Modular Kaizen

Continuous and Breakthrough Improvement

GRACE L. DUFFY

Modular Kaizen

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Grace L. Duffy

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Preface

Modular Kaizen is a development of necessity. Improvement has to happen on the fly in our rapidly changing world. This book is about using the resources, people, and schedules already in place to get things done.

Modular Kaizen is the counterpoint to a kaizen blitz, in which team members are confined in a room to hammer out an opportunity or a solution to some problem. In the hectic, interrupt-driven environment of many organizations, it is simply not possible to remove critical players from normal operations for any length of time.

I draw on 40 years of experience to incorporate techniques, innovations, and lessons learned in pursuit of effective continuous and breakthrough improvement. Part I provides the conceptual model along with steps and tools for process and system improvement in an extremely busy and interrupt-driven workplace. Part II offers three case studies—from manufacturing, healthcare, and aerospace—to show how the techniques work in real time.

If you are looking for proven approaches to integrating quality improvement into daily work, this is your book. It is written for those of us who have to "get it done," not just talk about it. So roll up your sleeves and dig in.

Grace L. Duffy, LSSMBB, CQM/OE
Tavares, Florida

Acknowledgments

I would like to thank those who contributed to this effort. Part II of this text is a series of three case studies using the techniques of Modular Kaizen. These success stories are written by the team leaders who made the results happen. They have shared their own experience and the tools that fit the specific situations of their improvement opportunity. These leaders are:

- Elizabeth Burns, CQE, RAB Lead Auditor, ASQ Fellow (Chapter 9, "Automotive Manufacturing Application of Modular Kaizen")
- Georgina Daniels, FCPA, FCA: TBDHU quality manager, finance manager, and team facilitator (Chapter 10, "Meeting Effectiveness Evaluation Project")
- Barbara Moro: Thunder Bay District Health Unit (TBDHU) executive assistant and team lead (Chapter 10, "Meeting Effectiveness Evaluation Project")
- John Adkisson, LSSBB, PMP ATP, FE, ASQ Senior Member: NASA engineer (Chapter 11, "A NASA Space Coast Kaizen Model")

I also wish to thank the vice presidents and quality directors of Laboratory Corporation of America for their expert suggestions for making this book a better reference for process and continuous improvement. I had the opportunity to share the concepts and tools of Modular Kaizen with these professionals just as the manuscript was in its final development stages. Their input served as the fine sandpaper finishing of the work.

I also acknowledge a long-term working relationship with Dr. John W. Moran, with whom I developed a number of the tools described in this book. Jack's brilliance in applying quality techniques to a broad range of industries has significantly expanded the science of quality and management.

Many thanks are long overdue to Matt Meinholz, acquisitions editor for ASQ Quality Press. I am indebted to his understanding of the business and quality industry. His advice for focusing my work to best fit the intended audience has been instrumental over the past ten years. I look forward to a continued successful working partnership.

Part I

What Is Modular Kaizen?

Chapter 1
Introduction to Modular Kaizen

Modular Kaizen is an improvement approach that integrates quality techniques into the busy schedule of everyday activities. All the components of an effective kaizen event are planned; however, the activities are scheduled in small segments, or "modules," that fit the rapidly changing time demands of team members and subject matter experts. Most Lean-Six Sigma texts currently in circulation stress the importance of the kaizen blitz, in which an improvement team is sequestered away from daily activities until significant parts of the problem-solving activity are complete. Modular Kaizen recognizes that taking critical employees and leaders out of mainstream work is simply not an option for many organizations today.

The Modular Kaizen approach is complementary to the Plan-Do-Check-Act (PDCA) and Define, Measure, Analyze, Improve, Control (DMAIC) models of quality improvement. The basic PDCA approach, using tools designed for Modular Kaizen, is introduced in Chapter 2, "Continuous versus Breakthrough Improvement." The more robust approach based on the DMAIC structure of Lean-Six Sigma is explored in Chapter 5, "Remove Disruptions to Improve Flow."

The contemporary poet Kathleen Norris shares a perspective that is consistent with the type of disruptions we encounter in our daily work:

> Before you begin a thing, remind yourself that difficulties and delays quite impossible to foresee are ahead. If you could see them clearly, naturally you could do a great deal to get rid of them but you can't. You can only see one thing clearly and that is your goal. Form a mental vision of that and cling to it through thick and thin.[1]

The intent of improvement models such as total quality management, Six Sigma, and PDCA is to anticipate difficulties and delays caused by variation in a planned process or the influence of external events. Modular Kaizen is based on defining expected performance, setting goals to attain customer outcomes, and planning and executing processes that effectively and efficiently achieve those desired outcomes in a predictable and sustainable fashion. Modular Kaizen refers to these difficulties and delays as "disruptions."

The word *kaizen* comes from the Japanese words *kai*, meaning "change," and *zen*, meaning "good." Organizations that want to implement Modular Kaizen must be willing to embrace constant change and continuous improvement toward an

ever-increasing standard of excellence.[2] Although the basic tenet of kaizen centers on continuous improvement, the improvement either can be incremental within the existing process or can result in a major redesign.

The Modular Kaizen model builds on the proven success of earlier improvement models identified by Joseph Juran,[3] W. Edwards Deming,[4] and the more recent practitioners of Lean and Six Sigma.[5] A basic problem-solving model begins with a clear understanding of the problem. A seven-step model is shown in Figure 1.1 and is described as follows:

1. "Understand and define the problem
2. Collect, analyze, and prioritize data about the problem symptoms, determine the root cause(s) of the most significant symptoms
3. Identify possible solutions
4. Select the best solution
5. Develop an action plan
6. Implement the solution
7. Evaluate the effectiveness of the solution in solving the problem"[6]

The generic problem-solving model illustrated in Figure 1.1 is consistent with either an incremental or a breakthrough improvement activity.

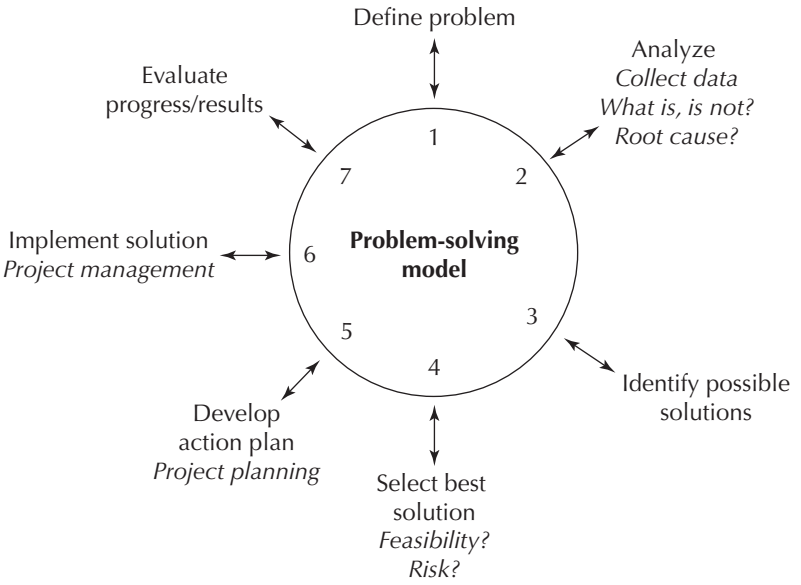

Figure 1.1 Basic problem-solving model.

Source: J. E. Bauer, G. L. Duffy, and R. T. Westcott, *The Quality Improvement Handbook*, 2nd ed. (Milwaukee, WI: ASQ Quality Press, 2006), 101.

MODULAR KAIZEN SUPPORTS BOTH INCREMENTAL AND BREAKTHROUGH IMPROVEMENT

There are two fundamental philosophies relative to improvement. Improvement may be achieved gradually, taking one small step at a time. A dramatically different concept is practiced by proponents of breakthrough improvement, an approach frequently referred to as process reengineering or process redesign. Both approaches have proven to be effective depending on the circumstances, such as the size of the organization, the degree of urgency for change, the degree of acceptability within the organization's culture, the receptivity to the relative risks involved, the ability to absorb implementation costs, and the availability of competent people to effect the change.[7] Figure 1.2 illustrates the incremental and breakthrough approaches.

Continuous improvement is a series of small changes based on incremental updates to a current process within the organizational library of processes that is defined, documented, and measured for sustainability. Breakthrough improvement is accomplished either by making significant changes to existing process activities or by revisiting required outcomes and rethinking how the process works at a basic level. Major redesign activities provide large jumps in improvement relative to the interim or outcome measures driving performance against customer requirements.

Both incremental and breakthrough improvement focus on improving the efficiency and effectiveness of processes that exist within the organization (usually unit or program processes that use incremental improvement) and those that cut across all functions (breakthrough improvement/redesign) in the organization.

Figure 1.2 Breakthrough versus continuous improvement.

HOW MODULAR KAIZEN RELATES TO THE FAMILY OF KAIZEN APPROACHES

The overall concept of kaizen is a system that encourages everyone to suggest incremental changes, eliminating "one time" improvement events. Under kaizen the organization is constantly improving. Kaizen does well in an organization that encourages and rewards teamwork and a customer-centric culture, integrating the use of quality tools at all levels to make individual improvements.

Two of the most common uses of kaizen are:

- *Kaizen event*—a problem-solving approach that requires training and facilitation to analyze and reorient a process
- *Kaizen blitz*—similar to an event but is focused on a short activity of two to eight days to improve a process and requires substantial use of human resources for this time period

This book is about the use of *Modular Kaizen*, defined as an improvement or redesign project planned along a timeline that recognizes the highly volatile nature of the organization's core business processes. High-priority projects are planned at the senior leadership level to establish realistic milestones, resources, and measurements and to ensure a return on investment that includes not only a financial commitment but also the involvement of highly skilled facilitators and subject matter experts.

THE ORGANIZATION MUST BE VIEWED AS A SYSTEM

Processes rarely exist as stand-alone functions. There are usually inputs and outputs that are dependent on other processes. Figure 1.3 is a representation of the organization as a system and illustrates the interdependence of processes, resources, customers, competition, and the external business environment.

A process-based continuous improvement culture is effective only to the extent that improvements are based on the overall performance of the organization as a system. Improving processes or subprocesses in a vacuum, without understanding their dependence on incoming and outgoing value from other processes, is simply a waste of effort. Improving a non-value-adding process is an exercise in futility.

Modular Kaizen supports viewing the organization as a system. Modular Kaizen focuses on value-added expenditure of resources from the customer's viewpoint. This viewpoint may be of either the internal or the external customer. Another way of putting it would be to give the customers:

- What they want
- When they want it
- Where they want it
- In the quantities and varieties they want

A planned, systematic approach to continuous improvement leads to better performance, better cash flow, increased sales, greater productivity and throughput, improved morale, and higher profits. Using a systems approach to minimize disruptions is an effective, integrated method that recognizes the interdependency

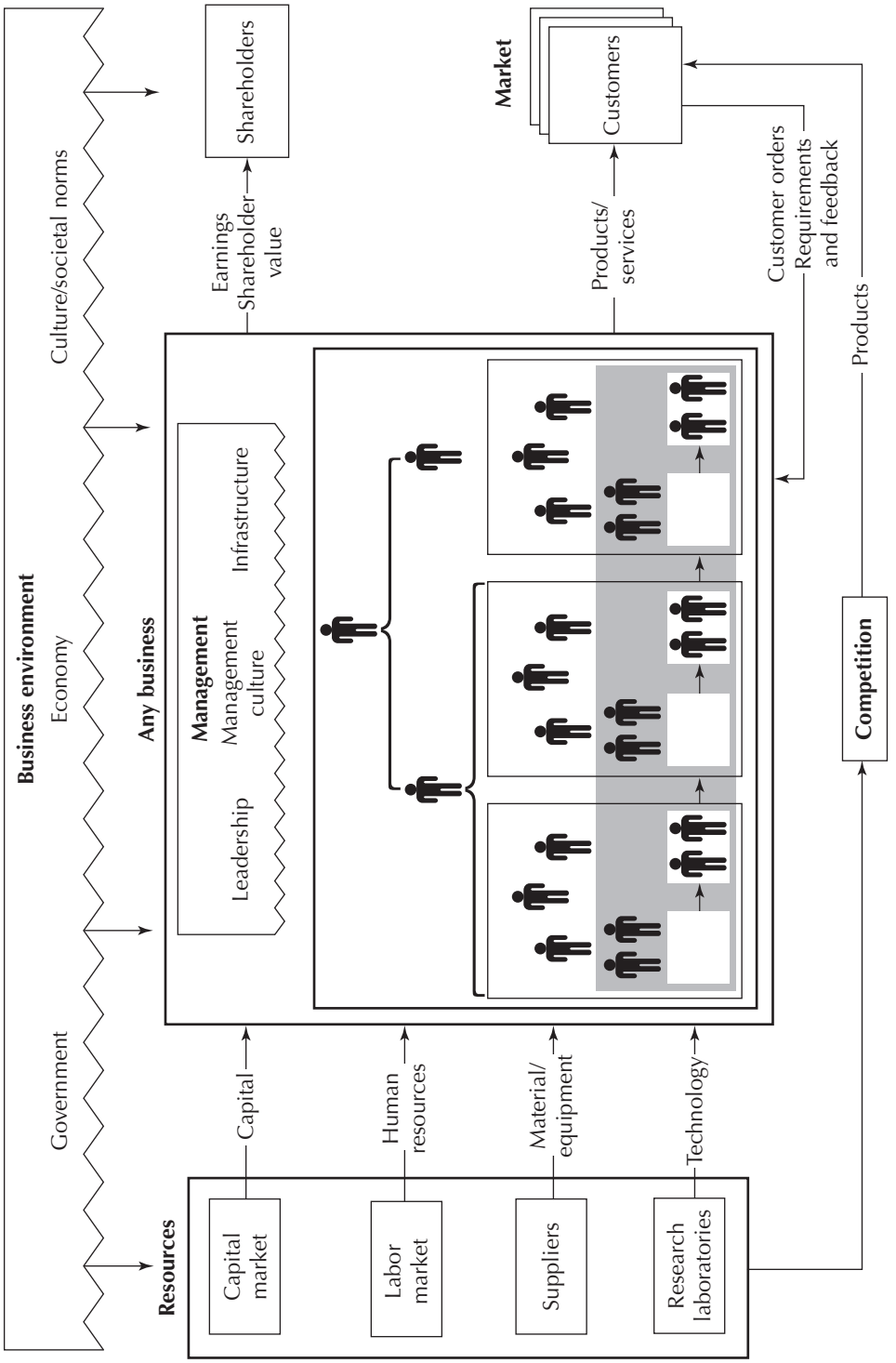

Figure 1.3 The organization as a systems lens.

Source: G. A. Rummler, A. J. Ramias, and R. A. Rummler, "Potential Pitfalls on the Road to a Process-Managed Organization (PMO), Part 1: The Organization as System Lens," *Performance Improvement* 48, no. 4 (2009): 7.

of all core processes and the impact of changes both internal and external to the organization.

A disruption, according to the Bing Dictionary, is defined as follows:

1. "unwanted break: an unwelcome or unexpected break in a process or activity
2. suspension: the interruption or suspension of usual activity or progress
3. state of disorder: a state of disorder caused by outside influence"[8]

Disruption within a defined process or activity causes waste—wasted time, wasted energy, wasted resources. Modular Kaizen uses the tools of lean and other improvement models to minimize the disruption of processes or activities by addressing potential disruptions through planned continuous or breakthrough improvements.

Improvement concepts are applicable beyond the shop floor. Companies have realized great benefit by implementing quality and improvement techniques in office functions of manufacturing firms as well as in purely service firms such as banks, hospitals, restaurants, and so on. The elements of a systems approach for organizational success provide the following benefits:

- A more sustainable, cost-effective system
- Greater collaboration across the system to improve quality and outcome
- Leveraged technology for greater utility for all participants and reduced disparities in access

A 2008 study by IBM identified four approaches for tying the actions of the organization together in an effective system:

1. "*Real insights, real actions.* Strive for a full, realistic awareness and understanding of the upcoming challenges and complexities, and then follow with actions to address them.
2. *Solid methods, solid benefits.* Use a systematic approach to change that is focused on outcomes and closely aligned with formal project management methodology.
3. *Better skills, better change.* Leverage resources appropriately to demonstrate top management sponsorship, assign dedicated change managers and empower employees to enact change.
4. *Right investment, right impact.* Allocate the right amount for change management by understanding which types of investments can offer the best returns, in terms of greater project success."[9]

The key to successful continuous improvement is a line-of-sight connection between what is transpiring at the customer front lines and the strategic direction of the organization. Process improvement is only busywork unless it is grounded in the drive to meet customer requirements. Change management, as represented by these four approaches, is the vehicle for connecting all action to the right outcomes.

First, senior management must know where it is going. Understanding the current situation and how to conquer the challenges of getting to the desired state is what the quality community calls a gap analysis. Where are we now and where do we need to go?

The next item suggested in the IBM study is employing solid methods tied to solid benefits for the organization. The systems concept incorporates project management and the value-added approach to continuous improvement that is required to design and sustain line-of-sight focus on both effective and efficient operations.

Early assessment of resource and skill availability to meet customer requirements is a critical step within the Modular Kaizen sequence. As listed in item 3 of the IBM study, ensuring better skills to enact better change combines the process-based concept of task execution with the human contribution of knowledge, skills, and abilities.

Finally, item 4 in the study is striking an appropriate balance of investment in an interrelated set of activities that draws the whole organization closer to meeting the wants and needs of the customer. Changes in one area of the organization can impact a wide range of outputs across the organization and beyond. As with a spider web, when one supporting strand is plucked, the waves of response radiate to all segments of the web.

THE BIRTH OF MODULAR KAIZEN

Modular Kaizen was developed as a method for implementing a culture of quality improvement within a major subagency of the US federal government during the 2009–2010 H1N1 novel flu virus response. The implementing organization was deeply involved in both the preparation for and the response to the impact of the H1N1 virus at the national and global levels. Key personnel involved in the strategic development of the cultural framework for quality were also leading scientists in the efforts surrounding the H1N1 epidemic.

The working environment in which the author was tasked with facilitating the implementation of a culture of process and quality improvement in federal government was characterized by:

- Highly interruptible, multiple-priority arena
- Strong requirement for flexibility and fast decision making
- Tradition of intuitive rather than data-driven decision making
- History of placing a higher priority on job content than communication and behavioral effectiveness
- Strong senior management support to quantitative interim and outcome measures
- Organizational commitment to accountability at all levels

A major challenge to the implementation of a culture of quality improvement was eliminating functional silos within a traditional senior federal agency. Barriers to be addressed were:

- Strong legacy of autonomous functions
- Diverse scientific disciplines with disparate processes
- Highly graded professionals with little incentive for teamwork

- Current duplication of activities due to consolidation of support functions
- The requirement to document value-added processes; the existence of non-value-added overhead
- The need for flexibility and agility within a validated range of outcomes and behaviors

Modular Kaizen was developed as an interactive, problem-solving process that utilizes in-house subject matter experts to minimize disruption to regularly scheduled organizational activities. The Modular Kaizen sequence places heavy focus on the planning phase, taking into account the availability of team members and subject matter experts. Another key characteristic of the approach is the presence of a project driver who serves as an ongoing communication hub for continuity of improvement efforts when team members are called away for crisis management or other critical functional activities. The Modular Kaizen flow is shown in Figure 1.4.

General project sequence for Modular Kaizen improvement activities

1. Understand and define the problem/opportunity
   a. Identify the issue
   b. Identify the sponsor/champion
   c. Choose the team
   d. Ensure appropriate skill levels (skills matrix)
   e. Develop initial Modular Kaizen timing requirements (map team members to schedule demands)
   f. Develop problem statement/aim (project charter)
   g. Map the current state (process map or flowchart)
2. Collect, analyze, and prioritize data about the problem symptoms; determine the root cause(s) of the most significant symptoms
   a. Assess customer needs (QFD—quality function deployment—house 1)
   b. Identify disruptions to current process or process omissions (cause and effect diagram)
   c. Set improvement indicators (needs to indicators matrix)
   d. Gather data (check sheets, etc.)
   e. Analyze and identify root cause of disruption (5 Whys, impact/priority matrix, cause and effect)
3. Identify possible solutions (solution and effect diagram)
4. Select the best solution
   a. Return to process as defined (check/act, or define, measure, analyze)
   b. Improve existing process (PDCA or DMAIC)
   c. Redesign process (PDCA or DMADV—define, measure, analyze, design, verify)
5. Develop an action plan (project plan, Gantt chart)
6. Implement and document the solution (storyboard)
7. Evaluate the effectiveness of the improvement (control plan)

Figure 1.4 Modular Kaizen improvement flow.

The seven-step process illustrated in Figure 1.4 should look familiar to most quality professionals involved in improvement efforts. The tools in parentheses are only suggestions to be used at each step. More about the basic and advanced tools of quality is available in Chapters 6, 7, and 8 of this text. Other applications and tools are described in the project application chapters in Part II of this text.

Modular Kaizen is more an integrated, organizational concept than a new set of tools and techniques. A major difference in the approach of Modular Kaizen is seen in step 1. Because of the need to plan more rigorously for interruptions in team member schedules, the team sponsor and quality management function are called on to identify team members and subject matter experts early in the chartering function. Specific skill identification is important to further focus on the most appropriate team members. Once the members are identified, their schedules must be accommodated or adjusted to establish a viable project timeline. Where skills need to be enhanced, planning takes place to schedule additional training or application experience.

Modular Kaizen is the counterpoint to a kaizen blitz, in which all team members are sequestered for a period of time to hammer out a solution. In the hectic, interrupt-driven environment of many organizations impacted by current downsizing, it is simply not possible to remove critical players from normal operations for any length of time.

REMOVE DISRUPTIONS TO IMPROVE FLOW

A Modular Kaizen approach minimizes disruptions by immediately identifying any deviation from the defined process. When any action is taken, it is taken using full knowledge of the impacted process flow. Once the disruption is identified, a team is chartered to develop a plan using the complete improvement cycle.

The iterative nature of rapid cycle improvement, as described in Chapter 5, is key to sustaining and improving an integrated set of core processes that make up the organization as a whole. A key component of continuous improvement is that processes are defined and followed for sustainability of operating outcomes. Figure 1.5 illustrates the basic rapid cycle improvement model.

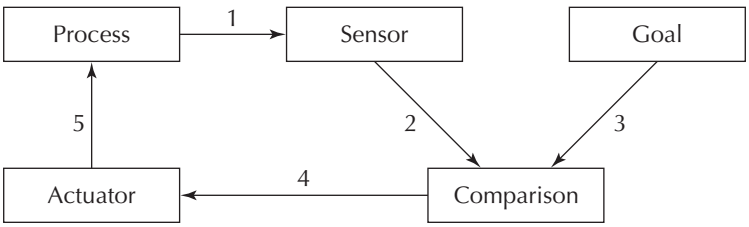

Figure 1.5 Basic rapid cycle improvement model.

Source: G. D. Beecroft, G. L. Duffy, and J. W. Moran, *The Executive Guide to Improvement and Change* (Milwaukee, WI: ASQ Quality Press, 2003), 20.

During operation, as the worker (the sensor) observes the results of process tasks, he or she is making comparisons between the intended outcome (the goal) and the process as defined. Questions to be asked are:

- How is the process supposed to work?
- What deviation is observed?
- Can the process be returned to expected flow without further action?

As long as the comparison indicates that the process is being followed within acceptable parameters, work continues. If the flow of the process is disrupted or begins to veer away from expected performance, the worker or automated measurement system (the actuator) is prompted to take action. Depending on the amount of deviation from the expected performance, action is taken to:

- Return to defined process flow,
- Adjust flow by modifying the existing process,
- Adapt the process to account for changing conditions external to the process, or
- Abandon the existing process by redesigning to meet new requirements.

Modular Kaizen is an approach that discourages an emotional response to process disruption. Once the process is stabilized, a full PDCA or DMAIC cycle is undertaken to develop a plan and action steps to proactively minimize the recurrence of the disruption. A final step of any Modular Kaizen activity is to document successes and lessons learned. Sharing the benefit of this planned modular improvement approach to crisis strengthens the total organization's leadership system.

THE TOOLS OF MODULAR KAIZEN

Modular Kaizen is based on the lean concept of improvement, which uses tools for efficient use of resources across the whole system of interrelated processes. Traditional lean tools grew out of the automotive and manufacturing industries and, over time, were modified to support service and other transactional environments. Modular Kaizen modifies many of the same tools for a highly interruptive, fast-paced workplace.

Figure 1.6 lists the major tools of Modular Kaizen. These tools are designed to assess the current state of performance, identify process disruptions, and reduce or eliminate any waste that affects the efficiency of the overall flow of operations.

The basis of any improvement effort is the awareness of the impact of change within the organization. As seen in Figure 1.6, change management is the foundation of the tools used within Modular Kaizen. Closely following change management as a prerequisite of effective improvement is the use of value stream mapping.

A culture of process improvement and change is required for long-term sustainability of performance excellence. The organization as a system must be considered before initiating process-level changes. Although all actions are local, the impact of those actions is often felt across a wide range of interrelated processes and activities within the organization. Change management addresses the planning and behavioral impacts of improvement actions. Value stream mapping provides the tangible evidence of those interactions by documenting the interdependencies

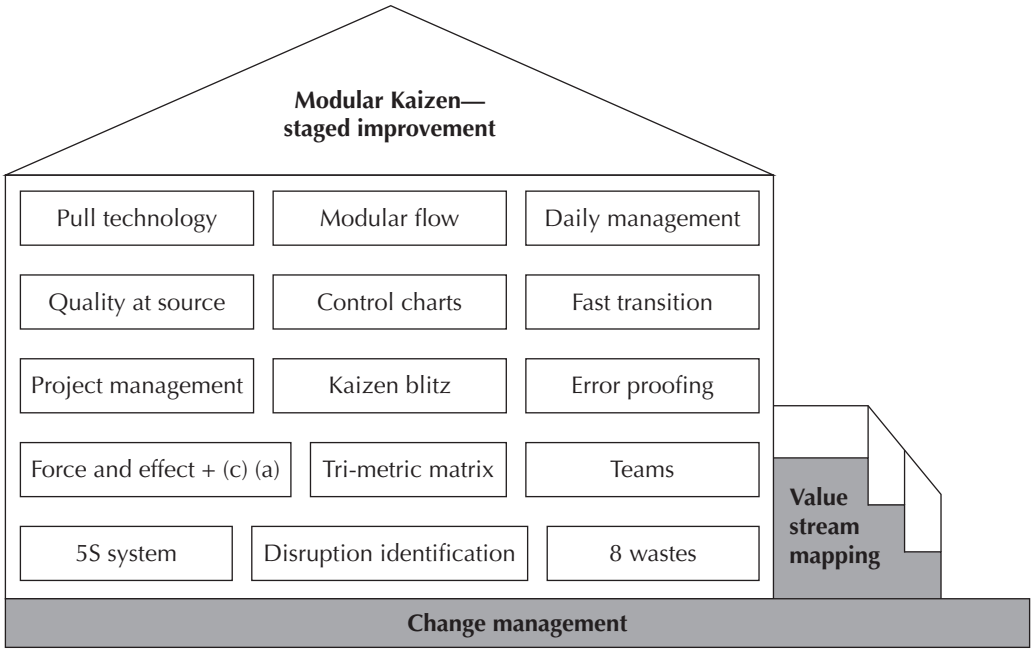

Figure 1.6 The House of Modular Kaizen.

of processes vertically and horizontally at least across the organization, if not across the total value chain of suppliers, internal organization, and customers. Unless these two initial tools are used to establish a strong culture of change and a clear knowledge of the process considered for improvement, the project will not have a strong enough foundation for success.

Chapter 6 provides a closer look at the major tools of Modular Kaizen and includes examples of how these tools support data gathering, analysis, decision making, and execution across a number of improvement projects.

PROCESS AND OUTCOME MEASURES IN MODULAR KAIZEN

Measurement frameworks are critical for linking organizational objectives to business unit and frontline operations. They ensure that everyone understands not only how roles align with organizational objectives but also how each unit and individual contribute to the outcomes. The end result is a scorecard that provides a strategic framework, organizational alignment, and measures that link to critical success factors and can be aggregated to draw meaningful conclusions.

There are many ways to measure and monitor a process. It is best to use the simplest graphical method. The method used will be determined by the availability of data and the degree to which the process is controlled. All of these monitoring methods provide a dynamic visual view of process performance. Neither numeric tables of data nor a comparison of summary measures offers the same graphical impact as visual representations.

Modular Kaizen uses the concepts of control and standardization to prioritize actions to reduce disruption. Performance management, based on the organization's

strategic plan, sets the foundation for critical measures that reflect required organization and customer outcomes. Using standards set for the organization during its annual planning cycle ensures that comparison of the activities performed with the required outcomes closely matches the unit's mission and objectives. The more aligned teams are to priority outcomes of the organization, the more efficient they will be in choosing the right process improvement projects. The benefit of keeping the improvement process directly related to priority activities is that the tasks performed blend easily with the daily work of the improvement team members.

Fast transition is an element of the House of Modular Kaizen. Improvement teams are able to transition quickly from normal work tasks to improvement tasks because the skills and information required for improvement are closely related to what they do in their normal work assignments.

APPLICATION EXAMPLES USING MODULAR KAIZEN

Modular Kaizen has been tested in a number of industries since it was first designed in 2010. Part II of this text contains sample project reports reflecting the flow of Modular Kaizen in manufacturing, healthcare, and aerospace. Although the House of Modular Kaizen illustrates a number of tools specifically modified to support the fast-paced, interrupt-driven environment of many organizations, the tool set is by no means limited to these tools. The tools of quality are exceedingly robust. The project teams represented in Part II of this text used a number of tools to gather and analyze data, to recommend solutions, and to execute pilots and final implementation. Modular Kaizen is an improvement approach that integrates closely with the daily operations of the organization. The author's hope is that readers will test this concept through their own improvement efforts and add to the tools and applications for future improvement teams.

NOTES

1. Goodreads, "Kathleen Norris quotes," accessed April 15, 2013, http://www.goodreads.com/author/quotes/60394.Kathleen_Norris.
2. R. Bialek, G. Duffy, and J. Moran, *Modular Kaizen: Dealing with Disruption* (Washington, DC: Public Health Foundation, 2011), 100.
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7. Bauer, Duffy, and Westcott, *Quality Improvement Handbook*, 72.
8. Bing Dictionary, accessed April 28, 2013, http://www.bing.com/Dictionary/search?q=define+disruption&qpvt=disruption&FORM=DTPDIA.
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Chapter 2
Continuous versus Breakthrough Improvement

INTRODUCTION

There are two fundamental philosophies relative to improvement. Improvement may be achieved gradually, taking one small step at a time. A dramatically different concept is practiced by proponents of breakthrough improvement, a "throw out the old and start anew" approach frequently referred to as process reengineering. Both approaches have proven to be effective, depending on the circumstances.

Figure 2.1 illustrates the difference between continuous and breakthrough improvement. Continuous improvement is an evolutionary progression of improvement over time. Breakthrough improvement is characterized by large step improvements to meet higher measures of process performance expectations. Continuous improvement can often be realized by making small changes to an existing process. Breakthrough improvement is usually obtained by rewriting significant activities of an existing process, thus creating a new process or subprocess as a result.

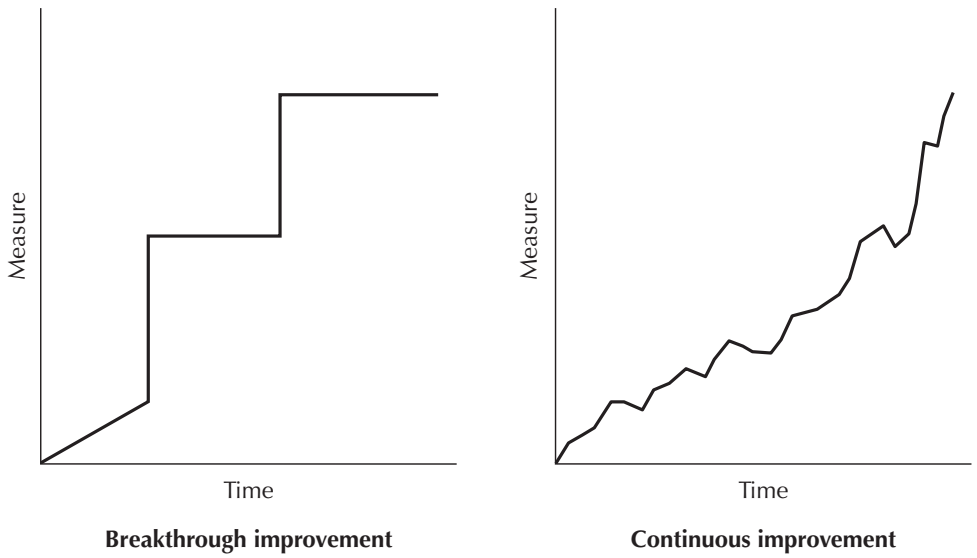

Figure 2.1 Breakthrough versus continuous improvement.

GENERAL SEQUENCE FOR IMPROVEMENT EFFORTS

Juran's universal sequence for quality improvement includes three components:

- Mission statement
- Diagnostic journey
- Remedial journey

The mission statement serves to identify the purpose and expected result of the improvement activity. It is unique to each project and serves as the guidance statement for the team. The diagnostic journey takes the team from symptoms to cause and includes analyzing the symptoms, theorizing as to the causes, testing the theories, and establishing the root cause or causes of the disruption. The remedial journey advances from cause to remedy. It includes developing the remedies, testing and proving the remedies under operating conditions, dealing with resistance to change, and establishing controls to hold the gains.[1]

Masaaki Imai made popular the practice of kaizen,[2] a strategy for making improvements in quality in all business areas. Kaizen focuses on implementing small, gradual changes over a long time period. Fully utilized, everyone in the organization participates. Kaizen is driven by a basic belief that when quality becomes ingrained in the organization's people, the quality of products and services will follow. Key factors are initiating operating practices that lead to uncovering waste and non-value-added steps, total involvement of everyone in the organization, extensive training in the concepts and tools for improvement, and a management that views improvement as an integral part of the organization's strategy. In a serious problem situation, an intensified approach may be used.

This intensified approach may still be categorized as continual improvement if it reflects incremental changes to an existing process. When the problem situation is serious enough to indicate that the current process is not capable of resolving the problem, a breakthrough improvement may be required.

Modular Kaizen strives for incremental or evolutionary change when possible, since this approach is less disruptive than breakthrough change. This is not always possible, nor recommended, depending on external competitive forces driving the organization. Modular Kaizen includes tools and techniques that step out of the traditional kaizen scope of small, incremental change by gathering data to support effective leadership decision making. This chapter addresses the decision-making process for pursuing either a continuous or a breakthrough approach to improvement.

Typical Modular Kaizen opportunities usually revolve around the following types of process disruptions:

- Disconnected processes and/or technology
- Manual tasks not yet fully documented as stable processes
- Processes that exhibit a high level of interaction or complexity
- Processes containing redundant or non-value-added steps

CONTINUOUS IMPROVEMENT

Continuous improvement, also referred to as continuous quality improvement (CQI), is a management approach to improving and maintaining quality that emphasizes internally driven and relatively constant (as contrasted with intermittent) assessments of potential causes of quality defects, followed by action aimed at either avoiding a decrease in quality or correcting it at an early stage.[3]

For example, a team is formed in the travel department of a sales organization to find ways to reduce processing time for reimbursing salespeople for business trips. The team will likely seek small steps it can take to improve the reimbursement turnaround time. When a change is implemented and an improvement is confirmed, the team may meet again to see if it can make further time reductions. This approach may be used throughout an organization.

Following basic process improvement training, the team members gather and analyze performance data, pinpointing the root causes of reimbursement delays and prioritizing the problem areas. Then they systematically address each problem in order of priority, first addressing those problems in which solutions can be immediately implemented. For each solution, a careful review ensures that no additional problems will be created once the solution is initiated. The team then takes the solutions back to its work area and begins piloting the changes. Once the piloted solutions are validated and accepted by the travel process owner, the changes are introduced to the workforce and integrated into a more effective and much shorter reimbursement cycle.

The approach described in the previous paragraph uses the concept of Modular Kaizen by taking small, planned improvement steps that can easily be integrated into the normal operations of the travel function. Team members are not taken from their daily activities for long periods of time to analyze large sections of the reimbursement process. The project team leader studies the current process to identify bottlenecks and provide data to the improvement team members in a concise format that expedites involvement by the individuals most experienced in the process.

A core component of Modular Kaizen is the involvement of an improvement leader who can view the target process in relation to the system in which it functions. Although Modular Kaizen at the task level breaks down processes into small, addressable parts, the long-term goal of any improvement effort is to reduce disruption across the whole value chain of activities supported by that process. Just taking pieces of a process and making adjustments without a proper perspective is tantamount to reproducing Deming's example of losses from overadjustment (tampering).[4]

The Modular Kaizen model shown in Figure 2.2, using the PDCA model, starts with **Check**, in which a disruption is investigated and understood to determine whether there is a special cause. As in any valid process improvement effort, a basic assumption is that the current process is understood and in control. All too often improvement teams immediately identify actions to be taken to remove disruptions or errors without understanding enough of the full impact of the process under study. It is possible that the disruption noticed by the individual or sensor (if an automated function) is unexpected but still within the process capability.

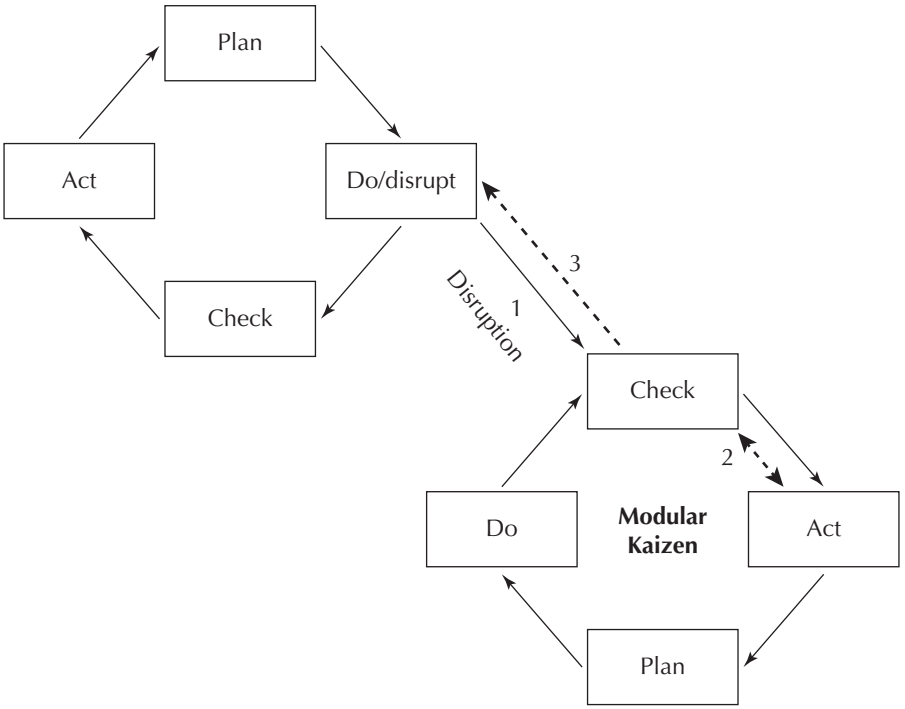

Figure 2.2 Modular Kaizen flow using PDCA.

