air academy ASSOCIATES

# Lean Six Sigma Summary

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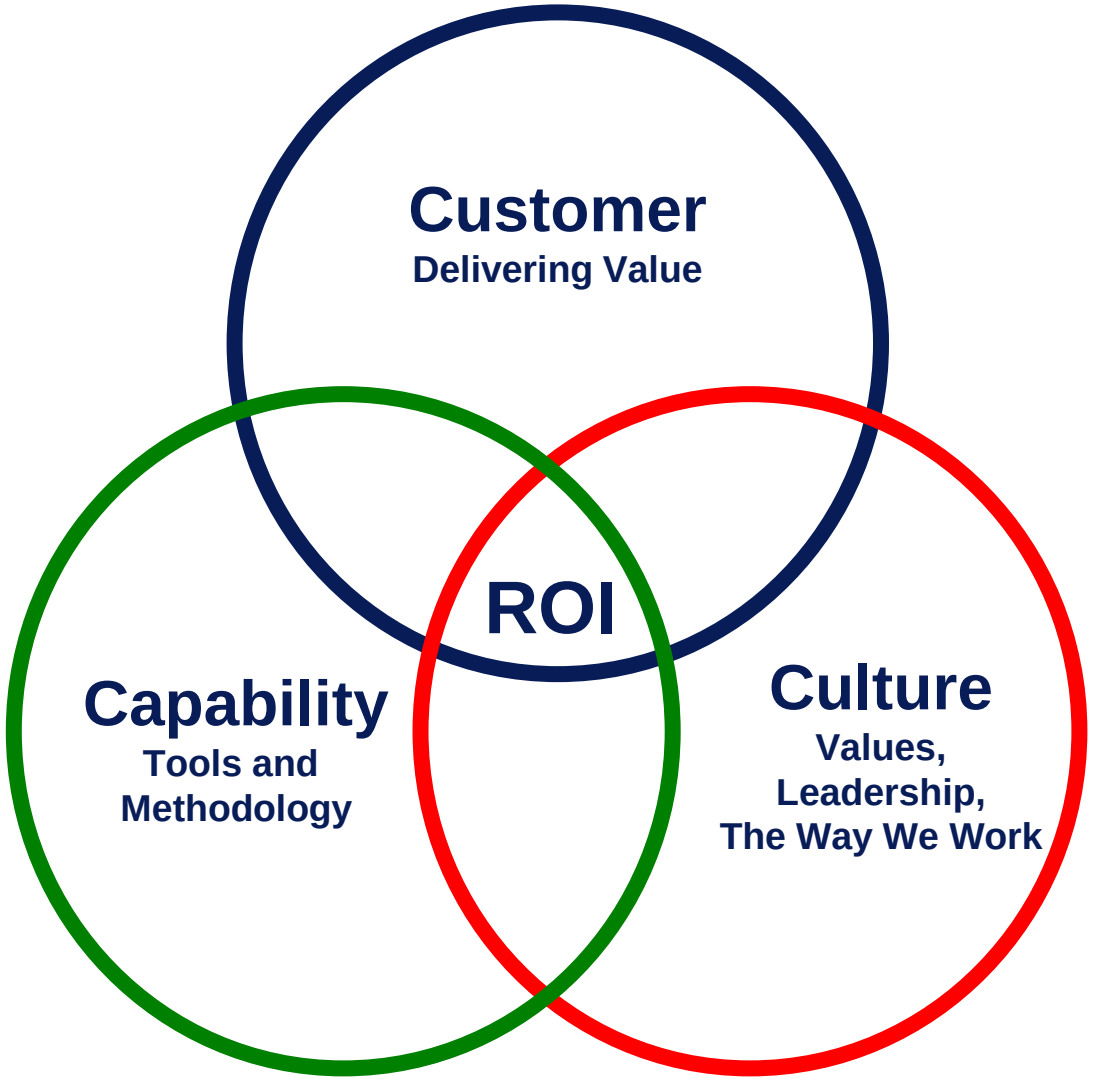
# Lean Six Sigma Summary

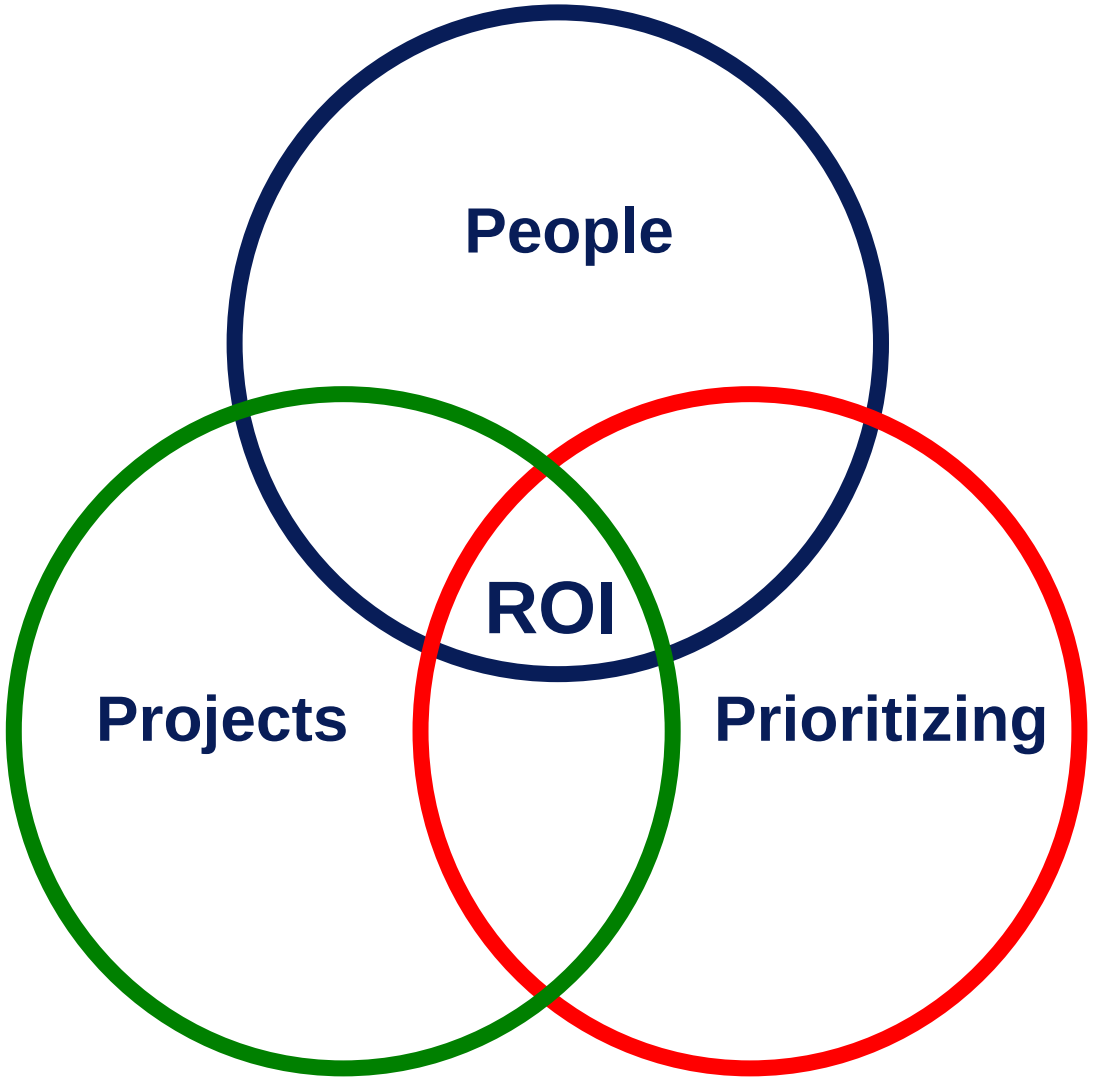
- In this session, we will discuss:
  - 3 Primary Ingredients for Success in a LSS Initiative (the 3 Ps)
    - People
      - The Big Picture
      - Infrastructure
      - Knowledge Gain
    - Projects
      - Types of projects
      - Mining projects
      - Selecting projects
      - Executing projects
      - Realizing and holding the gains
    - Prioritization
      - 10 Major Success Factors
      - 50 Best Practices
  - What's next?  The Evolution of Lean Six Sigma


- A list of supplemental material and additional practice/review questions for this session are provided at the end of this presentation
- You can download the pdf of this presentation, along with any supporting data files, on the site where you are accessing this course

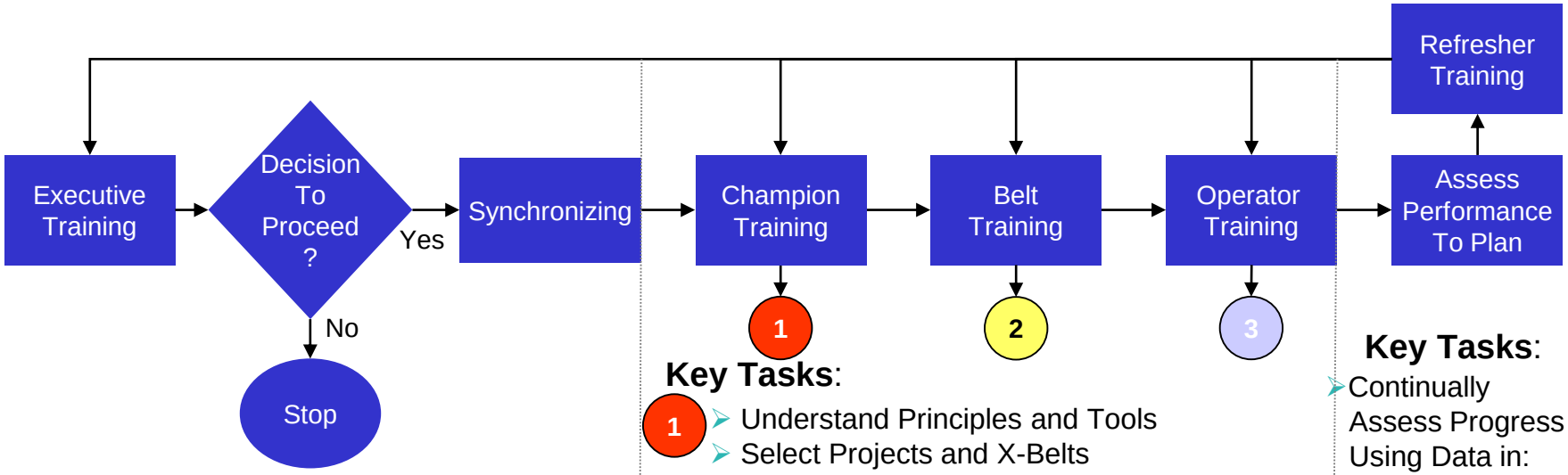
# The Impact Zones of Lean Six Sigma
## (the 3 Cs)



