	8.6 Supplier Development	15
9. Manufacturing		75
	9.1 Manufacturing Resurgence	10
	9.2 Quality Improvement in Manufacturing	40
	9.3 Cycle Time Reduction in Manufacturing	25
10. Field Operations		75
	10.1 Product Reliability	15
	10.2 Predelivery Services	15
	10.3 Services to Downstream Supply Chain	20
	10.4 Services to User	25
11. Service Industries'/ Support Services in Manufacturing		75
	11.1 Basic Principles of Next Operations as [Customer] (NOAC)	30
	11.2 NOAC Structure	30
	11.3 NOAC Implementation	15
12. Results		75
	12.1 Customers	20
	12.2 Leadership	20
	12.3 Employees	20
	12.4 Financials	15

FIGURE 6-1 Ultimate Six Sigma Self-Assessment Chart (cont'd.)

Ultimate Six Sigma

Rating	Criteria
1	No knowledge of the success factor
2	Only a conceptual awareness of the success factor
3	Success factor started, with less than 50% implementation
4	Success factor 50% to 80% implemented
5	Success factor implementation more than 80% complete, along with reflected business results

FIGURE 6-2 Success Factor Rating

Total Company Rating	Equivalent Business Health	Equivalent Sigma Level
800–1,000	Robust health	6 Sigma
600–799	Good health, but periodic physical checkups (audits) urged	5 Sigma
400–599	Poor health, continual monitoring needed	4 Sigma
200–399	Major surgery needed	3 Sigma
Below 200	Terminally ill	2 Sigma

FIGURE 6-3 Total Rating: A Corresponding Business Health and Equivalent Sigma Level

Ultimate Six Sigma
Tools for the 21st Century

❑ **Design Of Experiments (DOE)**
Shainin / Bhote variation

There is twelve techniques are associated with this variation:

1. Multi-vari
2. Components search
3. Paired comparisons
4. Product / process search
5. Variable search
6. Full factorial
7. B versus C
8. Scatter plot
9. Response surface methodology
10. Positrol
11. Process certification
12. Precontrol

Ultimate Six Sigma

Problem Solving Process

1. **Define the problem**
2. **Quantify and measure the problem**
   - Measure scatter plot
   - Use Likert scale to convert attributes into variables
3. **Define the problem history**
4. **Generate clues using:**
   - Multi-vari
   - Components search
   - Paired comparisons
   - Product / process search
5. **Implement formal design of experiments**
   - Variable search
   - Full factorials
   - B versus C
6. **Turn the problem on and off**
   - B versus C
7. **Establish realistic specifications and tolerances**
   - Scatter plots
   - Response surface methodology
8. **Freeze the process improvement**
   - Positrol
9. **Certify the process**
10. **Hold the gains with Statistical Process Control**
    - Precontrol

Ultimate Six Sigma

❑ **Multiple Environment over stress testing**

❑ **Mass customization and QFD**

❑ **Total productive maintenance**

❑ **Benchmarking**

❑ **Poka – Yoke**

❑ **Business process reengineering and next operation as customer**

❑ **Total value engineering**

❑ **Supply chain engineering and lean manufacturing**

Ultimate Six Sigma

Conclusion:

❑ **Ultimate six sigma brings the best practices together in a focused program.**

Chapter 7

Applying Six Sigma To Project Management

Purpose of this discussion to focus on the process and measurement issues that the project to implement six sigma for project management must resolve.

Process issues

Project management holds these aspects together:

➢ Achieving and maintaining six sigma

➢ Discipline of quality control

➢ Quality assurance

➢ The root discipline which is the subject of performance measure and improvement activity.

How To implement six sigma?

We start the term (DMAIC) which is:

➢ Define

➢ Measure

➢ Analyze

➢ Implement

➢ Control

How To implement six sigma?

➢ We would start by defining the problem statement or condition that identifies the need and desire to change.

➢ The organization needs to establish a capability for the administration and support for the project management.