In that instance, full understanding of the process allows the Check function to ascertain that the disruption is minor and warrants only continued monitoring for further deterioration.

If the disruption is outside the normal process expectations, the next step is to branch out to further problem determination (as seen in the arrow labeled "1" in Figure 2.2) to understand what the severity/urgency is, estimate who or what is impacted, estimate the length of the disruption timeline, and collect data.

The next step is **Act**. Using the data gathered in the expanded Check phase, the response team would:

1. Do nothing—continue to monitor the disruption until it either dissipates or needs more attention. If more attention is needed, establish an investigative team to dig deeper into the disruption and report back. This report would be in the form of a high-level-scope document.
2. Take short-term actions to stabilize the process while the team allocates time to use the PDCA cycle to solve the problem and bring the process back under control. This is represented in Figure 2.2 by the dashed line marked "2."
3. For a disruption that cannot be quickly returned to the standard process activity, problem determination continues in parallel with the short-term stabilization described in step 2. The resolution team continues into the **Plan** stage to rethink the process to ascertain whether improving the existing process will prevent the observed disruption from recurring. If that is possible, the solution is piloted in the problem determination **Do** phase and verified in the Check phase.

4. Once the disruption is resolved, either as a return to the existing process flow or as an improved process, resources can be returned to departments to resume regular activities, as illustrated in Figure 2.2 by the dashed line marked "3."

At this point, the team documents lessons learned, knowledge gained, and any unexpected results that emerged. It is important to continue to monitor activities and hold the gains so that the disruption remains under control.

Individuals responsible for the process may make incremental improvements. However, depending on organizational policies and procedures, appropriate approvals may be required. Also, there should be concern for interactions with other processes, before and after the process is changed. More typically, a team from the work group involved initiates incremental changes. If the organization has a suggestion system in place, care must be taken to ensure conflict of interest does not result.

BREAKTHROUGH IMPROVEMENT

Taken to its extreme, a breakthrough improvement may encompass totally reengineering an entire organization.[5] This usually means ignoring how the organization is structured and how it currently produces and delivers products and services. It's a "start from a clean slate" approach. The subject of much criticism and a number of notable failures, this approach has gained a negative reputation in recent years. Unfortunately, many organizations employed this approach as a way to drastically cut costs, most significantly by reducing the number of employees.

In some organizations, with their drive to radically cut expenses, the basic tenets of the reengineering approach were either ignored or sublimated. Some of the most important factors to be considered include the need to carefully understand the organization's culture and management's commitment to change (especially when positions are threatened); a well-communicated policy and plan for the disposition of people affected by the changes; a well-communicated plan for the transition (e.g., do the changes just pile more work on the remaining employees); means for dealing with the psychological trauma inherent in downsizing (e.g., survivor guilt, loss of associates, anger of terminated or transferred employees); and means for addressing the potential for sabotage, intentional or unintentional (e.g., lethargy, loss of interest in job, retaliation).

Redefinition requires a different approach than that of improving a current process. It often includes a larger vision of transformation above and beyond definition. Redefinition activities using the process framework result in a new organizational structure built around the process framework, typically with complete adoption of the three main uses (content management, benchmarking, and business process definition).[6]

Given the small number of real successes in totally reengineering an entire company all at once, a more limited approach has emerged, typically called process reengineering. Using process reengineering, a team examines a given process, for example, employee training. The team may take a macro look at how training is currently handled, just to gain a sense of the situation. Then, starting with a clean slate (perhaps based on benchmarking), it devises a new, hopefully better process approach without resorting to how the present process operates. The resultant process design is a breakthrough. Achieving the breakthrough presumes the team participants are able to shed their biases and their ingrained notion of how things have always been done.

Figure 2.3 illustrates the concept of "adapt, adjust, or abandon" in process improvement. The least disruptive condition is to have the current process flow smoothly from one process task to another, as viewed in flow 1. Occasionally, influences cause the process to veer off the expected target performance and exhibit a slight variation, as shown in flow 2. This variation is still within the expected range of performance for the current process, so the process simply adapts to the minor variation and returns to the expected flow. At other times, a special cause creates a situation where the flow is strongly disrupted, as exhibited in flow 3. Here process performance is outside the expected variation of the current process. At this point, the process must adjust operations to return to the current process flow. Finally, in flow 4, external pressures on the current process are so strong that it is no longer capable of meeting customer requirements. In this situation, the current state is abandoned and a new process is designed to meet changing requirements for the long term.

Breakthrough improvement encompasses this last option, leaving the current process assumptions and rethinking the basic requirements that drive the need for the process at all.

Certain generic steps are usually involved in initiating breakthrough improvements:

1. "Assure there is a strong, committed leader supporting the initiative.
2. Form a high-level, cross-functional steering committee.
3. Create a macro-level process map for the entire organization.
4. Select one of the major organizational processes to be reengineered.
5. Form a cross-functional reengineering team.
6. Examine customers' requirements and wants, in detail.
7. Look at and understand the current process, from a customer's perspective (its function, its performance, and critical concerns), but not in infinite detail.

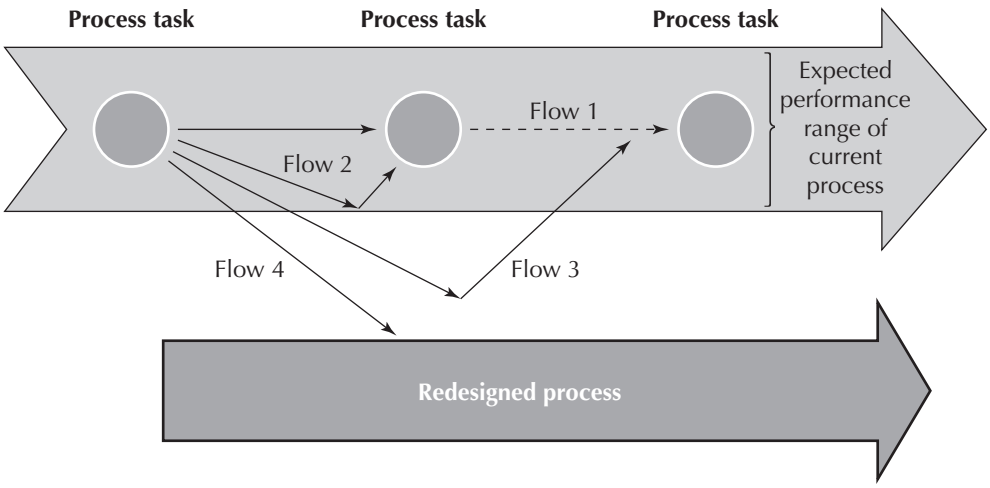

Figure 2.3 Incremental change versus process redesign.

8. Brainstorm ways to respond to customers' needs. *Think outside the box.*
9. Create breakthrough process redesign (assuming the process is still needed):
    a. Design to include as few people as possible in the performance of the process.
    b. Identify and question all assumptions, eliminate all possible.
    c. Eliminate non-value-added steps.
    d. Integrate steps, simplify everything possible.
    e. Incorporate the advantages of information technology wherever feasible.
    f. Prepare a new vision statement.
    g. Plan how to communicate the new vision and news of the process redesign.
    h. Determine how to achieve performers' "buy-in" of new process design.
    i. Determine how to get management to see the wisdom of dismantling the "old" process design.
    j. Determine how the inevitable displacement of people (new work procedures, job elimination, transfers, and downsizing) will be addressed.
10. Test-drive the new process design with a portion of the business and with one or two customers who can be counted on for collaboration and feedback.
11. Collect feedback from the selected customers, the involved employees, management and other affected stakeholders (e.g., union, suppliers, and stockholders).
12. Modify the process redesign as needed and communicate the changes.
13. Plan a controlled rollout of the process redesign.
14. Implement the rollout plan.
15. Evaluate effectiveness of redesigned process continuously at every stage.
    a. Assess assimilation of changes on workforce and management.
        - Individual acceptance of changes: technical, social
        - Understanding of need for displacement of people: reassignments, terminations
        - Changes to managerial and supervisory roles and status (redistribution of responsibilities and authority).
        - Changes to compensation, training, development, and other human support systems
    b. Assess impact of changes on customers (e.g., did redesign accomplish what the customers needed and wanted?)
    c. Assess impact of changes on other stakeholders (e.g., did redesign achieve its intended purpose, with minimum negative consequences?)"[7]

INNOVATION: EVOLUTION OR REVOLUTION?

Making the decision to improve an existing process or start over by designing a new process is not totally a science. There is a lot of judgment involved in assessing the current state and gauging the impact of either internal or external events that indicate that an untapped opportunity exists for improvement or change. Organizations tend to stay with the culture that has developed over years of operations. Senior leaders establish a comfort zone around which they can make decisions in the short term.

Sometimes organizations die rather than make changes that negate or violate the beliefs ingrained in their cultures. More often, however, they try to keep as much of their culture intact as they can while bending enough to survive.[8]

Innovation is usually associated with breakthrough change—the idea of a whole new approach to meeting a customer requirement, or a totally different way of solving a nagging production or service issue. This is not always the case. The Modular Kaizen approach to improvement can also contribute to innovative solutions. By actively involving those most familiar with a process in brainstorming around new ideas, the organization can encourage rapid-fire building on existing knowledge to venture into untested waters.

Innovation is not just coming up with a new answer to customer requirements. It is effective only when the idea can be turned into a marketable and successful addition to the company's cash-flow engine.

Figure 2.3 describes four different responses to an observed disruption in an existing process. Flows 1 through 3 are related to a return to the current defined process. Only flow 4 leaves the current process and designs a new process in answer to a divergence from expected performance.

As stated earlier, an organization tends to stay with its existing culture and behaviors. Figure 2.4 is an illustration of normal decision making when solutions are consistent with the existing culture and vision of the organization. The top row of boxes in the figure shows the organization as a culture with beliefs interacting with vision, goals, and activities. When external events put pressure on the current way of doing things, inconsistencies may arise between existing goals (agenda) and forecasts of future plans and actions.

In a continuous improvement approach, solutions to the new incompatibilities may resemble existing process flows, such as flows 1 through 3 in Figure 2.3. In this case, compatible changes can be made within the existing parameters of the process with only slight adjustments. Decisions are made with relative consensus.

Innovation in the evolutionary change model occurs within existing process steps. New use of technology and new task steps within the current process may be innovative on a smaller scale than process redesign. Examples of current-state process innovation may be job expansion efforts to use the skills of a different function within the organization, or adjustment of a current step in the process that significantly reduces waste or creatively employs 5S to better design work flows.

The revolutionary change model illustrated in Figure 2.5 is a more complex view of the change and decision model. Although the culture, vision, and activities are represented in the same manner as in the evolutionary model in Figure 2.4, the level of pressure from external events is strong enough to warrant a number of possible response options. When external events change the working environment to a level where the current process is no longer capable of consistently meeting customer requirements, a new process, or portion of the process, must be developed.

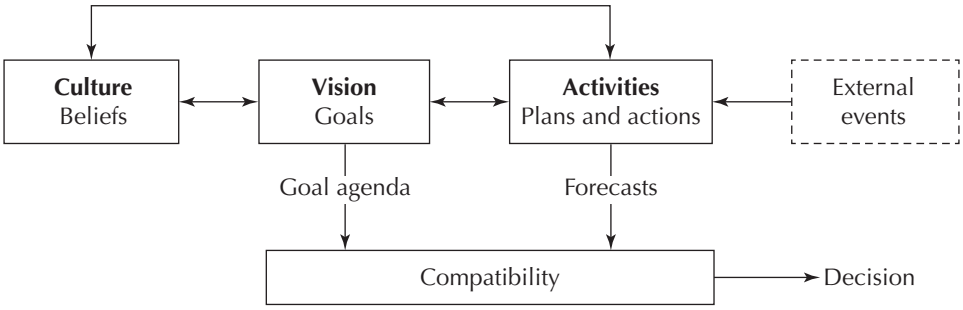

Figure 2.4 The evolutionary change model.

Source: Adapted from L. R. Beach, *Making the Right Decision* (Englewood Cliffs, NJ: Prentice Hall, 1993).

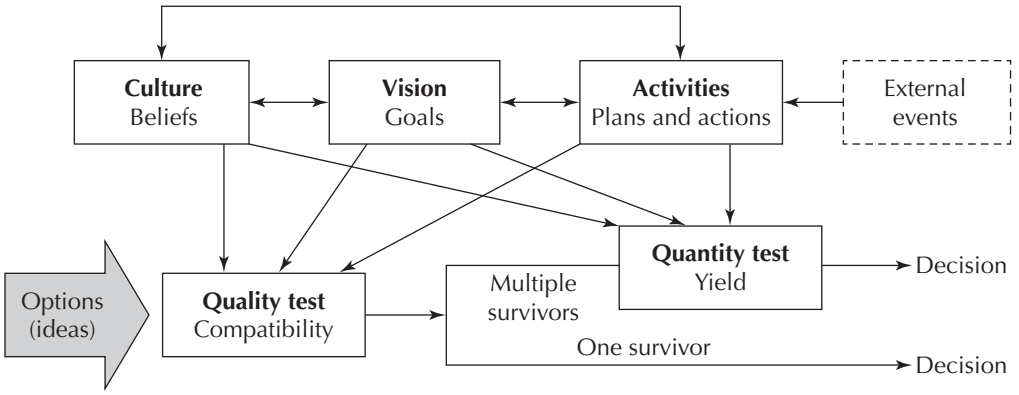

Figure 2.5 The revolutionary change model.

Source: Adapted from L. R. Beach, *Making the Right Decision* (Englewood Cliffs, NJ: Prentice Hall, 1993).

As seen in Figure 2.5, it is still possible that an innovative resolution to the external prompt can be identified that is compatible enough with current behaviors that consensus is easily reached. In this case, the option passes the quality test of compatibility and is scheduled for implementation. Often, however, external pressures create enough of a disruption to current activities that more intense study must be performed to assess a number of possible solutions. Because innovation, by definition, includes implementation of the new approach, there may be disagreement on what journey to take to resolution. Multiple options or survivors may need to be assessed and a decision made to choose the best alternative. In this case, it is usually better to use decision tools such as matrix diagrams, weighted decision making, or other quantitative priority tools to document the change finally decided upon.

Mention the word *process* to the business practitioners in the organization, and people immediately start thinking about the current reporting structure (the organizational chart and functional silos) and the steps and activities that transpire within each department. They then link these activities together, describing the result as a *process*. The point is that these two uses of the term *process* are talking about different things—a problem exists with dialect. In the abstract domain of business processes, deconstructing exactly what people mean can be very difficult.

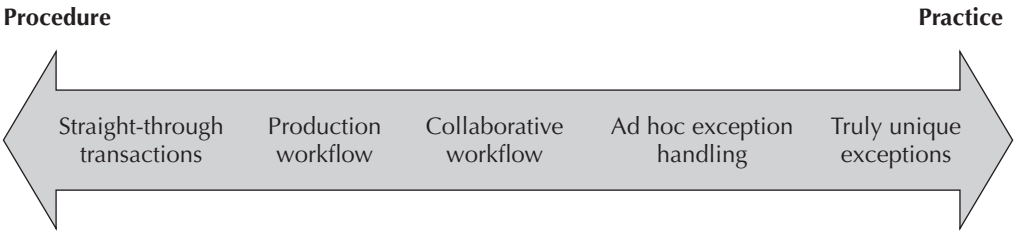

Figure 2.6 Process as a spectrum.

It is best to think about a process as a spectrum—with one end focused on efficiency ("procedures") and the other end focused on value and innovation ("practices"). Figure 2.6 represents this continuum of procedure to practice. Procedures are oriented toward control and are common in back-office operations. All would agree that the teller should not get creative with a bank draft. At the other end of the scale, practices are what knowledge workers do. They are goal-centric and guide work rather than control it. If the case in hand requires something special, a variation from the standard, knowledge workers are empowered to exercise their judgment.[9]

CHANGE MANAGEMENT

Any human process can be improved. Look to the white spaces in the process map. Where are the breaks in the handoffs between process steps? Measure something! Find out which processes are capable of meeting customer requirements and which are not. Measurement considerations are covered in detail in Chapter 8, "Process and Outcome Measures in Modular Kaizen."

Use measurement to determine whether the process is meeting requirements. If it is not, study the data to decide whether the current process can be adjusted to become capable, or whether it needs to be redesigned partially or completely to meet changing needs.

Improvement, whether incremental or breakthrough, is successful when the organization engages in continual alignment. Improvement is an iterative process of coordinating considerations of:

- Customer
- Goals
- Processes
- People

Although leaders can't always make people feel comfortable with change, they can minimize discomfort. Diagnosing the sources of resistance is the first step toward good solutions. Feedback from resisters can be helpful in improving the process of gaining acceptance for change.[10]

Rosabeth Moss Kanter, professor at the Harvard School of Business, writes a frequent blog on the subject of change and organizational performance. She recently listed 10 reasons people resist change, shown in Figure 2.7.

1. Loss of control
2. Excess uncertainty
3. Lack of timely notification
4. Everything seems different
5. Loss of face
6. Concerns about competence
7. More work
8. Ripple effects
9. Past resentments
10. Sometimes the threat is real

Figure 2.7 Ten reasons people resist change.

Source: R. M. Kanter, "Ten Reasons People Resist Change," *HBR Blog Network*, September 25, 2012, http://blogs.hbr.org/2012/09/ten-reasons-people-resist-chang.

A major theme flowing through Kanter's 10 reasons is that of loss—of control, of face, of our comfort zone. Preplanning for involving individuals in the anticipation and design of change is critical for reducing the sense of loss that comes with change. Modular Kaizen depends on the early assessment of affected processes and seeks to break down the steps of change into smaller steps that allow more comfortable movement from the current state to a future state.

Think of continuous versus breakthrough improvement as going up a hill as a student driver. When we first learn to drive, we think about the sequence of everything we do. It is as if we are working through the gears of the car in standard, rather than automatic, simply to allow ourselves to completely envision the process. As we get more comfortable with the sequence of the process, it becomes second nature. Then our minds and awareness go to automatic. Some may wish to remain at standard/manual rather than go all the way to automatic because they are more comfortable with that level of control. It is a cultural or individual style issue.

The responsibility of the project facilitator and the team leader is to assess the level of control each team member prefers and adjust the pace of change to the style of the individual. Modular Kaizen recognizes the need to map individual team member needs to schedules and assignments during the first steps of project management.

Whether the improvement project requires breakthrough improvement or is a candidate for continuous improvement, proper planning and change management are critical to early success.

NOTES

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Chapter 3
Alignment Using Top-Down and Bottom-Up Measures

INTRODUCTION

Quality improves when employees and partners are fully invested in the outcomes of the company. We are better than computers at identifying patterns. We are better decision makers in times of complex crisis. We work better when we have a desired goal in sight. Activities at the individual level of the organization eventually become the core values of the company. The critical focus of Modular Kaizen on integrating improvement activities into the normal daily tasks of the organization is all about keeping our eye on essential company goals. Modular Kaizen supports a lean system concept. That system is a tightly wrapped alignment of vision, mission, values, and goals directly focused on external customer requirements and internal process effectiveness and efficiency.

We can discover a company's overarching corporate values indirectly, much the same way that astronomers, witnessing an intense gravitational pull on particular celestial bodies, deduced the existence of black holes. Bedrock corporate values reverberate throughout an organization, shaping behaviors and driving companies to exhibit, collectively, many of the same characteristics as people.

There are a number of clichés that address this phenomenon of goal-driven human behavior: "What gets measured gets managed," "Paint a target on it and get out of the way," and "Run it up the flag pole and see who salutes" are a few that immediately come to mind. The idea is that we work better when we focus on a goal that matters to us. When we are truly invested in the goal, we modify our behavior and corporate culture to more effectively achieve the goal. The case study in Chapter 11, "A NASA Space Coast Kaizen Model," strongly supports the early recognition of aligning planning, team member selection, project management, and leadership involvement toward specific goals that are directly tied to the external deliverables required of the organization. This direct line of sight is a basic principle of Modular Kaizen.

Many companies have begun to implement performance measurement tools to more effectively manage the complex business environment that we operate in today. A common term coined to define such a measurement tool is the "balanced scorecard." More recently, the concept of alignment has overtaken the quantitatively oriented scorecard approach. Not only is it important to have a summary view of measures available to executive management, it is imperative that all members of the organization understand how these measures are created and how they influence decision making.

Quantitative measures are numbers reflecting outcomes. Outcomes are the product of action on the part of employees, customers, suppliers, and other stakeholders. The daily activity side of measurement requires an intimate knowledge of what is measured, how the measurements are obtained, what the measures mean, and what action must be taken as a result of the measure. Numbers and measures are valuable when they are connected to the goals of the organization. This connection is called "alignment." Every action within the organization should be aligned with some activity that eventually meets a customer need.

Strategic alignment refers to how business structure fits in relation to business strategy and the external environment. When alignment is attained, the firm gains competitive advantage and increased performance. Alignment is not just for executive levels of the company. To be truly effective, all levels of the organization must be able to tie their activities to the key drivers of the company. The direct line of sight from the front line to the board of directors is a significant motivational tool for employee ownership in business outcomes. One valuable contribution of the project driver in Modular Kaizen is to keep that direct line of sight from the front line to the board of directors. Often this project driver has a job title such as Master Black Belt, strategic planning manager, chief operating officer, quality manager, or senior engineer.

Alignment helps groups of people focus on what is important. This saves time and money. There is a strong tendency within every organization for functions and departments to take on lives of their own, including their own objectives, values, and activities. This tendency creates functional silos and gets in the way of effective communication of the employees who perform the processes. Alignment means that each part of the organization has priorities and activities that integrate with the whole and optimally serve the enterprise. Actions not pointed in the right direction generate waste, can promote duplication of effort, and can even work against the overall direction of the organization.

Measures are the most specific, objective way for people to understand exactly what is expected on the job. At every level in the enterprise, they help you know who has achieved and who has merely tried. Certainly, performance is not as simple as checking a few performance indicators. You have to communicate expectations, choose the right indicators, provide rewards, and build a culture of continuous improvement. Achieving alignment is largely about communicating direction without micromanaging. Well-developed performance measures, cascaded from enterprise to function and department levels, are one of the most effective tools to achieve this special kind of communication. The top-level enterprise measures become a guide for the level below in setting its measures.

HOW TO ALIGN

Figure 3.1 gives a visual concept of alignment of the corporate vision and goals from executives, management, and team leaders to the workforce. The workforce assesses overall goals; establishes tasks, actions, and dates for achievement; and provides feedback up through management to validate the ability of the organization to achieve the desired results.

It is true that corporate strategy comes from top management. That direction will not succeed without full involvement of the rest of the organization, including

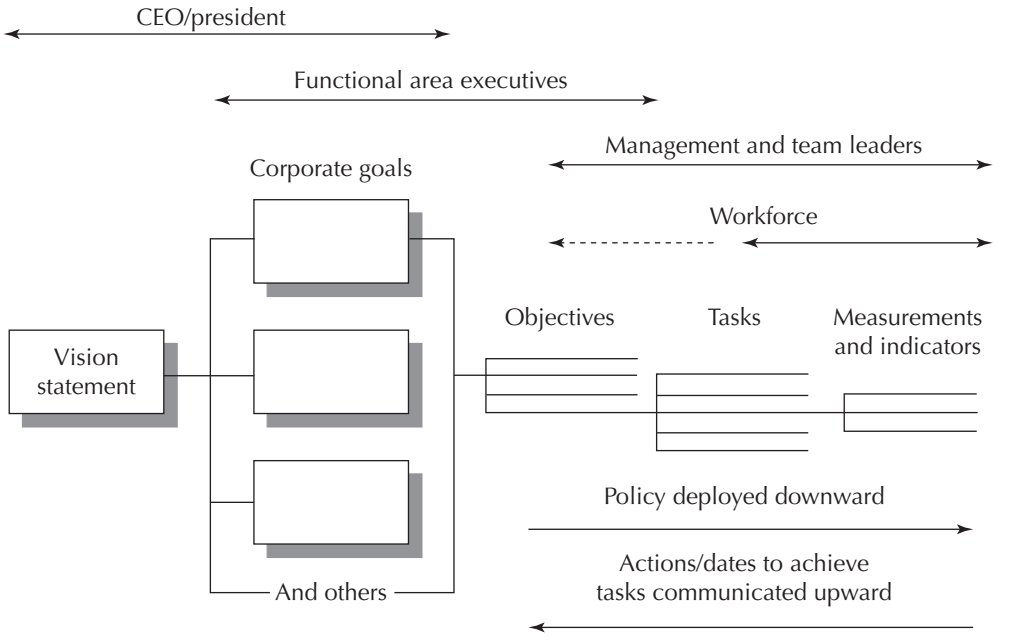


Figure 3.1 Alignment vertically within the organization.

Source: R. Bialek, G. Duffy, and J. Moran, *Modular Kaizen: Dealing with Disruptions* (Washington, DC: Public Health Foundation, 2011), 47.

partners, suppliers, and customers. There is a community of action that surrounds a successful company.

Figure 3.1 illustrates the top-down flow of policy deployed from the executive offices through the organization for translation into operational results. As the vision and goals move further into the functional levels of the company, they are translated into measurable objectives and finally into tasks with assigned accountability and verifiable measures. This translation is best done at the level where the action is performed. That is where the intimate knowledge of what it takes to get the job done resides.

Project plans are created at the operational team level and presented to higher levels of management, as reflected in Figure 3.1 by the arrow labeled "Actions/dates to achieve tasks communicated upward." Effective strategic and tactical planning is rarely a single-cycle process. Usually it is an iterative series of communication from the top down for review, verification, and suggested modifications at the operational level. Once operations is clear on its ability to perform effectively against the goals from top management, the project plans are rolled back up to top management for finalization, reporting, and tracking.

THE BALANCED SCORECARD

One of the major techniques for reporting and tracking these rolled-up performance measures is the balanced scorecard (BSC). Kaplan and Norton wrote their first Harvard Business School Press book on the BSC in 1996.[1] So what is a BSC?

Whatever the format or name you use, it is basically a report card on the core business processes and functions that includes three key components, or perspectives, on performance:

- Historical-state performance information (baseline/trends)
- Current-state performance level
- Future-state performance goals/targets

All companies are familiar with the most common form of performance reporting through the creation of annual budgets and the production and review of periodic income statements and balance sheets, or financial statements. However, these traditional tools are not sufficient to monitor progress, identify issues, and drive behavioral change in a timely and effective manner. They are produced at a very high level and are not operationally relevant to middle management or departmental staff requirements. As a result, organizations require a second-level information source that synthesizes and summarizes the myriad of information available in today's business environment. This second-level information provides a snapshot view of the key department and functional trends and results that can be used to address deficiencies and develop action plans to reduce adverse operational impacts. More information on process and outcome levels of measures is provided in Chapter 8, "Process and Outcome Measures in Modular Kaizen."

This second-level source has many names and formats, such as the BSC, key performance indicators, and dashboard report card. Regardless of the name, this second-level source serves to satisfy an organization's need and desire for enhanced reporting, increased control and accountability, and improved financial results.

The concept of the BSC is as follows:

- "Supports the organization's strategic plan by providing management with tangible indicators and goals relevant to daily activities
- Provides executive management with sufficient and timely information regarding the effectiveness and efficiency of operations before significant financial impacts are experienced
- Creates a work environment that supports and rewards coordination and cooperation among and between departments and key functional areas to attain desired results
- Clarifies management and staff roles and responsibilities as they relate to driving expected performance and outcomes
- Drives change by focusing resources and shaping behaviors towards specific and tangible expectations and results
- Establishes a mechanism for assigning and enforcing accountability, as well as for recognizing and rewarding outstanding performance"[2]

The historical, or baseline, information is important because it provides a sense of "beginning" from which future progress and results will be evaluated. The current-state performance level information is critical in that it tells people where the organization is in the "journey," how far it has come from its starting point

(or historical level), and provides an assessment of how far it has to go to meet its future-state goals. The future-state goals and targets are the most critical piece of information included in any report card. They provide incentive and drive actions and behaviors that support the organization's strategic plan and fiscal performance goals.

Figure 3.2 is a sample report card that was designed for and implemented in a healthcare setting. This is not an organization-wide BSC. Rather, it is a report card for a single, albeit extremely important, department—patient accounting. By combining summary financial information with key indicator benchmarking, this report card provides sufficient information to allow the organization to maintain a timely and accurate pulse on the performance of the patient accounting department. It also facilitates the identification of negative trends and performance disruption, which, in turn, allows for timely corrective action planning and implementation. This report was designed to be used at all levels of the organization, from the board of directors to management and staff.

Using a BSC to Align Performance

The key first step in designing any report card is to raise your sights above the income-statement bottom line and look at the business as a whole. The core business functions, units, or processes that make a critical impact on the organization's overall operations and fiscal performance need to be identified and defined. Most organizations have a number of departments and functions that play a prominent role in overall fiscal performance. It is important to note that we are not talking merely about issues like cost controls or staffing levels. Rather, we are concerned here with processes and functions that, when performed and managed effectively, play a critical role in driving positive financial results (and vice versa). Modular Kaizen focuses on removing any disruptions to the smooth and effective flow of process activities integrated into the daily workplace. Using financial results ties daily activities to the language of executive management, another key alignment strategy.

Establishing the future state, measuring the current state, and setting measures that drive performance are intense communication activities. The process of communication around this top-down and bottom-up iterative cycle is a significant part of the glue that binds an organization together. The conversation is about more than numbers, more than just the bottom line. It is about what we do, why we do it, and how it gets done. The strategic planning process is one of the most critical parts of the business. It is the process by which the vision and dream of the organization is translated into reality. Every employee in the company should be part of this process. In the current global business environment, it is even better to involve suppliers, major customers, and other stakeholders in this intense loyalty-building exercise. No one is more protective of a process than those who created it.

The key aspects of this step are:

1. The identification of those areas of your business that play a critical role in your success (be it financial, operational, satisfaction, or whatever you are focusing on)
2. The inclusion and participation of the departmental and functional managers who control these key areas in the overall BSC design and implementation efforts

XYZ Hospital Patient Accounting Report Card: Key Indicator Report Card

A: Accounts receivable (A/R) activity		
	Current month	**Year-to-date**
Starting A/R	$36,710,666	$34,111,964
Charges	$15,828,394	$90,558,000
Payments	($6,899,267)	($40,639,115)
Adjustments	($8,606,825)	($43,533,315)
Denial write-offs	($193,130)	($1,342,714)
Bad debt write-offs	($466,293)	($2,781,275)
Ending A/R	$36,373,545	$36,373,545
Dollar change	($337,121)	$2,261,581
Percent change	–0.92%	6.63%

B: Key indicators analysis					
Key indicator	**Current month**	**Prior month**	**Prior F/Y-end**	**Goal**	**Benchmark**
Gross days revenue – billed A/R	59.8	61.6	68.4	57.5	58.2
Net days revenue – net A/R	78.7	82.5	88.9	75.0	79.5
% billed A/R >90 days	34.1%	36.7%	39.6%	30.0%	27.5%
Gross days in credit balances	0.9	1.1	1.3	1.0	1.2
Gross days in medical records	6.8	6.9	7.9	7.0	7.1
Key indicator	**Current month**	**Year-to-date**	**Prior F/Y-end**	**Goal**	**Benchmark**
Gross collection percent	43.6%	44.9%	45.5%	46.0%	N/A
Denials and bad debt % of revenue	4.2%	4.6%	4.3%	4.0%	3.5%

C: Aging of accounts receivable by dollar amount										
	Unbilled	**0–30**	**31–60**	**61–90**	**91–120**	**121–180**	**181–360**	**>360**	**Credit balances**	**Total**
Current month	4,668,016	10,512,199	8,807,626	4,450,749	2,031,278	2,016,690	3,385,447	3,371,386	(2,869,846)	**36,373,545**
Prior month	5,437,963	10,967,660	7,854,939	3,720,133	2,009,780	2,118,474	4,143,898	3,195,549	(2,737,730)	**36,710,666**
Variance	(769,947)	(455,461)	952,687	730,616	21,498	(101,784)	(758,451)	175,837	(132,116)	**(337,121)**
Prior F/Y-end	4,234,423	8,836,959	8,197,536	4,178,681	2,340,199	2,394,089	4,100,414	2,998,410	(3,168,747)	**34,111,964**
Variance	433,593	1,675,240	610,090	272,068	(308,921)	(377,399)	(714,967)	372,976	298,901	**2,261,581**

D: Aging of accounts receivable by percentage										
	Unbilled	**0–30**	**31–60**	**61–90**	**91–120**	**121–180**	**181–360**	**>360**	**Credit balances**	**Total**
Current month	12.83	28.90	24.21	12.24	5.58	5.54	9.31	9.27	–7.89	100.00
Prior month	14.81	29.88	21.40	10.13	5.47	5.77	11.29	8.70	–7.46	100.00
Variance	–1.98	–0.98	2.82	2.10	0.11	–0.23	–1.98	0.56	–0.43	0.00
Prior F/Y-end	12.41	25.91	24.03	12.25	6.86	7.02	12.02	8.79	–9.29	100.00
Variance	0.42	2.99	0.18	–0.01	–1.28	–1.47	–2.71	0.48	1.40	0.00

Note: Information is for illustrative purposes only and does not reflect the actual performance or results of any specific hospital or healthcare provider.

Figure 3.2 Sample key indicator report card.

Source: G. D. Beecroft, G. L. Duffy, and J. W. Moran, *The Executive Guide to Improvement and Change* (Milwaukee, WI: ASQ Quality Press, 2003), 182.

Once you have identified the key business functions and processes to be included in the BSC, the next step is to define the critical success metrics that will measure and track progress and results associated with each function and process. This can be a difficult task because many of the people involved in the initiative won't be familiar with or used to managing to the specific performance metrics defined as part of the initiative. While most managers have a solid understanding of what their department and staff do and are responsible for on a daily basis, they are so close to the activity that their focus becomes too narrow in scope. Translating their daily activities and efforts into a set of success metrics will most likely be a challenging, if not threatening, task. As a result, it is important to follow a number of tenets when selecting and defining metrics:

1. *Remember that the goal is to create a brief and concise report card of pertinent business performance information.* Thus, it is imperative to keep the number of success metrics at a manageable level, with no more than a few per function or process. Fight the urge to continually drill down to the microlevel of a process or function. Too much information or too many metrics will not produce the desired end results and will become a burden to manage on an ongoing basis.
2. *Metrics need to be pertinent to the overall objective(s) that created the need for the BSC initiative in the first place.* In other words, remember that one of the goals of implementing any report card is behavior modification. When defining success metrics, be sure that in establishing the metric you encourage the actions and behaviors that will achieve the desired end results.
3. *It is easier to edit than to create.* In other words, where possible, select metrics that are already available and commonly used to track performance in your industry. Chances are you will find sufficient benchmarking and key indicator information to support the vast majority of your BSC goals and efforts. Try to minimize the number of metrics that are totally unique to your initiatives. This will make identifying, monitoring, and supporting your success metrics easier and more effective over time.
4. *Success metrics between departments and functions need to be supplementary and complementary.* You will find that the departments and functions included in your BSC initiative do not operate in a vacuum. They are most likely interconnected and interdependent at some level. As a result, it is important that the established success metrics all support the overall objective(s) and do not contradict one another.
5. *Success metrics need to be relevant to the particular department or function to which they are applied.* The management and staff within a department or function must be able to relate to and understand a performance measure in order to manage and work toward it. Many financial BSC initiatives are spearheaded by the finance department or by the CFO. It is very easy for metrics to start to be defined in terms that the CFO and other finance department staff relate to on a daily basis. However, these may or may not be relevant or pertinent to the department or functional staff. If they don't understand the metric, they most likely will not understand how, or even if, they impact it.

6. *Success metrics should be defined in terms that continue to be relevant as the business evolves and grows over time.* A metric defined today should be relevant a year from now, even five years from now. Mistakes are made in this area when metrics are defined in terms of today's business environment. As an example, defining a metric in terms of dollars of sales, as opposed to a percentage of sales or days of sales outstanding, will result in an obsolete measurement if the business either grows or contracts to any significant degree. As a result, the metrics will need to be continually reviewed and revised, creating too much effort to maintain a valid and reliable report card.
7. *Success metrics should be relatively easy to calculate and understand.* And, everyone involved should understand the calculation and rationale behind each metric. Remember, you do not want the outcome of your BSC initiative to include excessive time and effort required to calculate, validate, and produce the report card. In order to be effective, to promote desired actions, and to attain desired results, this information needs to be created consistently and in a timely manner. Whatever is measured needs to be understood from the boardroom to the break room.
8. *Not all success metrics lend themselves to a numeric or statistical quantification.* In those cases, some sort of metric still needs to be created to establish expectations and effectively manage the process or function. These areas tend to be those related to time frames, frequency of occurrence, or other more qualitative parameters.

Once you have defined your success metrics, you may begin creating the "anchor" for your report card by establishing historical and current-state/baseline performance measurements for each metric defined. Depending on the availability of information sources, this can prove to be a frustrating exercise. View the BSC effort as a go-forward initiative more focused on driving future results than on worrying over past failures. With respect to historical trends, if you can go back to the prior fiscal year-end and trend forward on a monthly basis up to the current month-end, that should be sufficient. Don't waste time and effort creating custom reports through the information systems department. If you have severe limitations on historical data, concentrate on establishing your current-state baseline performance and developing your reporting needs going forward, as this will be much more productive.