# The Primary Ingredients for Success
## (the 3 Ps)



# Rolling Out Lean Six Sigma: the Big Picture




**Key Tasks**:

- Understand the Need/ "Burning Platform"
- Realize the Opportunity (COPQ)
- Appoint "Line-of-Sight" Corporate Champion
- Commission Steering Committee
- Author Deployment Plan
- Establish Goals and Metrics
- Mobilize Commitment
- Initialize Finance, HR, Quality and Other Core Functions
- Communicate Decision Rational, Intent and Expectations to Workforce
- Integrate Lean Six Sigma into All Business Operations and Functions Include Corp. HQ
- Perform Baseline Assessment

**Key Tasks**:

1
- Understand Principles and Tools
- Select Projects and X-Belts
- Complete Project Contracts (include stretch goals + project IPO
- Provide Continuous Project Updates
- Serve as "DMAIC" Gatekeeper for Project
- Provide Resources for Project Success
- Ensure Timely Benefit Realization
- Mobilize Interest and Commitment

2
- Learn, Practice and Apply the Tools from Belt Training
- Manage Project to the DMAIC Project Roadmap
- Provide Continuous Project Updates
- Complete Knowledge Notebook for Project
- Ensure Timely Project Closeout, Benefit Realization and Team Recognition

3
- Learn What Lean Six Sigma is and How to Get Involved at Operator & Technician Level

**Key Tasks**:

- Continually Assess Progress Using Data in:
  - Project Selection
  - Project Execution
  - Benefit Capture
  - Belt Performance
  - Deployment Planning
  - Overall Performance
- Revise Training & Deployment Plan (as needed)
- Work Towards Self Sustainability
- Train-the-Trainer

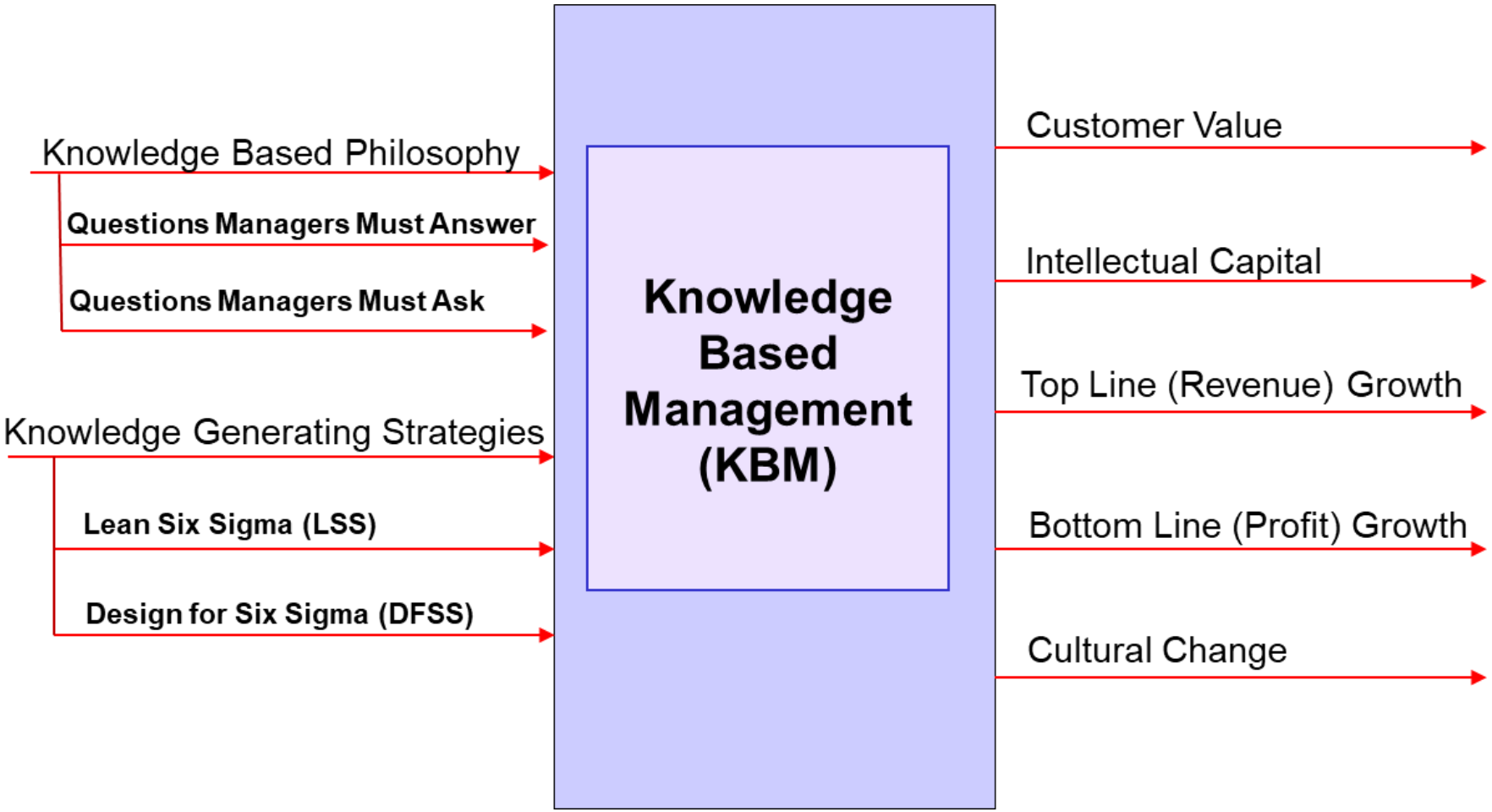
**Initialization** → **Execution** → **Assessment**

# Building the Infrastructure

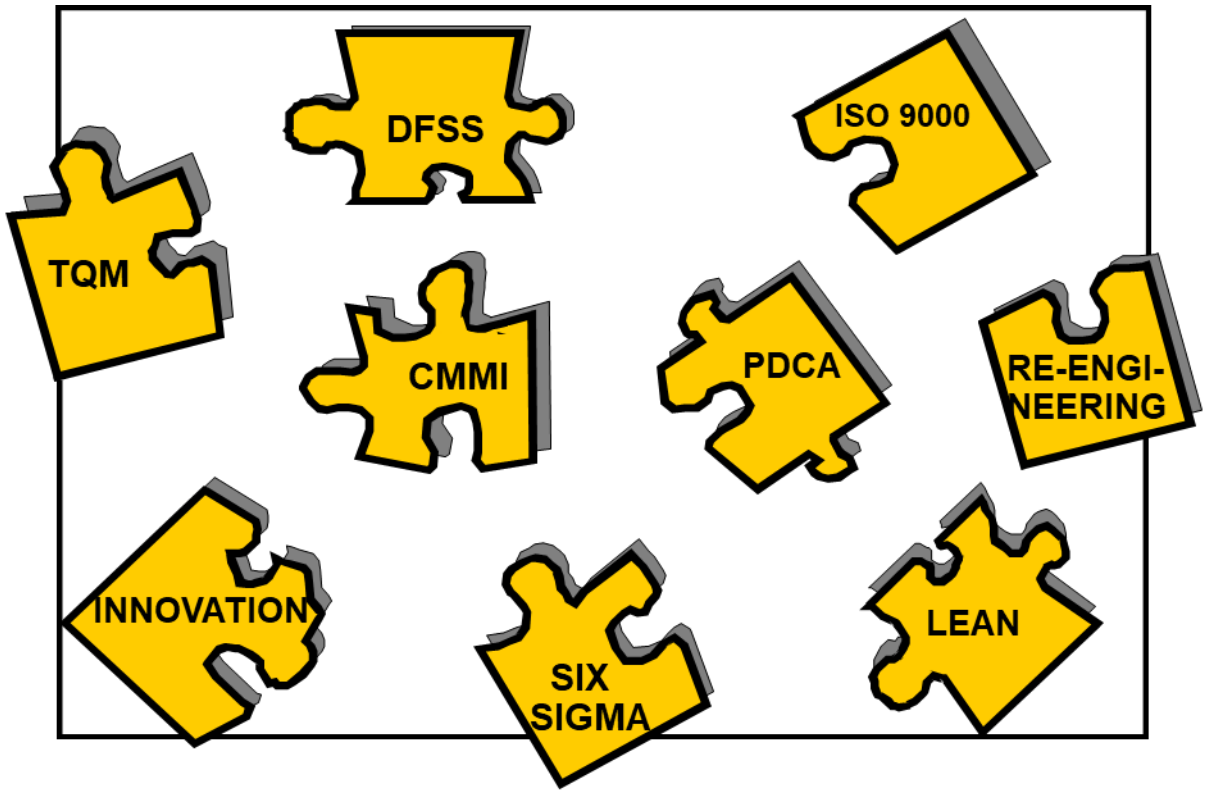
# Roles and Responsibilities

| | CHAMPION | BLACK BELT | GREEN BELT | MASTER BLACK BELT |
|---|---|---|---|---|
| **PROFILE** | • manager<br>• respected leader and mentor of business issues<br>• strong proponent of LSS who asks the "right" questions<br>• serves as a business mentor for belts | • respected by peers and management<br>• master of basic and advanced tools<br>• able to turn data into information | • respected by peers<br>• proficient in basic and advanced tools<br>• able to turn data into information | • technically excellent in the knowledge and application of statistical tools<br>• excellent communicator<br>• respected LSS role model at all levels of the company |
| **ROLE** | • provide resources and strong leadership for projects<br>• inspires a shared vision<br>• establishes plan and creates infrastructure<br>• develops metrics<br>• converts gains into $<br>• may serve on LSS Leadership Team | • leads strategic, high impact process improvement projects<br>• change agent<br>• teaches and mentors cross-functional team members<br>• full-time project leader<br>• converts gains into $ | • leads important process improve-ment teams<br>• leads, trains and coaches on tools and analysis<br>• assists BBs<br>• typically part-time on a project | • technical mentor for BBs and GBs<br>• internal consultant and trainer of LSS<br>• generates breakthrough thinking for improving LSS process<br>• serves on LSS Leadership Team |
| **TRAINING** | • 2 days of Champion training | • three or four 1-week sessions with three to six weeks in between to apply<br>• project review in every session | • two 1-week sessions with one month in between to apply<br>• project review in 2nd session | • 1-2 weeks of Train the Trainer / MBB training beyond BB training |