➢ A review of the process is needed to enable the organization to assess whether the resources are most organized and administered

Measure Issues

➢ The process for identifying measurements requirements- starting with definition of stockholders and proceeding to the production measurement plan.

Measure issues

Management has main three process:

1. To ensure that the project provides an adequate capacity to provide the needed project management capability.

2. To ensure that the organization meet current and the future needs

3. To ensure that the quality of the service

Measure issues

Measures of capability of a project management can focus on two areas:

1. The qualification of people
2. The capability and coverage of tools provided

Project Management As Process

- As process it must define an input, output and an activity that transform those inputs into those outputs. With process defined it then becomes more objective to evaluate the quality performance of the process.

- The key to understand non-repetitive process models is that while the steps and sequence are never the same, the people and tools are the same.

Project Management As Process

➢ As you define your processes and developed definitions for the defects, establish a reporting cycle and apply the metric across all.

➢ The real focus is not on number of defects or on number of opportunities or the sigma value. it is on improve and maintain the process.

Metrics For Improving Project Management Processes

It can be identified:

1- project management capability :

Metrics about the qualification of the staff, tools and support provided to project management.

2- Project Management Capacity:

Metrics about the number of projects and value of current and past projects. Also, projection of future projects.

Metrics For Improving Project Management Processes

3- Project management performance:

The sigma quality performance metric is primary senior management performance measure for any process implementing six sigma process improvements.

(sigma performance levels are senior management type metrics)
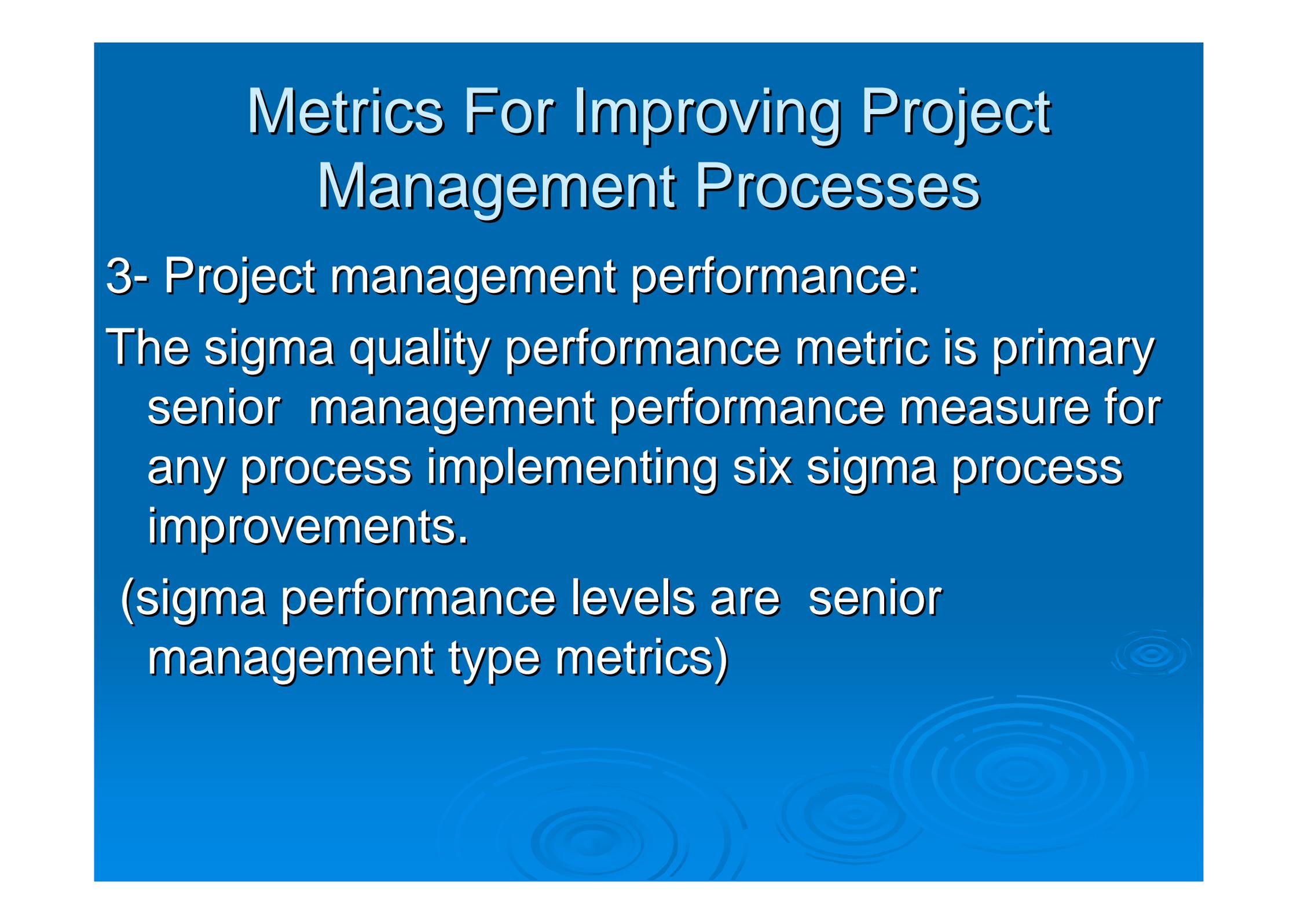
The DMAIC Process