Accurate and credible information is particularly important at this stage of the development process since this is the first time actual performance measures will be calculated and shared. As a result, you should expect a certain level of challenge and push-back with respect to the accuracy of the information, particularly from those areas that are not performing well according to the metrics. Again, this is to be expected and is most easily deflected by ensuring that the information sources are accurate. This is also a good opportunity to reinforce that the focus of the initiative is to improve system performance and not to finger-point and assign blame for past deficiencies. The alignment model in Figure 3.1 is useful in maintaining the involvement of all levels of the organization. The goals are clearly communicated in the organization, while suggestions, concerns, and observations are heard, recorded, and acted on as they surface.

On a final note, you may find it necessary to modify some of your metrics or the related calculations on the basis of either limitations of the information sources or some unique aspect of your particular operating environment that was identified while establishing your current-state performance measurements. This is fine. As scientific as we'd like them to be, BSC initiatives are still part art form. The BSC does not need to be exact, but it does need to be relevant and, more importantly, drive actions and behavior toward desired results.

Once you have defined success metrics, established current-state performance, and obtained comparative industry performance information, it is time to develop your own internal goals and targets for each metric. This can be another challenging and frustrating stage for department and functional managers, especially if their current performance measures are significantly below the comparative or benchmark indicators.

This is also a critical part of the process since the goals you establish now, although not set in stone, will be the initial catalyst for modifying behavior and activities directed at operational changes to reduce and eliminate disruptions to the overall flow of meeting customer requirements. Even if all of the work and actions taken to this point in the process have been carefully and appropriately completed, setting inappropriate or conflicting goals and targets can result in a loss of momentum and buy-in. With this in mind, when establishing your goals and targets you should consider and incorporate the following factors and caveats:

- Goals and targets should be reasonable and achievable in order to elicit actions necessary to attain the desired results. If goals and targets are perceived as unreasonable and without any consideration for the current environment and industry experience, the department and functional management and staff will not be motivated to reach those goals.
- Goals and targets need to have input and acceptance from the people who will be held accountable for their ultimate achievement. While the department and functional managers should be challenged to accept higher standards of performance, the ultimate approval of goals and targets rests with senior management. Goals and targets cannot be dictated in a unilateral top-down manner.
- It is easy to fall into the trap of establishing the top percentile "best practice" performance measurements as your targets across all metrics, the argument being "if they can do it, so can we." This is dangerous. The reality is that within most organizations there are certain limitations that are part of the current state and won't allow for best-practice-level performance across all core business processes. While these limitations can be addressed over time, they affect an organization's ability to drive results in the near-term. Further, you don't have to be "best practice" in order to produce good performance results. Again, goals and targets need to consider all factors, internal and external, and need to be based on sound business rationale.
- Depending on how your current-state performance indicators measure up against the comparative industry statistics, you may want to consider establishing different goals to achieve varying levels of performance improvement.

- Although nothing about the report card is intended to be static, goals and targets, once set and made public, are very difficult to modify. Therefore, it is important that you take the time and effort necessary to evaluate all of the information available and establish realistic and attainable targets and goals that the entire management team can support and live by. With that said, don't be afraid to modify an established goal if there is a sound and logical business case to do so. It is better to take on the battle with senior management in order to have realistic goals than to try to live with a goal that is not achievable.

Implementing a BSC/Report Card

Once you have developed a report card, the next stage of the process is implementation. What we are talking about here is not the mere production and distribution of the report card. In order to attain the desired results and maximize the benefits, the report card needs to become an integral part of the organization's operating culture. It needs to be recognized as *the* center of senior management's attention and evaluation of the performance and level of success attained by the core departments and functions in driving toward the overall corporate financial and operational goals.

If you've reached this point in the process, you have already accomplished a couple of key tasks needed for successful implementation. Specifically, in the development of the report card you have:

1. Identified the results you want to achieve through the use of a report card
2. Identified the core business functions and processes that have a critical impact on your ultimate financial and/or operational success
3. Engaged management and staff from multidisciplinary departments as the key participants in the process
4. Defined success metrics, obtained comparative performance measures, and established goals and targets

However, in order to implement the report card such that it has the desired impact, a few more key steps need to be considered:

1. Assign the ownership of, and accountability for, the routine production of the report card to a key member of the management team, usually the manager from the department or functional area that is most vested in the overall project and ultimate results. For example, within the healthcare revenue cycle example, this would be the manager of patient accounting or the director of patient financial services. This does not mean that this person is tasked with creating the entire document. Other staff should be responsible for calculating and providing their metrics information on a routine basis. However, somebody has to "own" the production process—it cannot be fragmented. It is recommended that the owner of the process being reported upon be the accountable manager. The Modular Kaizen project driver should be involved in the validation of the report card as another system-level view for overall organizational synergy.
2. Utilize the management team you assembled for creating the report card to establish a standing committee or forum charged with routinely monitoring

and addressing performance and progress issues related to the areas covered by the report card. In this way, the report card becomes "operationalized," or utilized and accepted by the team as a key management tool that helps them focus their department's daily work efforts toward established goals and results.

3. Use the report card as intended—as a management tool. However, the focus of discussions and actions needs to be centered on the processes, systems, and controls that ultimately drive the metrics. In other words, the report card will help identify the organization's symptoms (as a thermometer allows a physician to ascertain that you have a fever), but you need to delve into the actual daily operations in order to successfully diagnose and address the root causes of the deficiencies. This is where the focus needs to be in order to modify behaviors and achieve results.
4. Ensure that the report card is shared both upward and downward in the organization. Once you are comfortable with the information contained in the report card, it should be presented to the board of directors and should be able to become a standard component of the monthly reporting package provided to the board. In addition, the report card should also be explained to and shared with the rank-and-file staff in order to establish their buy-in and help focus their efforts toward common goals.

It has been my experience that the acceptance and adoption of a BSC is a process that happens much more quickly than one would expect. Members of the board see it as a positive, proactive measure that enhances senior management's (let alone their own) ability to monitor performance and progress, and it is aimed at improving the organization's overall performance and bottom line. In addition, the mere focus and attention created during the development process almost invariably has the effect of producing immediate, albeit not necessarily significant, improvements in a majority of the success metrics. As a result, the report card is quickly deemed a successful project. Further, the middle management team sees value in that it ("finally") clarifies senior management's expectations, it connects their individual department or function to the overall operations and strategic direction of the company, and it provides a mechanism for focusing their work effort and priorities based on the established goals and targets.

AN ALIGNMENT TOOL: CREATING TOP-DOWN LINE OF SIGHT

Tables 3.1 through 3.3 tie working-level activities to the corporate vision and goals. Table 3.1 addresses the key drivers of the organization, Table 3.2 ties the operational unit goals and objectives to the key drivers, and Table 3.3 establishes accountability and responsibility at the task and individual assignment levels.

The flow of the worksheets is based on the concept of alignment as discussed in the BSC model.[3] Organizational measurements must be guided by the voice of the customer. The external customer and other key stakeholders provide strong input to the major goals of the organization. These goals then cascade down through senior leadership to middle management, where they are translated into

operational objectives, tasks, and measures of performance and results. First-line management, teams, and individuals establish performance plans based on the cascaded measurements. These performance plans are tracked on a daily, weekly, monthly, and quarterly basis, with reports provided upward to management, which ties the reported results to the respective key drivers at the corporate level.

Use Tables 3.1 through 3.3 to organize metrics around the contributions of an operating unit, team, or individual to the core mission and requirements of the company. As the measures are identified, use the last two columns on the right in each table to describe how the measures are to be collected and what the expected level is for that measure. The intent is to show how activities at each level of the organization are linked directly to the core requirements of the company and department. The major message from this tool is that all levels of the organization are intimately involved in analyzing and establishing measurable indicators of reaching the goals of the organization. All members of the organization are cogs in the same set of gears.

USING THE ALIGNMENT TABLES

Table 3.1 asks for the mission, vision, goals, and objectives of the overall organization. These are the strategic goals that provide competitive advantage for the company. This table is divided into categories recognizable from the concept of the BSC: customer, operations, financial, and learning/innovation. Additional space is provided for including goals beyond the four basic BSC key driver categories. The table prompts research and identification of measurements the CEO and senior leadership use to ensure that customer and other stakeholder requirements are met.

Table 3.2 asks how the key drivers are translated into the tactical and operational objectives of the individual operating unit or department. It may be necessary to perform the functions within Table 3.2 a number of times to reflect levels of

Table 3.1 Mission and key drivers of the overall organization.

Mission/ vision (M/V) of company	Category of organizational goals or objectives	Measurement: What measurements do the CEO and senior leadership use to ensure customer and other stakeholder requirements are met?	Collection method	Expectation
Key drivers	Customer			
	Operations			
	Financial			
	Learning/ innovation			
	Other			

Table 3.2 Operating unit goals aligned to company goals.

Your operating unit's contribution to company M/V	Organization goals	Measurement: What indicators does your unit use to show the function meets its company responsibilities?	Collection method	Expectation
Key driver	Customer: External	What is your unit customer satisfaction rating? How does the company value the outcomes of your unit? What do stakeholder feedback, e-mails, and comment cards say about the performance of your unit?		
	Customer: Internal	How is your unit viewed by the other entities with which you interface inside the company? If you work with outside suppliers, what is their opinion of your unit?		
	Operations	What are the tangible outputs of your unit? How well are you meeting the demands the company puts on your unit? What is the general opinion of your unit within the company?		
	Financial	Does your unit stay within your budget allocations? What does your unit do to reduce waste and conserve resources?		
	Learning/ innovation	What knowledge, skills, or abilities does your unit contribute to the company? Does your unit offer additional skills that enhance your customer or other stakeholder relationships?		
	Other			

Table 3.3 Task contribution to operating unit goals.

Task contribution to operating unit goals	Operating unit goals	Measurement: What indicators does your unit use to track individual task contribution to the goals of the unit?	Collection method	Expectation
	Customer: External	What customer satisfaction results (survey comments, e-mails, etc.) provide feedback of individual task performance? Can the task group provide activity logs showing direct involvement with external customers?		
	Customer: Internal	Are there internal letters complimenting your team or individuals on tasks well done? Is specific involvement from your unit requested by others in the organization? What documentation is there of successful task and individual involvement?		
	Operations	What documentation provides tangible evidence of task, team, or individual contribution to unit outcomes? Can activities be tied directly to specific task, team, or individual performance measures?		
	Financial	What direct involvement do members of your team or individuals have with meeting or exceeding team financial goals? What documentation shows unit actions to reduce waste and maximize use of task, team, or individual resources?		
	Learning/ innovation	What scheduled or required training is completed in a timely manner? What additional training is completed on personal time to meet task, team, or individual skill needs?		
	Other	What additional activities are performed that may not directly tie back to key drivers for the company, but meet specific task, team, or individual requirements?		

management function within the company. Each of the major measurable outcomes of the operating unit should support one or more of the key drivers of the organization directly above it. Many department objectives will be operational in nature, whether providing products or services to external or internal customer segments. Others may be more innovative in the form of new market research, design, and test. Like Table 3.1, this table is broken into the four BSC categories. The customer segment is divided into external and internal customer subsets, to differentiate between end-user and organizational upstream or downstream interactions.

Questions are included within the center column of the table as prompts to the individual for researching measures that directly relate to the key drivers of the department. Other measures may be critical to the department. Discussion with senior members of the department or the supervisor is encouraged for accurate understanding of key department indicators. An additional row ("other") is included within Table 3.2 for department goals beyond those described by the basic BSC model. Most organizations have more indicators as required by customer, regulatory, or company stakeholder interest.

Table 3.3 focuses on the activities of the individual within the department. What does the employee do that directly contributes to the department's ability to meet the key drivers of the organization? It is entirely possible that many employee performance activities are not identified as directly relating to organizational key drivers. The most effective working environment is one in which the employee can tie each activity to one of the company priorities. This alignment creates energy and pride in the employee as a "player" in the performance of the organization. When it is not clear which goal an individual activity supports, it is easier to become diverted by lower-priority tasks.

The individual may need to think closely about how a particular project or task supports the overall goals of the organization. Direct product or service delivery is usually easy to relate back to customer requirements. Other activities, such as training, quality assurance, benchmarking, or other indirect activities, may be harder to align to specific strategic outcomes of the organization. If the purpose of an activity is not clear to the individual, it is a good idea to ask the team leader, supervisor, or other subject matter expert how it relates to the key goals of the company.

Individual value comes from meeting the needs of the customer, whether that customer is the end user, an organizational stakeholder, a company partner, or another internal customer.

Any activity with which the individual is involved that cannot be shown to contribute to overall corporate outcomes should be studied further. Most companies have some activities that are tied to corporate culture and thus are difficult to relate directly to any particular customer requirement. The Macy's Thanksgiving Day Parade in New York City each year is a major marketing event for Macy's employees. In itself, it does not provide immediate support to selling clothing or other Macy's merchandise. It does, however, provide significant visibility of the company and enhance its reputation within the community.

ALIGNMENT IS A CORE CONCEPT WITHIN MODULAR KAIZEN

Current performance research suggests that people cannot be fulfilled at work if they are not known, understood, and appreciated for their unique qualities,

abilities, and contributions. We need to know that our job matters to someone, and see a connection between our work and the satisfaction of other people. Modular Kaizen, as a lean approach, provides channels for us to gauge our progress and level of contribution for ourselves. We can't be fulfilled if our success depends on the subjective views, opinions, or whims of others. The organization as a system depends on the energy and motivation of workers at all levels to continually monitor performance to process and outcome expectations.

The worksheets offered in Tables 3.1 through 3.3 involve the individuals who make up the organization across three levels of goals that connect them directly to the ultimate outcomes of the organization. Using a BSC approach to alignment provides the relevance and measurability conditions that are necessary to maintain continuous attention to minimizing disruption yet are attuned to potential improvements. Chapter 8 expands on the concept of measurements and alignment at the process level rather than the organizational level.

NOTES

1. R. S. Kaplan and D. Norton, *The Balanced Scorecard* (Boston: Harvard Business School Press, 1996).
2. Kevin Sharlow, "Measurement, The Balanced Scorecard," chap. 14 in *The Executive Guide to Improvement and Change*, ed. G. D. Beecroft, G. Duffy, and J. Moran (Milwaukee, WI: ASQ Quality Press, 2003).
3. Kaplan and Norton, *Balanced Scorecard*.

Chapter 4
The Organization as a System

INTRODUCTION

A system is an integrated collection of parts, functions, and subsystems to accomplish an overall goal. It has various inputs that are acted on by certain processes to produce outputs, which together accomplish the overall desired goal for the system. A system is usually made up of smaller systems, or subsystems. For example, an organization is made up of many administrative and management functions, products, services, groups, and individuals. If one part of the system is changed, the nature of the overall system is often changed.[1]

The goal of any organization is to build a high-functioning system that continually exchanges operational feedback among its various parts. This constant exchange of information ensures that activities remain closely aligned and focused on achieving the goals of the organization. If any of the parts or activities in the system is identified as misaligned through its performance monitoring program, the system must make necessary adjustments to achieve its goals more efficiently.

Modular Kaizen recognizes the interconnectedness of processes into a whole system and respects the impact that improvement and change will have not only on an individual process but on the fabric of the complete system. The heavy focus on planning that is built into Modular Kaizen stresses the critical nature of a broad view of the organization and how its individual parts work together to meet the eventual outcomes the customer experiences.

A VIEW OF THE SYSTEM AS A WHOLE

The process improvement discipline has been aware of the importance of a systems approach for a long time. At the turn of the twentieth century, Frederick Taylor stressed the scientific view of managing the organization by breaking the production process down into individual tasks and standardizing as much as possible to increase productivity. His approach was to keep the worker focused solely at the task level, while management had the responsibility to see that individual tasks wove together in an efficient flow to meet market needs.

Later, during and immediately after World War II, Joseph Juran described process improvement as a top-down approach, starting with the overall system to meet the declared need of the user. Juran recognized that processes were composed of many subprocesses and all the individual components were managed through

planning, control, and improvement. Each improvement project was managed as one segment of the aggregate of all organizational processes.

Beginning in the 1980s, Geary Rummler insisted that the place to begin work in an organization was with an organization model and high-level process architecture. The basic Rummler model was introduced in Chapter 1, "Introduction to Modular Kaizen." Paul Harmon produced a generic organization model (Figure 4.1) to provide a visual picture of the issues Rummler focused on.

The organization model in Figure 4.1 provides a graphic representation through which a process improvement or redesign team could not only identify the high-level processes in an organization but connect them with flow arrows to various external stakeholders. This transparency of process involvement from top management to frontline worker maximizes engagement and clear alignment of daily work to overall organizational performance. Modular Kaizen uses this visibility of the total organizational system to orient improvement activities to the highest-priority processes.

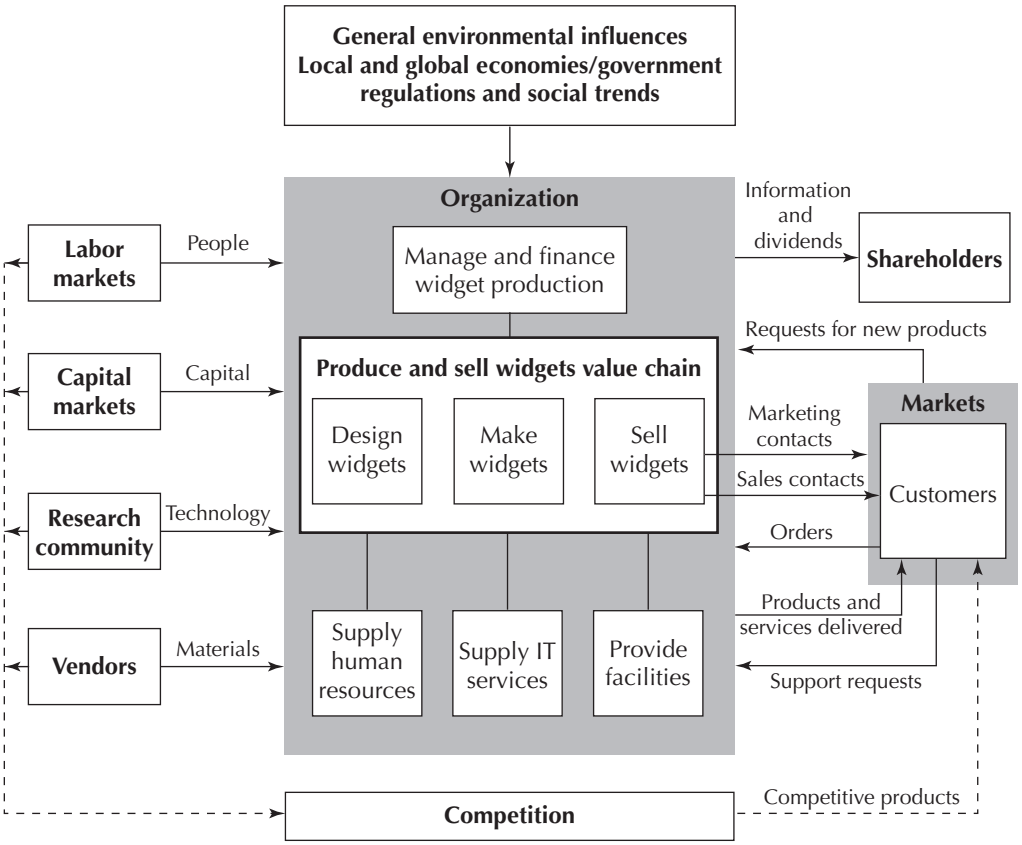


Figure 4.1 A Rummler organization model.

Sources: P. Harmon, "Architecture and Process Management," *Business Process Trends* 10, no. 7 (2012), accessed March 28, 2013, http://www.bptrends.com/publicationfiles/advisor201204102.pdf; G. A. Rummler, A. J. Ramias, and R. A. Rummler, "Potential Pitfalls on the Road to a Process-Managed Organization (PMO), Part 1: The Organization as System Lens," *Performance Improvement* 48, no. 4 (2009): 8.

At a minimum, this ensures that everyone in the organization knows exactly what is being discussed when the team decides to focus on a process, such as "Sell widgets" in Figure 4.1. The representation in Figure 4.1 uses a generic labeling convention for identifying inputs to the organization:

- People
- Capital
- Technology
- Materials

The organization is represented as a general picture of operations for making widgets, although most organizations are now in the service sector. For example, the value chain for a health department might be:

1. Assess population needs
2. Plan services to meet identified needs
3. Provide services
4. Validate effectiveness through feedback

The organization model was very important to Rummler because he worked primarily with business executives and this was a perfect way to get businesspeople talking about how their organizations worked.[2]

Modular Kaizen was developed to support all forms of business: public, private, for-profit, and not-for-profit. Any process has inputs, performs activities (processes), and creates outputs. An organization exists to meet the needs of a consumer, customer, client, or stakeholder. The generic model in Figure 4.1 provides a useful high-level picture of the weaving of process components into an integrated model of the organization. General environmental influences affect operational decisions of the organization. Competition exists with which the organization must vie for market share. Producing a product or service requires inputs and produces outputs that are consumed by a number of markets and shareholders. Feedback comes into the organization from all stakeholders in the form of additional requests for products, services, and information.

SYSTEM VERSUS PROCESS

When applied to a complex organization such as a corporation or multinational company, systems thinking means focusing on the organization as a whole—and transforming it as a whole—rather than merely paying attention to its individual parts or departments. By focusing on the entire system, you can identify solutions that address as many problems as possible. The positive effect of those solutions leverages improvements throughout the system. Systems thinking is not about copying other people's best practices. It requires studying the process, testing the process against customer requirements, reinventing it, and readapting it to meet the particular requirements of each new situation. The foundation of systems thinking is continuous improvement and cooperation, not competition among

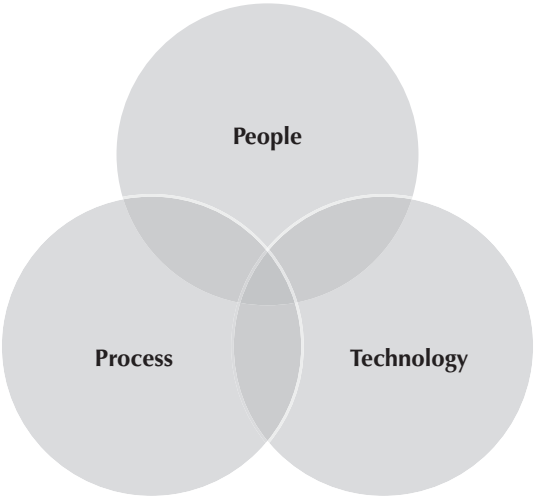


Figure 4.2 The interaction of systems within the organization.
Source: P. J. Sherman, "Get the Whole Picture," *Quality Progress* (February 2010): 35.

different parts of the organization. The systems outlook is long term rather than short term.

Organizations try to look at their businesses from a new perspective—horizontally—and need a common language to define and relate daily functional work to specific processes and individuals. Figure 4.2 illustrates the interaction of people, process, and technology required to effectively create and sustain a business. It is only at the intersection of all three perspectives of the organization that success is gained. Each organization has its own approach to doing so, but ultimately, a few core practices stand out as key to the success of maintaining a competitive advantage in the marketplace:

- Centralize ownership regardless of adoption location within the organization
- Adopt a framework before adapting it
- Use tools after building a solid foundation of process expertise and capability

Chapter 5 looks more closely at these three key success factors at the activity level.

THE SYSTEM VIEW OF PROCESS IMPROVEMENT

Business process management practitioners should have knowledge of and skills in the following seven areas:

- Strategic alignment
- Governance
- Process mode

- Change management
- Performance and maturity
- Process improvement
- Tools and technology

Strategic alignment ensures that the actions taken at the frontline work level of the organization are directly tied to the key outcomes identified by top management. The organization must be structured to allow for effective governance based on industry requirements, leadership style, and stakeholder expectations.

Modular Kaizen uses the organization's chosen strategy and form of governance to assess the best approach for process effectiveness and change management. Executive leadership must decide how they wish to create and lead the organization. The mission, vision, and values of the organization then influence the way processes are designed to meet customer requirements. Change management and performance monitoring are employed to drive the business through levels of maturity as the business grows from its rudimentary beginnings to a full-fledged, complex organization.

The stepping stones for the business's journey to full maturity as a best-practices organization are derived from the tools and techniques of process improvement. Modular Kaizen does not dictate the use of any one set of improvement tools and techniques. Improvement teams are encouraged to use any techniques that fit the situation and leadership style of the process owner and functional unit involved.

The pursuit of operational excellence has been characterized by functional improvements and project-based methodologies such as Six Sigma and lean. Functional excellence and pockets of improvement do not create the organizational capability required to change operational competence, particularly when applied to complex global companies. There are just too many intricate process interdependencies across the total supply chain. The challenge for organizations is to manage and coordinate a sequenced and prioritized set of interrelated actions across multiple functions, departments, and the global network to execute strategy.

The company therefore must provide an integrated set of work flows that allows each part of the organization to execute the many pieces of work in a coordinated manner that guides the entire organization toward process-based excellence.

To be most effective, improvement must be a never-ending process that pervades the organization through an overall approach to building an improvement culture. The author has developed a model by which senior leaders can address the quality of the system at a macro level. At the middle level of the organization, professional staff attacks problems in program or service areas by improving particular processes. At the individual level, staff seeks ways to improve their own behaviors and environments. Leaders must be deliberate and persistent in their efforts to push improvement throughout the organization until it becomes part of the everyday culture and practice. Figure 4.3 is a representation of the author-developed continuum of quality improvement (QI).[3]

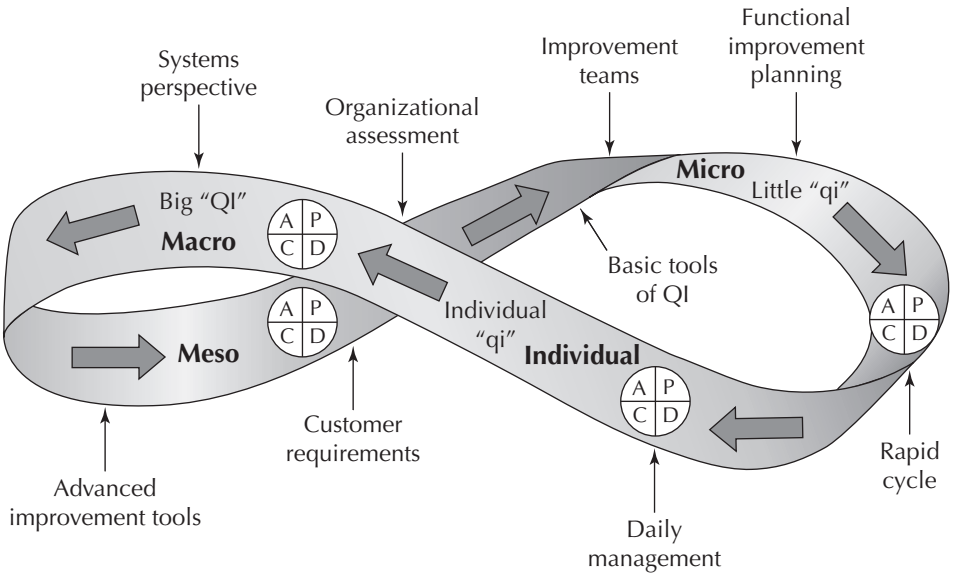


Figure 4.3 The continuum of quality improvement (QI).

Source: G. Duffy, K. McCoy, J. Moran, and W. Riley, *The Continuum of Quality Improvement in Public Health*, IRM UK's Newsletter, December 2009.

LARGE-SCALE SYSTEM QUALITY IMPROVEMENT

Building a QI capacity needs to be done at both the large-scale system level and the organizational level. At the large-scale system level, the author has been involved in integrating the macro-meso-micro-individual model of continuous QI within a number of organizations.

The Möbius strip illustration in Figure 4.3 illustrates the never-ending process of improvement within the organization. Activities associated with the macro, meso, micro, and individual QI levels are suggested around the Möbius strip. At the macro level, a systems perspective guides senior leadership in defining the mission and vision of the organization. Advanced tools of quality enable strategic identification of internal and external requirements at the meso level. The meso level contains the planning and deployment of programs that translate strategic vision and long-range outcomes into local projects or activities to meet specific department needs. The micro level encompasses the projects and programs instituted at the functional unit level.

An organizational assessment at the transition from the meso to the micro level provides the current state of organizational performance and comparison with the mission and vision. The gap between current and desired state provides direction to improvement teams for internal process enhancement and drives performance to meet customer requirements.

Improvement teams at the micro level use the basic tools of QI, including the PDCA cycle (as shown in Figure 4.3), for functional improvement planning and rapid cycle implementation. At the individual QI level, each worker integrates the tools of QI into his or her daily management and work activities. Feedback

from process tasks and outcomes is communicated back to the organizational level through operational and tactical monitoring and reporting.

INTEGRATING BIG "QI," LITTLE "QI," AND INDIVIDUAL "QI"

A transformational change is when QI is based on a comprehensive approach that starts at the macro or big "QI" level and uses a model such as the Malcolm Baldrige Performance Excellence Model, which describes an overall method to manage an organization. Table 4.1 illustrates three levels of QI (big "QI," little "qi," and individual "qi") and lists five QI characteristics: improvement, quality improvement planning, evaluation of quality processes, analysis of processes, and quality improvement goals.

Table 4.1 shows how the macro, meso, micro, and individual levels of the continuum of QI relate to big "QI," little "qi," and individual "qi." The meso-level tool of quality function deployment (QFD) overlays the macro and micro levels as a transition for deployment from organizational to unit-specific projects. Table 4.1 also suggests the use of basic and advanced tools of quality within the scope of organization versus unit activities. Figure 4.4 is a modified version of the continuum recommending appropriate tools at each of the system levels.

Big "QI" in Figure 4.4 refers to the practice of striving for excellence in all of an organization's services, products, processes, and overall operations, making it a top management philosophy resulting in complete organizational involvement in quality.

Table 4.1 Macro, meso, micro, and individual mapped to big, little, and individual QI.

Topic	Big "QI"—organization-wide	Little "qi"—program/unit	Individual "qi"
System level → **Quality tools** →	***Macro*** **Advanced**	***Meso*** **QFD/Lean-Six Sigma**	***Micro*** ***Individual***
Improvement	System focus	Specific project focus	Daily work level focus
Quality improvement planning	Tied to the strategic plan	Program/unit level	Tied to yearly individual performance
Evaluation of quality processes	Responsiveness to a community need	Performance of a process over time	Performance of daily work
Analysis of processes	Cut across all programs and activities	Delivery of a service	Daily work
Quality improvement goals	Strategic plan	Individual program/unit level plans	Individual performance plans

Source: R. Bialek, G. Duffy, and J. Moran, *Modular Kaizen: Dealing with Disruptions* (Washington, DC: Public Health Foundation, 2011), 33.

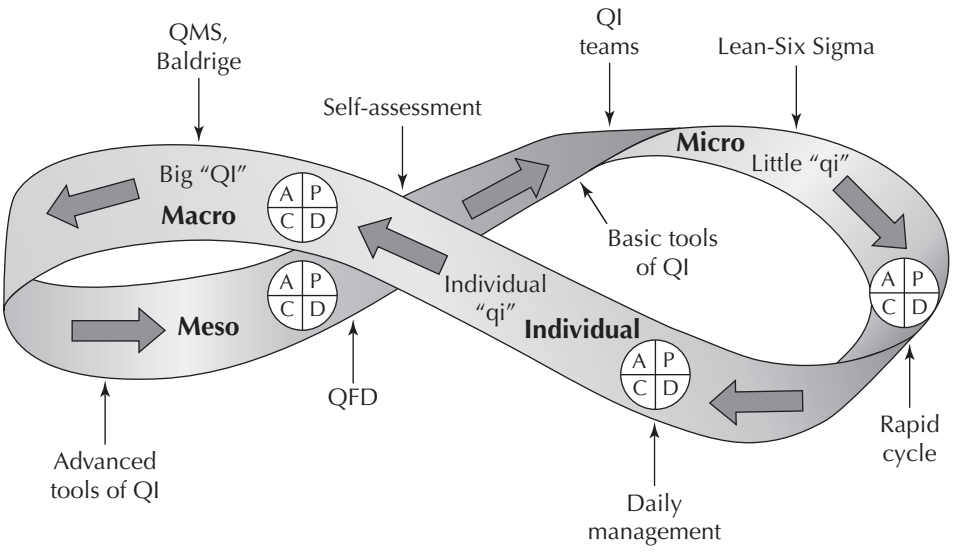


Figure 4.4 The continuum of QI suggesting quality tools and techniques.

As organizations become knowledgeable about and more experienced with QI, and as leaders and staff witness the results of little "qi" efforts, they are likely to seek ways to expand the impact of QI to more parts of the organization.

Big "QI" can be viewed as a strategic or macro systems approach to implementing quality. Integration of QI processes into daily work and organization-wide performance management is often driven by implementation of frameworks such as the ISO quality management system (QMS), the Baldrige criteria, lean, or BSC.

Big "QI" characteristics are focused on the organization as a whole. Little "qi" is viewed as the project or program level within a specific department or, occasionally, across local departments serving a large metropolitan area that overlaps several customer geographies. Individual "qi" reflects the concept of daily management as practiced by the QI professional within the scope of his or her work assignment.

QFD[4] and Lean-Six Sigma (LSS)[5] are two additional QI methodologies that we introduce to this model. We position them between the meso system level and the micro system level to help expand the problem-solving ability of QI teams. QFD assists in capturing the voice of the customer (VOC), which is market needs as determined through a needs assessment, and translating it into programs and services that address user needs. LSS is a methodology that integrates concepts and tools from lean enterprise and Six Sigma methodologies.

QFD identifies what is important to the customer segments served by the organization, and LSS ensures that all available resources are directly engaged in the fulfillment of customer needs. Lean activities maximize the use of resources and minimize waste within all processes. This elimination of waste is a critical success factor in a resource-constrained environment. Lessons from competitive industry suggest there will always be better ways to do the same function for less, or faster, or better given the same use of resources. Six Sigma activities seek to reduce variation in delivery of products and services to meet customer expectations and needs.

Although flexibility is required in using tools based on project need, the basic tools of quality, such as flowcharts and histograms, address more quantitative and tangible issues of immediate problem solving. The advanced tools of quality use more behavioral and decision-making tools, such as force field analysis and interrelationship digraphs. The meso level uses even more flexible tools such as QFD and LSS to provide structure for translating customer needs into specific actions and tasks for problem solving and improvement. The individual system level uses any tools that support the specific task, although the basic tools are most often employed.

Figure 4.4 shows the entire continuous macro-meso-micro-individual quality improvement system and how tools, techniques, methodologies, and approaches fit together and support one another. An organization can start anywhere on this model, but as the QI capacity expands, individual departments can move to a technique more appropriate for their needs.

Once an organization understands the priority areas of focus for improvement, it migrates to a meso system level model of improvement, which is usually described as PDCA (Plan, Do, Check, Act), PDSA (Plan, Do, Study, Act), or DMAIC (Define, Measure, Analyze, Improve, Control). At the meso system level there needs to be a clear problem statement so that those assigned to work on the priority issues understand the importance and scope of their assignment. The problem statement should clearly indicate whether the project and problem to be solved are specific to a program/unit or organization-wide.

Modular Kaizen is designed to use any of the above improvement models for addressing disruptions to expected performance. Chapter 5, "Remove Disruptions to Improve Flow," describes a step-by-step approach to using the DMAIC model. The PDCA/PDSA model is described in Chapter 2, "Continuous versus Breakthrough Improvement."

QI in an organization can start top down, bottom up, or both simultaneously. As QI becomes the norm in an organization, we start to see individual "qi" appearing in daily work. Daily management is the use of individual "qi" to make improvements to daily work; in other words, it becomes a habit. Daily management is the overarching philosophy of incremental change in the day-to-day work performed to meet the needs of the customer and the community. It is a cornerstone of the continuum of QI. More information is provided at the task level in Chapter 5. People doing the work have to make daily incremental improvements to keep up with constantly shifting customer needs.

WORK PROCESSES INTEGRATE TO FORM A SYSTEM

Both a systems view and a functional view of work processes are important to understand how the subsystems, or functions, are interrelated. The interrelationship usually is in the form of inputs and outputs that are delivered to internal or external customers. These inputs and outputs can be measured both quantitatively and qualitatively to determine how the parts and the system are functioning and where improvements should be made. Figure 4.5 shows a systems view and a functional view of work processes. Big "Q," at the left of Figure 4.5, relates to the quality functions required to sustain the overall performance of the organization as it relates to its environment of suppliers and customers. The systems level

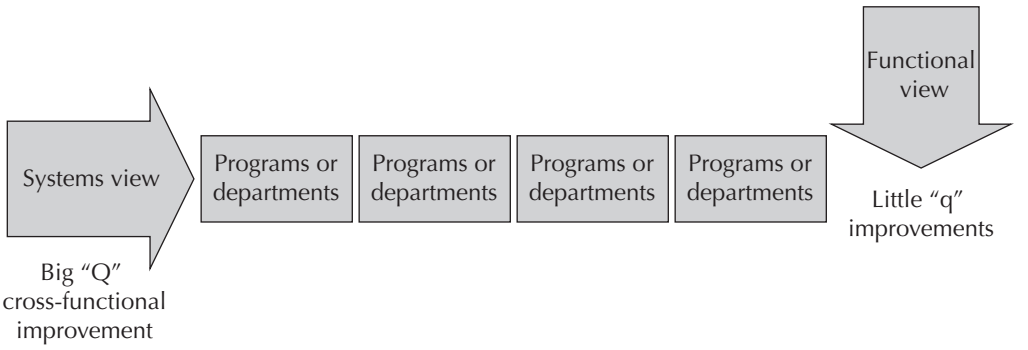


Figure 4.5 Big "Q" drives to little "q."

Source: R. Bialek, G. Duffy, and J. Moran, *Modular Kaizen: Dealing with Disruptions* (Washington, DC: Public Health Foundation, 2011).

functions of quality are decomposed into smaller functions related to individual programs or departments at the tactical and operating levels of the organization. Little "q" improvements, at the right of the figure, are tasks that create change.

QI is a never-ending process that pervades the organization when fully implemented. Top organizational leaders address the quality of the system at a macro level (big "Q"). In the middle, professional staff attacks problems in programs or service areas by improving particular processes (little "q"). At the individual level, staff seeks ways of improving their own behaviors and environments (individual "q").[6] Modular Kaizen uses the focusing effect of measurement to translate the performance management strategies identified by leadership (big "Q") down to the functional or departmental activities (little "q"). Chapter 8, "Process and Outcome Measures in Modular Kaizen," provides more on measurements.