# The Underlying Philosophy of Lean Six Sigma



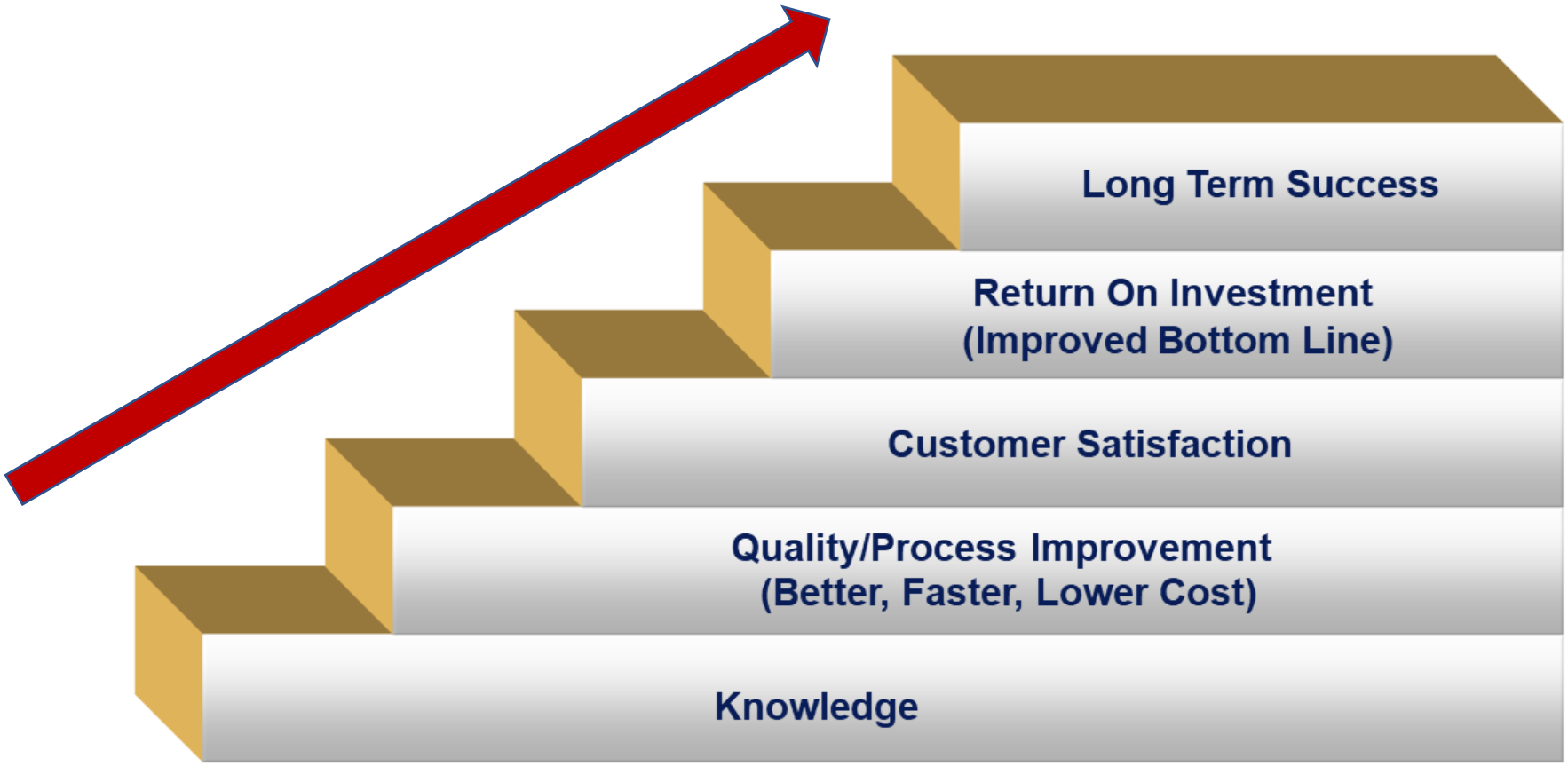
# The Importance of Knowledge




**The Multiple Initiative Puzzle:**

**"A Set of Disjointed Pieces?" or "Do the Pieces Fit Together?"**

# Knowledge: The First Step to Long Term Success



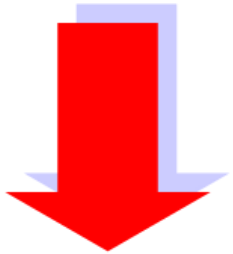

***"Knowledge has become the key economic resource and the dominant, if not the only, source of comparative advantage."***

Peter Drucker

# Profound Knowledge

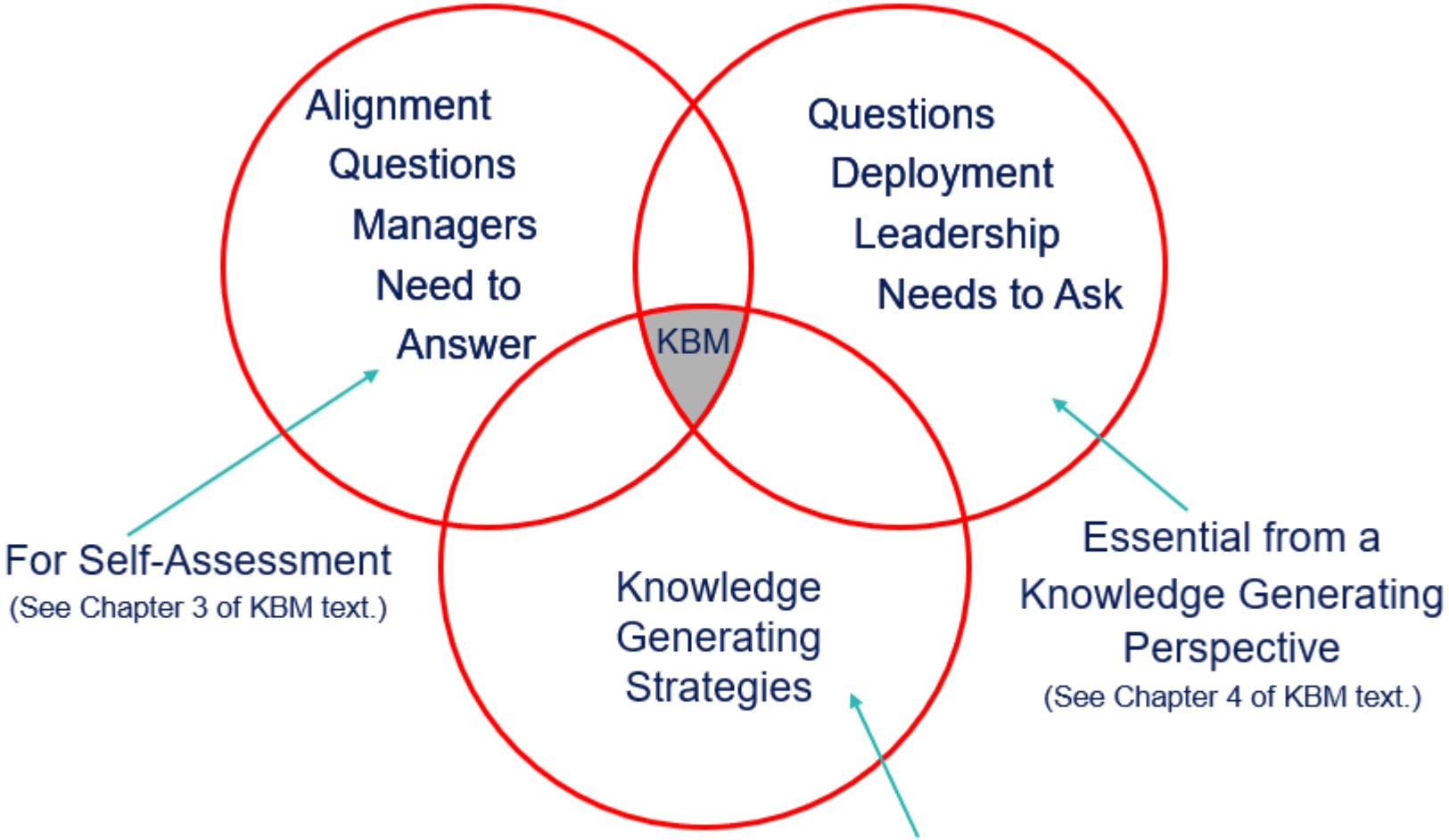
> *"Hard work and best efforts put forth without guidance of profound knowledge may well be the root of our ruination. There is no substitute for knowledge ...."*
>
> Deming

**PROFOUND KNOWLEDGE**



**Ability to Answer**
**Profound Questions**

# Key Ingredients to a Knowledge Based Pull System for Delivering Value




Note: KBM = Knowledge Based Management

# Questions Champions Need to Ask

**Define**

1. **Which value stream are you supporting and who is the recipient of the value, i.e., who is the customer? Who is the value stream owner and who are the players or team members? How well does the team work together?**
   **(VSM , PF)**
2. ***Within the value stream, which process or processes have the highest priority for improvement? Show me the data that led to this conclusion.***
   **(VSM, PF, Frequency and Monetary Pareto Chart)**

**For the process or processes targeted for improvement,**

**Measure**

3. **How is the process performed? How does the value flow? What activity is value added and what is non-value added?**
   **(IPO, PF)**
4. ***What are the process performance measures, i.e., how will we gauge if a process is improving? Why did we choose those? How accurate and precise is the measurement system? Show me the data.***
   **(MSA, IPO)**
5. ***What are the customer-driven requirements or specifications for all of the performance measures? Are the process performance measures in control and how capable is the process? Show me the data.*** **What are the improvement goals for the value stream or process performance measures?**
   **(Run Chart, Control Chart, Histogram, Capability Analysis)**

# Questions Champions Need to Ask (cont.)

Analyze

6. ***What kinds of waste and cost of poor quality exist in the value stream or process and what is the financial and/or customer impact? Show me the data.***

   **(CE, COPQ Analysis)**

7. ***What are all the sources of variability in the value stream or process and which of those do we control? How do we control them and what is our method of documenting and maintaining this control? Show me the data.***

   **(PF/CE/CNX/SOP, FMEA)**

8. **Are any sources of waste or variability supplier-dependent? If so, what are they, who are the suppliers, and how are we working together to eliminate waste and variability? Show me the data.**

   **(PF/CE/CNX/SOP)**

9. **What are the key input variables that affect the average and standard deviation of the measures of performance? How do you know this? Show me the data.**

   **(DOE and Regression Analysis)**

10. **What are the relationships between the measures of performance and the key input variables? Do any of the key input variables interact? How do you know for sure? Show me the data.**