- ➢ It is like initial planning step of the project.
- ➢ define the problem.
- ➢ knowledge and experience will help setting realistic expectation for result and progress.
- ➢ Improve project
- ➢ Control project

The DMAIC Process

➢ It is the systematic way in which we constantly improve on the way to achieve the six sigma levels of performance.

Conclusion

- We answered the question How To implement six sigma?
- DMAIC is like initial planning step of the project.
- Organizations must be ready to accept the change.

Organizing for Six Sigma

✓ The ability to implement a significant organizational change is not an obstacle to successfully implementing six sigma.

✓ Organizational change is a topic that has been studies extensively , some major points are relevant to project managers involved in six sigma.

✓ The expression " getting your ducks in a row" meaning getting organize to get thing done.

✓ To continue with the metaphor of ducks In a row and to get change ,there are five ducks:

    1. Vision

    2. Skills

    3. Incentives

    4. Recourse

    5.Action

Organizing for Six Sigma

1.Vision

- ✓ a vision is a picture
- ✓ What does the desired future look like? to be of any value
- ✓ A vision must encompass goals
- ✓ It must include a context the reflects the environment in which the vision will be a reality
- ✓ It must be comprehensive to the point where it has valuable meaning to every one who is expected to share a commitment to achieving the vision.
- ✓ It must be controlling

Organizing for Six Sigma

2. Skills

- ✓ Without the skills needed to make the change and operate in the new environment … anxiety results
- ✓ Without the knowledge and the skills the risk of failure to achieve six sigma or to gain any net improvements in quality is very high.
- ✓ People tend to assume that because they are good at what they do, they should be good at doing thing related to what they do, like improving its quality or measuring it ..
- ✓ The reality is that being able to do some thing will requires learning , before the learning take place the performance is not nearly as good as possible.

3. Incentives

✓ If there are negative incentives, at worst, sabotage will happen.

✓ In formal six sigma, most of the successes are rewarded with significant and tangible rewards for the participants.

Organizing for Six Sigma

4. Resources

✓ it is important to commit resources to make the change, however, it is also essential to stop the commitment of recourse for what ever it is the change is suppose to supersede.

✓ Not only is commitment demonstrated by sufficient recourse being allocated and made available , but it also shown through actions that manifest the belief that failing to make the change is not an alternative.

5. Action

✓ "When all is said and done , there is lots more said than done"

✓ Without clear direction about how those are all to be arranged to accommodate the actions that will make the change happen, nothing will happen..

Conclusion

- ✓ Many organization that think they have been in business for 20 years have really been in business for one year 20 times
- ✓ The key to successful implementation lies with management commitment.
- ✓ Management should commit to adopt radical changes while ceasing to do things in the old ways