When starting their quality journey, organizations tend to embrace little "q," which means striving for quality in a limited or specific improvement project or area. This endeavor is accomplished by utilizing an integrated set of QI methods and techniques that create a value map,[7] identify the key quality characteristics, analyze process performance, reengineer the process if needed, and lock in improvements. Little "q" can be viewed as a tactical approach to implementing quality and beginning to generate a culture of QI within the organization.[8]

UNDERSTAND THE SYSTEM TO MANAGE PERFORMANCE

Understanding individual processes is critical for improving and maintaining organizational performance. Improving processes individually, however, without assessing the interconnected impact of change to related processes is a recipe for inefficiency. The approaches introduced in this chapter enable the reader to envision the interrelated nature of the department as a system of processes to meet the strategic goals of the organization. Change management and the ramifications of performance management on the overall operation of the organization are covered in subsequent chapters. Once the overall expectations of system performance are understood, additional tools are available to define the cause of disruptions and analyze the best alternatives for reducing or eliminating waste and defects.

Change and improvement are successful when accomplished at the level of daily work. These accomplishments are integrated into the overall activities of the organization. Performance management techniques capture the results of these improvements at the middle and senior management levels.

NOTES

1. Carter McNamara, "Systems Thinking, Systems Tools and Chaos Theory," Free Management Library, accessed March 31, 2013, http://managementhelp.org/systems/systems.htm.
2. Paul Harmon, "Architecture and Process Management," *BPTrends* 10, no. 7 (2012), accessed March 28, 2013, http://ww.bptrends.com/publicationfiles/advisor201204102.pdf.
3. Grace Duffy, Kim McCoy, John Moran, and William Riley, *The Continuum of Quality Improvement in Public Health*, IRM UK's Newsletter, December 2009.
4. J. ReVelle, J. Moran, and C. Cox, *The QFD Handbook* (New York: Wiley Press, 1998).
5. Michael L. George, *Lean Six Sigma for Service* (New York: McGraw-Hill, 2003).
6. G. Duffy, J. Moran, and W. Riley, *Quality Function Deployment and Lean-Six Sigma Applications in Public Health* (Milwaukee, WI: ASQ Quality Press, 2010).
7. A value map is a specialized process map that identifies monetary or other quantitative measures of where value is added by the activities performed within a process.
8. W. Riley, J. Moran, L. Corso, L. Beitsch, R. Bialek, and A. Cofsky, "Defining Quality Improvement in Public Health," *Journal of Public Health Management and Practice* 16, no. 1 (2009): 5–7.

Chapter 5

Remove Disruptions to Improve Flow: Project Sequence for Modular Kaizen

Modular Kaizen is an improvement approach that uses existing daily activities to accomplish priority outcomes. So far in this book, we have looked at the difference between continuous and breakthrough improvement and how all processes within the organization must work together to meet the needs of a complex set of customers and stakeholders.

Many readers will remember the old adage "think globally, act locally." Performance improvement works the same way. The real difference is made at the street level, in day-to-day changes in behavior. These changes, however, must be thought out in the greater context of the organization as a whole. This context is not just within the walls of the organization but within the environment in which the organization does business. This concept of anticipating changes influenced by external events was introduced in Chapter 2, "Continuous versus Breakthrough Improvement." Figures 2.4 and 2.5, respectively, show the process of continuous or evolutionary change and breakthrough or revolutionary change when precipitated by an external event. Change also happens as a result of internal events, such as strategic planning, innovation, or redesign.

This chapter looks at the process of improvement from the task level. How does senior management transform top-down change into daily results? What communication must happen between the executive level and the operation level? Management has the ultimate responsibility for organizational performance and sustainability. The overall vision of the organization begins with management.

On the other hand, how do step-by-step small changes take hold and grow into a long-term, sustainable change that impacts the strategic outcomes of the organization? Improvement happens from both the top down and the bottom up. In order to be effective, line of sight has to be in place no matter what direction the change is going.

THE VALUE OF MODULAR KAIZEN AT THE ACTION LEVEL

Quality is not just a set of tools, concepts, or policies; it is the way work is performed every day, by everyone. Enterprise leaders cannot dictate or mandate quality, but they can influence the culture of quality for their staff. One of the major characteristics of a Modular Kaizen approach to improvement is effective planning before action is taken. The NASA case study shared in Chapter 11 focuses almost completely on pre-team kickoff preparations performed by the sponsor and the

chosen team facilitator. Figure 5.1, like Figure 1.4, shows the seven steps that make up the first section of the sequence.

In this first section, it is important that you know what you are doing. As Juran suggested some 60 years ago, define and redefine the issue. Get the correct sponsor for the process under study. Identify team members who have knowledge of the process and the situation. Make sure the right skills are available to address the issue.

Many books on team development suggest that the above-mentioned tasks can be performed during the forming stage of the team itself. Modular Kaizen considers these tasks to be prerequisite activities to be performed by the process owner, sponsor, champion, and anticipated team facilitator or leader before the first team meeting. Vetting team members must be done before they are invited to join the team. The author of the NASA case study takes personal responsibility to meet with each potential project team member. The team facilitator makes sure targeted individuals have the skills necessary and the availability in their schedule to even begin their role as a team member.

Modular Kaizen uses the existing pace of the organization to plan improvement activities based on the highest-priority areas of impact. Figure 5.2 illustrates

1. Understand and define the problem/opportunity
   a. Identify the issue
   b. Identify the sponsor/champion
   c. Choose the team
   d. Ensure appropriate skill levels (skills matrix)
   e. Develop initial Modular Kaizen timing requirements (map team members to schedule demands)
   f. Develop problem statement/aim (project charter)
   g. Map the current state (process map or flowchart)
2. Collect, analyze, and prioritize data about the problem symptoms; determine the root cause(s) of the most significant symptoms
   a. Assess customer needs (QFD—quality function deployment—house 1)
   b. Identify disruptions to current process or process omissions (cause and effect diagram)
   c. Set improvement indicators (needs to indicators matrix)
   d. Gather data (check sheets, etc.)
   e. Analyze and identify root cause of disruption (5 Whys, impact/priority matrix, cause and effect)
3. Identify possible solutions (solution and effect diagram)
4. Select the best solution
   a. Return to process as defined (check/act, or define, measure, analyze)
   b. Improve existing process (PDCA or DMAIC)
   c. Redesign process (PDCA or DMADV—define, measure, analyze, design, verify)
5. Develop an action plan (project plan, Gantt chart)
6. Implement and document the solution (storyboard)
7. Evaluate the effectiveness of the improvement (control plan)

Figure 5.1 General project sequence for Modular Kaizen improvement activities.

the concept of kaizen activity as a series of improvement steps interspersed with standard operations. When a problem is encountered, a kaizen activity is planned and implemented, thus raising the standard of performance for the impacted process. As actual performance is improved, the standard is raised.

Figure 5.2 is a generic illustration of continuous kaizen process improvement. Traditional kaizen approaches are designed to group improvements into short, intense bursts of activity that remove the response team from normal operations. An even more focused approach is the kaizen blitz, which sequesters the response team until the improvement is defined, piloted, and initially implemented. Although the kaizen blitz is an effective approach for high-severity situations in which work cannot continue until the problem is resolved, not all improvement situations require such drastic means. Also, once the initial change has been implemented, ongoing monitoring is required for sustainability. At some point, the new changes must be integrated into standard operations. Quality and line management are responsible for supporting the process owner and workers to maintain the improvements over time.

The benefit of Modular Kaizen is that improvements are integrated into daily work activities on the basis of the impact of the disruption, resources, and personnel available. Detailed examples of integrated improvement are shared in Part II of this text.

Step two in the general project sequence for Modular Kaizen improvement activities shown in Figure 5.1 involves studying the process or set of processes where the disruption manifests itself. Figure 5.3 is a representation of the nesting characteristic of processes within a complex organization.

Figure 5.3 illustrates the decomposition of a high-level process into steps that can be further decomposed into processes at a more detailed level. As the process is expanded from a strategic design to actual work instructions, the level of detail within each process becomes greater until finally the process is equivalent to a work instruction for an individual performing the work. Although management is responsible for the overall sustainable performance of the organization, work actually gets done at this task level. The importance of the individual in

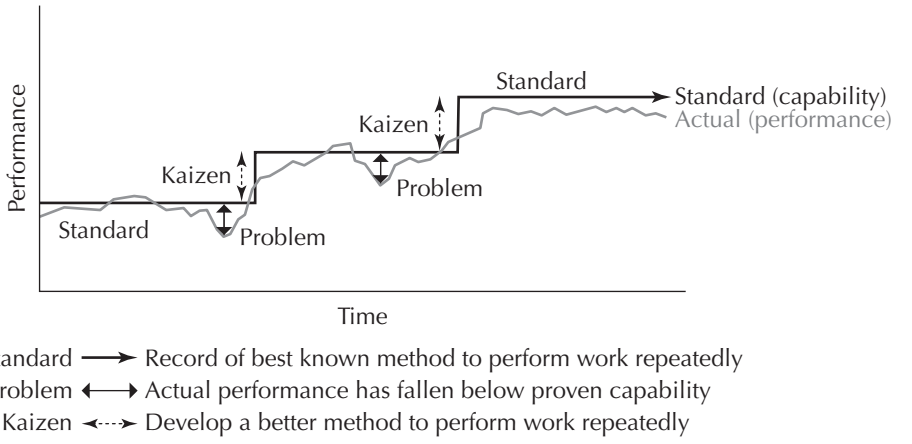


Figure 5.2 The traditional kaizen method of perpetual improvement.

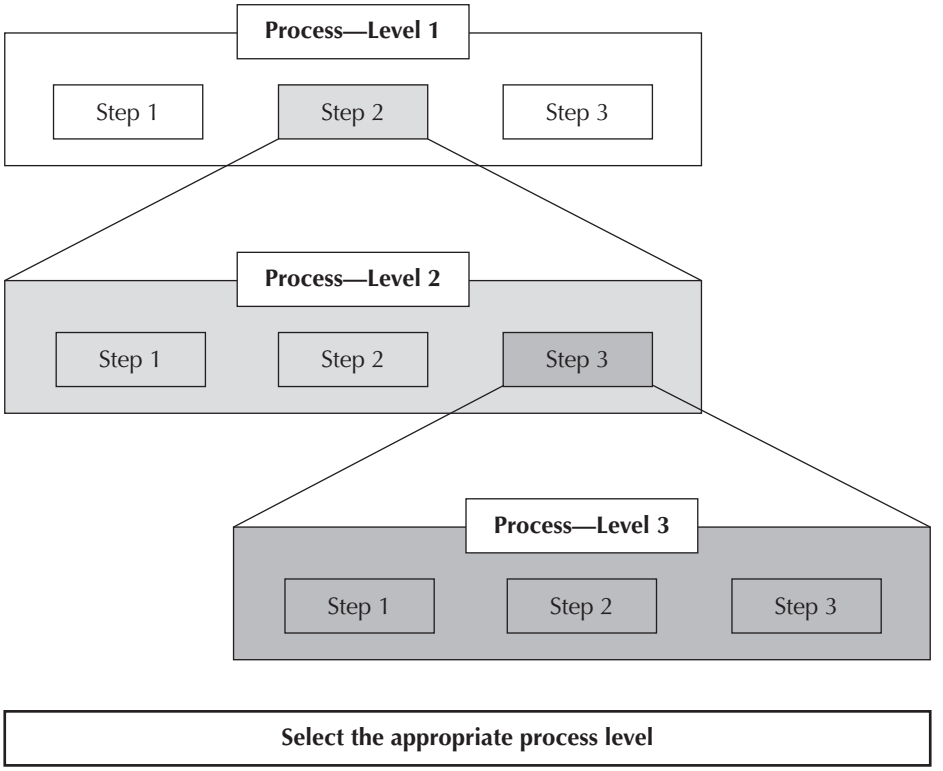


Figure 5.3 Example of the hierarchy of processes from organizational to individual task level.

identifying disruptions and other opportunities for improving efficiencies within the organization cannot be overplayed. Because processes are interdependent, what happens in one process step can be a significant influence in the outcome of the whole set of processes as they work together.

The underlying requirement for any sustainable process is to understand the process and control the variation both within the process and between processes in the full value stream that creates the desired outcome. One of the critical first tools for process improvement is the process map or flowchart. Once the process is defined and documented, training takes place to ensure that all individuals responsible for the performance of the process are doing tasks the same way. The process must be stable before effective improvements can be made, since unexplained variation cannot be controlled.

MODULAR KAIZEN USING THE DMAIC MODEL

Modular Kaizen is a structured plan for scheduling improvement tasks, including the availability of information and resources, in units that can be performed within the time limits of a busy and interrupt-driven work environment. This

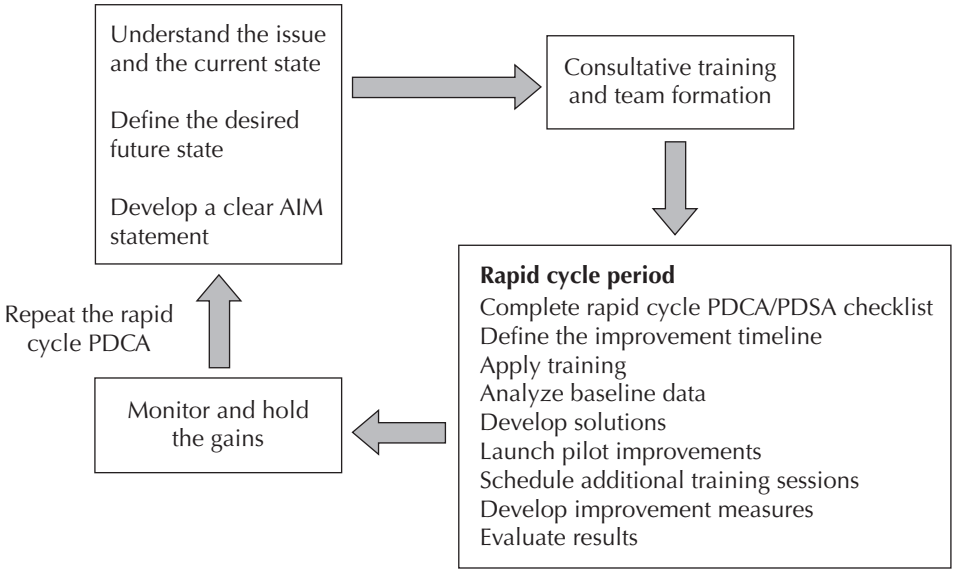


Figure 5.4 Rapid cycle PDCA/PDSA process model.

planning involves employees in a well-defined context of tasks and deliverables closely aligned with the highest priorities of the department. Modular Kaizen takes advantage of the concept of rapid cycle improvement to plan and implement improvements quickly and effectively, using the resources available in the time allowed. Rapid cycle has been defined in previous works by the author and colleagues.[1]

Rapid means done or occurring in a brief period of time and characterized by speed. *Cycle* means an interval during which a recurring sequence of events occurs. Therefore, *rapid cycle PDCA*, as shown in Figure 5.4, is applying the recurring sequence of PDCA in a brief period of time to solve a problem or issue facing a team or organization that will achieve breakthrough or continuous improvement results quickly.

The rapid cycle process is not limited to the PDCA/PDSA improvement model. This highly focused and planned activity is equally effective using the Define, Measure, Analyze, Improve, Control (DMAIC) model originally developed to support Six Sigma. The steps for rapid cycle improvement are:

- **R**ealization of a problem or issue that needs to be corrected. Management is committed to making the change.
- **A**ct to start a resolution or change to the problem or issue by utilizing quality improvement tools and techniques.
- **P**lan for success by developing a clear aim statement.
- **I**nvolve key constituents in the improvement process.
- **D**evelop the change team and establish the rapid cycle time line.

- **C**onsultative training interventions as required by the team.
- Anal**Y**ze baseline data and understand the current state and scope of the problem.
- **C**onstruct solutions to get to the desired future state.
- **L**aunch pilot improvement solutions to determine if the desired change can be achieved.
- **E**valuate results achieved from pilot improvement, make any necessary adjustments, and launch it throughout the organization.

Continuous improvement is accomplished by utilizing an integrated set of improvement methods and techniques that create a value map, identify the key quality characteristics, analyze process performance, reengineer the process if needed, and lock in improvements.

Joseph Juran's basic seven-step problem-solving model was introduced in Figure 1.1. The reader will quickly see the derivation of the Modular Kaizen–suggested approach as illustrated in Figure 5.1.

Typical steps taken in incremental improvement are:

1. Select the process or subprocess to be process mapped
2. Define the process:
   a. Inputs to the process, including suppliers
   b. Outputs from the process
   c. Users/customers to whom outputs are directed
   d. Requirements of users/customers
   e. Restraints (e.g., standards, regulations, policies)
3. Map out the principal flow (main flow without exceptions)
4. Add the decision points and alternative paths
5. Add the check/inspection points and alternative paths
6. Analyze the process flow to identify:
   a. Non-value-added steps
   b. Redundancies
   c. Bottlenecks
   d. Inefficiencies
   e. Deficiencies
7. Prioritize problems:
   a. Quantify results of each problem
   b. Identify the impact each problem has on overall process
   c. Pareto the problems and identify the most important problem

8. Redo the map to remove a primary problem
9. Do a desktop walk-through with persons involved in the process
10. Modify the process map as needed (and it will be)
11. Review changes and obtain approval
12. Institute change(s)
13. Review results of change
14. Make needed changes to documented procedures
15. Do it again for the next important problem area

PROCESS MAPS PROVIDE DIFFERENT VIEWS OF THE SYSTEM

The process map is a symbolic representation of a single process without a lot of detail. The intent is to provide a high-level picture of the steps within a process. This picture provides a strategic view of how one process may impact others and assists in overall balancing of resources across a set of interrelated processes.

PROCESS is a construct for organizing value-adding work to achieve a business-valued milestone so that it:

- Can be performed effectively and efficiently
- Can be managed effectively
- Offers the potential for a competitive advantage[2]

A flowchart is a detailed picture of a process at the procedural level. This version of a process map includes steps, decisions, and inputs from outside the process, and outputs or interchanges with resources or other activities outside the process. The flowchart provides enough information about the process to establish working measures for monitoring and improving outcomes or interim milestones.

A value map is a high-level representation of the process that guides the team through identification of activities that increase the value of the process output in the eyes of the customer or end user. This tool, often called a value stream map, is a system-level instrument, since value is often added through a series of interrelated processes. The result of changing one process in the stream of activities may negatively impact the efficiency of another process within the system. The intent of the value map is to remove all activities that add no value to the end product or service and to reduce any waste that makes those process steps that add value less efficient. Figure 5.5 illustrates the relationship between value stream mapping and subsequent kaizen improvement activities. Table 5.1 compares value map, process map, and flowchart characteristics.

Use the value stream mapping (VSM) graphic as an overarching system integration model with little kaizen activities improving parts of the larger value chain. VSM activities highlight areas where improvement is a priority, but in context with the complete system.

Functional improvements (maintenance, quality, sales and operations planning, etc.) are not integrated. Often improvement projects are driven as separate

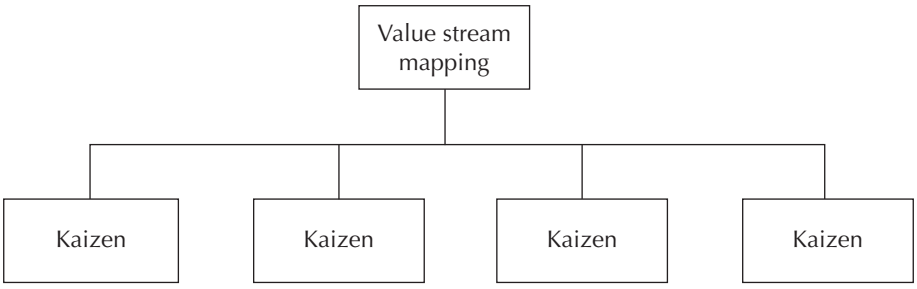


Figure 5.5 Relationship of value stream mapping activity and subsequent kaizen improvement activities.

Table 5.1 Value map, process map, and flowchart characteristics compared.

Value map (value stream map)	Process map	Flowchart
Starts with first process block	Starts with inputs	Starts with start block
Focuses on one service from beginning to end	Identifies individual process of a larger process	Identifies each step of a process
Does not use decision boxes	Has very few decision boxes	Has many decision boxes
Ends with last process block	Ends with outputs	Ends with end block
Encompasses the complete set of processes and/or steps representing a defined value stream	May be part of a procedure	Is usually a procedure on its own
Illustrates value-added versus non-value-added process activities	Helps paint a high-level picture	Helps paint a detailed picture

initiatives without consideration of their impact on the greater organizational outcomes experienced by the customer. This lack of integration of separate processes within the organization to produce desired outcomes is a major cause of disruption. Modular Kaizen stresses the planning aspect of process definition to reduce the impact of disjointed improvements at the functional level.

The example in Figure 5.6 illustrates the output of a value stream map. Each step of the series of processes is measured for wait times, number of persons waiting, cycle time for each step, and total elapsed time. Also included is use of resources (procedures, materials, personnel, etc.). This example does not convert time values into dollar amounts, although many value maps do. The intent of using this version of a process map is to reduce disruption and time through the total flow of the overall system composed of interrelated processes.

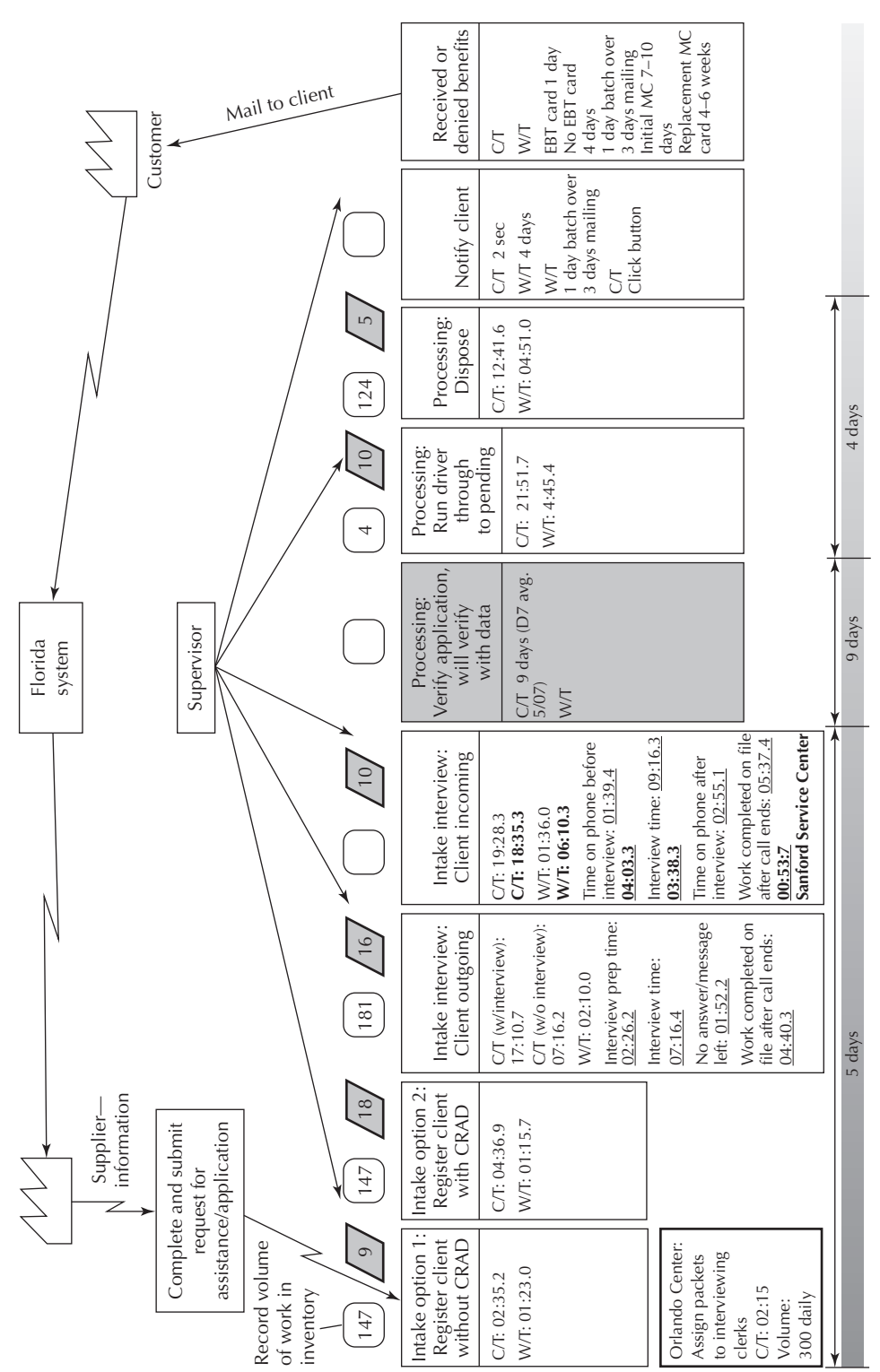


Figure 5.6 As-is value (stream) map of Florida agency client intake process, 2008.

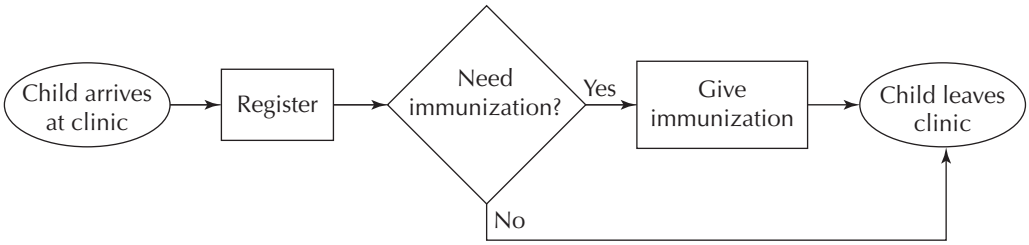


Figure 5.7 Basic process map for childhood immunization clinic.

Figure 5.7 is a basic process map of a health department's childhood immunization clinic. This high-level picture of clinic flow provides enough information for communication about the general operation of the activity. Little detailed information is available from this map type. The intent here is to focus the scope of discussion around a particular activity.

The flowchart in Figure 5.8 shows enough detail to identify activity and some outcome measures. The level of each block or decision symbol in the example flowchart for archive processing for Community Services is at the point where a work instruction or procedure could be the next level of granularity were more detail desired.

Figure 5.9 illustrates the DMAIC version of the Modular Kaizen continuous improvement cycle. The model starts with **Measure**, where a disruption is investigated and understood to see if there is a special cause. As in any valid process improvement effort, a basic assumption is that the current process is understood and in control. This assumption is represented by the **Define** step at the top of the DMAIC cycle on the left of the figure.

All too often improvement teams immediately identify actions to be taken to remove disruptions or errors without understanding enough of the full impact of the process under study. It is possible that the disruption noticed by the individual or sensor (if an automated function) is unexpected but still within the process capability. In that instance, full understanding of the process allows the Measure function to ascertain that the disruption is minor and warrants only continued monitoring for further deterioration. In this case, the individual assessing the disruption will continue to monitor the process within the standard cycle on the top left of Figure 5.9.

If the disruption is outside the normal process expectations, the next step is to branch out to further problem determination (as seen in the arrow labeled "1" in Figure 5.9) to understand what the severity or urgency is, estimate who or what is impacted, estimate the length of the disruption timeline, and collect data. This branch on the lower right side of Figure 5.9 takes us to an extension of the Measure step in the DMAIC process. Data are gathered to better understand the disruption and how it diverges from expected performance of the standardized process.

The next step is **Analyze**. Using the data gathered in the expanded Measure step, the response team would:

1. Do nothing—continue to monitor the disruption until it either dissipates or needs more attention. If more attention is needed, establish an investigative team to dig deeper into the disruption and report back. The report would be in the form of a high-level-scope document.

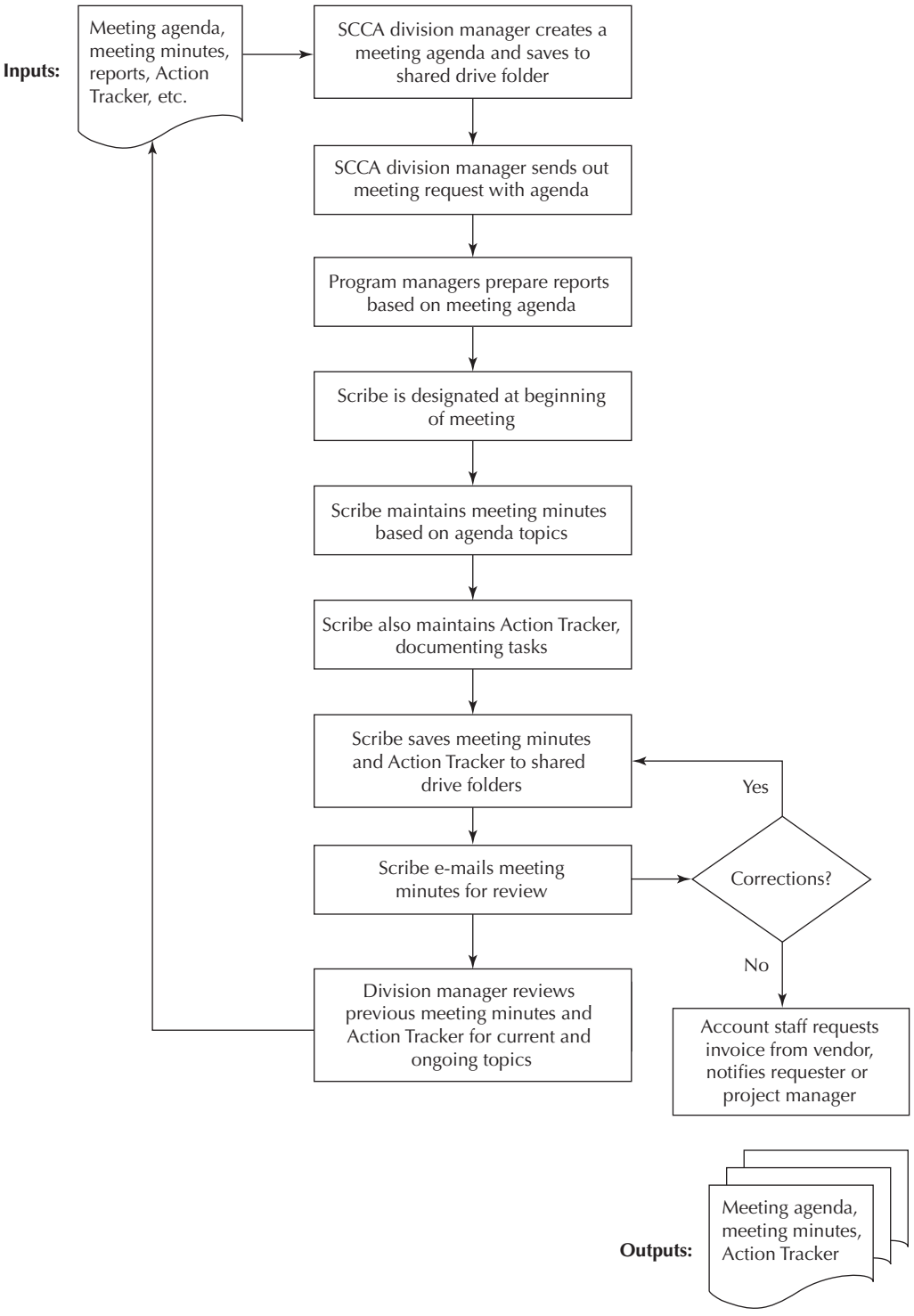


Figure 5.8 Detailed flowchart of Community Services archive processing.

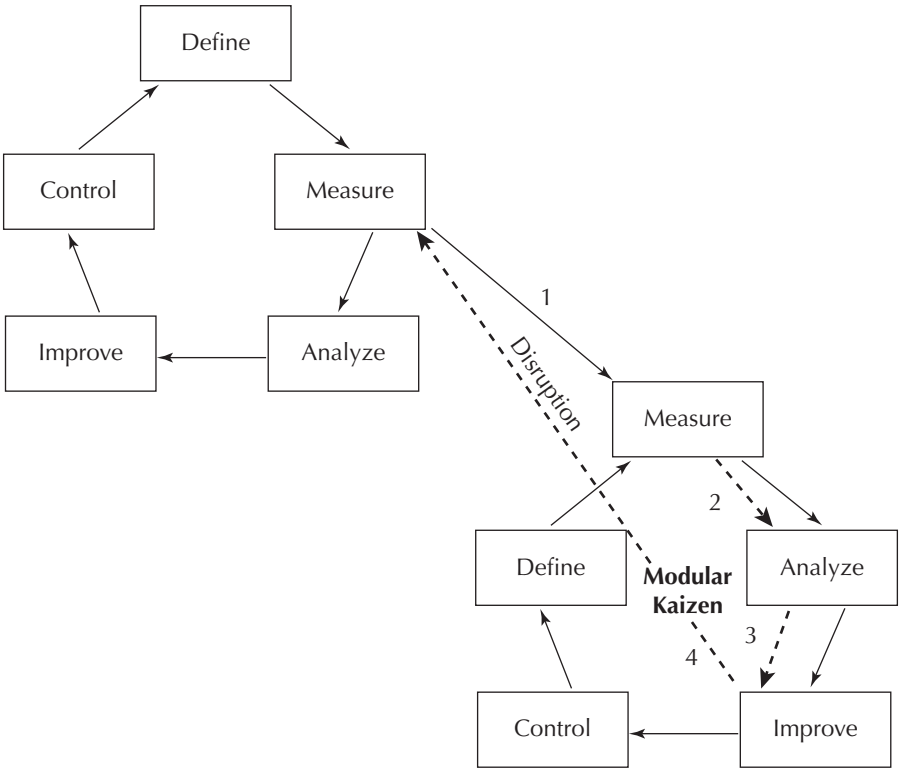


Figure 5.9 Modular Kaizen flow using the DMAIC model.

2. Take short-term actions to stabilize the process while the team allocates time to use the DMAIC cycle to solve the problem and bring the process back under control. This is represented in Figure 5.9 by the dashed line marked "2."
3. For a disruption that cannot be quickly returned to the standard process activity, problem determination continues in parallel with the short-term stabilization described in step 2. The resolution team continues into the **Analyze** stage to rethink the process to ascertain whether improving the existing process will prevent the observed disruption from recurring.

   If the solution identified in the Analyze stage is possible, it is piloted in the problem determination **Improve** phase for verification, as shown by the dashed line marked "3." This set of steps is also reflected in Figure 5.1 in steps 2 through 7.
4. Once the disruption is resolved, either as a return to the existing process flow or as an improved process, resources can be returned to departments to resume regular activities, as seen by the dashed line marked "4" in Figure 5.9.

It is entirely possible that the initial disruption is a result of a major external event that changes the basic assumptions of the process. In this case, the improvement cycle in the lower right of Figure 5.9 continues through a new establishment of

improvement activities and new **Control** measures to realize a significant change to the existing process or, possibly, enter into a full redesign activity. Step 4.c of Figure 5.1 describes this activity as "Redesign process (PDCA or DMADV)."[3]

The **Define** stage in the improvement cycle in the lower right of Figure 5.9 represents the new process design (Redesign) activity. This redesign will require a full journey through the improvement cycle to fully measure, analyze, improve, and control the newly designed process.

At this point, the team documents lessons learned, knowledge gained, and any unexpected results that emerged. It is important to continue to monitor activities and hold the gains so that the disruption remains under control.

Individuals responsible for the process may make incremental improvements. However, depending on organizational policies and procedures, appropriate approvals may be required. Also, there should be concern for interactions with other processes, before and after the process is changed. More typically, a team from the work group involved initiates incremental changes.

DOCUMENTATION AS PART OF THE CONTROL PHASE

The Modular Kaizen improvement flow first introduced in Figure 1.4 and reproduced in Figure 5.1 encourages the use of storyboards as a way to document knowledge gained and to provide a permanent record of the results of the team improvement. Figure 5.10 is an example of a storyboard (modified for confidentiality) documenting a significant cycle time reduction project in a federal agency. The reader may have observed storyboard presentations at professional conferences and during team excellence competitions as vehicles for sharing successes and lessons learned.

The storyboard serves as a closing document for team recognition, final milestone deliverable, and summary of the more detailed final project report. The storyboard document is usually applied at the end of a full cycle of DMAIC or PDCA and not necessarily during the short, incremental changes reflected in continuous, daily process appraisal and adjustment activities. The idea of reducing disruption with Modular Kaizen is to integrate improvement activities into the ongoing awareness of tasks as they are performed. Usually the storyboard is used for breakthrough or major continuous improvement projects where a defined start and stop can be tracked and where a charter is created during the Define stage to formalize sponsorship expectations. An exception to this practice is a long-term improvement effort that not only sustains exceptional outcome performance but also achieves a level of customer delight that should be shared in a highly visible venue with both internal and external stakeholders.

Modular Kaizen encourages alignment of job tasks with the ultimate priority goals of the organization, as identified in Chapter 3, "Alignment Using Top-Down and Bottom-Up Measures." Thus, daily appraisal and return of variation to standard process performance should be acknowledged by the team lead, supervisor, or peer work group as part of the regular performance-recognition system of the company.

Quality Improvement Storyboard

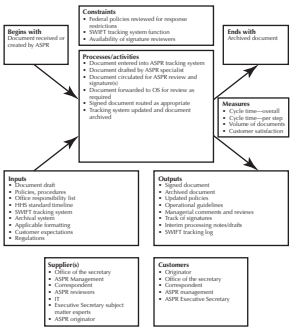
Correspondence
Cycle Time Reduction

Define

Define problem or improvement opportunity

Team members:
Department staff, team lead, MBB, and champion

Problem statement:
It takes too long to get correspondence through the different processes for department and CEO signature.



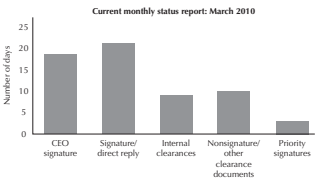
Create charter. Identify current categories of correspondence and measure critical cycle times. Build SIPOC of high-level process view. Refine the project plan.