    **(DOE and Regression Analysis)**

# Questions Champions Need to Ask (cont.)

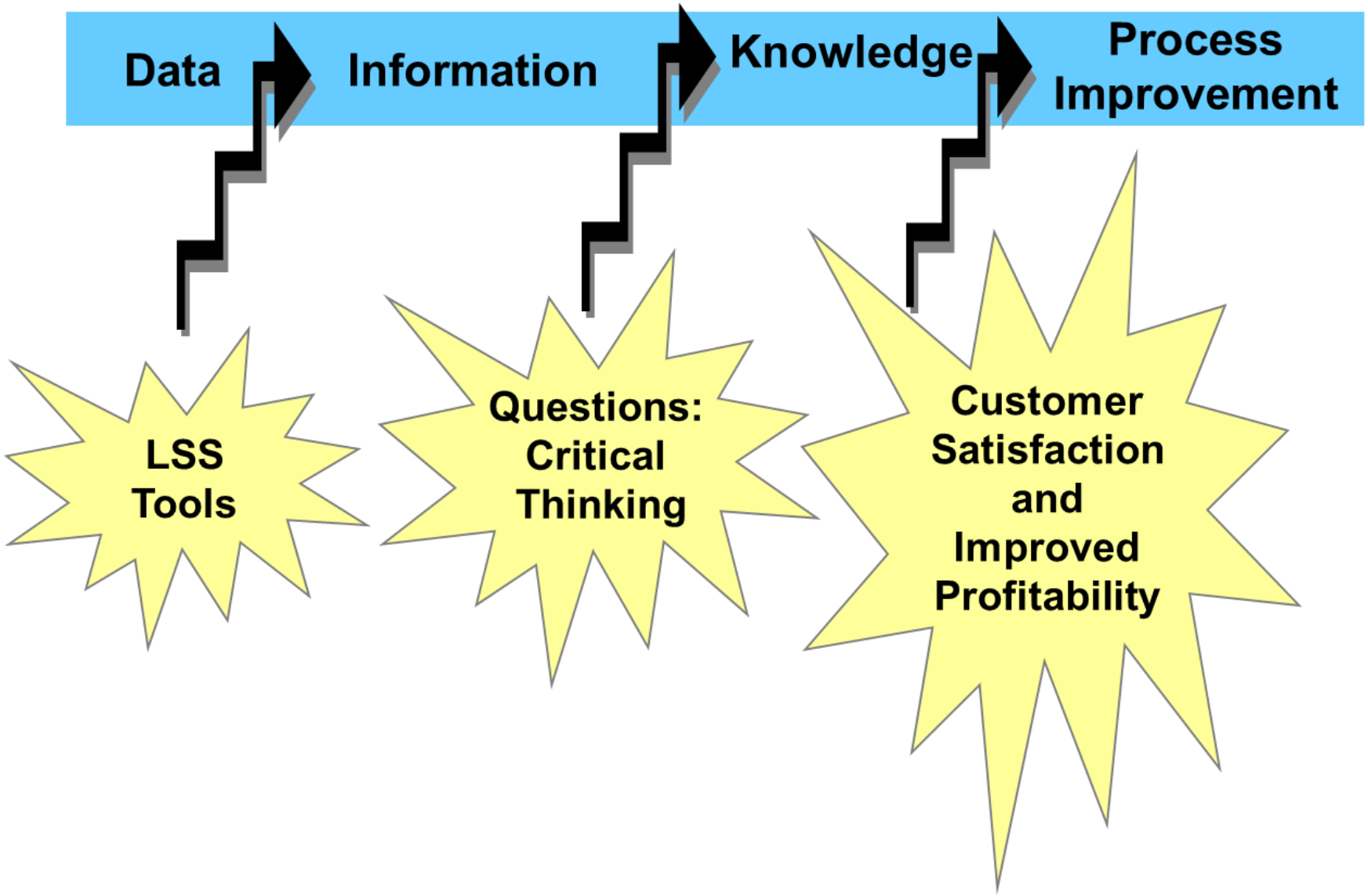
**Improve**

11. ***What settings or values for the key input variables will optimize the measures of performance? How do you know this? Show me the data.***
    **(DOE and Regression Analysis)**
12. **For the optimal settings of the key input variables, what kind of variability still exists in the performance measures? How do you know? Show me the data.**
    **(DOE and Regression Analysis)**

**Control**

13. **Have we implemented a process flow and control system to sustain the gains and continuously improve the process? Show me the data.**
    **(Run Chart, Control Chart, Capability Analysis)**
14. ***How much improvement has the value stream or process shown in the past six months? How much time and/or money have our efforts saved the company? Show me the data.***
    **(SOPs, Quantify the Benefits)**

# Gaining Knowledge to Achieve Process Improvement



# Types of Projects

- Rapid Improvement Events (RIEs)
  - Kaizens (1 week + pre/post work)
  - PF/CE/CNX/SOP could last anywhere from several hours to several days
- Full-Blown DMAIC Project (up to 4 months)
  - Goes through formal tollgate process

# What is a Kaizen event?

- Kaizen is a Japanese word that means “Continuous Improvement”
  - Generates a better result, not necessarily the “best” result

- Typically a one week event
  - Results oriented
  - Make quick process improvements
  - Must be supported by management for:
    - Decision Making
    - Resource Prioritization

- Facilitated by a Lean Six Sigma Expert
  - Requires experience in the technique
  - DMAIC and LSS expertise is needed for appropriate tool usage

# Where do we look for projects?

"Within the value stream, which process(es) have the highest priority for improvement? Show me the data that led to this conclusion."

- "Burning Issues"
- COPQ and COW Analysis
- Strategic Linkage

# Burning Issues

- Customer demands / complaints
  - Delivery times are too slow
  - Costs are too high
  - Too many failures in product(s)
- Response to competitor gains
- “Urgent” business needs
  - Expenses are too high
  - Erosion of customer base
- Shareholder requirements
  - Quarterly goals
  - End-of-Year goals, etc.
- Excessive warranty costs
- Community/society interests
- Management “intuition”

# COPQ and COW Analysis

…. to reduce the Cost of Poor Quality (COPQ) and
the Cost of Waste (COW) …. to reduce

- Internal Failure Costs (incurred prior to reaching customer)
- External Failure Costs (incurred after reaching customer)
- Appraisal Costs
- Lost Opportunity Costs
- The usual suspects:

**Waste & Variation**

# Strategically Driven Business Measures

- Customer retention rate
- Overall product/service yield rates
- Customer satisfaction rate
- Product market share
- Revenue
- Expenses
- Profit margin
- EBITDA
- Employee turnover
- “Operational Excellence”
- Capacity
- Growth

# Selecting (Prioritizing) Projects

| IPO Prioritization Matrix | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | |
| | Weighting | 4 | 4 | 2 | | **Weighted Total** |
| **Project Name** | | **ROI** | **Ease** | **VOC** | | |
| A | | 4 | 5 | 3 | | 42 |
| B | | 2 | 4 | 5 | | 34 |
| C | | 3 | 3 | 4 | | 32 |
| D | | 4 | 5 | 2 | | 40 |
| E | | 3 | 4 | 4 | | 36 |

1st
4th
5th
2nd
3rd

Order In Which Projects are Commissioned

Rating Factors:

ROI = Estimated Return on Investment

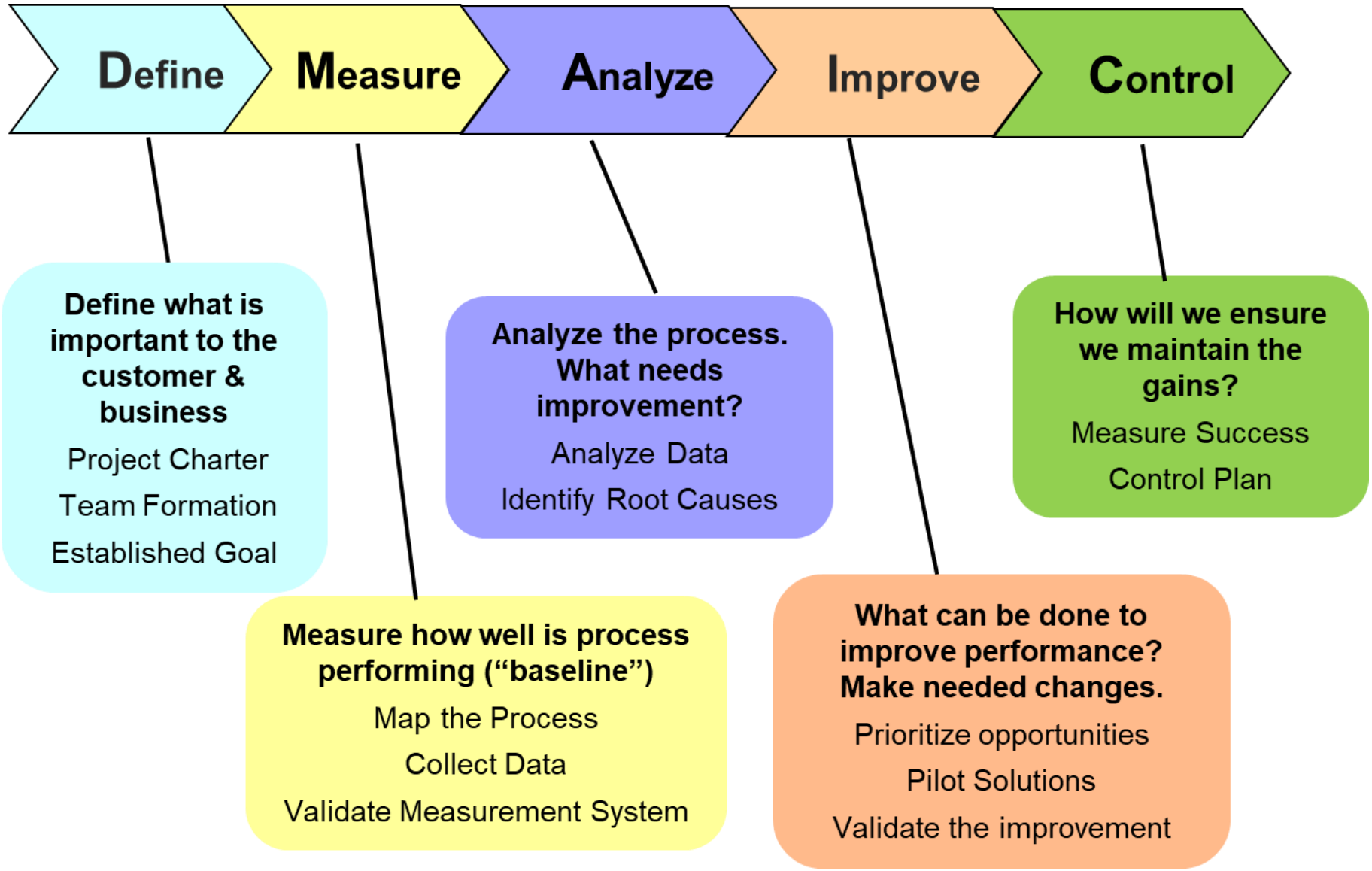
Ease = Ease Index (Complexity, # of People, Duration)

VOC = Voice of Customer

Weighted Total for Each Project = ROI x Weighting + Ease x Weighting + VOC x Weighting


***IPO Prioritization Matrix.xlsx***

# Project Execution



# DMAIC Quick Reference Guide

| Phase | Activities | Helpful Tools |
|---|---|---|
| Define | Define the problem and project<br>Define the stakeholders, customers and team<br>Define the high level process | Business case<br>Project contract with SMART goals<br>Stakeholder Analysis<br>SIPOC<br>Voice of the Customer (QFD) |
| Measure | Map the current process<br>Measure the current capability<br>Refocus / re-scope the project if necessary | Process flow (PF) maps<br>Graphical Analysis (histograms, run charts, Pareto charts)<br>Capability Measures and Analysis (Cp, Cpk, dpmo, etc.) |
| Analyze | Analyze the waste and causes of poor performance<br>Collect data<br>Prioritize the critical few causes / variables | 8 wastes and Cost of Poor Quality<br>Cause and Effect Diagrams (CE) with CNX<br>Pareto charts<br>Scatter diagrams<br>voting, IPO matrix, Effort/Impact Grid<br>Hypothesis tests |
| Improve | Identify candidate solutions to test<br>Select solutions; implement and validate improvements<br>Mistake-proof the process | IPO matrix<br>Hypothesis Tests<br>Charts and graphs (Run chart, box plots, histograms, Cp, Cpk, etc.)<br>FMEA<br>SOPs<br>5S |
| Control | Realize the Benefits and Summarize Learnings<br>Plan to hold the gains<br>Hand off to process owner(s) | Control plan and SOPs<br>Control charts<br>Project storyboard |


***DMAIC Quick Reference.pdf***

# Tracking Project Progress


***DMAIC Project Tracker.xlsx***

| **Lean Six Sigma Project Progress** | | | |
|---|---|---|---|
| Project: | *your project name* | | |
| Name: | *your name* | | |
| | | | |
| | online exam - taken and passed | Incomplete | << change status items using dropdown menu |
| | | **Status:** | **Comments:** |
| **Define** | Project Charter (goals, measures, scope, etc.) | NS | |
| | Initial financial benefit estimate (& meet with Finance to discuss | NS | |
| | Identify Team, Resources | NS | |
| | Kickoff team meeting | NS | |
| | Stakeholder analysis | NS | |
| | Gather Voice of Customer (interviews, surveys, etc.) | NS | |
| | IPO or SIPOC diagram | NS | |
| | Other: | NS | |
| | Tollgate review with Champion | NS | |
| **Measure** | Detailed process mapping | NS | |
| | Data collection plan | NS | |
| | Validate measurement system (MSA) | NS | |
| | Collect baseline data | NS | |
| | Capability analysis (graph + sigma capability, Cpk, etc.) | NS | |
| | Other: | NS | |
| | Tollgate review with Champion | NS | |
| **Analyze** | CE (fishbone) diagram with CNX | NS | |
| | Analyze waste, non-value added activities, etc. | NS | |
| | Collect/Analyze data and Narrow list of potential causes: | | |
| | graphical (box plots, scatter, paretos, etc.) | NS | |
| | statistical (hypothesis tests, correlation, etc.) | NS | |
| | team (voting, effort/impact, IPO matrix, etc.) | NS | |
| | Identify key inputs/causes to focus on (root cause(s)) | NS | |
| | Other: | NS | |
| | Tollgate review with champion | NS | |
| **Improve** | Identify potential solutions | NS | |
| | Select solution(s) to test (effort/impact, IPO matrix, voting, etc.) | NS | |
| | Pilot solutions (pilot test) | NS | |
| | Analyze results (hypothesis test) | NS | |
| | Analyze results (graphs) | NS | |
| | Apply mistake proofing (FMEA, poka yoke, etc.) | NS | |
| | Update process maps and SOPs | NS | |
| | New capability analysis | NS | |
| | Other: | NS | |
| | Tollgate review with champion | NS | |
| **Control** | Monitor performance/capability | NS | |
| | Control charts | NS | |
| | Control plan (how will you hold the gains?) | NS | |
| | Summarize best practices / lessons learned | NS | |
| | Recommend follow up projects and/or actions | NS | |
| | Handoff to process owner | NS | |
| | Calculate savings; final verification with Finance | NS | |
| | Document project (storyboard/presentation) | NS | |
| | Tollgate review with champion | NS | |

# Realizing Project Benefits

- Financial results must be validated by a financial analyst
- Computed at the completion of the project
  - Quantifies the actual benefit
  - For example, COPQ before vs. COPQ after
- Taken when project is in Control phase (DMAIC)
- Period of benefit is 12 months (to get annualized benefit)
- Headcount savings must be realized to be counted
  - Can be achieved by attrition
- Financial tracking rules determined before project commencement
  - Hard savings vs. soft (cost avoidance) savings


***LSS Project Financial Benefits Examples.xlsx***

# Thoughts on Project Benefits/Savings
## (it's always about the money, but it's not only about the money)

- Focus should be on hard (P&L) savings
  - However, if we focus solely on hard savings, many excellent projects will be overlooked, especially wrt VOC. Additionally, there will typically be push back from the business units because all projects will be viewed as cost reduction

- Soft savings can be difficult to measure in terms of $$
  - However, leaving soft savings out will result in the above

- Ensure all projects are linked to the fulfillment of key business measures (e.g., on-time delivery, top line growth, reduction in customer complaints, reduced lead times, improved invoice accuracy, etc.) to which accountability is linked

- When doing Lean Six Sigma project reviews at standing management meetings, report on both hard ($$) savings and soft (non $$) savings and offer credit to both

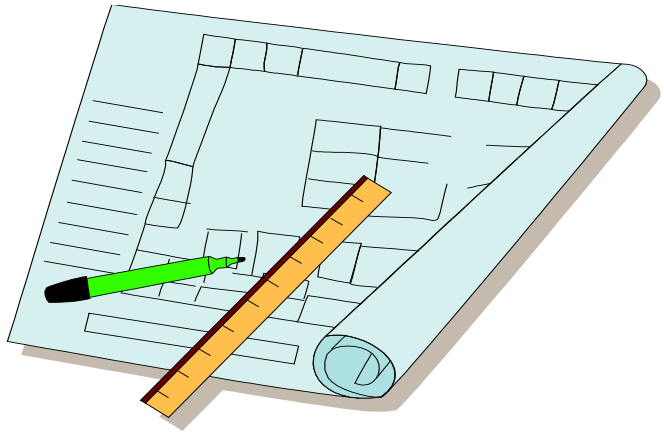
# ROI Depends on Strategy

| TRAINING | DEPLOYMENT: Quality Initiative | DEPLOYMENT: Business Strategy |
|---|---|---|
| **Knowledge Based Approach** (A Pull System for Tools) | | Highest* ROI (2%) |
| **Heavy Statistics Based Approach** (A Push System for Tools) | Lowest* ROI (0.2%) | |

* Based on a 2004 meta-study of 23 companies using Lean Six Sigma for at least 2 years.

# Holding the Gains:  Control Plans

- A control plan is a means for holding the gains and sustaining process improvements
- It documents information about the critical variables in the process which we've learned about during our Lean Six Sigma project
- It provides an action plan for what to watch, how often, in what manner, by whom, and corrective actions
- It empowers local process owners
- Its intent is to institutionalize the improvements



# Control Plans

- With the team, identify additional actions and plans needed to ensure improvements are institutionalized
  - Is any additional training needed (who?, when?, what kind?)
  - Have all the work instructions, SOPs, etc. been updated? Have visual controls and/or mistake-proofing been addressed?

| What could go wrong? (possible errors) | What actions were taken? |
|---|---|
| | |
| | |
| | |
| | |

  - What data should be collected on an ongoing basis? How often? Who's responsible and how should it be reported?
  - What should be done if results aren't sustained?
  - What recommendations does your team have for follow-on projects? (things you identified during the project which were outside of your scope or unable to be addressed in your time frame)

# Control Plan Example Formats

| Process name: | Prepared by: | Orig. Date: |
|---|---|---|
| Process Owner: | Approved by: | Revision Date: |
| Customer: | Core Team: | |

| Departments | Process Step Description | Performance Indicators KPIV KPOV | Requirements (Target, specs) | Measurement | | | | | Reaction Plan (Corrective Action) | SOP Ref. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Msmt. Method | Sample Size | How Often? | Who? | Where Record? | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**Need accountability … owners of the metrics!**

- KISS example

| Action | Tool / Data / Chart / etc. | Who? |
|---|---|---|
| Example: Meet with process owner and review results and actions needed | | Larry S., Dave O. |
| Example: Train all operators on both shifts (review SOPs, process steps, etc.) | In person sessions | Larry S. and operators |
| Example: Monitor cycle time for each batch | IMR chart | operators |
| Example: Post results in area monthly | Cycle time average and trends (run chart) | Dave O. |
| Example: Review results monthly | | Dave O. and team |

***Control Plan Example Format.xlsx***

# Documenting Your Project: A3 Format Example

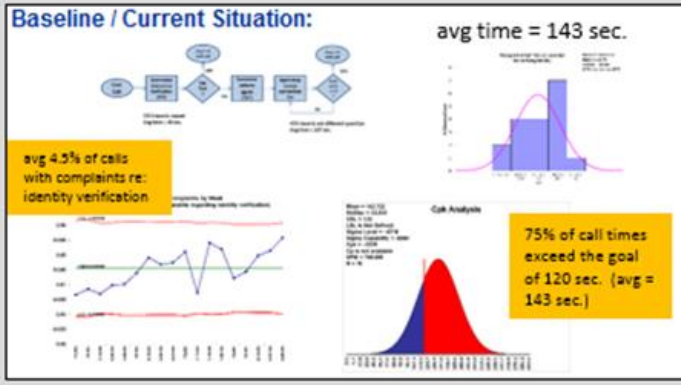
**Date: 1/14/13** **Call Center Customer Complaints - A3 Report** **Prepared by: Christine Green**

**Background: (problem statement / current pain)**
Our credit card divison call center is receiving a large number of customer complaints (about 75 per week) concerning the time it takes to complete the identify verification process. The complaints have been steadily increasing over time, negatively impacting our call center metrics such as customer satisfaction and call time. Continued frustration may cause loss of business.

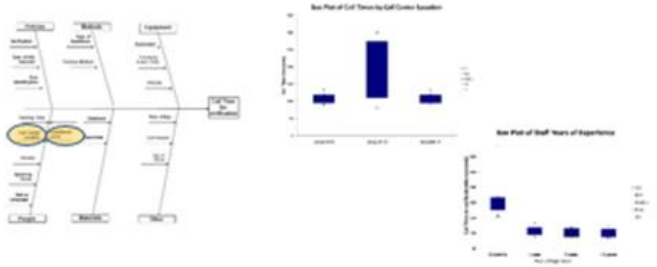
**Project Goals / Targets:**
1. Reduce customer complaints regarding idenity verification by
2. Reduce time spent validating identity by 30%.

**Team Members:**
Joe McElroy (call center), Amy Henry (marketing), Justin Fox (call center), Terry Lane (HR), Christine Green (Green Belt candidate), Nathan Smith (security)

**Baseline / Current Situation:**




**Analysis (Root Cause(s)):**
Call Times vary significantly by years of experience of call center staff. Also, call times vary significantly by call center location.