Measure

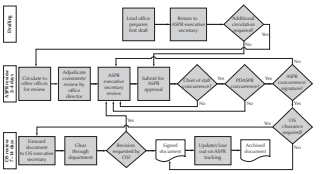
Determine current performance

Data gathered on average cycle time to produce each of five key forms of correspondence through the office of the agency CEO and department manager.

Document type	HHS standard	Current ASPR as of 04-09-10	Current ASPR as of 01-10	6-month goal (reduce by approx. 50%)	12-month goal **
Secretary signature (including letters decision memos, clearances)	5 days	7 avg. days	18 avg. days to draft, clear and mail a response	9 days	**5 days**
ASPR signature/ direct reply	10 days	10 avg. days	21 avg. days to draft, clear and mail a response	11 days	**10 days**
ASPR internal clearances	5 days	5 avg. days	9 avg. days to complete clearance	6 days	**5 days**
Non-signature/ other exec. sec. clearance documents	5 days	10 avg. days	10 avg. days to complete review/clear	6 days	**5 days**
Priority secretary signatures	3 days	13 avg. days	3 avg. days to draft, clear and submit response	3 days	**3 days**



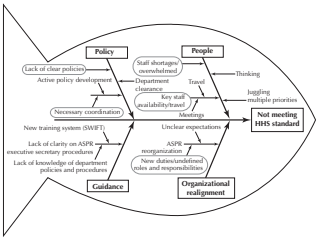
Created process maps for each of the five correspondence flows. Identified bottlenecks, areas of control, and areas of influence for managing cycle time.



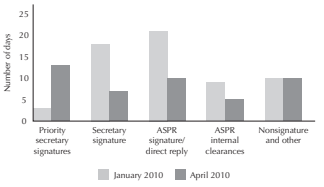
Note: Due dates are scheduled regardless of the complexity of the issues to be addressed in the memos and letters. On many occasions, meetings must be scheduled with subject matter experts, or policy decisions not already decided must be made prior to responding to inquiries or issues discussed in correspondence. This directly affects the timeliness of the response. The nature of the clearance process is to identify and adjudicate all conflicts before presenting the final product to the ASPR EC, secretary, deputy secretary, and the chief of staff. The goal is always to respond in a timely fashion; if a timely response is not possible, communicate this to the ASPR EO as well as the OS ER.

Analyze

Analyze process and measurements, gather data, determine root cause

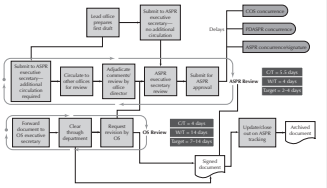


Developed cause and effect diagram and possible solutions. Analyzed measurement system and gathered actual cycle time data for three months. Determined and validated root causes of delays.



Improve

Select practical approaches, establish performance targets



Used value stream mapping to identify priority areas for improvement.

Communicated with suppliers and customers of the documentation processes to validate cycle time expectations. Implemented the automated document tracking system. Set 6- and 12-month performance goals. Meeting 6-month goals within 3 months.

Document category	6-month goal	12-month goal
Secretary signature	9 days	5 days
ASPR signature direct reply	11 days	10 days
ASPR internal clearances	6 days	5 days
Non-signature/other executive secretariat clearance documents	6 days	5 days
Priority secretary signature	3 days	3 days

Control

Implement solutions, measure and sustain results

Cycle time for the five document categories is calculated on a monthly basis and displayed in the executive conference room for culture of QI visibility.

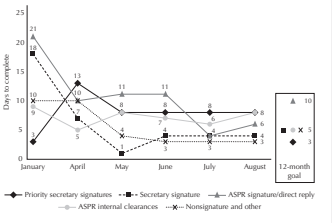


Figure 5.10 Example of a storyboard created during the Control phase.

ANALYZE SYSTEM DISRUPTION

Each organization has its own approach for doing so, but ultimately, a few core practices stand out as key to the success of maintaining a competitive advantage in the marketplace:

- Centralize ownership regardless of adoption location within the organization
- Adopt a framework before adapting it
- Use tools after building a solid foundation of process expertise and capability

Centralized ownership provides a single point of responsibility for the process under study. Each process should have a process owner identified. This individual or function is responsible for the overall performance, stability, and improvement of this process, including the responsibility to communicate effectively with process owners of upstream and downstream functions.

One of the key strategic activities for organizational success is the establishment of a structured framework of business operations, technology, and human resources. Eight factors make up the work environment and, thus, patterns of behavior at work: the organization, the physical workplace, work flow or processes, peoples' skills and orientations, rewards and punishments, performance metrics, information distribution, and decision allocation. Senior management is responsible for initiating this framework, which is then cascaded to each level of the organization and maintained through constant alignment between strategic and operational levels. This alignment was introduced in Chapter 3. More on this alignment for success in Chapter 8, "Process and Outcome Measures in Modular Kaizen."

To put it simply, a process framework allows tasks to be grouped into standardized buckets of activity that can then be objectively compared. Developing this common language typically consumes a large portion of an organization's time. A process framework or reference model accelerates this step and increases the speed and depth at which an organization can study internal and external practices and processes.

A myriad of quality and business tools exist to support the improvement process. Modular Kaizen does not endorse any particular set of tools, although a number of tools and techniques have been developed by the author and colleagues that further support this specific approach to reducing disruptions. Chapters 6, 7, and 8 introduce a number of tools useful for general improvement activities. Figure 5.11 suggests a sequence of tools appropriate to guide an improvement team through the five stages of the DMAIC process.

The **Define** stage uses process definition through VSM as the foundation for understanding the situation and identifying the disruption. Process control and metrics serve to **Measure** the current situation so that reliable decisions can be made for identifying root causes and potential solutions in later stages. A number of tools are useful during the **Analyze** stage. Once the root cause or causes are identified, the **Improve** stage has many tools available depending on the situation surrounding the disruption. Figure 5.11 calls out a number of tools from the House of Modular Kaizen, although the reader is encouraged to use any and all tools that assist in reaching the goal of process stabilization, improvement, or reduction of variation. The same tools used in the Measure stage are also appropriate for the **Control** stage. Process, outcome, and capacity measures are further discussed in Chapter 8.

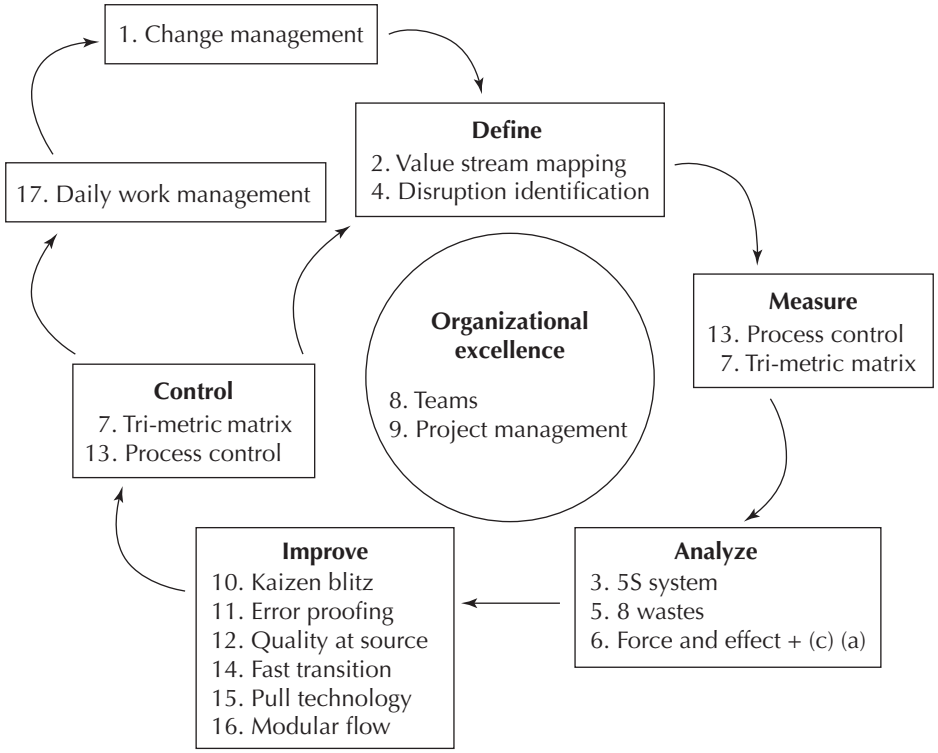


Figure 5.11 Use of the Modular Kaizen basic tools mapped to the DMAIC improvement model.

Figure 5.11 places the five DMAIC stages in a framework for organizational excellence. Teams and project management are critical techniques for establishing a culture of improvement. Integrating the DMAIC activities into daily management reduces the feeling of "doing something different" in the mind of the individual. When process improvement and sustainability are assumed to be part of the culture of the organization, it is easier for the individual's thoughts to automatically go to a basic set of tools for identifying, analyzing, and resolving disruptions. The basis of a culture of improvement comes from the use of effective change management skills across all levels of the organization, starting with senior management all the way to the front line.

PRIORITY—PROCESS—TASK—ACTION

Modular Kaizen, as an approach based on the lean and Six Sigma family of improvement tools, views the interaction among processes within the organization from an efficiency perspective. Figure 5.12 illustrates methods by which lean activities seek to reduce waste and eliminate redundancies as work is performed. A typical process is shown in the upper portion of the figure, with embedded error correction, unnecessary tasks, and queuing or waiting before outcomes are realized. The more efficient process flow on the bottom shows a very direct flow to the desired outcome.

Lean methods provide an efficient way to reduce operational waste, save time, save cost, and extend capacity of valuable resources.

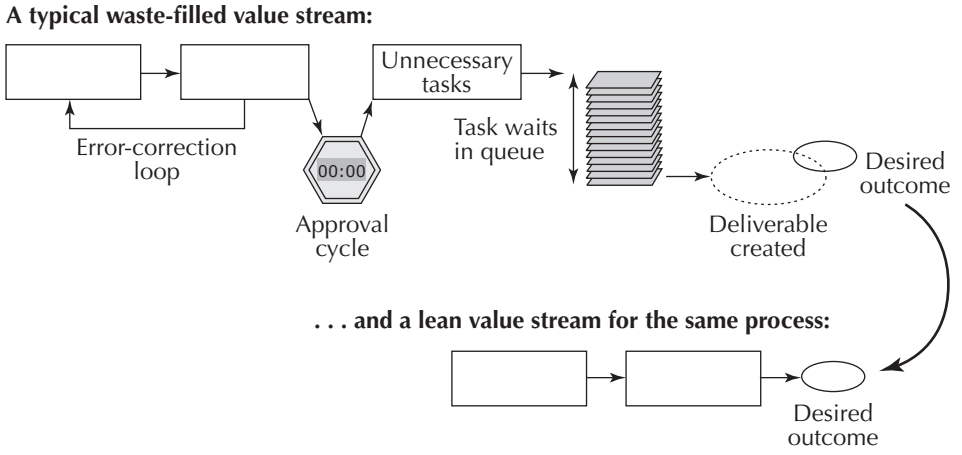


Figure 5.12 Comparison of typical process waste and the efficiency of a lean process.

Chapter 6 introduces the details of the tools within the House of Modular Kaizen, including some traditional lean tools such as the 5 Whys and the 8 wastes. The fishbone family of tools described in Chapter 7 includes a number of techniques for capturing team and individual observations of a disruption, waste, or unnecessary task. The intent of Modular Kaizen is to anticipate any potential disruption to the designed flow of a process. Figure 5.12 is a graphic representation of moving from an error-prone process design to a smooth, efficient flow to achieve the desired outcome.

Once the area of disruption is identified, the improvement team must design its strategy and actions to resolve the disruption in the most effective and efficient way possible. Table 5.2 is a worksheet developed to guide team discussion from the process to specific action and measures to get the job done. The far left column of the table identifies the process or activity under analysis. The example in Table 5.2 is to create standards of performance for a hospital system. A set of activities from benchmarking standards of performance through gathering feedback on testing its own new standards is listed in the leftmost column. The "Customer need" column identifies why this activity is required. The next column identifies whether the customer need is met or unmet. Since this is a newly developed process, all activities for this example are unmet. Were these activities part of an existing process simply in need of improvement, a "met" in this column may mean that the priority for action is lower because the current requirement is already met.

The "Requirements" column is the internal outcome for the activity. "Target/goal" is the description of the met requirement, while "High-level measure" in the rightmost column is tangible evidence of activity completion. Involving the team members in the development of this worksheet brings out valuable ideas and encourages a feeling of ownership for performing the activities required. Another example of the drill-down worksheet is Table 10.3 in Chapter 10, "Meeting Effectiveness Evaluation Project."

The worksheets in Tables 5.2, 5.3, and 5.4 support steps 4 and 5 of the general project sequence for Modular Kaizen improvement activities shown in Figure 5.1.

Table 5.2 Priority–process–task–action drill-down worksheet example.

Process/activity	Customer need	Met/ unmet	Requirements	Target/goal	High-level measure
Benchmark other hospitals for standards of service performance	What works and what doesn't, senior management	U	Documented performance standards with related effectiveness reports	Two hospitals or services benchmarked and reported to senior management	Date of completion and report to senior management
Gather and review all current job descriptions	Know what job descriptions exist	U	Copies of all Ready H/C job descriptions	List of all job descriptions for system	Number of job descriptions updated, date back to human resources
Research journals for trends on behaviorally based hiring (BBH)	What are the successful characteristics to hire?	U	Identify characteristics	Set of characteristics in alignment with values	Characteristics approved by senior management, human resources, and employees
Work with human resources and senior management to establish Ready H/C standards	Set of standards for all employees at all levels	U	List of standards, definition of standards	Published list	Date list is available to management
Update job descriptions and performance planning models to new standards	Job descriptions support standards	U	All job descriptions updated, performance and planning models modified to new standards	Job descriptions updated, formatted, and in human resources	Date and number of job descriptions updated
Develop training materials for standards for current employees and hiring supervisors	Skills for exhibiting or interviewing for desired characteristics	U	Supervisors and employees exhibit behaviors to meet standards	Materials developed, training scheduled, attendees scheduled	Materials accurate and done, training schedule in place, all employees scheduled by date
Announce rollout, timelines, and measurements	Awareness and top level management commitment	U	Rollout content, dates, times, locations, and measures to be used	Content written and approved, schedule and measurements set	Feedback from employees and other stakeholders

Table 5.2 Priority–process–task–action drill-down worksheet example. *(continued)*

Process/activity	Customer need	Met/ unmet	Requirements	Target/goal	High level measure
Work with supervisors and employees to put standards into each performance plan	Set employee and manager expectations	U	New performance plans in place for employees	All new plans in place by 9/30/12	Number of plans in place per quarter, all by 9/30/12; Level 1 feedback of process
Gather feedback, adjust, report, and maintain	Pilot team members and senior management project need	U	Frequent feedback and data for in-flight adjustments	At least monthly data and reports to management	Level of acceptance. Completion to plan

The final two steps of the general project sequence are reflected in Chapter 8 and in the case study chapters in Part II of this text.

The worksheet shown in Table 5.3 is a continuation of the project documentation for implementing standards of performance for a healthcare system after a merger of two culturally divergent hospitals. Note that the process steps listed in the leftmost column are the same as those in Table 5.2. This time, however, the activity is very specifically identified in the next column to the right. In the third column are tools that the team used to accomplish the activity, while the last column identifies the information to be gained by using the tool. The conversation required to fill out this worksheet engaged not only the improvement team members but the team leader, facilitator, and process owner. This cross-functional and multilevel management involvement gave strong credibility to the exercise and provided much-needed energy for moving forward.

Table 5.4 is the final worksheet showing specific assignments for accomplishing the tasks listed in the worksheet in Table 5.3. This project management planning was performed by the very people listed in the second column from the left. Each individual either volunteered for the task or was assigned the task and completely understood the reason for their assignment. The beginning and end dates, expected outcome, and measurement for completion further served to clarify the outcome of the individual assignment.

The sequence of planning and task assignments covered in this section demonstrates how the Modular Kaizen approach engages individuals in improvement activities that are directly related to their responsibilities. Management has the responsibility to choose the right team members with the correct skills to accomplish the required outcome. Individuals are consulted and included in the activities that identify actions, tools, and measures of progress and completion. Sustainability of the outcomes is, again, the responsibility of management through the development and ongoing adherence to the measurements making up the process control plan. Chapter 8 addresses process and outcome measures in detail.

Table 5.3 Tools for implementation.

Process step	Activity	Tool	Information to be gained
Benchmark other hospitals for standards of service performance	Benchmark Pensacola Presbyterian	Benchmarking	World-class customer service
Gather and review all current job descriptions	Collect all job descriptions used in system	Communicate with human resources	What descriptions are out there, how many different versions
Research journals for trends on BBH	Review major academic and business journals	Literature search	The most appropriate characteristics for customer-focused organization
Work with human resources and senior management to establish Ready H/C standards	Identify performance excellence standards	Team skills and consensus	Standards and levels of expectation
Update job descriptions and performance planning models to new standards	Writing and formatting job descriptions	Written communication, team communication, and consensus	Standardized job descriptions effective to new culture
Develop training materials for standards for current employees and hiring supervisors	Needs analysis and course development	Systems approach to education, instructional systems development	Effective package for skills transfer
Announce rollout, timelines, and measurements	Plan and design announcement materials	Market analysis	Feedback on acceptance level of organization
Work with supervisors and employees to put standards into each performance plan	Coach and advise at line-management level	Mentoring and coaching	All employees comfortable with performance plan in place
Gather feedback, adjust, report, and maintain	Data gathering, analysis, and reporting	Measurements, written communication, reporting	Quantitative and qualitative data for process improvement

Table 5.4 Task assignments for standards of performance project.

Action, step, or task	To whom assigned	Begin date	End date	Outcome	How measured
Benchmark other hospitals for standards of service performance	Marion Fisher	1/10/04	3/31/04	Report on best practices from other hospitals	Completed report, usable benchmark performance standards
Gather and review all current job descriptions	Human resources	1/10/04	2/10/04	All job descriptions located and numbered	Listed and numbered
Research journals for trends on BBH	Consultant	3/31/04	4/30/04	Interview questions for each performance standard	BBH questions and guidelines approved
Work with human resources and senior management to establish Ready H/C standards	Marion Fisher and consultant	4/1/04	4/30/04	Establish standards for Ready H/C system	Standards approved and published
Update job descriptions and performance planning models to new standards	Human resources	3/15/04	5/1/04	Consistent job descriptions using new standards	Completion and availability to system
Develop training materials for standards for current employees and hiring supervisors	Consultant and VP of human resources	3/31/04	4/30/04	Training package	Package approved and printed
Announce rollout, timelines, and measurements	James Brown, CEO	2/1/04	2/1/04	Commitment and awareness	Do it and document
Work with supervisors and employees to put standards into each performance plan	Human resources, Marion Fisher, and service line managers	5/1/04	9/30/04	All new performance plans in place	Number of plans in place, feedback from all
Gather feedback, adjust, report, and maintain	Marion Fisher	1/10/04	12/15/04	Data for improvement	Various

ANTICIPATING THE IMPACT OF CHANGE ACROSS THE SYSTEM

Everyone signs up for continuous improvement. Of course—great idea! Why wouldn't we go for that? Well, we also need to get our minds around the certainty that continuous improvement means continuous measurement, change, challenge, activity, and organizational friction.[4]

This chapter addresses the frontline activities that are necessary to realize the required outcomes. These activities constitute change. Some of the activities are small changes; some are huge. Change often causes resistance.

IBM Business Solutions published a valuable paper titled *Making Change Work*. This paper discusses a model called the change diamond, which summarizes the components required for effective and sustainable change. The components of the diamond, as shown in Figure 5.13, are greater than the sum of the parts.

Figure 5.13 lists the four facets of effective organizational change. Only if all four of these facets or perspectives are understood and applied at the task level will improvement be realized. These facets are described as:

- *Real insights, real actions.* Strive for a full, realistic understanding of the upcoming challenges and complexities, and then follow with actions to address them.
- *Solid methods, solid benefits.* Use a systematic approach to change that is focused on outcomes and closely aligned with formal project management methodology.
- *Better skills, better change.* Leverage resources appropriately to demonstrate top management sponsorship, assign dedicated change managers, and empower employees to enact change.
- *Right investment, right impact.* Allocate the right amount for change management by understanding which types of investments can offer the best returns, in terms of greater project success.[5]

While each facet of the change diamond had a distinct benefit individually, when companies combined all four facets their overall project success increased dramatically—

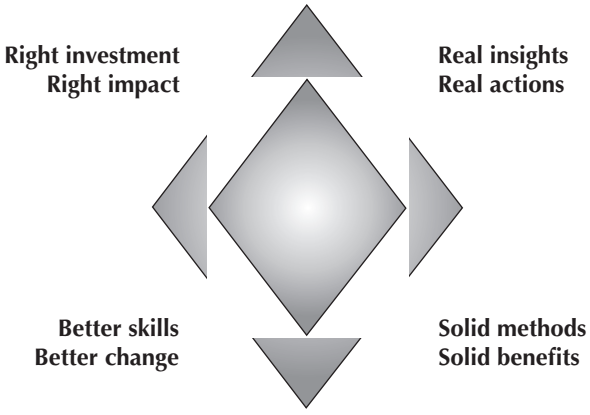


Figure 5.13 The change diamond.

Source: H. H. Jørgensen, L. Owen, and A. Neus, *Making Change Work: Continuing the Enterprise of the Future Conversation*, IBM White Paper (Somers, NY: IBM Global Services, 2008), 15.

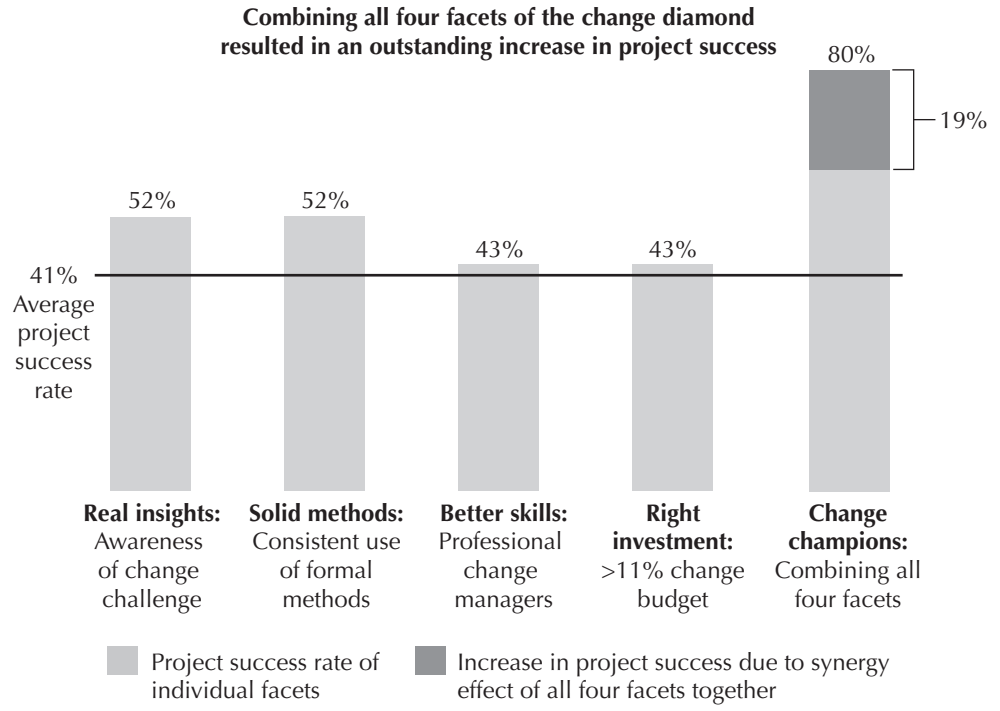


Figure 5.14 Individual versus aggregate effect of various actions.

Source: H. H. Jørgensen, L. Owen, and A. Neus, *Making Change Work: Continuing the Enterprise of the Future Conversation*, IBM White Paper (Somers, NY: IBM Global Services, 2008), 34.

far more than the effect of the individual parts would indicate. Neglecting even one area can inhibit change excellence. As shown in Figure 5.14, combining all four facets of the change diamond resulted in an outstanding increase in project success.

To truly shine in enacting change, organizations need to "polish" all four facets of their change diamond. By combining all four facets, leadership attained an 80% success rate—an increase far beyond the individual effects. Together, Figures 5.13 and 5.14 demonstrate the potential rewards of devoting attention to:

- Real insights, real actions
- Solid methods, solid benefits
- Better skills, better change
- Right investment, right impact[6]

CONCLUSION

The kaizen event is a social vehicle for process change. Creating collective experiences capable of changing beliefs brings clarity and focus to such discussions. Culture has changed when a critical mass of people in an organization change some significant shared belief. A kaizen event is a transformative experience, a series of well-orchestrated events and a powerful lever for moving the culture in the desired direction.[7]

Modular Kaizen respects the current culture of the organization and works with all levels of leadership and the workforce to integrate the tools of process improvement into everyday activity.

Starting with a well-written, clearly defined problem statement, vision, and project scope ensures that the project team and stakeholders have a common understanding of what is expected. Improvement needs to be set up as a project with the following attributes:

- "A problem statement
- A clear, measurable set of objectives such as "reduce customer complaints by 10%" or "reduce processing time by 2 days"
- A clearly defined scope
- A clear plan of who is responsible for delivering what, by when
- Properly allocated resources—(people and money)"[8]

Tangible deliverables should be produced as part of each drill-down to the next level of activity. As shown in the worksheets in Tables 5.2, 5.3, and 5.4, each time a requirement was discussed or a task assigned, a measurement was identified. The work performed during each iteration should be prioritized and the project team should focus its efforts on high-priority items first. Feedback sessions should be conducted at the end of each iteration to capture lessons learned and to make improvements for the next iteration.[9]

NOTES

1. Grace Duffy, John Moran, and William Riley, "Rapid Cycle PDCA," *Texas Quality Foundation Newsletter*, August 2009, 2.
2. Geary A. Rummler, Alan J. Ramias, and Richard A. Rummler, "Potential Pitfalls on the Road to a Process-Managed Organization (PMO), Part 1: The Organization as System Lens," *ISPI Performance Improvement Journal* 48, no. 4 (2009): 8.
3. DMADV stands for Define, Measure, Analyze, Design, and Verify—an innovation process that ensures that an organization's products, processes, or services consistently meet current customer requirements.
4. Jean Harvey, "Make the Leap; A Kaizen Event: An Experience That Can Transform Beliefs," *Quality Progress*, May 2012, 33–38.
5. Hans Henrik Jørgensen, Lawrence Owen, and Andreas Neus, *Making Change Work: Continuing the Enterprise of the Future Conversation*, IBM White Paper (Somers, NY: IBM Global Services, 2008), 15.
6. Jørgensen, Owen, and Neus, *Making Change Work*, 36, 37.
7. Harvey, "Make the Leap," 38.
8. John Parker, "10 Keys for Successful Process Improvement Programs (Part 1)," *Business Analysis & Requirements Management Blog*, April 17, 2012, http://blog.enfocussolutions.com/Powering_Requirements_Success/bid/133157/10-Keys-for-Successful-Process-Improvement-Programs-Part-1.
9. Ibid.

Chapter 6
The Tools of Modular Kaizen

INTRODUCTION

Modular Kaizen is based on the concept of lean enterprise, which employs tools for efficient use of resources across the whole system of interrelated processes within an organization. Traditional lean tools grew out of the automotive and manufacturing industries and, over time, were modified to support service and other transactional environments. Modular Kaizen modifies many of the same tools for a highly interruptive, fast-paced workplace.

Figure 6.1 lists the major tools of Modular Kaizen. These tools are designed to assess current-state performance, identify process disruptions, and reduce or eliminate any waste that lessens the efficiency of the overall flow of operations.

As shown in Figure 6.1, the foundation for any improvement effort is change management. Modular Kaizen uses change management to anticipate potential

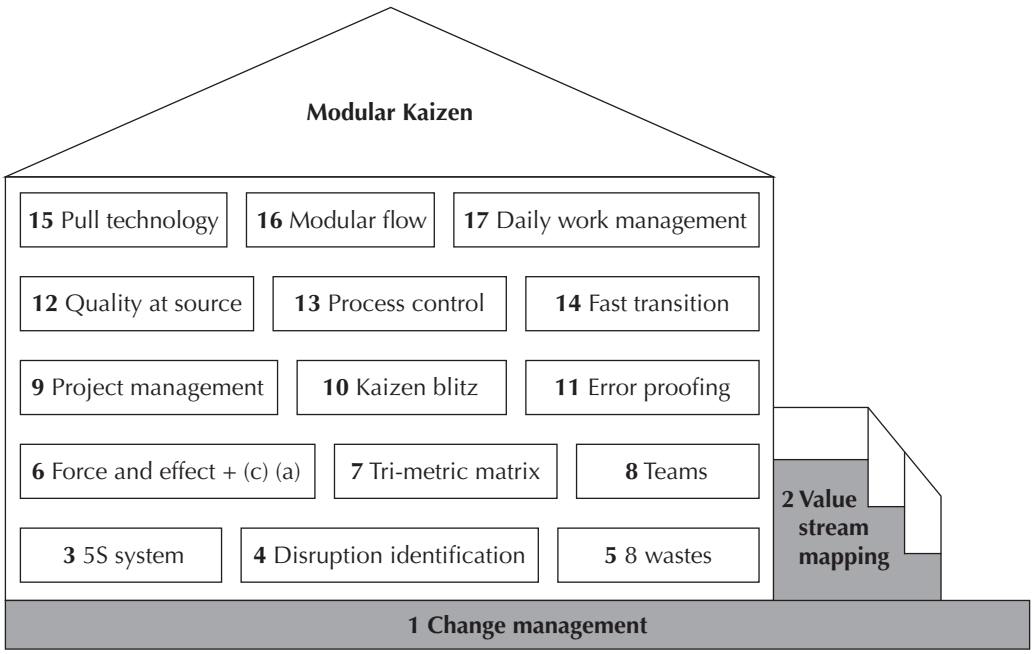


Figure 6.1 The House of Modular Kaizen.

change to the organization. Change creates an opportunity for improvement. The entry into the House of Modular Kaizen is value stream mapping, a technique for identifying opportunities for efficiency and elimination of process waste.

Figure 6.2 suggests a sequence for using the tools of Modular Kaizen within the Plan-Do-Check-Act (PDCA) cycle for process improvement. The individual tools are described later in this chapter. Strategic tools are used to establish an overall structure to support PDCA activities. During the **Plan** phase of the PDCA cycle, measures are used to identify any disruption to the expected process flow. Opportunities for improvement are prioritized on the basis of an integrated performance management system, tracking key objectives of the organization. Chapter 3 describes the value of alignment with organizational priorities using performance management. The **Do** phase uses tools to test improvement options for the best alternative on the basis of resources available in the time allowed. The Modular Kaizen tools suggested during the **Check** phase focus attention on specific areas of disruption, while performance management again is the basis of the **Act** phase, where updated processes are standardized for ongoing sustainment of efficiencies.[1]

The tools of Modular Kaizen are applicable to any process improvement model. Although the PDCA model is commonly used, the Define, Measure, Analyze, Improve, Control (DMAIC) model is equally effective for identifying and eliminating disruptions to existing processes. Figure 6.3 shows the suggested sequence of Modular Kaizen tool use for the DMAIC model.

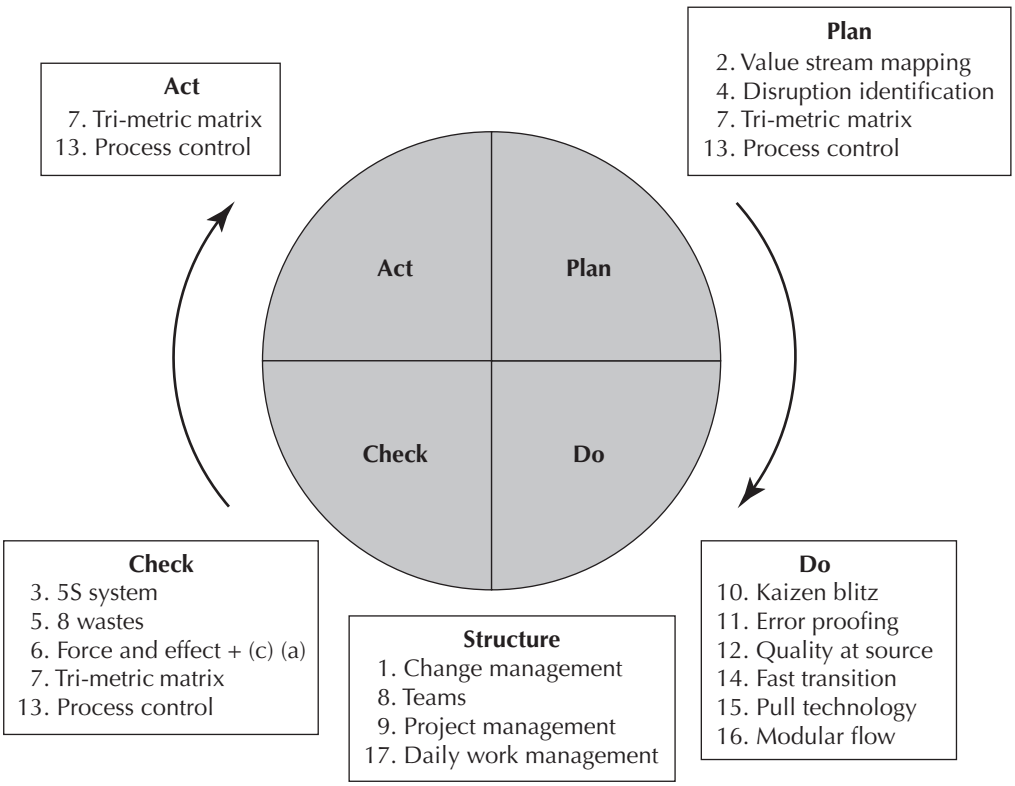


Figure 6.2 Sequence of the Modular Kaizen tools by PDCA phase.

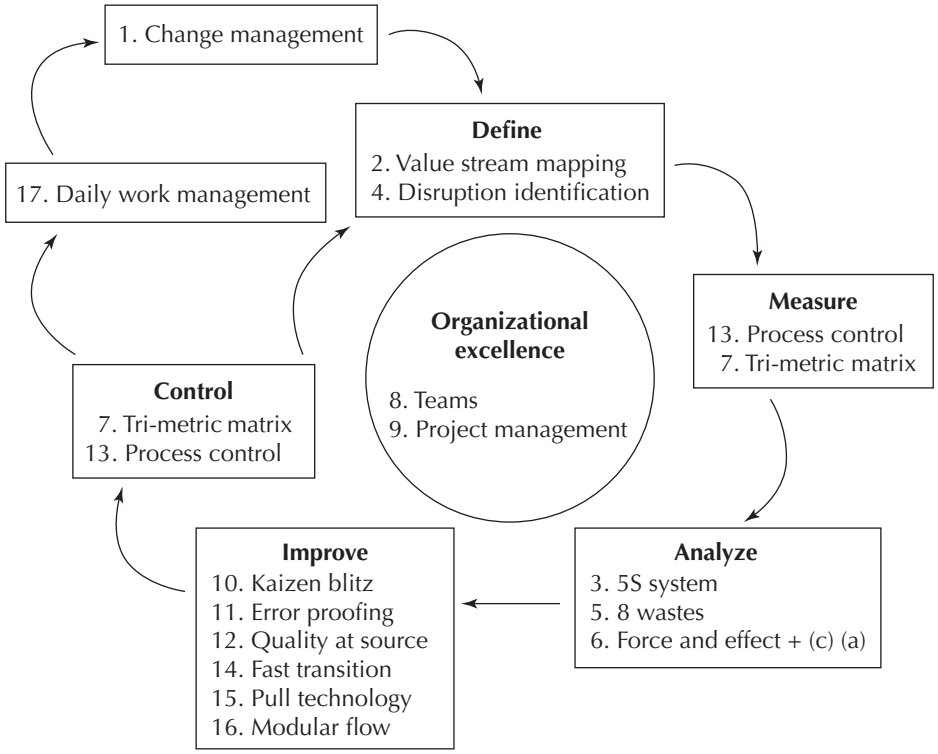


Figure 6.3 Use of the Modular Kaizen basic tools mapped to the DMAIC improvement model.

The DMAIC improvement model uses a different sequence of tools from that of PDCA. The DMAIC model, although similar to PDCA, focuses on Measure as a distinct activity during the initial planning stages of a project. This distinction is valuable. Measurement clarity early in project planning provides a quantitative base from which to make decisions on the best avenues for additional information gathering and subsequent analysis. Having a good understanding of the current state of a process is critical before choosing potential solutions with which to pilot during the Improve phase of the project.

THE EVOLUTION OF THE HOUSE OF MODULAR KAIZEN

The Modular Kaizen set of tools is closely related to the traditional lean enterprise tool kit. Figure 6.4 is the traditional House of Lean as described by George Alukal and Anthony Manos.[2] The terminology describing the individual tools in the traditional House is based on manufacturing applications. Success using the lean tools within manufacturing created interest by other industries in realizing the same efficiencies. Early work by Michael George[3] using lean combined with Six Sigma tools within the service industry encouraged many organizations to modify the initial manufacturing tools to a broad range of industries, including healthcare, nonprofit, government, and others.

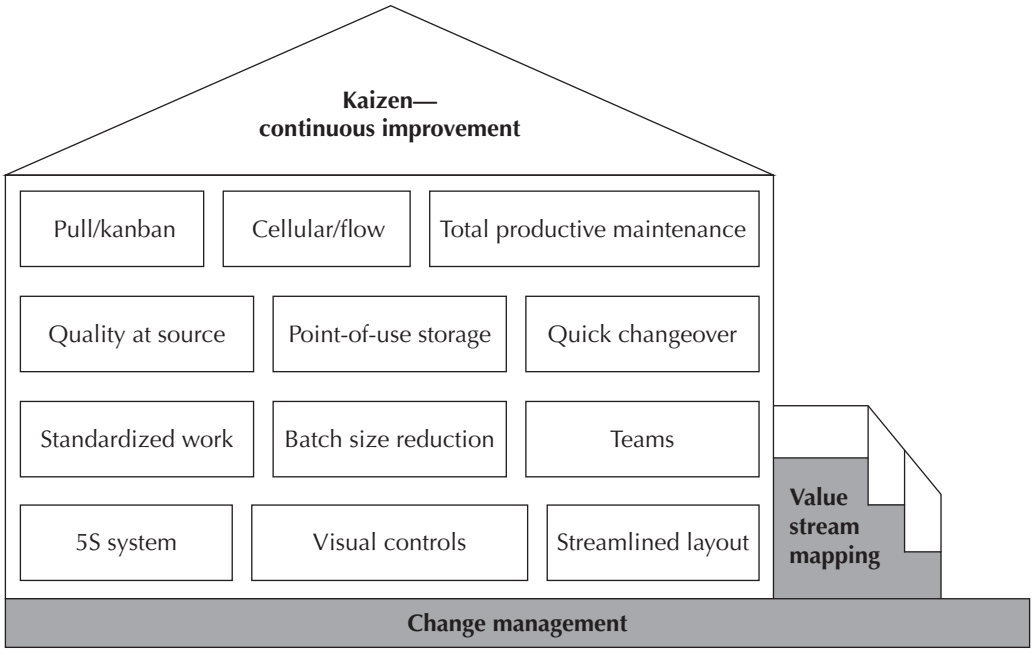


Figure 6.4 Traditional House of Lean.

Source: G. D. Beecroft, G. Duffy, and J. Moran, *The Executive Guide to Improvement and Change* (Milwaukee, WI: ASQ Quality Press, 2003), 134.

The building blocks of the traditional House of Lean include:

- *Change management:* A process that helps define the steps necessary to achieve a desired outcome.
- *Value stream mapping (VSM):* A special type of process map that examines flow within a process with the intent of maximizing efficiency and eliminating waste or non-value-added steps.
- *5S system:* A visual method of setting the workplace in order. It is a system for workplace organization and standardization. The five steps of this technique all start with the letter "s" in Japanese (*seiri*, *seiton*, *seison*, *seiketsu*, and *shitsuke*). These five terms are loosely translated as *Sort*, *Set in order*, *Shine*, *Standardize*, and *Sustain* in English. This Lean-Six Sigma (LSS) tool is often used in both front- and back-office applications. Clean, orderly workplaces reduce both aural and visual noise.
- *Visual controls:* The placement in plain view of all tooling, parts, production activities, and indicators so that everyone involved can understand the status of the system at a glance is crucial. Labeling of storage cabinets, closets, and other workstation resources is an example of this tool, along with diagrams of frequently performed activities for either clients or staff.
- *Streamlined layout:* A workplace needs to be designed according to optimum operational sequence. VSM is a means of representing the flow of the product or service through the process. A few of the important components of this flow include value-added activities, non-value-added activities, non-value-added

but necessary activities, work in process (WIP), inventory (queues), processing time, and lead time.

- *Standardized work:* The consistent performance of a task—according to prescribed methods, without waste, and focused on ergonomic movement—is important. A spaghetti diagram is a visual representation that uses a continuous flow line to trace the path of a task or activity through a process.
- *Batch size reduction:* The best batch size is one-piece flow. If one-piece flow is not appropriate, the batch size should be reduced to the smallest size possible.
- *Teams:* In a lean environment, emphasis is on working in teams, whether they are process improvement teams or daily work teams. LSS incorporates the use of teams whenever possible to provide multiple perspectives for decision making and problem solving.
- *Quality at the source:* Inspection and process control by frontline employees helps them to be certain that the product or service passed on to the next process is of acceptable quality. Since staffing is usually tight, having more than one person in the office with the appropriate skills saves time and provides backup within the office.
- *Point-of-use storage:* Raw material, parts, information, tools, work standards, procedures, and so on, should be stored where needed. Natural work teams within a department often design a common work area to maximize availability of supplies and workstations for effectiveness of staff within the office.
- *Quick changeover:* The ability to change staff or equipment rapidly, usually within minutes, so that multiple products in small batches can be run on the same equipment is crucial. Another common application is the consolidation of computerized data input systems so that staff does not have to take one program down and bring up another to input different forms when working with the same client.
- *Pull/kanban:* This system of cascading production and delivery instructions from downstream to upstream activities directs the upstream supplier not to produce until the downstream customer signals a need, using a "kanban" system.
- *Cellular/flow:* Physically linking and arranging manual and machine process steps into the most efficient combination to maximize value-added content while minimizing waste leads to single-piece flow.
- *Total productive maintenance:* This lean equipment maintenance strategy maximizes overall equipment effectiveness. Although the title of this tool seems complex, it is really quite simple. Every office has equipment such as copiers, printers, or shredders that require scheduled maintenance, calibration, new release updates, and so on. A preprinted checklist or electronic reminder system for when administrative, technical, or other programmatic updates are required minimizes downtime or lack of availability of equipment when needed.

Figure 6.1 uses the format of the traditional House of Lean to identify the major tools adjusted for the Modular Kaizen application appropriate for highly "interrupt-driven" organizations. Some of the tools are pulled directly from the traditional

lean techniques. Others have been modified or replaced to better support the modular nature of the planned improvement steps of Modular Kaizen. Change management remains the foundation for Modular Kaizen, just as it supports traditional lean concepts. A culture of quality improvement requires the adoption of change on a continuous basis to maximize resources based on flexibility and agility to meet customer requirements. The tool that identifies opportunities to employ Modular Kaizen is also consistent with traditional lean concepts. VSM, as a follow-on to flowcharting and process mapping, remains a robust vehicle for identifying disruptions and opportunities for improvement within existing processes or those under initial design.[4]

The following are tools identified within the House of Modular Kaizen:

1. *Change management:* A process that helps define the steps necessary to achieve a desired outcome.
2. *VSM:* A special type of process map that examines flow within a process with the intent of maximizing efficiency and eliminating waste or non-value-added steps.
3. *5S system:* A visual method of setting the workplace in order. The use of 5S is no different under the concept of Modular Kaizen or traditional lean. Although first documented for organizational effectiveness within manufacturing and assembly operations, 5S is successfully used in hospitals, front offices of small businesses, nonprofits, and organizations of all types. Some simple examples of each of the five organizing activities are:
   - *Sort*—Separate items, documents, or ideas. Distinguish the necessary from the unnecessary. Get rid of what no longer holds value. Free up space for other materials and ideas that support the organization more effectively.
   - *Straighten*—"A place for everything and everything in its place" is applicable for this step. Pegboards with locations clearly marked in a home garage or workshop, the numbering and proper placement of books in a library, or organization of the supply cabinet in the office so that it is neat and easy to use exemplifies this step.
   - *Shine*—Straightening up the copier room, washing and waxing hospital hallways, keeping oil and grease off the automobile service bay floor, or keeping equipment clean in the laboratory supports this step.
   - *Standardize*—It is helpful to have as few ways to perform frequent activities as possible. Monitor and maintain the first three Ss. Standardized processes, work flows, documentation, and equipment, where possible, simplify the workplace. This element facilitates cross-training, providing backup for tasks and minimizing work procedures.
   - *Sustain*—Exert the discipline to stick to the 5S procedures for the long term. Set a schedule to Sort, Straighten, Shine, Standardize, and Sustain so that this iterative set of activities perpetually reinvigorates the workplace and the staff who populate it. Clean, orderly workplaces reduce noise, both aural and visual.

5S can be instituted in any location. A wheel bearing maintenance facility in Charleston, South Carolina, used 5S to:

- Sort all liquids and chemicals in the work area for safety and toxicity
- Set in order all materials, storing all liquids and chemicals according to restrictions based on safety documentation
- Shine all work areas to remove trash, spills, and extra materials; clean floors, work surfaces, and machinery
- Standardize the work areas by flowcharting and documenting the steps for safety, consistency, and ease of training new employees
- Sustain the process by including measures and review points for the location's team coordinator and first-line supervisor

4. *Disruption identification:* Identifying the places where work is interrupted or where the process breaks down provides excellent opportunities for improvement. Disruptions identify either organizational bottlenecks or specific breaks in the flow of daily operations and procedures that waste time or other resources. Disruptions are not limited to processes that create products or services. Communication among coworkers can also be disrupted by attitudes, unexpected occurrences, or misunderstandings. Anything that insinuates waste into a transaction or process can be considered a disruption. Figure 6.5 illustrates a form used to document disruptions and identify the impact and potential actions to resolve. The disruption identification form provides an effective tool for facilitating conversation among involved and impacted parties concerning the disruption and optional solutions for minimizing or eliminating the disruption moving forward.

5. *8 wastes:* If an activity consumes resources, time, or capital but does not add value, it is wasteful and should be eliminated. The idea is to eliminate as many of these wastes as possible in daily work activities. Removing waste makes additional time and resources available for higher-priority outcomes of the department. The 8 wastes are shown in Table 6.1.

6. *Force and effect + (c) (a):* This chart is designed to identify barriers to agreement among team members concerning a specific situation. Once barriers are identified, the Check (c) and Act (a) phases of the improvement cycle are used to resolve disruptions and to return to stable operation.

   Figure 6.6 is an example of using a modified force and effect chart to guide discussion on priority actions for reducing the disruption of a major power outage in a medical facility. The force and effect chart is described in detail in Chapter 7, "A School of Fishbones Guides Quality Improvement."

   The force and effect + (c) (a) tool addresses each identified symptom of a disruptive state by associating it with an action for resolution or minimization. For the most disruptive negative impacts, check (c) to see what is the extent of the impact—both quantitative (time, temperature, etc.) and qualitative (feelings, perceptions, etc.) measures can be used. Display the measure visually on a graph, pie chart, or radar chart. Use the Modular Kaizen disruption

Modular Kaizen disruption identification form: High-priority barriers to address

Process or activity name:	Prepared by:
Responsible:	Date (orig) _____ (rev) _____

Process or activity step	What is the disruption?	Impact of disruption	Priority	Potential causes	How is the disruption managed now? (Measure)	Recommended actions (Analyze)	Performance measures (Control)	Owner	Actions taken (Improve)
What is the process step/ activity under investigation?	In what way is the activity impacted?	What is the impact on the outcome (customer requirements) or internal requirements?	How severe is the impact?	What causes the activity to go wrong?	What are the existing controls and procedures that prevent either the cause or the disruption?	What actions will reduce the occurrence of the cause or minimize the disruption?	What controls or measures will effectively prevent this disruption from recurring?	Who is responsible for the recommended action?	What are the completed actions taken to eliminate the disruption?
Stripping and waxing hallway floors on third shift	Hospital hallway floor is still wet after stripping and waxing during third-shift maintenance	Visitors, patients, and staff may walk on wet and slippery floor when arriving at start of first shift	High/safety	Improper schedule for start of floor maintenance on third shift	Procedure is in place to time maintenance procedure from start of third shift	Enforce procedure use so maintenance staff begin floor stripping at start, not middle, of third shift	Awareness training, maintenance schedule checklist, team leader review, and follow-up	Environmental services team lead or supervisor	Nightly review by third-shift team leader for start and completion of maintenance activity

Figure 6.5 Modular Kaizen disruption identification form for DMAIC improvement approach.

Table 6.1 Eight types of waste.

Waste	Description	Example
Overprocessing	Spending more time than necessary to produce the product or service	Combining client survey instruments into one form rather than developing specific instruments for each program
Transportation handling	Unnecessary movement of materials or double handling	Department vehicles stored in a central facility, requiring constant movement of vehicles to and from other high-traffic locations
Unnecessary motion	Extra steps taken by employees and equipment to accommodate inefficient process layouts	Laboratory testing equipment stored in cabinets far from specialists' work area
Unnecessary inventory	Any inventory that is not directly required for the current client's order	Overestimating vaccination support materials, requiring additional locked storage cages, inventory counting, and reconciliation
Waiting	Periods of inactivity in a downstream process that occur because an upstream activity does not produce or deliver on time	Paperwork waiting for management signature or review
Defects	Errors produced during a service transaction or while developing a product; damage to equipment	Ineffective scripts for initial intake applications or unclear directions for filling out required forms
Overproduction	Items produced in excess quantity and before the customer needs them	Too many dated client information collection sheets prepared at beginning of shift
People	Not fully utilizing people's abilities (mental, creative, skills, experience, and so on); under- or overutilization of resources can also include waste created by safety issues impacting the human involvement within processes	Poor job design, ineffective process design within business functions, lack of empowerment, and maintaining a staffing complement not in balance with workload demand

identification form (see Figure 6.5) to brainstorm and organize high-priority barriers.

Where applicable after (c), take small actions (a) appropriate at that time. Take no major action until the overall impact of the disruption is fully understood. These modularized short-term actions make impacts that provide some stability to the disruption and will potentially be part of the long-term solution. Each of these modularized actions may involve subject matter experts called on to help for short periods.

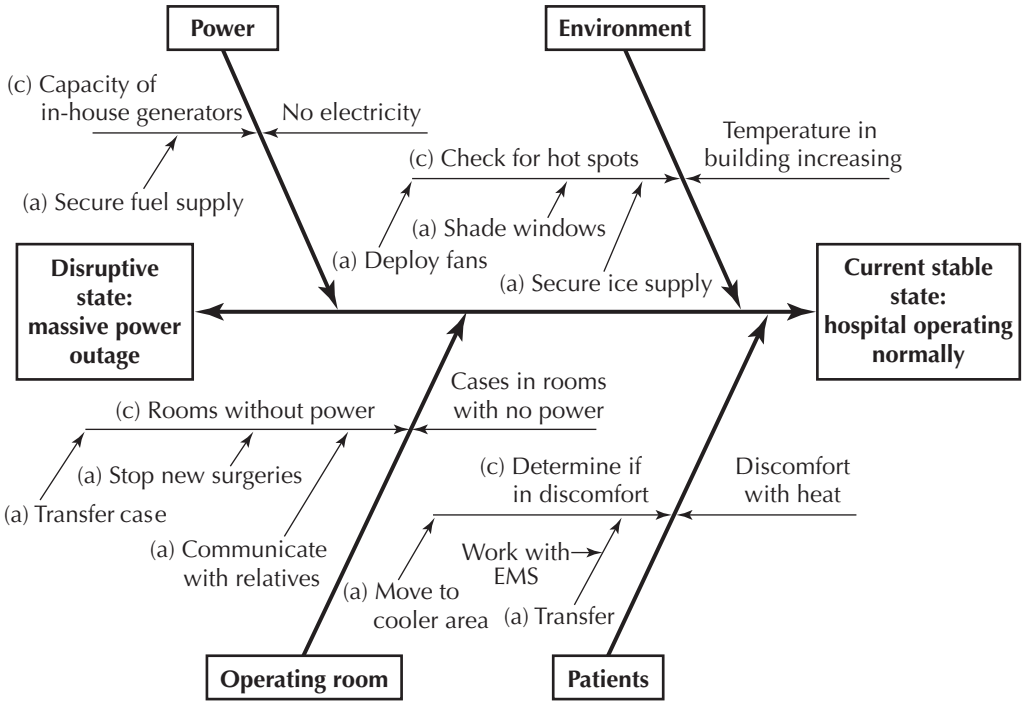


Figure 6.6 Force and effect + (c) (a) example for reducing disruption from a power outage.

Source: R. Bialek, G. Duffy, and J. Moran, *Modular Kaizen: Dealing with Disruptions* (Washington, DC: Public Health Foundation, 2011), 124.

7. *Tri-metric matrix:* The tri-metric matrix helps the decision maker measure important aspects of a process's capacity, capability, and outcomes. Table 6.2 is a worksheet designed to guide the identification and documentation of the three types of measures used to sustain process performance. This figure reflects the project discussed in full in Chapter 10, "Meeting Effectiveness Evaluation Project." Illustrations of the use of the tri-metric matrix are provided in Chapter 8, "Process and Outcome Measures in Modular Kaizen."
8. *Teams:* In the lean environment, the emphasis is on working in teams, whether they are process improvement teams or daily work teams. Modular Kaizen employs teams not only for the traditional purposes but also for backup when subject matter experts are interrupted from their improvement efforts to address other key business priorities. Figure 6.7 identifies six essential characteristics for an effective team member, including detailed attributes for each characteristic.[5]
9. *Project management:* This tool involves all activities associated with planning, scheduling, and controlling projects. Good project management ensures that an organization's resources are used efficiently and effectively.[6]
10. *Kaizen blitz:* An event in which people work only on an improvement project. In a traditional kaizen blitz project, the people from a particular work area come together with select experts for three to five consecutive days and complete

Table 6.2 Tri-metric matrix of board of director meeting evaluation.

Tri-metric	Indicator	Definition	Baseline	Improvement target
Capacity	Board meeting agenda covered completely	The items to be covered during a single board meeting are all addressed by consensus of board attendees	6/7/12—Agenda of previous board meeting covered 100% of priority items and 67% of nonessential items	9/6/12—All items scheduled to be addressed on board meeting agenda covered to satisfaction of board attendees
Process	Board meeting agenda managed according to defined policy and procedure	Board policy #12-3 defines sequence and flow and responsibilities for conducting quarterly board meetings	6/7/12—Policy in place, section 12-3:5 requiring meeting evaluation requires analysis and improvement	9/6/12—Policy section 12-3:5 updated by board-selected improvement team; new evaluation process piloted during third-quarter meeting
Outcome	Board members and company executive participants make effective decisions or take appropriate action on items listed on agenda	Each item on the agenda to be described effectively; action or decision specified without bias to outcome; background information available to all board attendees prior to meeting, if appropriate	6/7/12—All items adequately described; each item identified as action, decision, or information; background information available in preparatory packets mailed to attendees before meeting	9/6/12—Maintain high quality of information available to board meeting attendees for each item listed on agenda

most or all of a DMAIC cycle on a narrowly targeted, high-priority issue. The model has been so successful that this basic approach has been adapted to other uses such as service design sessions. Although Modular Kaizen is designed to address environments where it is not possible to employ the traditional kaizen blitz process, there are situations in which this focused activity can and should be scheduled and used effectively.

11. *Error proofing:* The implementation of fail-safe mechanisms to prevent a process from producing defects.
12. *Quality at source:* Inspection and process control by frontline employees ensures that the product or service passed on to the next process is of acceptable quality. Since staffing is usually tight, having more than one person in the office with the appropriate skills saves time and provides backup within the office.

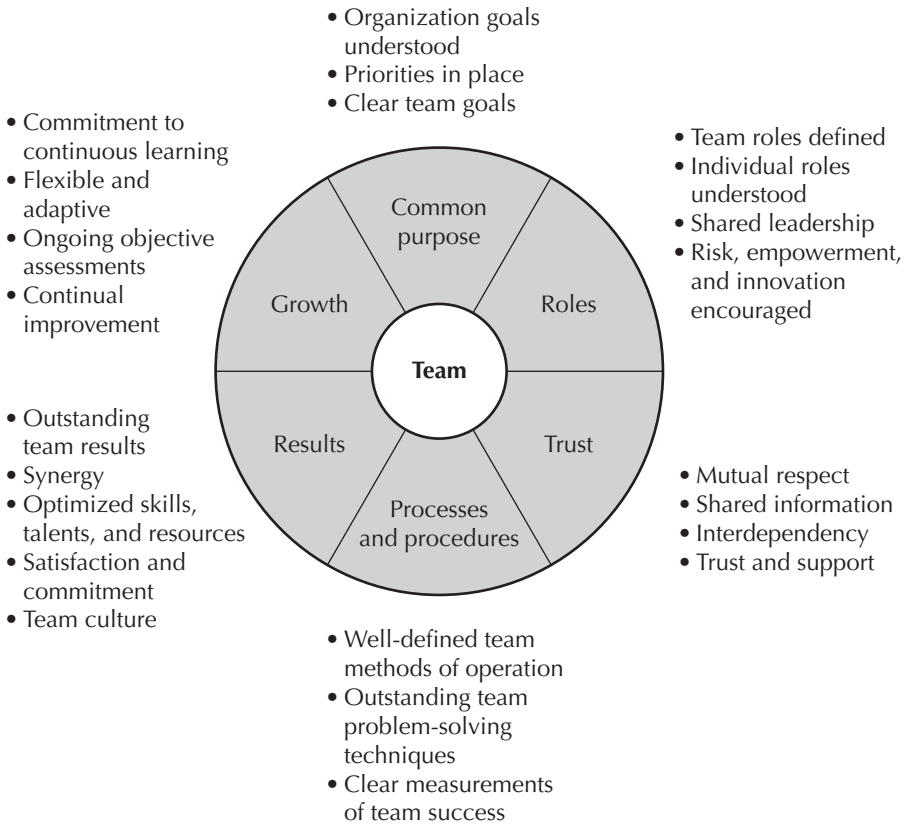


Figure 6.7 Essential team characteristics.

Source: G. D. Beecroft, G. Duffy, and J. Moran, *The Executive Guide to Improvement and Change* (Milwaukee, WI: ASQ Quality Press, 2003), 89.

13. *Process control:* This tool is used to monitor, control, and improve process performance over time by studying variation and its source. Modular Kaizen uses a combination of run, control, and Paynter charts to track and represent process performance visually.
14. *Fast transition:* This tool is translated from quick changeover in a production environment to a service environment by providing cross-training for staff to allow quick movement from one project or client requirement to another.
15. *Pull technology:* This system of cascading procedures and instructions from downstream to upstream activities ensures that the upstream supplier does not perform activity related to a specific transaction or service until the downstream customer signals a need.
16. *Modular flow:* Organizations often empower an improvement team of cross-functional staff, specialists, and management to create a seamless sequence of steps from client application, through processing, to delivery and final review. Modular Kaizen designs these sequenced steps into "chunks" that can be efficiently performed within the time frames allowed by a highly interruptive workplace.

17. *Daily work management:* The utilization of the tools and techniques of quality improvement in day-to-day work activities by those doing the work is crucial. Daily work management puts control and change at the lowest level possible within the organization. Quality improvement in daily work is called daily work management because it uses the tools and techniques of quality improvement to make daily work better, more customer focused, and more manageable.

Use of the tools contained within the House of Modular Kaizen is not limited to the PDCA or DMAIC phase in which they are listed in Figures 6.2 and 6.3. Although the tools strongly support the phases identified in Figures 6.2 and 6.3, like all tools, they are to be used when conditions are appropriate. Modular Kaizen encourages early project planning to design and implement process improvement activities in a series of tasks that can be accomplished within the normal work flow of team members and subject matter experts.

NOTES

1. R. Bialek, G. Duffy, and J. Moran, *Modular Kaizen: Dealing with Disruptions* (Washington, DC: Public Health Foundation, 2011).
2. G. D. Beecroft, G. Duffy, and J. Moran, *The Executive Guide to Improvement and Change* (Milwaukee, WI: ASQ Quality Press, 2003).
3. M. George, *Lean Six Sigma for Service* (New York: McGraw-Hill, 2003).
4. Bialek, Duffy, and Moran, *Modular Kaizen*, 17.
5. John Bauer, Grace Duffy, and Russell Westcott, *The Quality Improvement Handbook*, 2nd ed. (Milwaukee, WI: ASQ Quality Press, 2005).
6. J. Evans and W. Lindsay, *The Management and Control of Quality*, 6th ed. (Mason, OH: Thomson South-Western, 2005).

Chapter 7
A School of Fishbones Guides Quality Improvement

The structure of a fishbone diagram graphically illustrates the relationship between a given outcome and all the factors that influence the outcome. The original fishbone tool, the cause and effect diagram, is sometimes called the Ishikawa diagram (after its creator, Kaoru Ishikawa) or the fishbone diagram (due to its shape). Figure 7.1 shows the basic configuration of the fishbone family of tools.

This type of diagram displays the factors that are thought to affect a particular output or outcome in a system. The factors are often shown as groupings of related subfactors that act in concert to form the overall effect of the group. The diagram shows the relationship of the parts (and subparts) to the whole by:

- Determining the factors that cause a positive or negative outcome (or effect)
- Focusing on a specific issue without resorting to complaints and irrelevant discussion
- Determining the root causes of a given effect
- Identifying areas where there is a lack of data

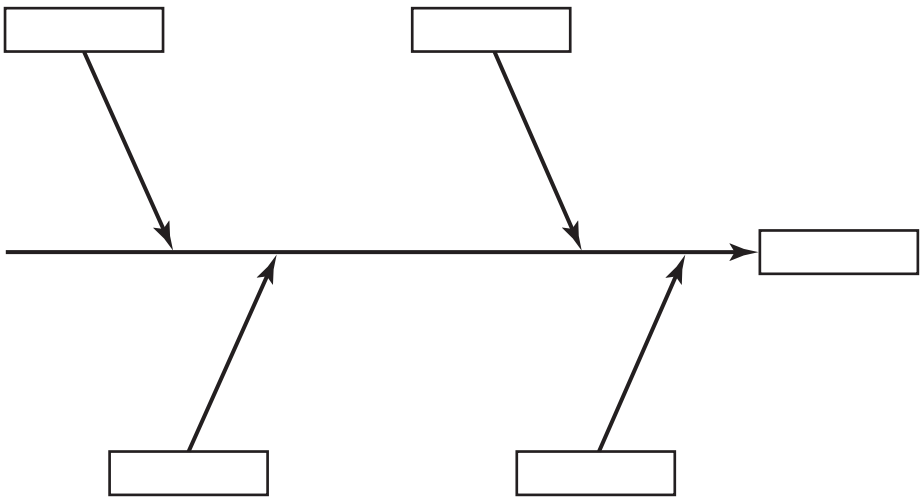


Figure 7.1 Generic fishbone diagram configuration.

The fishbone construct is a useful format for organizing thoughts around a number of improvement opportunities. A family of fishbones that guide information gathering and analysis include:

- Force and effect chart
- Solution and effect diagram
- Success and effect diagram

The cause and effect diagram is the foundational tool for organizing an individual's or team's thoughts related to the symptoms that impact a particular outcome or effect. Since dialogue is beneficial to exploring the impact of observed symptoms, the force and effect chart provides a focus for facilitated resolution of conflict between individuals surrounding the impact or validity of the suggested symptom. The solution and effect diagram is the final tool in the problem-solving sequence of fishbones. This construct allows the team to focus closely on symptoms or issues that have a high potential for affecting the outcome under study. Brainstorming possible solutions for high-priority root causes opens team thoughts to creative solutions to be studied for viability and appropriateness.

The success and effect diagram is a tool developed to encourage positive discussion around opportunities that leverage existing skills and successes for improvement. This fishbone can stand alone or be combined with a force and effect chart and solution and effect diagram to choose a high-priority opportunity to exploit for greater process performance or total redesign.

CAUSE AND EFFECT DIAGRAM

The cause and effect diagram is used for identifying potential causes of a problem or issue in an orderly way. It can help answer questions such as "Why does it take so long for my meal to arrive?" "Why isn't mail being answered on time?" and "Why are our orders taking so long to be shipped?" It is also used for summarizing major causes into categories.

Although individuals and teams use the cause and effect diagram, it is most effective when used within a group. The team leader usually draws the fishbone diagram on a board or flip chart, states the main problem, and asks for assistance from the group to determine the main causes of an event or effect. These causes are subsequently drawn on the board as the main "bones" of the fish, and eventually the entire cause and effect diagram is filled out. The team then discusses which causes are the most likely root causes of the problem.

The cause and effect diagram is useful when a problem-solving team needs to consider the complexity of a problem and can take an objective look at all the contributing factors related to the issue. Brainstorming both primary and secondary causes is often helpful for identifying a number of potential symptoms of the underlying issue. Involving a team of individuals familiar with the situation under analysis provides an effective environment for getting creative input for further study.

Figure 7.2 shows a completed diagram resulting from a team's initial effort to identify potential causes for customer confusion when a customer arrives at the reception area of a company. This example uses the four basic categories for

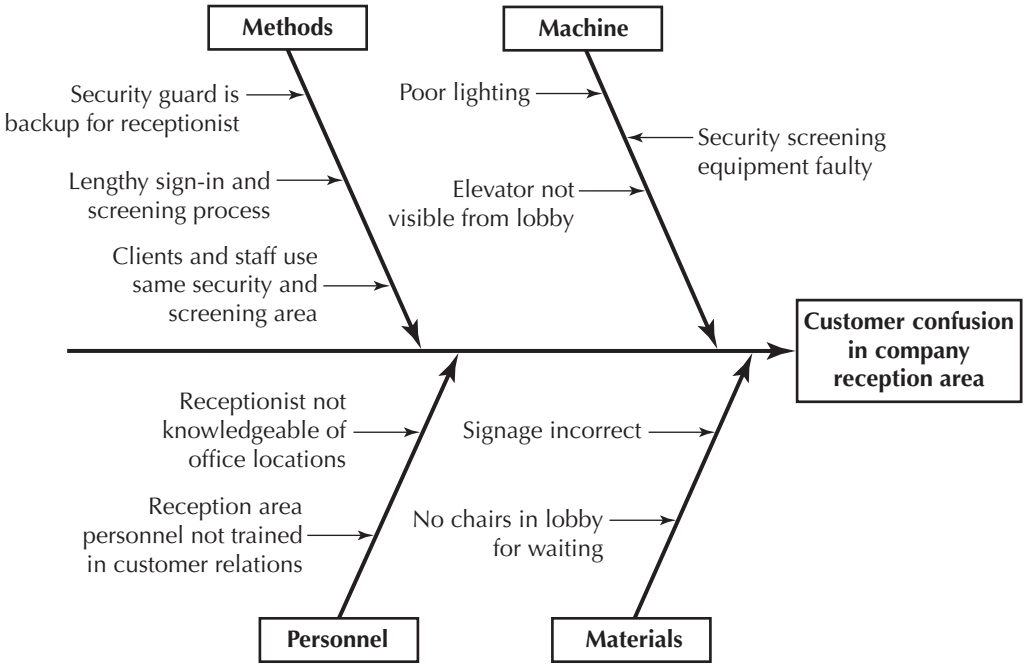


Figure 7.2 Cause and effect diagram for customer confusion in reception area.

symptoms originally recommend by Ishikawa: man (personnel), methods, materials, and machine.[1] Some references include a fifth recommended category: measurement. Although these five categories often are sufficient for organizing potential areas for solution, many teams use an open labeling process to identify the different groupings of observations on the basis of the specific content of the brainstorming output.

FORCE AND EFFECT CHART

The force and effect chart is designed to identify barriers to agreement among team members concerning a specific situation. It combines features of the cause and effect diagram with the dialogue of a force field analysis. Using the traditional fishbone structure, the right side of the header bone identifies barriers to attaining the desired effect, while associated left-side entries describe possible solutions to minimize these barriers.

The force and effect chart is constructed as follows:

1. Draw the basic fishbone structure
2. Summarize the current state and place it in the box on the far left
3. Describe the desired future state and place it in the box on the far right
4. Brainstorm the major cause categories and place them on the diagram as major cause branches or copy the cause categories from a previously developed cause and effect diagram

5. For each major cause branch, list the restraining forces (right side) and the driving forces (left side)
6. Determine the impact of each force as either high (H), medium (M), or low (L)
7. Beginning with the high-impact forces, determine how to:
   – Increase the strength of driving forces by asking why it happened and how to increase its positive effect
   – Decrease the strength of restraining forces by asking why it happened and how to decrease its negative effect
8. Once all the major forces, both positive and negative, have been analyzed, the team should develop an action plan to remove the barriers to the desired state.

Note in Figure 7.3 that the items originally observed in the cause and effect diagram in Figure 7.2 have been transferred to the right side of each of the category fishbones. Each observed symptom has been identified as high, medium, or low impact in attaining the desired state of "All entrants to reception area are quickly and clearly directed to destination." Additional barriers were added through team brainstorming as the force and effect conversation occurred.

The team circled high-impact positive drivers as potential solutions to be considered for further study using the solution and effect diagram. One medium-impact item ("Increase lighting") was also selected for priority consideration since the team sensed that a simple cleaning of the fixtures might alleviate some of the lighting issues.

The next step in the "fishbone" journey is to select one of the circled items in the force and effect chart to brainstorm and prioritize potential detailed solutions.

SOLUTION AND EFFECT DIAGRAM

A useful preparation for employing the solution and effect diagram is to use the 5 Whys technique. This technique allows a team to drill down to the details of a cause that has been identified. This is done by repeatedly asking "why" until no other causes can be identified. Figure 7.4 illustrates the relationship of the 5 Whys technique in looking for the root cause of a symptom on the cause and effect diagram, with the 5 Hows technique used during the solution and effect diagram discussion.

The solution and effect diagram is a derivative of the cause and effect diagram. Analysis is now focused on a solution rather than the cause. This tool identifies changes and recommendations for problem solving. Using the flow of thought from the original cause and effect diagram provides a systematic approach to analyze the solution more effectively than brainstorming alone.

The solution and effect diagram is useful when a problem-solving team needs to consider the complexity of a proposed outcome and take an objective look at all the contributing factors. Brainstorming solutions is a good start, but the use of the structured fishbone leads participants to consider both the primary and the secondary solutions to a problem by delving into the details in more depth.

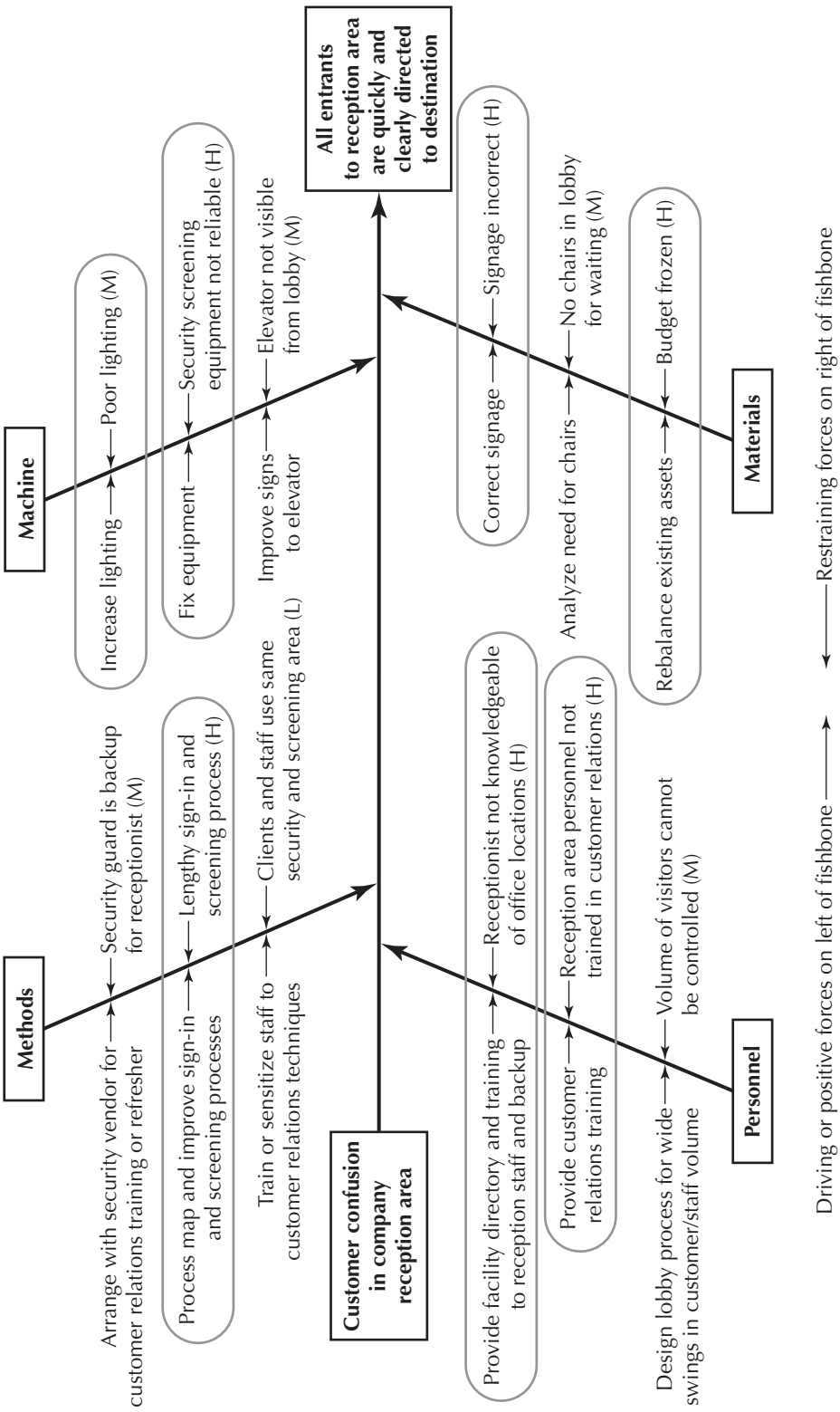


Figure 7.3 Force and effect chart: positive and restraining forces for customer confusion in reception area.

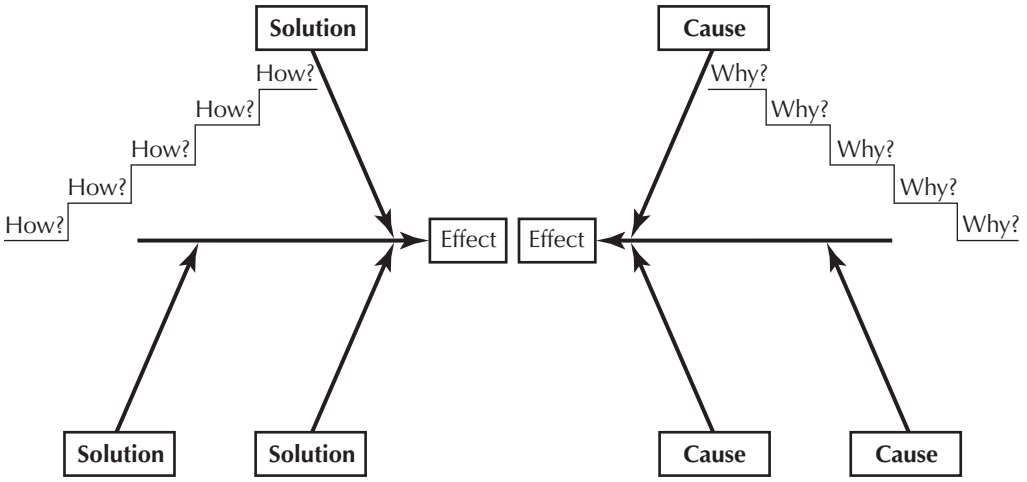


Figure 7.4 Relating the solution and effect diagram to the cause and effect diagram.

Source: R. Bialek, G. Duffy, and J. Moran, *The Public Health Quality Improvement Handbook (*Milwaukee, WI: ASQ Quality Press, 2009), 185–187.

Typical solution and effect category headings are similar to the cause and effect category headings:

- 4 Ms—manpower, materials, methods, machinery
- Policies
- Equipment
- Lifestyle
- Environment
- Etc.