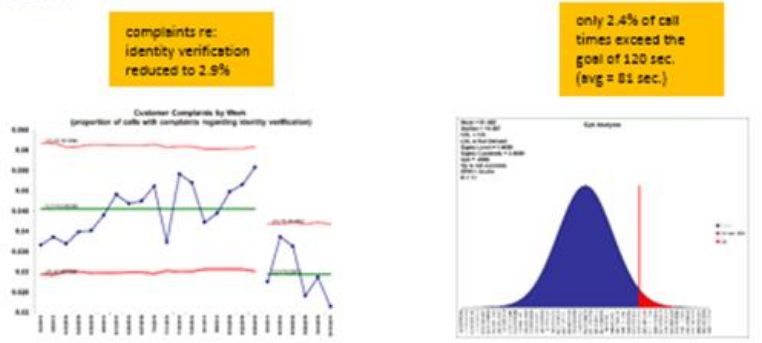
**Improvements/Recommendations**
1. Eliminate re-verification of customer identity for certain calls based on risk level
2. Standardize training guide for questions to verify identity; eliminate questions that are most frequently causing problems when suitable alternatives exist
3. Revise training for new hires

**Implementation Plan:**

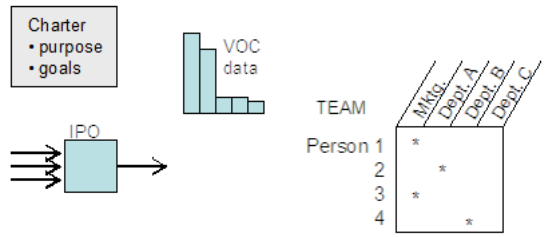
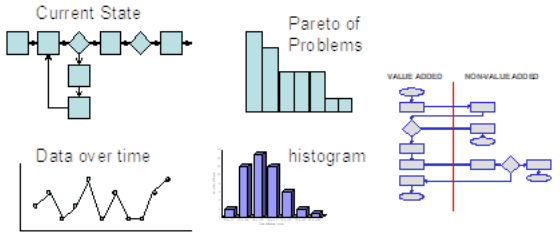
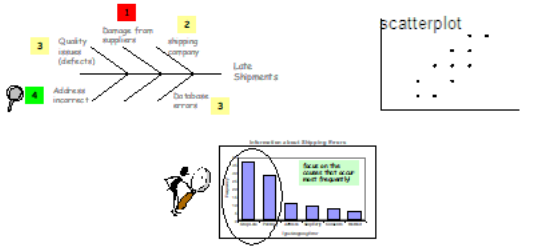
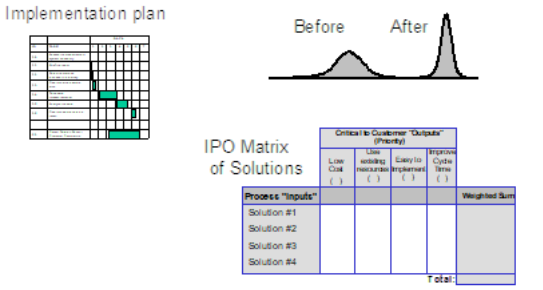
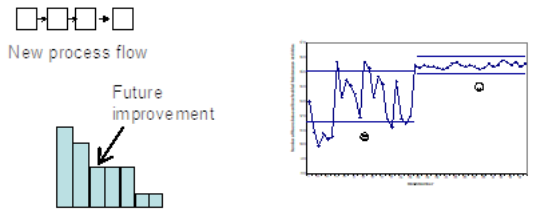
| Activity | Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Lead | % complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Review training procedures | | | | | | | | | | | | CG | 100% |
| Revise policies for identity verif. | | | | | | | | | | | | CG | 100% |
| Standardize questions | | | | | | | | | | | | JM | 100% |
| Update training/SOPs | | | | | | | | | | | | DH | 100% |
| Pilot test | | | | | | | | | | | | JR | 100% |
| Launch | | | | | | | | | | | | CG | 20% |

**Follow Up Activities:**
1. IMR control chart by month of customer complaints for identify verfication and call times(Joe M.)
2. Review customer survey data every 6 months (AH)
3. Annual reviews of new hire training and SOPs for identify verification.

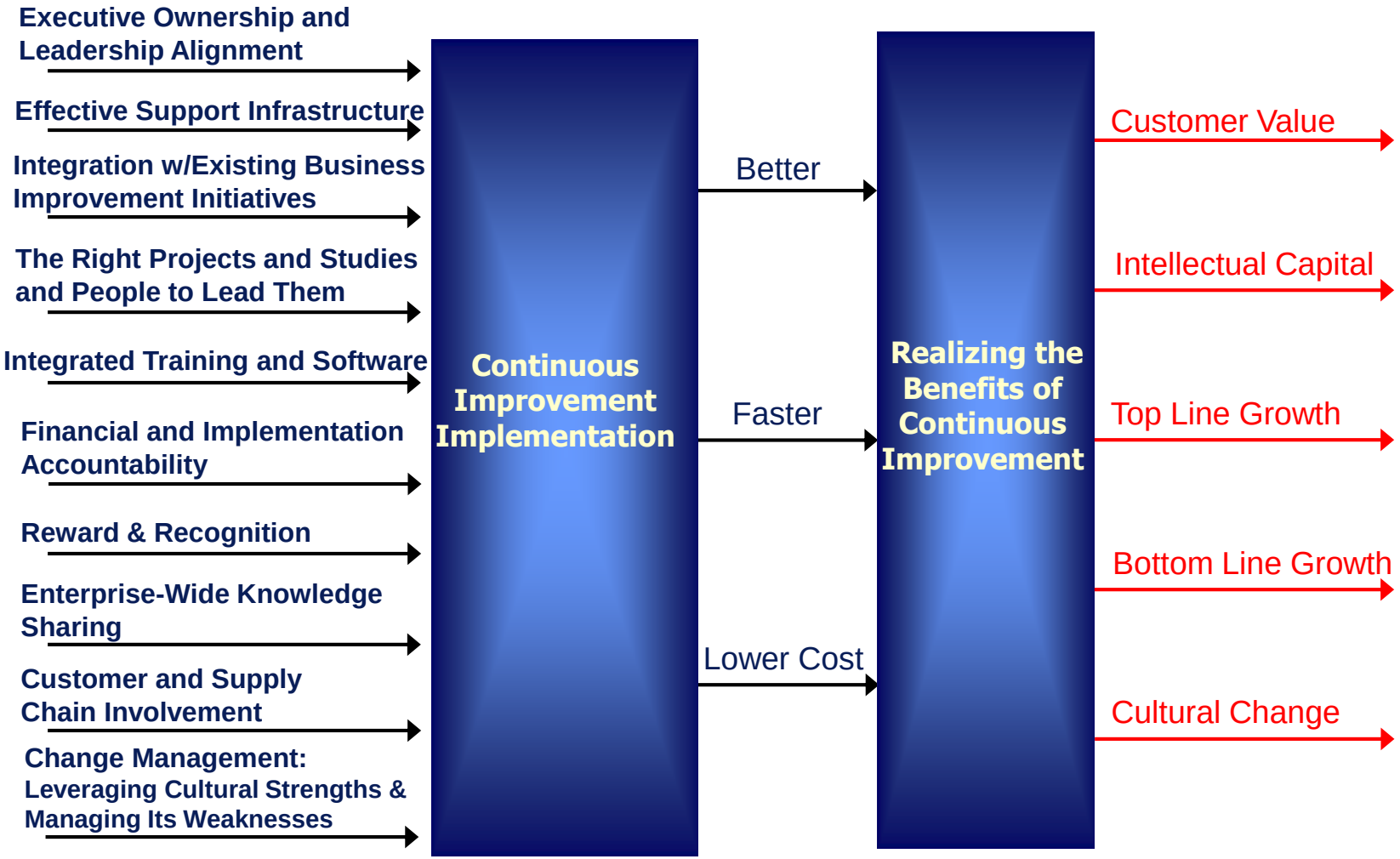
**Results:**



# Documenting Your Project: Project Storyboard

| Stage | Brief Description | Supporting Graphics (examples) |
|---|---|---|
| **Define** | • Discuss project, charter, business case, etc. |  |
| **Measure** | • Discuss current state (baseline analysis) |  |
| **Analyze** | • Describe problems, causes, and how they were verified<br>• Analysis and interpretation of data |  |
| **Improve** | • Analysis of results from tests (pilots)<br>• Improvements made and criteria used<br>• Implementation plan |  |
| **Control** | • Summary of key learnings and next steps<br>• Updated SOPs, PFs, etc. |  |

# Critical Factors That Impact the Effectiveness of a Continuous Improvement Initiative*




* The complete research report can be found in the article *"The Critical Inputs for Lean Six Sigma Success"* published in ***iSixSigma Magazine***, May/June 2011.

# 10 Key Factors Evaluated from Best Practices

| | No. | Best Practice | Self-Assess Your Degree of Implementation (0-Min, 2-Max) |
|---|---|---|---|
| **Executive Ownership and Leadership Alignment** | 1. | Establish ownership at the executive level. | |
| | 2. | Develop and communicate the need, vision, and plan. | |
| | 3. | Train leadership first. | |
| | 4. | Link compensation to involvement and success. | |
| | 5. | Continuously assess what is working and what is not and adjust. | |
| | | **Sub-Total (Max = 10):** | |
| **Effective Support Infrastructure** | 6. | Designate a well-respected Deployment Champion early. | |
| | 7. | Commission and use a guiding coalition. | |
| | 8. | Partner with a capable and reputable service provider. | |
| | 9. | Integrate key stakeholders into the plan. | |
| | 10. | Create position descriptions that mandate a pull for excellence. | |
| | 11. | Quickly attain a critical mass of practitioners. | |
| | | **Sub-Total (Max = 12):** | |
| **Integration with Existing Business Improvement Initiatives** | 12. | Maximize the synergy of multiple initiatives. | |
| | | **Sub-Total (Max = 2):** | |
| **The Right Projects and Studies and People to Lead Them** | 13. | Establish criteria for project selection and prioritization. | |
| | 14. | Use quick-hitting studies to accelerate results. | |
| | 15. | Select top-tier candidates for first waves of training. | |
| | | **Sub-Total (Max = 6):** | |
| **Integrated Training and Software** | 16. | Use motivational and experienced instructors and coaches. | |
| | 17. | Keep the software simple and easy to use. | |
| | 18. | Use a blended approach to learning. | |
| | | **Sub-Total (Max = 6):** | |