Once team members are accustomed to using the fishbone format, they will assign category labels specifically associated with the content of the themes they are addressing for symptoms or solutions. The affinity tool is a good one to use for organizing the brainstorming output of ideas. The categorization of the affinity groupings automatically creates the labels for the cause and effect or solution and effect major "bones."

Figure 7.5 illustrates a 5 Whys exercise, drilling down to the root cause of one of the high-priority symptoms identified in the force and effect chart example from Figure 7.3. The 5 Whys technique can be used with the original cause and effect diagram or after the force and effect chart has identified the positive desired state. Figure 7.5 is based on the format for both the force and effect chart and the solution and effect diagram. It shows the current, defective state on the left side of the primary fish "backbone" and the desired or future "effect" on the right side. The "effect" is made into a positive statement of "All entrants to reception area are quickly and clearly directed to destination."

Although the 5 Whys technique is a highly effective way to encourage team involvement in the search for solutions to an issue, one downside is that the results

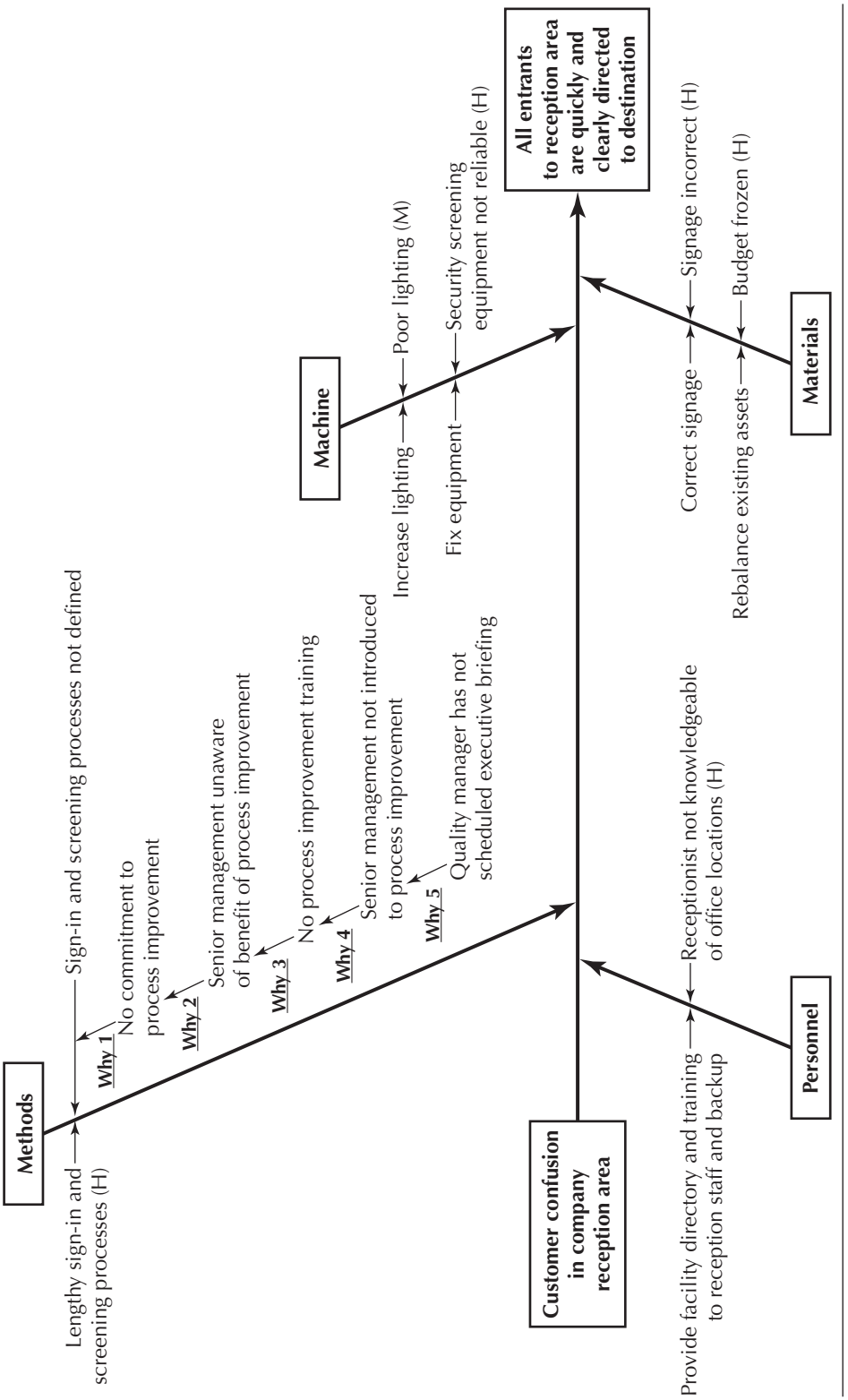


Figure 7.5 Expanded example of high-priority force and effect diagram using the 5 Whys technique.

are not always repeatable. This is not necessarily a problem, since the drill-down of potential solutions can be performed a number of times to generate new and creative responses. Employing a series of 5 Whys drill-downs with different customer or team groups may provide useful perspectives from which to choose the best alternative solutions.

Note that the example in Figure 7.5 illustrates the use of the 5 Whys on only one high-priority item. Using the same fishbone diagram to perform the activity on all items would be too much to include in one illustration. It is recommended that a separate fishbone be created for each 5 Whys activity. The benefit of showing all of the selected items (high, medium, or low impact as desired) on each solution and effect diagram gives participants a complete perspective of action items chosen for improvement.

Figure 7.6 is a corresponding 5 Hows exercise for mapping the sign-in and screening processes identified under the "Methods" category on a solution and effects diagram. The level of detail required for identifying tasks at this point in the solution process is such that the teams may take only one "why" from an earlier exercise and expand it into a rudimentary action item. There may or may not be an exact matching of a "why" to a "how" on the fishbone figures. This is fine. The idea is to keep repeating the "how" questions until no other subsolutions can be identified.

Once the "how" items are identified, usually on a number of separate fishbone diagrams for the sake of legibility, the team prioritizes the highest-impact action items for implementation.

SUCCESS AND EFFECT DIAGRAM

The success and effect diagram is a quality improvement tool used to analyze a successful process. It is developed in a similar way to the cause and effect diagram, but instead of using the 5 Whys it uses the 5 Whats as the analysis tool.

The success and effect diagram is used to understand successful processes as insight into improving other processes. The fishbone family of tools is not only for solving problems. Too often we ignore the successful things that operate in our organizations while we focus on the problems needing immediate attention. By understanding our successful processes we can uncover what is working well and transfer that knowledge to other processes to make them more efficient or effective.

The success and effect diagram is constructed as follows:

1. As shown in Figure 7.7, write the success as a symptom statement on the right-hand side of the page and draw a box around it with an arrow running to it. This success is now the effect to analyze.
2. Generate ideas about the main successes of the effect. Involve team members who have completed a successful process improvement project to identify what worked for them. Label these as the main branch headers.
3. For each main success category, brainstorm ideas about the related subsuccesses that might affect the issue statement. Use the 5 Whats technique when a success is identified—"What" caused this success? Keep repeating the question until no other symptoms can be identified. List the subsuccesses using arrows.

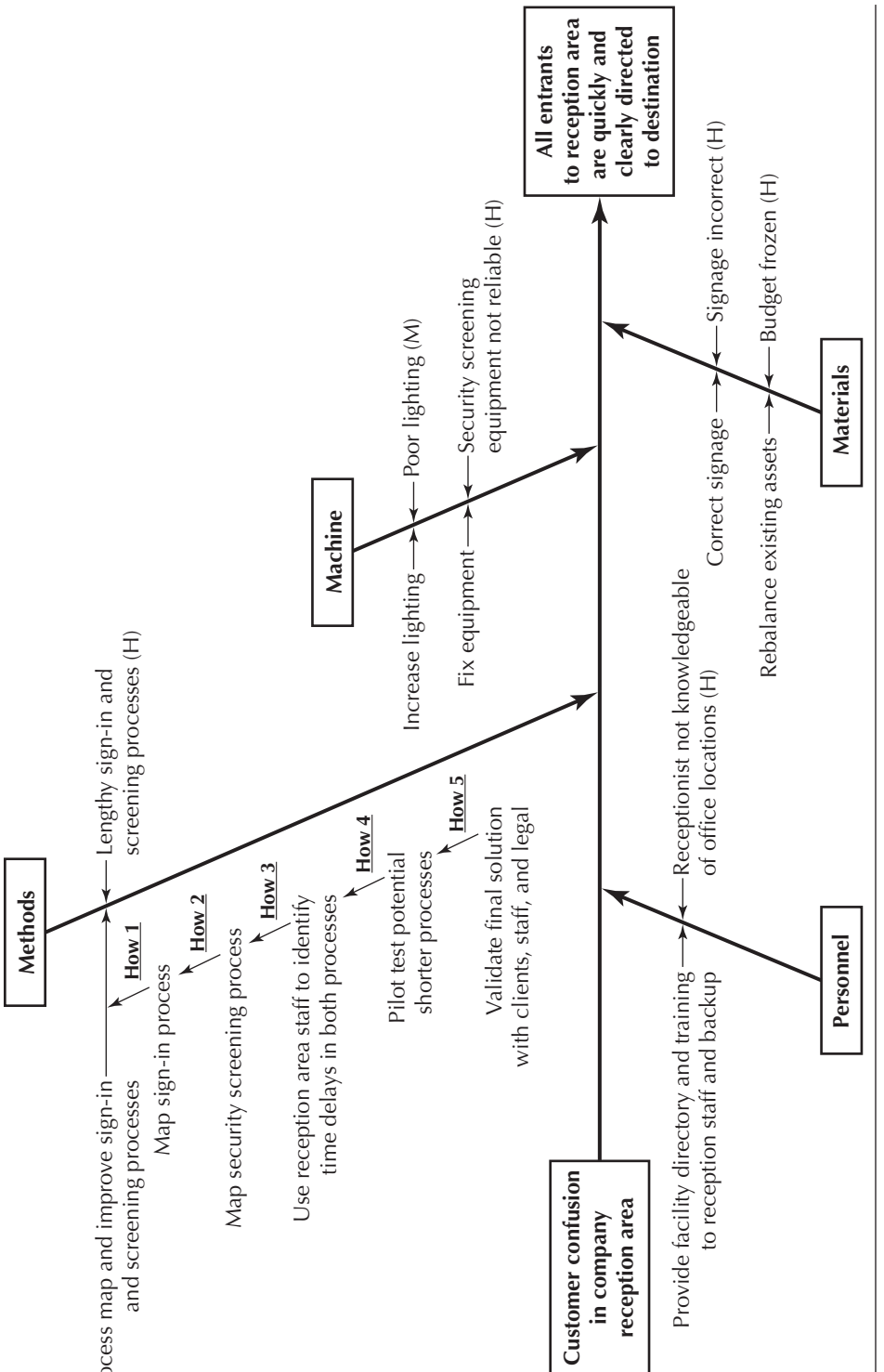


Figure 7.6 Solution and effect diagram showing use of 5 Hows for high-priority action.

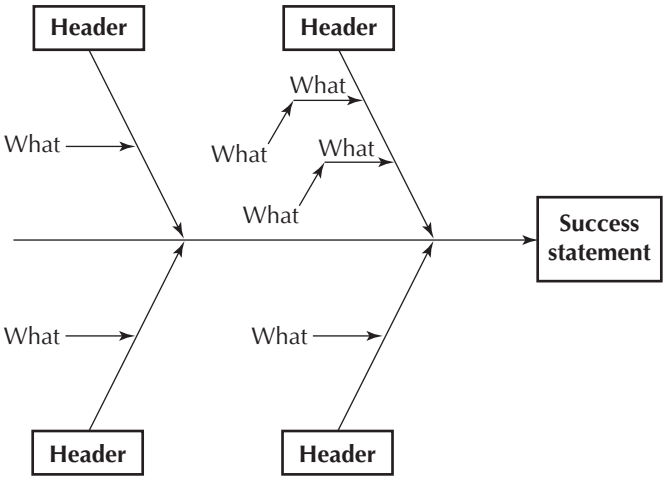


Figure 7.7 Success and effect diagram template.

Figure 7.8 is a success and effect diagram created to analyze a successful top-level organization correspondence project. The team members chose the four major headers most frequently used with cause and effect diagrams (personnel, methods, materials, and machine) to illustrate the parallel associations of the success and effect diagram discovery process. Next, they added subheaders specific to the successful process they were analyzing. Under the four major headers they asked "what" made this successful. The "what" question can also be used on the subheaders to drill down into the details of the successful activities.

When the success and effect diagram is finished, the next step is to decide which few "whats" to expand on to support the team in future improvement efforts. This is a case of playing to your strengths. In Figure 7.8, the personnel category was a particular strength for this departmental team. They had not only an excellent manager but a strong senior staff specialist who could lead the department members effectively in the absence of the supervisor. The team exploited the "whats" under the personnel category to launch another process improvement effort to enhance the partnership between their department and another key governmental agency with which they worked frequently to write and distribute classified documents.

There may be more than one root success that makes a process perform at an optimal level. Each main header needs to be analyzed to determine what made it successful. Many successful processes have compound successes, where different factors combine to make the process a success. It is rare that a successful process has a single root success. One check that a team can make after it has determined the top few root successes is to determine how the successful attributes relate to each other. The team can use an interrelationship digraph[2] to determine whether there are interconnections between the potential root successes. Determining these interconnections may show patterns that influence the team's decision on which root success or successes to exploit for the particular situation.[3]

The format of the fishbone "school" of tools is a visually satisfying way to hang ideas on category hooks for team discussion and analysis. The classification

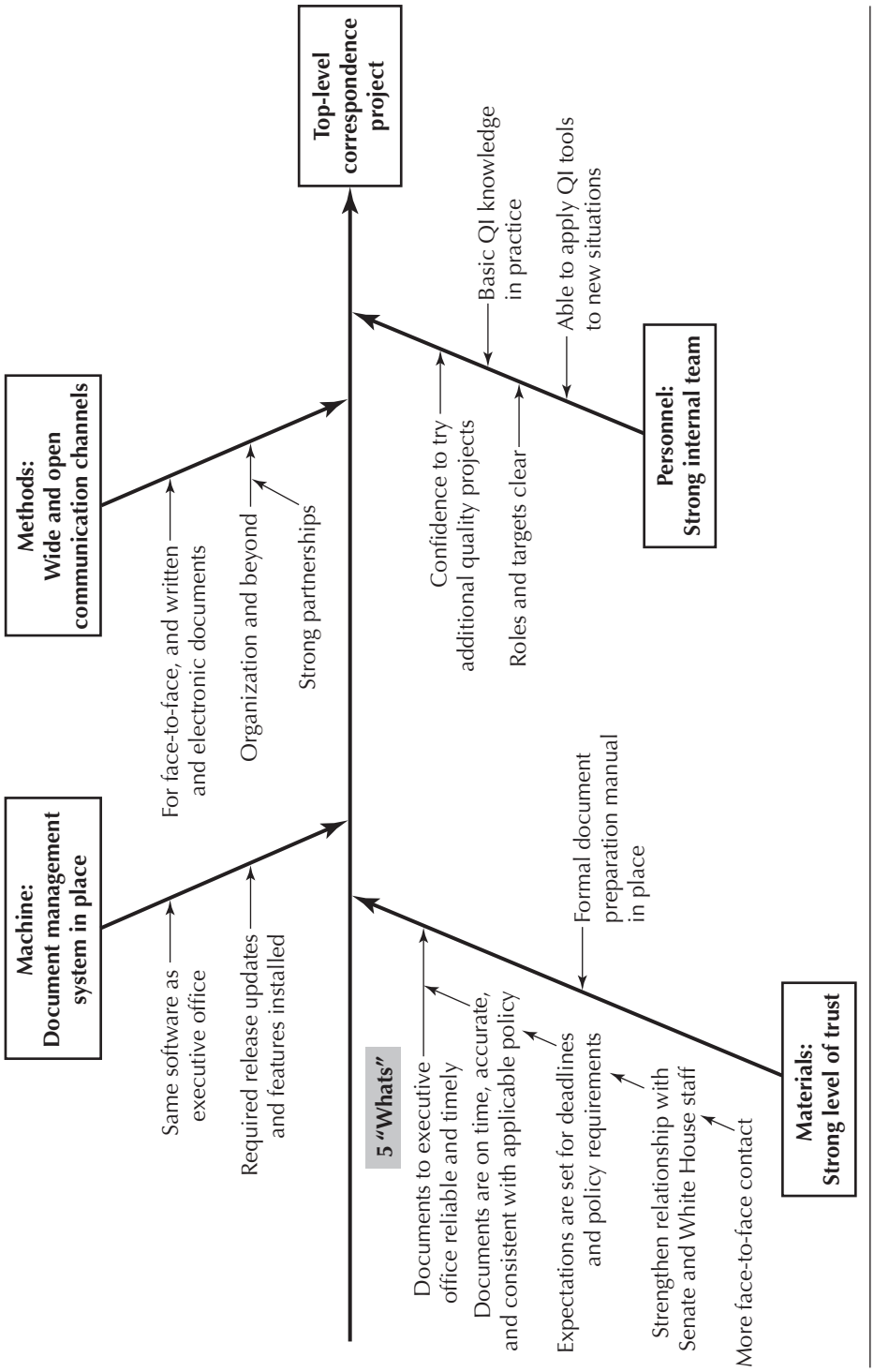


Figure 7.8 Success and effect diagram: top-level correspondence project.

of ideas by themes allows the mind to focus on one section of ideas at a time, without being distracted by other possibilities. The original cause and effect diagram is one of the seven basic quality control tools identified by Ishikawa in the 1950s. The seven tools are:

1. Cause and effect diagram
2. Check sheet
3. Shewhart's control charts
4. Histogram
5. Pareto chart
6. Scatter diagram
7. Stratification (some lists replace stratification with flowchart or run chart)[4]

Although there is some inclination on the part of longtime quality practitioners to remain loyal to the traditional tools, there is nothing sacred about them. Developing additional tools to assist and motivate efforts for innovation or problem solving is totally acceptable. The school of fishbones is offered as a sequence of activities to guide a team from initial observations to root causes, potential solutions, and eventual implementation.

NOTES

1. Kaoru Ishikawa, *What Is Total Quality Control? The Japanese Way* (Englewood Cliffs, NJ: Prentice Hall, 1985).
2. For more information on the interrelationship digraph, see pp. 199–201 of Ron Bialek, Grace Duffy, and John W. Moran, *The Public Health Quality Improvement Handbook* (Milwaukee, WI: ASQ Quality Press).
3. Grace L. Duffy and John W. Moran, "Success and Effect Diagram: Quality Improvement Is Not Just for Problems," ASQ Healthcare e-Newsletter, July 15, 2011.
4. Nancy R. Tague, *The Quality Toolbox*, 2nd ed. (Milwaukee, WI: ASQ Quality Press, 2004), 15.

Chapter 8
Process and Outcome Measures in Modular Kaizen

The concept of Modular Kaizen is dependent on accurate measures to move effectively through the planned steps of an improvement project. Organizing tasks within a Modular Kaizen project includes a possibility that one task may be performed and the next task left to wait until the improvement team comes together again much later to pick up the problem solving and decision making. Having a well-defined, organized matrix of requirements provides a solid foundation for resuming effective operations after a planned hiatus.

An organization is a system of activities composed of a network of regularly occurring interrelationships. A system dovetails and drives excellence across the organization. This system of interrelationships has common patterns, behaviors, and properties that can be understood through measurement. Measurement is used to develop greater insight into the behavior of these interrelated groups of activities. Measures are gathered from tasks and activities that form complex, goal-oriented processes. Activity-level measures are rolled up to department and division levels until consolidated measures finally summarize operations for the organization as a whole.

Because of the interrelated nature of processes within a total system, the overall capacity, capability, and outcome of one process is usually dependent on interaction with other processes. This chapter describes the value of measurement and how it supports the overall performance of the organization using the Modular Kaizen approach.

Unless you measure something you don't know if it is getting better or worse. You can't manage for improvement if you don't measure to see what is getting better and what isn't. This chapter will help you learn what to measure and how.

So let's start with some definitions:

- *Measure*: The verb means to ascertain the measurements of something
- *Measurement*: The figure, extent, or amount obtained by measuring
- *Metric*: A standard of measurement
- *Benchmark*: A standard by which others may be measured

We collect data (measurements), determine how they will be expressed as a standard (metric), and compare the measurement with a benchmark to evaluate progress. For example, we measure the number of customers a banker serves during the week. We measure (count) the number of corrections required by customers for those services. We establish "errors per customers served" as the metric. We

compare each banker's metric against the benchmark of "less than 0.1 errors per hundred customers served."

MEASUREMENT ACTIVITIES USING THE DMAIC IMPROVEMENT MODEL

The DMAIC improvement model, described in earlier chapters, has two major areas where measurements are critical. The first area is during the Measure phase. Here is where the current process is measured. What is happening now? This set of measures gives us information to accurately view the current situation. The second major use of measurement is during the Control phase. Here is where the new process measures are applied to provide ongoing feedback on process activities and outcomes. The control plan is managed for long-term sustainability of the process.

These are not the only DMAIC phases where measurement is used. Measurement is employed at all stages of the improvement process to assess progress toward the defined goal. Measures are valuable during the Define phase to assess the status of the current situation. The formal Measure phase looks more closely at the status of the current situation, comparing it with the expected outcomes of the process under study. The Analyze phase uses measures to focus on specific disruptions or make observations about the process. The Improve phase is driven by the comparisons of the Measure phase to modify, stabilize, redesign, or simply confirm process activities. Finally, the Control phase uses measures to hold the gains and continuously monitor the performance of the adjusted or redesigned process.

Figure 8.1 illustrates a basic feedback loop for comparing process measures with the expected performance goal. Process improvement models must have each of these components in order to be effective. As stated earlier in this text, Modular Kaizen bases its improvement efforts on the formal mapping of a process. In arrow 1 of Figure 8.1 a sensor (either an automated or a manual measure) is used to compare the performance of a process with the goal indicated by an objective, standard, or requirement. The results of that sensor (arrow 2) and the comparison with the goal (arrow 3) generate an observation that prompts the initiation of an actuator (arrow 4). The actuator, as discussed surrounding Figure 5.9 in Chapter 5, precipitates any of three responses: (1) if process performance equals the goal, do nothing, (2) if process performance is within expected range but showing deterioration, adjust the existing process, and (3) if variation has gone beyond process capability, redesign is warranted.

The case study shared in Chapter 9, "Automotive Manufacturing Application of Modular Kaizen," used this common comparison and feedback loop to

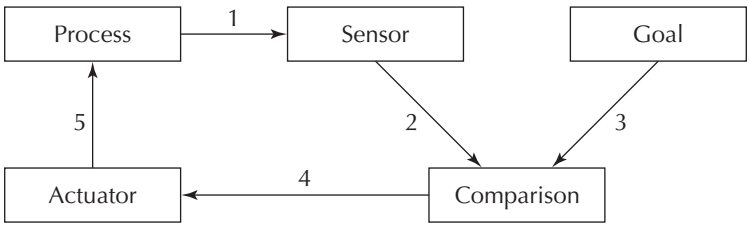


Figure 8.1 Basic feedback loop.

identify a situation where management was not following established procedures for final inspection of materials before shipment to the customer. In this situation, the actuator response was to reinforce the existing procedure, not to redesign the process. An external audit uncovered the inconsistency between current practice and the goal.

Organizations spend a lot of time and money trying to obtain timely and relevant information about their customers, markets, processes, employees, finances, and product or service outcomes. We build elaborate dashboards and form committees to track hundreds of measures and then wonder why we do not have any useful information upon which to base important decisions. It is essential to have a process to convert data to information and then to knowledge. Deming used to say, "Lack of knowledge . . . that is the problem."[1] Decision makers take data, apply statistical processes to them, display them graphically, and convert them to knowledge to make decisions.

Organizations attempt to capture all relevant information on a situation of interest to them; we think that information is knowledge. We indiscriminately go about amassing information and measurements to "find out all there is to know." This action wastes time, effort, and money. Once we have all relevant information available, we find that it is useless because it is not centered on a specific need. This "gather all the information" syndrome impedes planning and problem solving by burying an organization in an avalanche of irrelevant, unmanageable details. It leads to "analysis-paralysis."

Data and information should be tied directly to the outcome desired. Measurement is a key ingredient of any improvement program. To make lasting improvements, everyone in an organization must understand how to measure and monitor processes and be able to use those data and information to prioritize where improvements are made. Improvement consumes scarce organizational resources and should be focused on the most important and strategic needs of the organization. Measurement helps shift attention to areas of important needs.

A measurement protocol can be developed for most processes. Lean and Six Sigma practitioners refer to this as a "control plan." A control plan helps guide the decision maker in measuring the important aspects of a process's capacity, capability, and outcomes. When developing measures, the following questions need to be asked for each measure proposed:

- What is the measure measuring?
- What is the baseline for this measure?
- If no baseline exists, can one be obtained or developed?
- Will this measure help identify how the process is functioning?
- Is the measure directly linked to the current strategy?
- Will this measure positively impact the process under review?
- Will the measure positively impact the customers if it is improved?
- Will employees have personal incentives to improve this measure?
- Are improvements in the measure likely to result in better service?
- Are resources available for improving this measure?

When developing a measurement plan for a process, the goal is to determine what measures should be the key process indicators (KPIs). The following are guidelines for potential major KPIs:

- *Effectiveness*—does the process output conform to stated requirements? This is doing the right things.
- *Efficiency*—does the process produce the required output at minimum resource cost? This is doing the right things right.
- *Quality*—does the output meet customer requirements and expectations?
- *Timeliness*—does the process produce its output correctly and on time?
- *Productivity*—how well does the process use its inputs to produce its output? This is the ratio of the amount of output per unit of input.
- *Output*—how much does the process produce in a given time period?

Depending on the process in place, the KPIs may be a combination of the above or others. It is desirable to have proactive measures that show what is happening now in the process rather than reactive measures that show what has happened. The thing to remember is that the chosen measures should give a clear indication of how the process is operating and when action must be taken.

Peter Sherman, Lean Six Sigma Master Black Belt and ASQ Certified Quality Engineer, shares a list of 10 questions to be asked when assessing the value of data as information. Table 8.1 lists the questions and a general interpretation of the reason the question should be asked of any data gathered in support of root cause analysis or decision making.[2]

THREE MAJOR MEASUREMENT AREAS

Every improvement project needs to focus on the following three measures:

1. Capacity
2. Process
3. Outcome

Measurement is the key to having processes that successfully deliver customer satisfaction. Measurement needs to build outward from capacity to process to outcomes. These three measures must be aligned and regularly monitored to ensure that processes are running at maximum efficiency.

Measuring capacity, process, and outcome gives three critical perspectives to the overall performance of a process. Capacity dictates whether resources to meet current demand of the product or service exist. Process allows the monitoring of the continuing effectiveness of activities performed to create an acceptable product or service. Outcome gauges the satisfaction of the end user with the product or service once it is delivered or experienced.

A *capacity measure* of a process is defined as an output measure of activity. Sometimes this is referred to as the maximum output rate measured in terms of some type of units provided per period of time. For example, 10 clients per hour can be processed in a clinic, 100 calls per hour can be processed in a call center, 8 surgeries per hour can be performed in an operating room (OR), or 100 boxes of

Table 8.1 Ten key questions for gathering useful data.

Question	Interpretation
1. What is the message?	Get past the presentation to the facts
2. Is the source reliable?	Think about the information's quality
3. How strong is the evidence overall?	Understand how this information fits with other evidence
4. Does the information matter?	Determine whether the information changes your thinking and leads you to respond
5. What do the numbers mean?	Remember that understanding the importance of risk requires that you understand the numbers
6. How does the risk compare to others?	Put the risk into context
7. What actions can be taken to reduce risk?	Identify the ways you can mitigate the risk to improve your situation
8. What are the trade-offs?	Make sure you can live with the trade-offs associated with different actions
9. What else do I need to know?	Focus on identifying the information that would help you make a better decision
10. Where can I get more information?	Find the information you need to make a better decision

Source: Peter Sherman, "Data Analysis—10 Key Questions and Reasons," *Quality Digest*, July 10, 2009.

cookies can be packed every 10 minutes. Once the maximum output rate of a process is known, the capacity utilization or the percentage of the maximum output currently utilized can be understood. Knowing that the OR has a 75% utilization rate for the past three weeks is useful information.

Sometimes it is useful to understand activity measures that describe the level of resources committed to a process. Just knowing these three measures does little to help us understand how the process is satisfying our customers. Process and output measures help us understand the capability of the process to meet our customer needs.

Process measures are descriptors of how the process is performing in its current state. It is very important to understand how the current state is operating and define the baseline before attempting any type of improvement activity. It is important not to change a process before understanding where it is centered or the amount of variation that is present. The most common measures of a process are the mean and the standard deviation. Once those measures have been calculated, conducting a capability study that measures the number of standard deviations between the process mean and the nearest specification limit in sigma units (σ) can occur. In general, as a process's standard deviation rises, or the mean of the process moves away from the center of the tolerance:

- Fewer standard deviations will fit between the mean and the nearest specification limit
- The likelihood of items outside specification increases

Error or "variance" ideally should be designed out of any process before it is launched. The intent is to prevent errors rather than correct them once they create a disruption. When that is not possible, variance is best controlled at the point where it first occurs. For rapid and effective control, the individuals at this place in the process must have:

- Immediate awareness of the error
- The skill and resources to correct the cause
- The authority to take the corrective action

Modular Kaizen, as an improvement approach, uses preplanning to design measures at the same time that process activities are defined. Involving those who perform the work in the development of process measures ensures that the individual at the point of the error will recognize any divergence from expected performance. Proper training on processes and procedures ensures employee skill to correct the error. Management involvement is essential to plan capacity of resources and to delegate authority to take corrective action when required.

The two indices used in defining process capability are:

- C_p: Measures the variation—how well the data fit within the upper specification limit (USL) and the lower specification limit (LSL)—width of the process distribution relative to a set of limits.
- C_{pk}: Measures the central tendency. It is an index that measures how close a process is running to its specification limits and how centered the data are between the specification limits.

The larger the index, the less likely it is that any item will be outside the specifications.[3]

In service industries, healthcare, and not-for-profit organizations, many processes do not have defined specifications. For these processes, it is important to develop limits of the process variation that customers will tolerate. The questions to ask a customer might be, "How long are you willing to wait for the doctor, to get a flu shot, to get service at the bank, or to get a meal at a fast-food restaurant?"

Since many customers understand that waiting is inevitable, it is important to compile an average from many customers on what would be the upper tolerate limit on wait time. Everyone would like zero wait time, but people will accept a minimal wait. Defining that minimal acceptable wait as the lower tolerate limit is important.[4]

A process capability study of this process shows where it is centered and its variability. It is possible to see whether the process is capable of meeting customer wait-time levels. If it is not, improvements can be made to center the process so that it meets customer needs. This approach could also be applied to cycle time and process efficiency percentages.

Outcome measures are measures of the result of a process output. An outcome measure is used to gauge the success of a process. For most processes, an Aim statement declares what the process is supposed to accomplish. The following are examples of outcome measures:

- Achieving a customer satisfaction score of 99%
- Reducing wait time in the bank lobby service queue by 25%
- 300 accident-free days

- An audit with no major findings
- 100% completion of required employee safety training

Table 8.2 shows some typical capacity, process, and outcome measures.

Table 8.2 Example capacity, process, and outcome measures.

Metric	Indicator	Definition	Baseline	Improvement target
1. Capacity				
	Output rate	Units/time	400/hour	450/hour
	Capacity utilization	% of maximum output utilized	75%	85%
	Resources committed	FTE,* space, equipment, etc.	40 FTE 900 sq. ft.	30 FTE 800 sq. ft.
2. Process				
	Mean	Mathematical average of a set of numbers	μ = 10 minutes	μ = 8 minutes
	Standard deviation	Measurement of variability or the square root of the variance	σ = 2 minutes	σ = 1.5 minutes
	C_p	How well the data fit within the spec limits (USL, LSL)	C_p = 1.6	C_p = 2.0
	C_{pk}	How centered the data are between the specification limits	C_{pk} = 1.0	C_{pk} = 1.33
3. Outcome				
	Customer satisfaction	% satisfied customers	98% score	99% score
	Accident-free days	# accident-free days	300 days	350 days
	Meeting evaluations completed	# of board members completing end-of-meeting evaluation	75%	100%

*FTE = full-time equivalent headcount

MATCHING MEASURES TO THE PROCESS AND OUTCOME

The best way to identify effective measures for monitoring and sustainability is to develop them at the same time the process activity is designed. This uses team member time efficiently and does not further interrupt schedules with another meeting when the information is already part of the initial meeting agenda. Tables 5.2, 5.3, and 5.4 in Chapter 5 illustrate worksheets used by improvement teams in the development of standards of performance for a healthcare system. The last column of each worksheet asks the team to identify measures by which they can tell the assigned task has been completed. In Table 5.2, this is a high-level measure, since the process or activity is identified only through analysis of customer need. In Table 5.3, the last column of the worksheet requests a different type of measurement in the form of information to be gained from using an improvement tool to accomplish a process step. In Table 5.4, the final outcome of an action, step, or task is identified.

Other worksheets in the series used for this improvement project also require the improvement team to identify measures as the project moves from definition, through analysis, and into improvement and control. All 10 worksheets for the healthcare system project are available in the appendix of this text. The team charter identified in worksheet 3 requires the team leader, sponsor, and team members to identify success metrics in field no. 13. Worksheet 5 requires measurements to be identified as part of the feedback loop for the initial definition of the process during the Define phase. Worksheet 7 develops the initial improvement change plan, including items to be measured and the conditions under which the change activities will be measured and tested. Tables 5.2, 5.3, and 5.4 are worksheets 6, 9, and 10 of this same improvement sequence.

DEVELOP THE MEASUREMENT PLAN

A measurement plan is a tool that guides an improvement team through the steps of identifying capacity requirements, process expectations, and outcomes for a product or service. The value of this tool is more than a checklist for filling in customer or process requirements. This tool prompts the improvement team to interact with customers, suppliers, subject matter experts, and one another to understand enough about the overall process to control it effectively.

The organization must place a premium on monitoring the business environment, understanding shifts in economics and public opinion, and developing the capacity for agile response. To this end it will:

- Maintain very close connections with key groups in the business community (customers, vendors, regulatory bodies, sources of new technology, etc.), especially those that are shifting the fastest or most unpredictably
- Develop the capacity to correctly interpret the information it receives and plan an appropriate response
- Communicate these plans and the reasons for them to all those within the organization who must respond
- Clarify the organization's purpose and goals

- Develop an organization (vision, structure, human resources, and culture) that is willing and able to move quickly and flexibly

The measurement plan is a living document that uses the measures identified by the project team and aligned with the strategic plan of the organization. Just as the improvement team in the above example developed measures and metrics specific to the disruption under analysis for improvement, so senior management must develop measures at a higher level that reflect the outcomes of the total combination of processes that maintain the organization's competitive position in the market.

Use enterprise-level quality measures to influence the culture and improve performance by creating challenging goals. Collecting, analyzing, and reporting quality data at least quarterly allows leaders to frequently adjust goals and improve upon the status quo. This, in turn, sets a cultural expectation that the status quo is not enough.

Start with the business problem that you're having. Are you trying to get new customers or increase sales to the customers that you have? Work through what exactly it is that you're trying to do, and then go back and figure out what data you have that might answer that question, what data you need to answer that question, and how your data need to be put together to make that work. Data do not create any value until you put them into action, so start by understanding what action you want to take.

One imperative for organizations trying to create meaningful enterprise quality measurement systems is to use measures as part of an effort to embed quality into the organizational culture. The more ingrained quality standards are in work processes and activities, the higher the level of quality the organization will naturally achieve. How measures are used drives people's behavior and attitudes toward quality. Measures can either push people away as they resist change or help people understand what quality means in the context of their jobs. It depends on how the organization introduces and approaches measurement.

When measurement plans are developed appropriately, they become a business management model organizations can use to make sound decisions and improve performance. When successfully implemented, measures:

- Focus the enterprise on what is important (desired behaviors and outcomes)
- Link strategy and tactics
- Help assess performance against a baseline
- Provide feedback that guides change
- Supply support for business cases

Senior management commitment is an elemental principle for continuous improvement. It is not effective without supporting vertical and horizontal action at all levels of the organization.

Focus on strategic alignment, not simply process-driven outcomes. Establish a framework for organizational excellence by considering the following questions:

- How are you redefining value and success for your organization?
- What methods are you using to identify and address customer requirements?

- What relationships do you cultivate with your customers to validate organizational outcomes?
- To what extent is your organization evolving to a value-based model?
- What competencies must you develop?
- How will you know how much progress you are making?

Companies that work without a similar framework might use more traditional methods of project selection, such as firefighting, which can produce limited results and benefits. Without an emphasis on core processes, there is the danger that teams might be called on to improve a portion of a process, for example, as it cuts across a single department, without having the ability to consider the impact on the larger system. While the department can realize the benefit, a firefighting approach can suboptimize the organizational systems as a whole. It might also deliver limited benefits or require a significant number of projects and extended time before the higher-level business KPIs show improvement. This delay can result in a loss of customers, dissatisfaction with the pace of improvement, and a waste of critical resources.[5]

As companies shift their focus to system-level end-to-end processes, attempting to reduce overall cycle times or increase overall throughput, project selection becomes more critical and more challenging. Unless project selection is focused on eliminating a key system constraint or disruption, the immediate impact will not be visible. The difference must be felt by the customer or the business system as a whole, as measured by increased revenue, growth, retention, or profit. Today corporate executives expect to see results in these areas and see them quickly.[6]

When given two process steps or subprocesses that represent a roughly equal constraint, select the project that either will generate the highest number of reusable services or process components or will use the highest number of existing services first. Measure those processes or outcomes that are important to successfully achieving your organization's goals. KPIs help an organization define and measure progress toward its goals.

KPIs differ depending on the organization. A business may have as one of its KPIs the percentage of its income that comes from return customers. A customer service department may have as one of its KPIs the percentage of customer calls answered in the first minute. A KPI for a software development organization might be the number of defects in its code.

You may need to measure several things to be able to calculate the metrics in your KPIs. To measure progress toward its customer calls KPI, the customer service department will need to measure (count) how many calls it receives. It must also measure how long it takes to answer each call. Then the customer service manager can calculate the percentage of customer calls answered in the first minute and manage toward improving that KPI.