# 10 Key Factors Evaluated from Best Practices

| | No. | Best Practice | Self-Assess Your Degree of Implementation (0-Min, 2-Max) |
|---|---|---|---|
| Financial and Implementation Accountability | 19. | Use a consistent, simple and straightforward approach. | |
| | 20. | Generate successes early and communicate them. | |
| | 21. | Plan the service provider's exit strategy. | |
| | 22. | Develop internal subject matter experts. | |
| | 23. | Manage the expectations of every practitioner. | |
| | 24. | Define and use a meaty certification process. | |
| | 25. | Train all areas of the organization. | |
| | 26. | Apply the training immediately. | |
| | 27. | Provide expert coaching on all projects and studies. | |
| | 28. | Scope projects carefully. | |
| | 29. | Establish and follow rules for assessing benefits. | |
| | 30. | Publicize and use savings wisely. | |
| | 31. | Regularly review projects and act based on the assessment. | |
| | 32. | Conduct refresher sessions for leaders and practitioners. | |
| | 33. | Connect and use Champions to upgrade the initiative. | |
| | 34. | Make everyone aware of what is going on. | |
| | 35. | Design and use standardized templates. | |
| | 36. | Anticipate and manage position loss resulting from projects. | |
| | 37. | Include team-oriented "soft" tools. | |
| | 38. | Develop transfer functions to predict, optimize, and assess risk. | |
| | 39. | Make innovation systematic. | |
| | 40. | Solve new problems using trained resources and trumpet successes. | |
| | 41. | Make Process Excellence part of the human resource succession plan. | |
| | 42. | Integrate Process Excellence into all mergers and acquisitions. | |
| | 43. | Update the implementation plan based on feedback and results. | |
| | | **Sub-Total (Max = 50):** | |
| Reward and Recognition | 44. | Recognize people who execute successful projects. | |
| | | **Sub-Total (Max = 2):** | |
| Enterprise-Wide Knowledge Sharing | 45. | Establish a project-tracking database and keep it current. | |
| | 46. | Schedule benchmarking sessions. | |
| | | **Sub-Total (Max = 4):** | |
| Customer and Supply Chain Involvement | 47. | Involve suppliers and customers early on. | |
| | 48. | Implement a fact-based process for assessing the Voice of the Customer. | |
| | | **Sub-Total (Max = 4):** | |
| Change Management: Leveraging Cultural Strengths and Managing Its Weaknesses | 49. | View Process Excellence as a mindset, not just a toolset. | |
| | 50. | Leverage cultural strengths that promote change. | |
| | | **Sub-Total (Max = 4):** | |

# Go to Air Academy's Six Sigma Quick Tools App to take survey

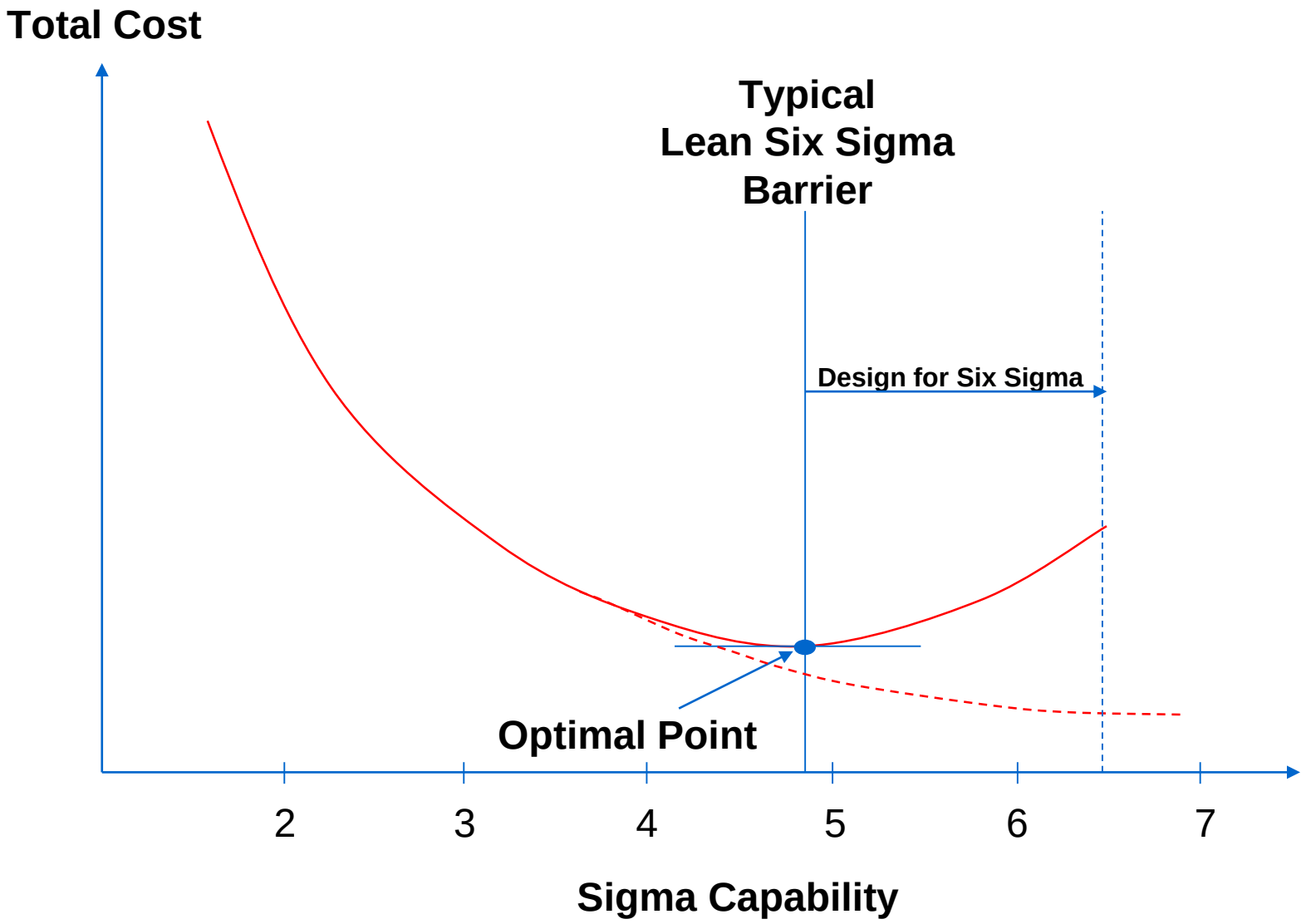
(use ***Reversing the Culture of Waste*** option)

| Consolidated Process Excellence Score Sheet | | |
|---|---|---|
| **Input Variables (x's)** ↓ | **Max Score** | **Insert Your Scores From Tables at End of Chapters 1-10 and Sum** |
| Executive Ownership and Leadership Alignment ($x_1$) | 10 | |
| Effective Support Infrastructure ($x_2$) | 12 | |
| Integration with Existing Business Improvement Initiatives ($x_3$) | 2 | |
| The Right Projects and Studies and People to Lead Them ($x_4$) | 6 | |
| Integrated Training and Software ($x_5$) | 6 | |
| Financial and Implementation Accountability ($x_6$) | 50 | |
| Reward and Recognition ($x_7$) | 2 | |
| Enterprise-Wide Knowledge Sharing ($x_8$) | 4 | |
| Customer and Supply Chain Involvement ($x_9$) | 4 | |
| Change Management: Leveraging Cultural Strength and Managing Its Weaknesses ($x_{10}$) | 4 | |
| Max Score & Your Total: | 100 | |

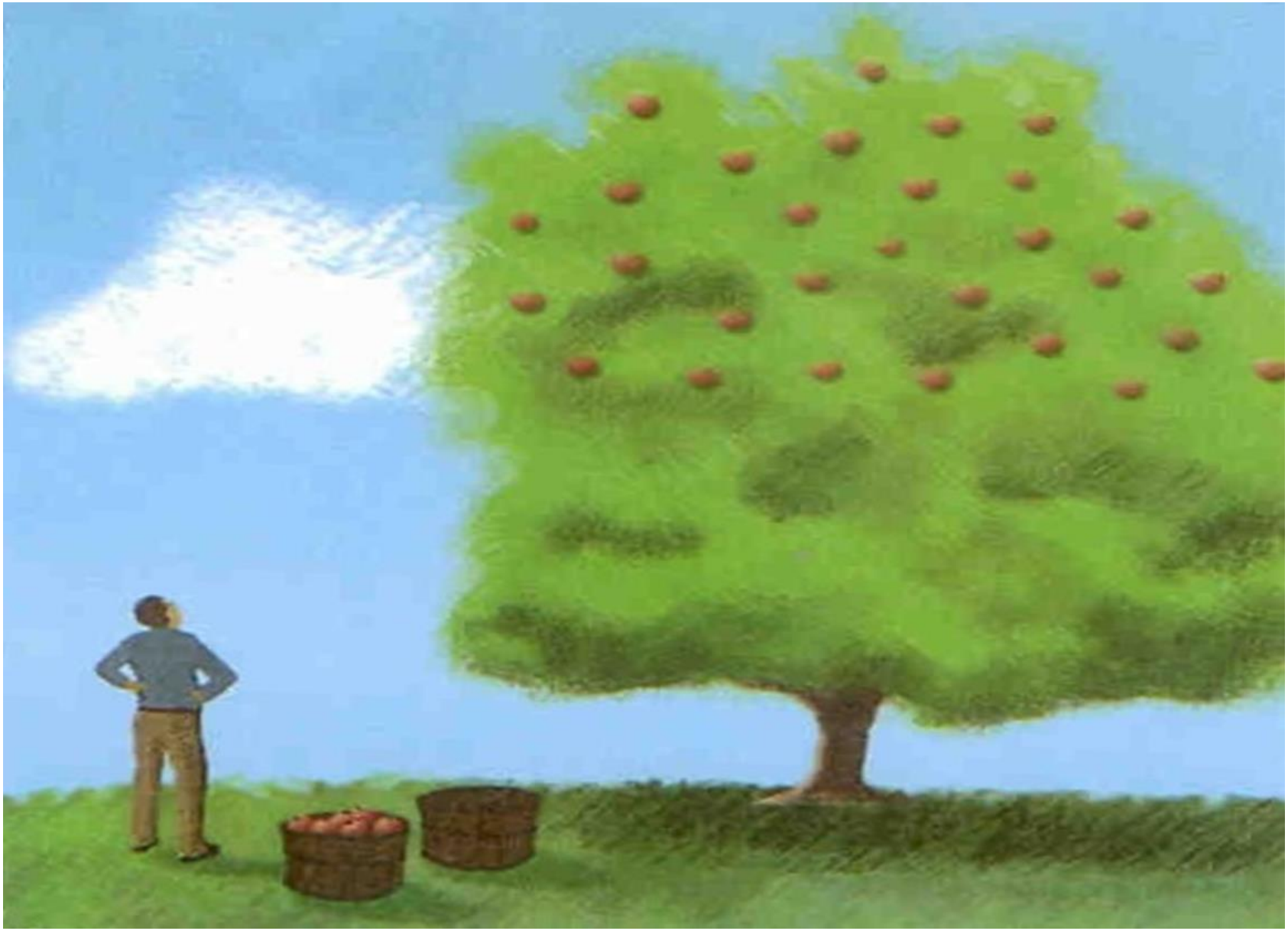
| Total Score | Percentile | Total Score | Percentile |
|---|---|---|---|
| 2 | 0% | 52 | 39% |
| 4 | 0% | 54 | 43% |
| 6 | 0% | 56 | 45% |
| 8 | 0% | 58 | 48% |
| 10 | 1% | 60 | 52% |
| 12 | 1% | 62 | 56% |
| 14 | 1% | 64 | 59% |
| 16 | 1% | 66 | 62% |
| 18 | 2% | 68 | 65% |
| 20 | 3% | 70 | 70% |
| 22 | 4% | 72 | 72% |
| 24 | 5% | 74 | 77% |
| 26 | 6% | 76 | 81% |
| 28 | 8% | 78 | 85% |
| 30 | 9% | 80 | 88% |
| 32 | 10% | 82 | 90% |
| 34 | 14% | 84 | 93% |
| 36 | 16% | 86 | 95% |
| 38 | 19% | 88 | 97% |
| 40 | 20% | 90 | 98% |
| 42 | 23% | 92 | 99% |
| 44 | 26% | 94 | 100% |
| 46 | 30% | 96 | 100% |
| 48 | 33% | 98 | 100% |
| 50 | 36% | 100 | 100% |

**Your Organization's Percentile: _____**

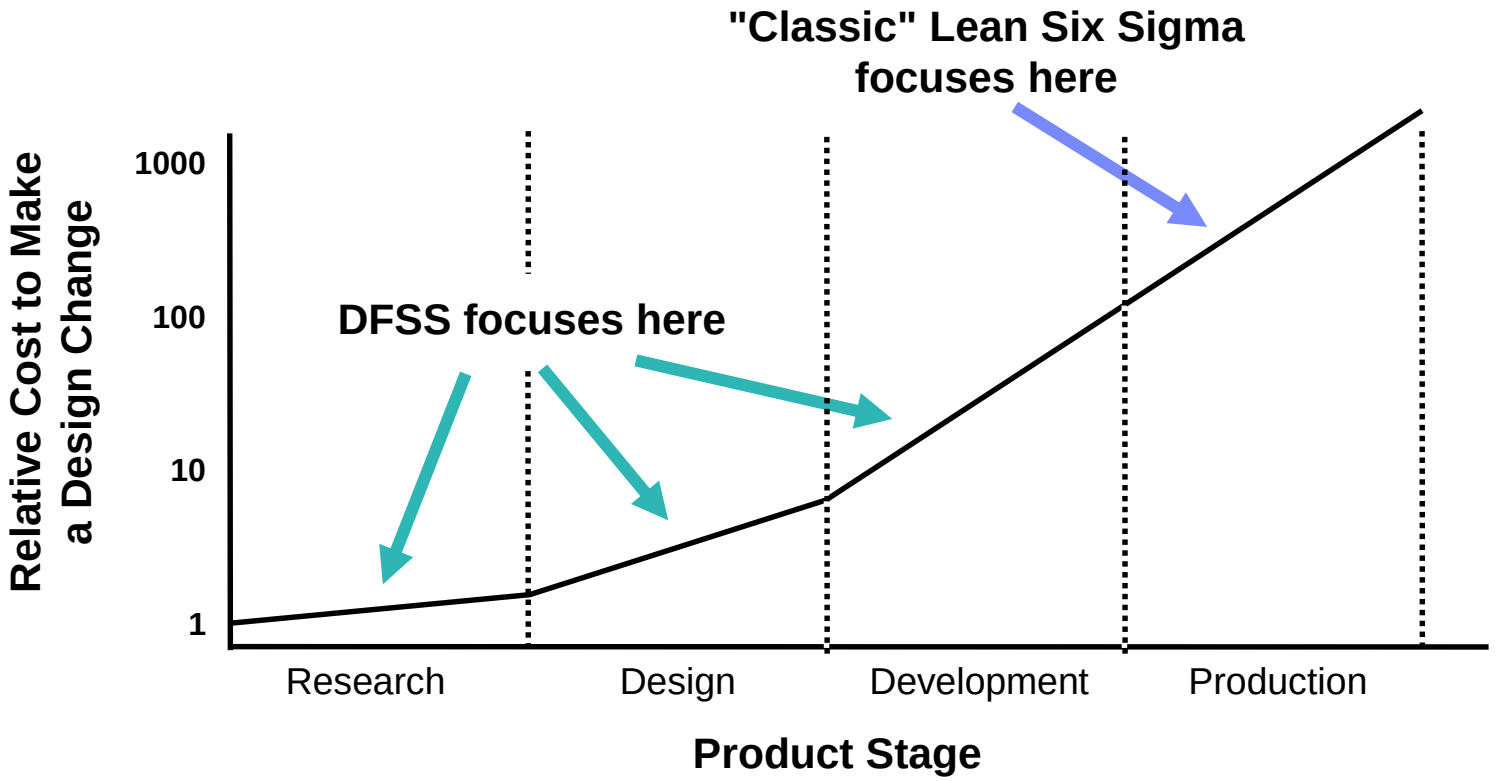
# The Evolution of Lean Six Sigma



# DFSS: getting to the high hanging fruit

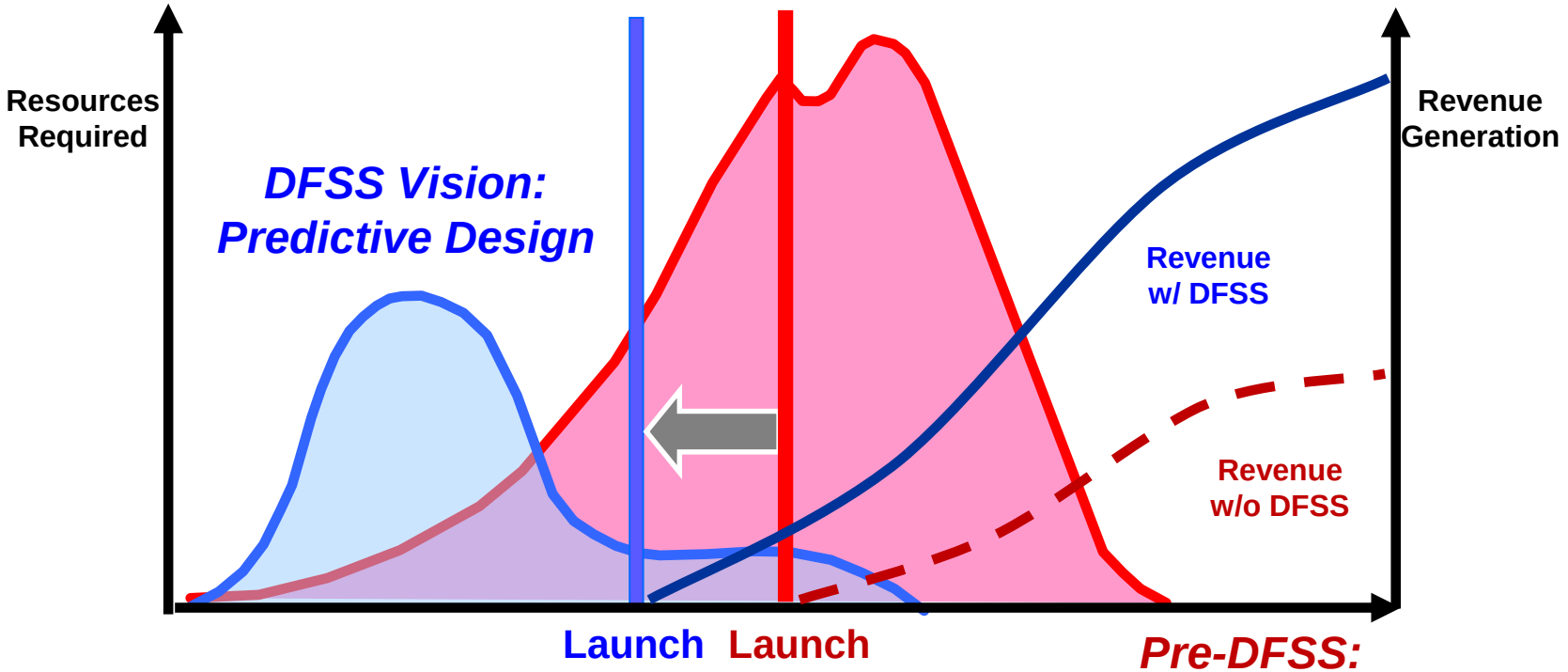


# DFSS Focus




- **Gain knowledge when costs are lowest**
- **Design in quality right from the start**

# Benefits of DFSS




- Early problem identification; solution when costs low
- Faster market entry: earlier revenue stream, longer patent coverage
- Lower total development cost
- Robust product at market entry: delighted customers
- Resources available for next game-changer

***Pre-DFSS: Reactive Design***

- Unhappy customers and employees
- Unplanned resource drain
- Skyrocketing costs
- Next product compromised

- **Upfront investment is most effective and efficient**
- **Show customers high quality products right from the start**

# Key Takeaways

- As a review, you may want to pause the video at this point and summarize the key learnings from this session, at least from a high-level view.  When you are finished, you may resume the video and complete the session.

# Key Takeaways

- Primary ingredients for a successful LSS initiative are the 3 P's
  - People
  - Projects
  - Prioritization

- People are the heart and soul of Lean Six Sigma
  - They form the infrastructure to capture the right kinds of knowledge at the right time, all for the purpose of better decision making
  - Champions, belts, and coaches are all key players and must work together

- Projects are the avenue via which benefits are delivered to both the customer and organization
  - The DMAIC roadmap could take up to 4 months
  - Rapid Improvement Events (RIEs) are much quicker

- Prioritization must happen at every level due to resource limitations
  - At the micro level in mining, selecting, and executing projects
  - At the macro level of an organization for better decision making

- Lean Six Sigma has evolved to include the entire life cycle of a product or service
  - DFSS has special tools and methods that allow earlier involvement in new product development
  - DFSS provides for earlier market entry with better products; this combination effect results in greater market share and faster revenue growth and profitability

Are you ready to get engaged in LSS?

# Supplemental Material

- Suggested Reading:
  - ***Lean Six Sigma: A Tools Guide*** by Adams, Kiemele, Pollock and Quan (pp. 1-7)
  - ***Knowledge Based Management*** by Kiemele, Pollock and Murrow (entire book)
  - ***Reversing the Culture of Waste: 50 Best Practices for Achieving Process Excellence*** by Pollock and Kiemele (entire book).
  - Air Academy's app: ***Six Sigma Quick Tools***

GET IT ON Google Play

Download on the App Store

- SPC XL™ and A3 training tutorials:
  - https://airacad.com/our-insights/training-videos/spc-xl/
  - https://airacad.com/our-insights/training-videos/a3/

- The data files for this session can be downloaded from the site where you are accessing this course.

# Review Questions

1) What are the 3 Ps and how do they relate to Lean Six Sigma?

2) Name 3 critical roles within the infrastructure of Lean Six Sigma?

3) What is Knowledge Based Management?

4) Where can we go to mine projects?

5) What is one prioritization tool that can be used to select projects?

6) What are a couple of ways to document projects?

7) What is the key tool/methodology used to hold the gains achieved in project results?

8) What is the methodology that has evolved from Lean Six Sigma, how is it different from Lean Six Sigma, and what are its primary benefits?

# We can help…
# Connect With Us


Air Academy Associates
Phone: (719) 531-0777
Email: aaa@airacad.com
https://airacad.com/
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Download on the App Store

There's an app for that!
***Six Sigma Quick Tools***

## Remote Project Coaching

There are times when help outside your organization is needed. When that time comes, benefit from a partner that is experienced, tested, and trusted.

Expert coaching is one of the Top Five Best Practices for generating step change in project execution, as well as enhanced return on investment. We can work remotely with your organization to provide coaching support.