MEASURE THE PROCESS TO ENSURE CONTINUED SUCCESS

How you measure is as important as what you measure. In the previous example, we can measure the number of calls by having each customer service representative (CSR) count their own calls and tell their supervisor at the end of the day. We

could have an operator count the number of calls transferred to the customer service department. The best option, and the most expensive, would be to purchase a software program that counts the number of incoming calls, measures how long it takes to answer each call, records who answered the call, and measures how long the call took to complete. These measurements would be current, accurate, complete, and unbiased.

Collecting the measurements in this way enables the manager to calculate the percentage of customer calls answered in the first minute. In addition, it provides additional measurements that help him or her manage toward improving the percentage of calls answered quickly. Knowing call duration allows the manager to calculate whether there is enough staff to reach the goal (capacity). Knowing which CSRs answer the most calls identifies expertise that can be shared with other CSRs.

Measurements and performance data (both qualitative and quantitative) gathered during quality activities can be used to find quick wins for process improvement initiatives. These can be either minor adjustments, completed with relatively little or no cost, or more involved adjustments that can be replicated across multiple processes and thus realize huge benefits based solely on the sheer number of impacted processes. Understanding how these measurements affect processes helps managers understand potential cost-benefit ratios for improvement efforts.[7]

The key is that organizations engage in thoughtful and thorough analysis to determine not only the best measures that truly affect priority outcomes but also the weight and precedence assigned to each improvement based on organizational priorities. Modular Kaizen builds the design, development, and implementation of capacity, process, and outcome measures into each modularized component of an improvement project. The team leader and the facilitator have the responsibility to plan and guide these measurement activities and to communicate the results of team progress to the sponsor, process owner, and upper management.

NOTES

1. Wikiquote, "Talk: W. Edwards Deming," accessed September 22, 2013, http://en.wikiquote.org/wiki/Talk:W._Edwards_Deming.
2. Peter Sherman, "Data Analysis—10 Key Questions and Reasons," *Quality Digest*, July 10, 2009.
3. The details of process capability are beyond the scope of this text. For more information on C_p and C_{pk}, see Nancy Tague, *The Quality Toolbox*, 2nd ed. (Milwaukee, WI: ASQ Quality Press, 2005), 421–428.
4. G. Duffy and J. Moran, "The Voice of the Process," ASQ Quality Institute for Healthcare, Proceedings of the 2012 World Conference on Quality and Improvement, Anaheim, CA, May 21, 2012.
5. Hans Skalle, Seshadri Ramachandran, Marc Schuster, Vincent Szaloky, and Samuel Antoun, *Aligning Business Process Management, Service Oriented Architecture, and Lean Six Sigma* (Armonk, NY: IBM RedBooks, 2009), 11.
6. Ibid., 12.
7. APQC, "Three Areas Where Process Frameworks Make a Big Impact," *2010 Frameworks Survey*, 2011.

Part II
Modular Kaizen Applications

Chapter 9
Automotive Manufacturing Application of Modular Kaizen

The concepts of Modular Kaizen have evolved from basic process improvement tools and techniques. There is not just one way to apply the tools of Modular Kaizen in the workplace. One of the most direct applications is within the traditional manufacturing environment. The project described in this chapter is an actual situation addressed with a client in Ontario, Canada. Names have been changed for confidentiality purposes. The information and data have remained as documented during the course of error detection, problem determination, resolution planning, execution, and follow-up. In this project, the details of the root cause and corrective action were documented internally using an 8D corrective action request. To ensure confidentiality, those details have not been duplicated here.

The flow of problem identification and subsequent resolution is broken down into the general project sequence for Modular Kaizen improvement activities, as outlined in the following sections.

UNDERSTAND AND DEFINE THE PROBLEM

Using the generic flow of Modular Kaizen (see Chapter 5, "Remove Disruptions to Improve Flow: Project Sequence for Modular Kaizen"), the team lead (who is also the contract auditor for this automotive company) began with understanding and defining the problem.

Consistent with implementing process improvement through the ISO family of standards in an automotive environment, the team used the 8D corrective action request[1] rather than the more generalized team charter.[2]

"Eight disciplines problem solving," reflected in the 8D model, is commonly used by the automotive industry. This approach to resolving problems is typically employed by quality engineers or other professionals. Its purpose is to identify, correct, and eliminate recurring problems, and it is useful in product and process improvement. It establishes a permanent corrective action based on statistical analysis of the problem and focuses on the origin of the problem by determining

Team lead: Elizabeth Burns, CQE, RAB Lead Auditor

its root causes. Although it originally comprised eight stages, or disciplines, it was later augmented by an initial planning stage. The disciplines are:

D0: Plan—Plan for solving the problem and determine the prerequisites.

D1: Use a team—Establish a team of people with product/process knowledge.

D2: Define and describe the problem—Specify the problem by identifying in quantifiable terms the who, what, where, when, why, how, and how many (5W2H) for the problem.

D3: Develop interim containment plan; implement and verify interim actions—Define and implement containment actions to isolate the problem from any customer.

D4: Determine, identify, and verify root causes and escape points—Identify all applicable causes that could explain why the problem occurred. Also identify why the problem was not noticed at the time it occurred. All causes shall be verified or proved, not determined by fuzzy brainstorming. One can use 5 Whys and cause and effect diagrams to map causes against the effect or problem identified.

D5: Choose and verify permanent corrections (PCs) for problem/nonconformity—Through preproduction programs, quantitatively confirm that the selected correction will resolve the problem for the customer.

D6: Implement and validate corrective actions—Define and implement the best corrective actions.

D7: Take preventive measures—Modify the management systems, operation systems, practices, and procedures to prevent recurrence of this and all similar problems.

D8: Congratulate your team—Recognize the collective efforts of the team. The team needs to be formally thanked by the organization.

The first step in initiating the improvement project was to understand and define the problem. The issue was identified by the external auditor as an audit nonconformance. The internal process for responding to an external audit nonconformance required the completion of an 8D corrective action request. In this organization, an 8D corrective action request evaluation checklist was used to ensure that the problem-solving team considered all aspects. This checklist is part of the initial planning done by the company and is consistent with Modular Kaizen. The auditor, process owner, and improvement sponsor all are familiar with the 8D process and could quickly gather information about an observed defect using this ISO-based quality tool.

Figure 9.1 shows the team's determination that documented root cause, and corrective action was indeed required in this situation ("Was documented root cause and corrective action required?"). Other options for identifying appropriate action are listed in the checklist. The audit nonconformance for this application warranted root cause and corrective action at the producer's location. The problem is identified later in the 8D documentation process.

Following the preestablished process described in the 8D corrective action request evaluation checklist, the process owner and the sponsor identified the

8D Corrective Action Request—Evaluation Checklist ISO-FRM-029-A Revision No. 0				
Issue date: Today	**ICAR No.:** From ICAR log			
Part number: N/A	**Part description:** N/A			
Prepare for the 8D process—is an 8D required? Yes				
	Y	**N**	**N/A**	**Comments**
Sorting and/or containment activities were implemented immediately to protect the customer from receiving additional defective product			X	
A representative investigated the issue at the customer location			X	
The disposition of the material was communicated to the customer			X	
An initial written response was sent within 24 hours			X	
Was documented root cause and corrective action required?	X			

Figure 9.1 First section of the 8D corrective action request evaluation checklist for audit nonconformance.

Establish the team—identify champion and team leader				
	Y	**N**	**N/A**	**Comments**
The problem-solving team was assembled, and a team champion and a team leader were chosen	X			
Did the team membership include people with the skills, time, and authority to solve the problem and prevent recurrence?	X			

Figure 9.2 Team establishment section of the 8D corrective action request evaluation checklist.

problem-solving team and the champion. Figure 9.2 is the next segment of the evaluation checklist; it confirms that the team was assembled and that the champion and the team leader were identified. The team consisted of the following:

- Experienced internal auditor—team lead
- Quality technician—team member
- Sales manager—team member
- Operations manager—champion

The team was kept small to allow for maximum flexibility of scheduling and decision making. Because the corrective action process was already well established by the company, the team lead could quickly communicate the need for team activity to gather data pertinent to the audit finding. The process being audited was also well defined, therefore providing clear expectations on performance relative to required outcomes.

The process under audit, corrective action, is a core process and subject to incremental improvement monitoring for the purposes of this corrective action (see Table 9.1). The concept of Modular Kaizen reinforces the need for appropriate skill levels for all those involved in a process.

Corrective action is a core quality management system process. For this reason, skills necessary for effective implementation must be in place before the process is performed—and most certainly before the process is audited. Each of the team member's training was verified during the 8D project description phase as follows:

- Internal auditor
  - Experienced auditor
  - Knows the details of ineffective root cause and corrective action analysis
  - Certified lead auditor (see auditor prerequisites, Table 9.1)
  - ISO 9001: RAB lead auditor
- Quality technician
  - Trained on all major processes internally; additional training provided by a major customer of the firm
- Sales manager (one of the owners of the company)
  - Requirements of the quality management system processes
  - Root cause and corrective action

Not only does the internal auditor comply with the specific requirements in the above list, but he or she also practices the additional recommendations spelled out in Table 9.1 for the purposes of professionalism and good client relations.

Figure 9.3 is an example of the training requirements and performance evaluation form for a quality technician at this automotive supplier. As part of the skill requirements for the job of quality technician, the company has chosen to include the Body of Knowledge for the ASQ Certified Quality Technician. As identified in the segment of the 8D corrective action request evaluation checklist shown in Figure 9.2, the quality technician assigned to this process is appropriately trained for the responsibilities of this position.

The challenging set of skill requirements pertains to the sales manager. A partial owner of the firm, the sales manager exhibits behaviors that do not always comply with the requirements of the quality management system processes espoused by the organization. An early observation on the journey to a root cause of the corrective action dealt with a decision made by the sales manager relative to the criticality of final inspection activities.

Table 9.1 Important auditor prerequisites above the minimum requirement for ISO lead auditor.

The Dos and Don'ts of Process Auditing Remember the auditor prerequisites that are important:	
The Dos	**The Don'ts**
Be professional	Don't be judgmental
Obtain and assess objective evidence fairly	Don't make judgments based on personal biases
Be confident—be prepared	Don't be hesitant, uncertain
Explain your questions clearly	Don't confuse the auditee
Ask additional questions when necessary for more details	Don't imply blame
Evaluate the effects of audit observations and personal interactions during the audit	Don't consult or offer suggestions for resolution of audit findings
Take copious notes	Don't rely on your memory
Use all three auditing techniques	
Remain within the audit scope	Don't go outside the audit scope unless necessary
Make observations, discuss concerns with auditees, and take notes	Don't hide audit findings
Collect and analyze copies of relevant documentation	Don't retain the original versions of documentation
Control the timing of the audit	Don't allow yourself or the auditee to get off track
Listen carefully	Don't let your mind wander while your auditee is responding

Communications—Ten hints
• Think before you speak. • Take time to analyze what you hear. • Take into account people's understanding, culture, and position whenever you communicate. • Two heads are better than one, so if possible, use teamwork to plan communication. • Be mindful of the overtones and your expression as well as the basic content of your message. • Do not give consultative advice, but if appropriate, convey something of value to the receiver (i.e., technical advice). • Always leave the recipient with an understanding of what you have said. • Communicate for tomorrow as well as today. • Cross-reference or detail objective evidence in support of your communications. • Last but not least . . . seek not only to be understood but also to understand. Be a good listener.

Quality Technician Training Program ISO-FRM-018 Revision No. 0	
Skill required	**Training required**
Certified Quality Technician (ASQ) designation or equivalent experience	Not applicable if Certified Quality Technician; external training (e.g., local college) to match Certified Quality Technician Body of Knowledge
Hands-on coordinate measuring machine (CMM) experience	
Experience with tool accuracy and precision of measuring and equipment tools	
Knowledge of basic inspection and testing techniques	
Reading and interpretation of blueprints (drawings)	
Knowledge of calibration processes and requirements	
Competence in basic math calculations	
Understanding of material test report/certificate of compliance	
Quality technician certification—ASQ Body of Knowledge	
I. Quality concepts and tools A. Quality concepts B. Quality tools C. Team functions II. Statistical techniques A. General concepts B. Calculations C. Control charts III. Metrology and calibration (19 questions) A. Measurement and test equipment (M&TE) B. Calibration IV. Inspection and test (21 questions) A. Blueprint reading and interpretation B. Inspection concepts	C. Inspection techniques and processes D. Sampling V. Quality audits (9 questions) A. Audit types B. Audit components C. Tools and techniques VI. Preventive and corrective action (10 questions) A. Preventive action B. Corrective action C. Nonconforming material

Figure 9.3 Quality engineer training program.

The internal auditor/team lead was immediately aware that one of the root causes of the observed audit nonconformance was not going to be a training issue. The sales manager had already been well oriented to the requirements of the quality management system and was not concerned with the details of performing a root cause analysis. The team lead suspected that one of the solutions to the corrective action would hinge on a "will do" attitude rather than a "can do" training issue. The challenge the team lead faced was how to motivate an owner of the company to follow the quality management system processes and to be trained on root cause and corrective action. The reality is that telling one of the company owners that

Annual performance evaluation—quality control technician

Title: Quality control technician Date: _____

Follow-up date: _____

Responsibility	Skill required	Evaluation
Complete all inspection and test requirements according to quality plan and documented procedures/ instructions	Working knowledge of basic quality control techniques and use of calibrated equipment	
Document inspection and test requirements	Working knowledge of basic quality control techniques and reporting requirements	
Ensure all requirements have been satisfactorily met prior to shipment of product to the customer	Working knowledge of basic quality control techniques and customer requirements	
Notify manufacturing manager of nonconforming product or processes	Understanding of acceptable and unacceptable product and process characteristics	

Employee name: _____

Employee signature: _____

Manager's signature: _____

Training required (for the year _____)

Figure 9.3 Quality engineer training program. *(continued)*

they need training on root cause and corrective action was just not a viable option. The team leader had to make up the difference. The knowledge at the process level had to come from somewhere else: the internal auditor and the quality technician.

The sequence of brainstorming potential solutions to a nonconformance in a well-defined process situation in a small business sometimes gets collapsed because there are so few players in the corrective action process. Although root cause analysis in large organizations usually is deferred until the team has performed formal data gathering, analysis, and potential solution brainstorming, the improvement team was small enough (three individuals) that most information was already contained within the group conscience.

Part of understanding and defining the problem within Modular Kaizen is to develop the initial timing requirements for the improvement effort (map team members to schedule demands). Having formally defined the process for corrective action and documented the organization's quality management system, the required corrective action time horizon was already established: Send the corrective action plan to the registrar within seven days. This is a short timeline, so training issues were dealt with in an alternate way (see above for the solution, which did not include training the sales manager).

As this corrective action was for a minor nonconformance, verification of the corrective action would not be performed for another year. The project schedule was established under only internal timing for this situation. Team schedules for any prolonged feedback and preventive improvements could be accommodated given the long-term timing for verification. The short-term reporting of the proposed resolution plan could easily be provided within the required seven days.

The actual situation was expedited by the operations manager, who wanted the plan in 24 hours, not 7 days. A team meeting was scheduled for the first morning after the audit to build the resolution plan. Meanwhile, an unrelated customer complaint was received and required the attention of a key team member (quality technician). This customer demand created a major barrier to the first team meeting: two critical schedule requirements for the same resource, the quality technician.

Modular Kaizen stresses an intimate understanding of operational and core processes; therefore, the team lead was able to fall back on an established escalation procedure to resolve the timing conflict for the quality technician. The team lead went to the operations manager with the reality of the situation. True to a customer-focused organization, it was decided that responding to the external customer complaint was the more important activity for the quality technician to perform in the short term. The team lead rescheduled the corrective action plan meeting after the customer complaint was resolved. Again, because processes were clearly defined before the corrective action surfaced, the improvement team still met the documented seven-day deadline for getting the corrective action plan to the registrar.

The 8D corrective action request evaluation checklist next guided the team to develop the problem description. Figure 9.4 is the completed segment illustrating the improvement team's responses to the checklist items. Where items were not applicable to the specific situation, a mark was made in the N/A column of the form.

Describe the problem—what is wrong with what				
	Y	**N**	**N/A**	**Comments**
Did the problem description include who, what, where, when, and how many?	X			Problem described by registrar during external audit
Are the manufactured/lot dates of the defective parts identified?			X	
Were all key items or main issues listed?	X			
When an entire lot/heat/shipment is returned, are the parts sorted and the customer advised in writing of the total quantity defective?			X	

Figure 9.4 Problem description section of the 8D corrective action request evaluation checklist.

The final step in the Define phase of the Modular Kaizen improvement process is to map the current state using a process map or flowchart. Although it is not necessary to provide a flowchart as part of the documentation for a minor nonconformance, this automotive company used the already-created flowchart for the corrective action process. Figure 9.5 is a copy of the flowchart for corrective action.

COLLECT, ANALYZE, AND PRIORITIZE DATA

Once the customer complaint was addressed to the customer's satisfaction, the corrective action team returned to gathering data about the external audit nonconformance symptoms. During the external audit, an internal audit nonconformance (with root cause and corrective action) was reviewed. The internal audit nonconformance initially identified an issue with product being shipped to a customer before final inspection was completed. Root cause was based on the problem statement "Product was shipped before final inspection was completed" and was determined to be "Approval by the sales manager to ship product without final inspection."

During the external audit, it was determined that the initial problem statement (and thus the root cause and corrective action) was incorrect. The external audit nonconformance was identified as:

> Internal root cause investigation did not delve deeply enough into the situation. (Root cause indicated the sales manager had approved shipment to the customer without completion of final inspection. It was believed that nonconforming product had been shipped to the customer and the root cause was a missed final inspection point; further investigation showed final inspection was not missed.)

Since the nonconformance was discovered during an external audit and not a direct customer product shipment, there was no need for interim containment actions. Figure 9.6 is the segment of the 8D corrective action request evaluation checklist that pertains to containment issues and the validation of their effectiveness.

Note that each of the items in this segment has been identified as "N/A." Using the 8D checklist during each corrective action activity serves as reinforcement of the documented flow of corrective action using the 8D process. Modular Kaizen stresses the adherence to established standards and protocols as integrated into daily work management. Since the procedures are well understood by all members of the organization, these steps are performed quickly and with little to no disruption to normal operations. If these forms were used infrequently, there could be significant confusion by untrained personnel while trying to answer the items in the checklist.

IDENTIFY POSSIBLE SOLUTIONS

Once the problem was succinctly defined, the corrective action team was able to focus on possible root causes. A very simple (and common) root cause analysis was used—5 Whys. In reviewing the reasons why the initial problem statement

Corrective action:
A reactive activity (and the associated controls) implemented to resolve a nonconformance and restore a product or process to a satisfactory condition.

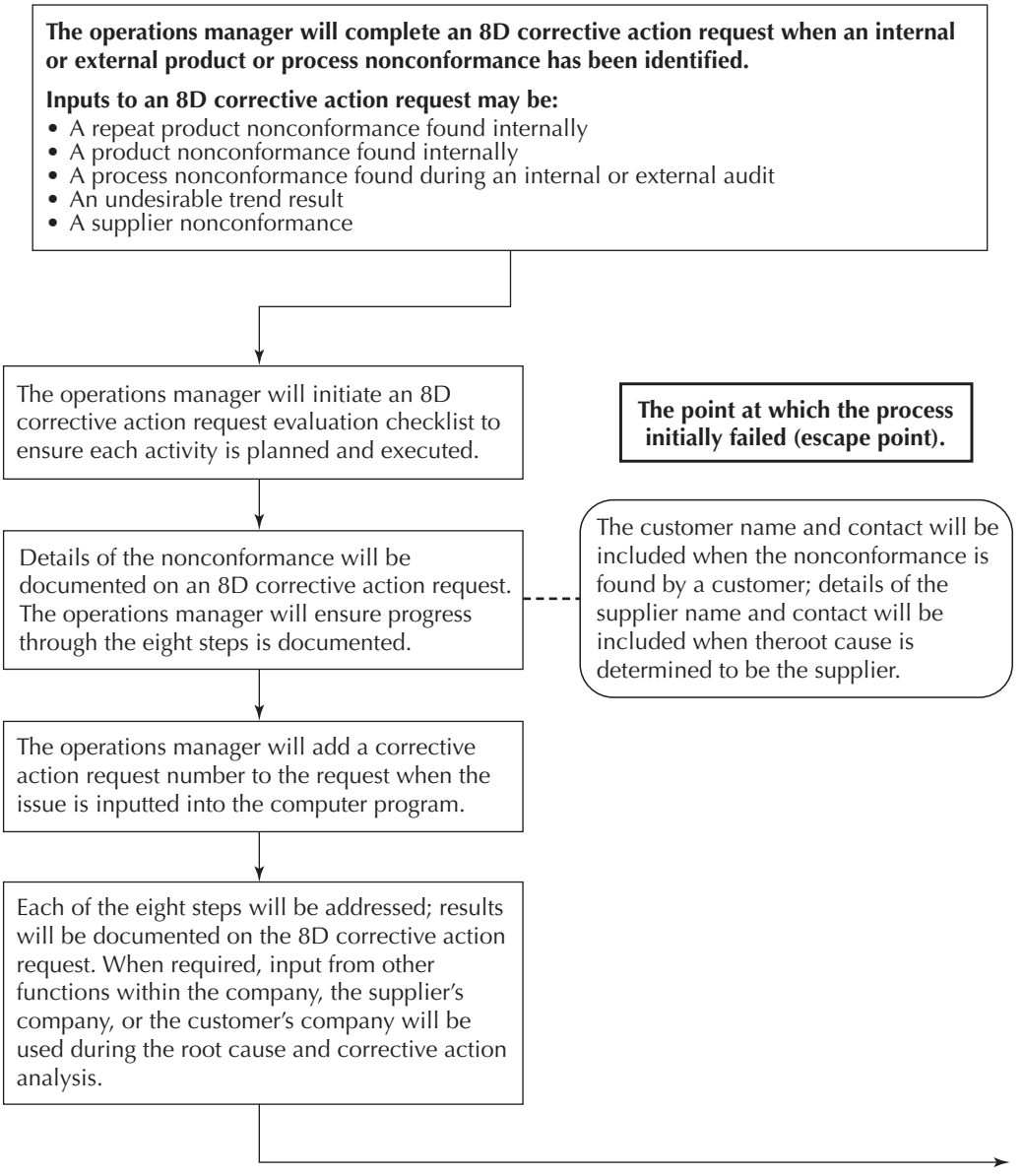


Figure 9.5 Flowchart of corrective action process.

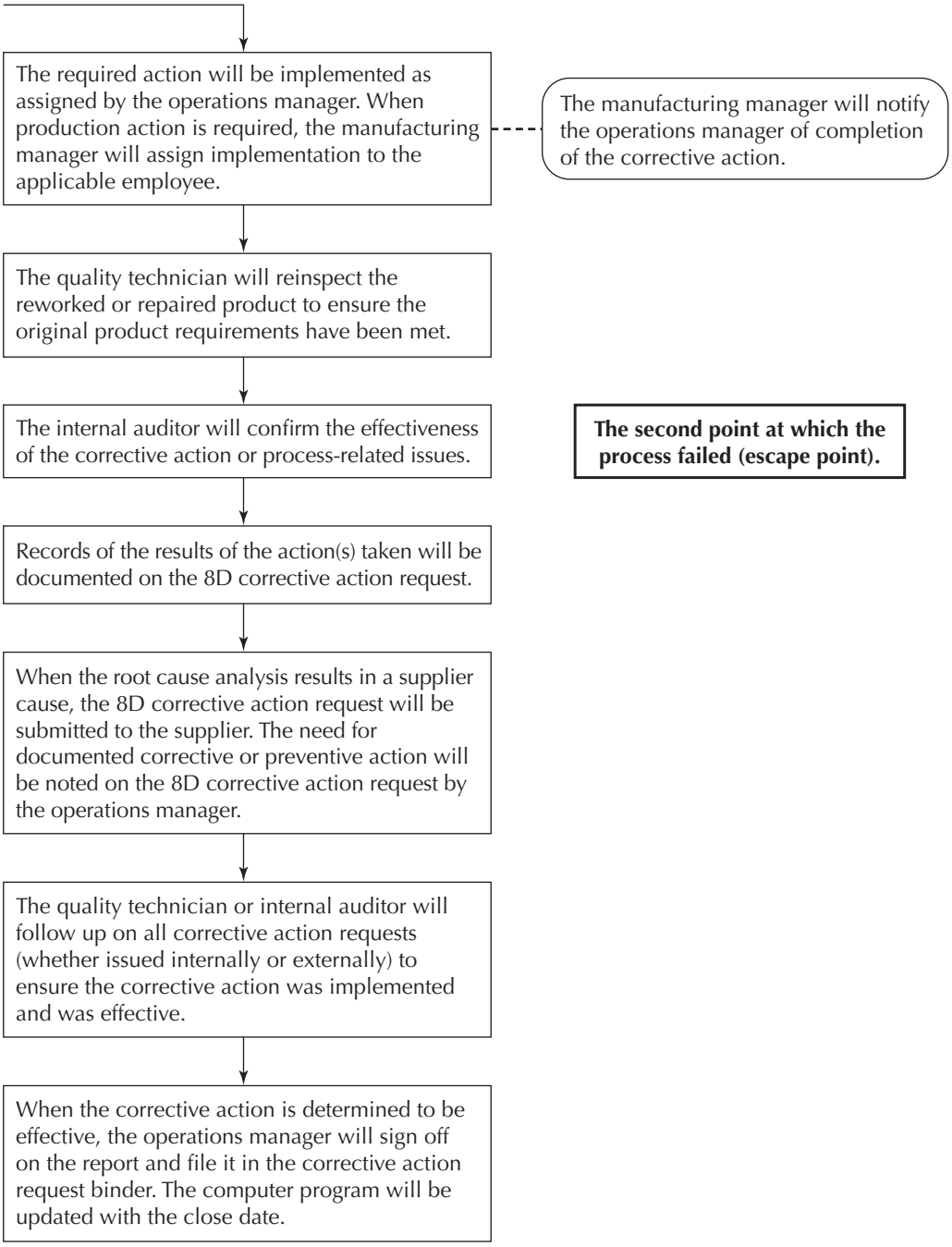


Figure 9.5 Flowchart of corrective action process. *(continued)*

Develop interim containment actions—validate their effectiveness				
	Y	**N**	**N/A**	**Comments**
Was the method of sorting identified?			X	
Were all stock locations purged (customer, supplier, in-house, in-transit)?			X	
Were sort data (%, PPM, total defective) recorded?			X	
Were internal containment actions, with dates, recorded?			X	
Was the certification identification method identified?			X	
Was there a "clean" date identified for certified stock?			X	
Containment action(s) were verified before implementation and validated after implementation to ensure that the customer is 100% protected			X	
Were similar parts supplied to the customer examined to see if containment was necessary?			X	
All containment action(s) remained in place until the permanent action(s) were verified to be effective and the 8D was closed by the customer			X	

Figure 9.6 Interim containment actions section of the 8D corrective action request evaluation checklist.

(and thus the initial root cause and corrective action) was not correctly identified, the problem-solving team asked "why" five times:

> Why #1: The quality technician did not investigate the problem but relied on the sales manager's explanation of what occurred.
>
> Why #2: The sales manager often circumvented internal quality management system processes in order to ship product to customers.
>
> Why #3: The quality technician did not truly understand the process and criticality of effective problem solving.
>
> Why #4: In-depth root cause and corrective action analysis training had not been provided to the quality technician.
>
> Why #5: Repeat internal and external product and process nonconformances were not common in the company. The training was regarded as a non-value-added expense.

With the root cause identified as a training issue, potential solutions to prevent incorrect problem definition and ineffective root cause and corrective action activities were documented. In this situation, the root cause analysis for the external audit nonconformance was "ineffective root cause and corrective action activities." Therefore, the process for identifying possible solutions revolved around ineffective root cause and corrective action. Figure 9.7 shows the 8D corrective

Define and verify root cause and escape point—where in the process could the effect of the root cause have been detected and contained?				
	Y	N	N/A	Comments
Was the root cause(s) of the occurrence identified?	X			
Was the escape point identified?	X			
Was the root cause(s) verified by being able to turn the problem on and off?	X			

Figure 9.7 Root cause section of the 8D corrective action request evaluation checklist.

action request evaluation checklist segment guiding the team through definition and verification of the root cause.

The root cause of the problem was identified as an ineffective root cause for customers receiving product without final inspection being performed. The faulty root cause was defined as the dispositioning of discrepant product, whereas the true root cause appeared to be an inadequate measuring system to control adherence to the control of product realization process. If the process were followed as designed, there would be no opportunity to disposition discrepant product in the first place. Prevention would be the resolution, not the internal failure of an audit identifying final inspection as not being completed before product was shipped.

The process step in which the nonconformance was observed is identified in the flowchart in Figure 9.5. Note the activities in this section identified two escape points.

SELECT THE BEST SOLUTION

The solution was to return to the corrective action process as defined. Through the identification of the two escape points, it was determined that improvement was necessary for the process. A rapid cycle PDCA Modular Kaizen activity quickly identified the process steps that were not effectively implemented when the initial root cause and corrective action activities were completed.

Two improvement indicators were identified as "more formal training for the quality technician during root cause and corrective action analysis" and for "confirmation by the internal auditor of the effectiveness of the corrective action." Figure 9.8 is the checklist segment related to the final resolution of the corrective action discovered during the external audit.

DEVELOP AN ACTION PLAN

More formal training on root cause and corrective action has been scheduled for the quality technician. Nonconformities that are currently documented will be reviewed by the internal auditor and the quality technician to ensure that effective and complete root cause and corrective action has been implemented. Corrective action processes will be scheduled for quarterly internal audits to ensure root cause and corrective action is correct and effective. Results will be presented to the operations manager and the quality technician for review and possible additional actions.

Choose and verify permanent corrective actions—verify success when implemented without causing undesirable effects				
	Y	**N**	**N/A**	**Comments**
Were permanent corrective actions that will remove the root cause(s) and address the escape point specifically stated?	X			
Was the timing of the implementation of the permanent corrective actions determined?	X			
Have all contributing factors to the root cause(s) been addressed?	X			
Was related documentation updated (instructions, forms, etc.)?	X			

Figure 9.8 Permanent corrective action section of the 8D corrective action request evaluation checklist.

IMPLEMENT AND DOCUMENT THE SOLUTION

Figure 9.9 is the permanent corrective action documentation.

Implement and validate permanent corrective actions—remove interim containment actions, monitor long-term results				
	Y	**N**	**N/A**	**Comments**
Did each permanent corrective action have a team member responsible for follow-up?	X			
Was verification completed to ensure that the corrective action was effective and that no other effect was caused before implementation?	X			
Are objective verification data available for each permanent corrective action?	X			
Prevent recurrence—modify the systems and documentation, look for systemic improvements, document lessons learned				
Were systems (policies, procedures, instructions, Process Failure Mode and Effects Analyses, control plans, etc.) reviewed and revised to prevent the problem from reoccurring?	X			
Were poka-yoke/fail-safe devices used where possible?	X			

Figure 9.9 Implement and validate permanent corrective action section of the 8D corrective action request evaluation checklist.

EVALUATE THE EFFECTIVENESS OF THE IMPROVEMENT (CONTROL PLAN)

The last step in the 8D process is to provide appropriate recognition to the team and involved individuals for a job well done. Figure 9.10 is the documentation archived with the project report verifying that the team, as well as the quality technician, was recognized for improvements made.

Recognize team and individual contributions				
	Y	**N**	**N/A**	**Comments**
Were the team's efforts recognized?	X			
Were individual efforts recognized?	X			
Checklist completed by: Operations manager				
Date opened: July 2011	Date closed: July 2012			

Figure 9.10 Recognition section of the 8D corrective action request evaluation checklist.

NOTES

1. "8 Disciplines Problem Solving," *Wikipedia*, accessed October 4, 2012, http://en.wikipedia.org/wiki/Eight_Disciplines_Problem_Solving.
2. Grace L. Duffy and John W. Moran, "Team Chartering," *ASQ Quality Management Division Forum* 37, no. 1 (Spring 2011): 11–16.

Chapter 10
Meeting Effectiveness Evaluation Project

INTRODUCTION

The Thunder Bay District Health Unit (TBDHU) is one of 36 public health units operating in the province of Ontario, Canada. We are a nonprofit agency funded jointly by the provincial government and the municipalities we serve.

In response to the health needs of the community, we:

- Provide health information and prevention-related clinical services to people of all ages
- Advocate for healthy public policy
- Protect district residents by investigating reportable diseases
- Uphold regulations that apply to public health

The health unit is governed by the Board of Health, which comprises 12 municipal representatives and up to 11 provincial appointees. The current composition is 12 municipal representatives and 2 provincial appointees.

The Board of Health is committed to ensuring that TBDHU is well governed. The board recognizes that continuous quality improvement (CQI) for individual members and the collective whole of the members of the Board of Health is an important factor in its ability to ensure that TBDHU is well governed and operating in the best interests of the community.

TBDHU began its CQI program in 2011. By working through a CQI process and establishing its own project team, the board showed its leadership and its full commitment to the quality initiative. The quality council, made up of senior management and middle managers of the health unit, met to identify criteria for selecting projects that would align with the strategic vision of the organization as well as provide immediate improvement to daily activities of leadership and staff. Figure 10.1 shows the criteria established for selecting the initial quality projects supporting the implementation of a quality framework for TBDHU.

Team lead: Barbara Moro, TBDHU executive assistant
Team facilitator: Georgina Daniels, FCPA, FCA, TBDHU quality manager, finance manager

Quality Council—Projects Criteria
June 2012

Criteria for initial quality projects
To build internal capacity related to the design and development of CQI concepts and processes, the following criteria were identified by the consultants for the first set(s) of quality projects:

- **Controllable.** Projects/processes should be within the (total) control of the TBDHU. The more control we have over the processes that are being reviewed/implemented, the higher the likelihood of achieving positive outcomes.
- **Relatively easy.** Projects/processes should be relatively easy, with objectives and outcomes that can be identified and measured. Organizations build capacity starting at the "beginning" and build up to projects/processes where the objectives and/or outcomes are more difficult to identify and measure.
- **Short.** Projects/processes should be short in nature so that project teams can see success in the recommendations that they make.
- **Cost.** Projects/processes should have no or minimal cost that is within the control of existing budgets.
- **Visible.** Project outcomes should be visible across the organization and easy to communicate.
- **Maximize involvement.** Projects should provide an opportunity to maximize involvement across the organization, including at the management level, so that knowledge exchange and transfer can be enhanced.
- **Strategic direction.** Projects should be consistent with the strategic direction of the organization.

Figure 10.1 Project selection criteria for TBDHU.

UNDERSTAND AND DEFINE THE PROBLEM/OPPORTUNITY

In mid-2012, the quality manager (QM) met with the TBDHU executive assistant (EA) to identify priority issues suggested by members of the Board of Health during recent feedback sessions. The board had already approved the implementation of a framework for quality improvement within the health unit and was supportive when the QM and the EA proposed a pilot CQI project involving board members.

The CEO and the board chair scheduled an agenda item for the January 2012 board meeting to involve the board in the selection of the CQI project. One significant desire expressed by the board members was to better assess their own performance during board meetings. Discussion among board members and health unit leadership indicated that the current evaluation process was not as effective as it should be. It was suggested that through an effective evaluation process, the Board of Health would also be better able to solve other related issues of board governance. The issue was first identified during the board meeting and subsequently refined through individual discussions with the board chair, the CEO of TBDHU, the QM, and the EA prior to presenting the project concept to the Board of Health.

The board developed the following opportunity statement: to adopt a continuous improvement board evaluation system. Doug Heath, TBDHU CEO, was chosen as team sponsor. The Board of Health chair served as team champion for the project.

Board members were asked to volunteer to work through the CQI process, and from those who volunteered, team members were randomly selected, ensuring representation from each category of board members (i.e., council, citizen, and provincial appointees). In addition, the executive assistant as secretary to the Board of Health and the CEO, who provide direct support to the Board of Health, were included to support the project team.

Introductory quality tools and techniques training was provided to the team members as part of a contract with the American Society for Quality (ASQ) to assist TBDHU in implementing a framework of quality.

As part of the initial discussions before chartering the project, the quality manager, the sponsor (CEO), and the team lead identified that consideration needed to be given to ensuring representation on the team covered each of the legislated areas of representation on the Board of Health (i.e., council, citizen, and provincial appointees).

Other areas of expertise were identified as required by the team lead, the quality manager, the sponsor (CEO), and the facilitator. The facilitator suggested the use of a modified Bloom's Taxonomy[1] to indicate the level of cognition recommended by each team member to be effective on the project. Table 10.1 is a copy of

Table 10.1 Personal mastery matrix.*

Project skills required	Board of Health project team members							
	Board chair	**Municipal rep.**	**Provincial rep.**	**Rural rep.**	**CEO**	**Subject matter expert**	**Team lead**	**Facilitator**
Health unit vision	C	U	U	U	C	R	Ap	Ap
Health unit strategic plan	C	U	U	U	C	R	Ap	U
Provincial requirements	Ev	Ap	Ap	Ap	Ev		U	
Health regulations	U	U	U	U	Ev		U	
Local policy/ procedures	Ev	Ap	Ap	Ap	Ev	Ap	U	Ap
Project management	U	U	U	U	U	U	Ap	Ap
Effective communications	Ap	U	U	U	Ap	Ap	Ap	An
Evaluation and assessment skills	Ap	Ap	Ap	Ap	Ap	An	Ap	U
Quality tools/ techniques	U	U	U	U	U	Ap	Ap	Ap

*Levels of cognition are based on *Bloom's Taxonomy* (revised 2001): R = Remember, U = Understand, Ap = Apply, An = Analyze, Ev = Evaluate, C = Create.

the Modular Kaizen personal mastery matrix created to ensure that team members had the correct skill set for serving on the Board of Health quality improvement project. Use of the matrix provided an iterative guide for selecting the most qualified volunteers for the team, while also highlighting areas where additional skill enhancement was necessary before project launch.

COLLECT, ANALYZE, AND PRIORITIZE DATA

The Board of Health members referred to in Table 10.1 began their assessment of personal mastery by reviewing the shared vision of the health unit, assisted by the CEO, the quality manager, and facilitating consultants. Reviewing the vision prompted the project team members to rethink their assumptions upon which the original meeting effectiveness evaluation was based. In the case of the Board of Health, the steps of establishing the vision and adjusting assumptions were an iterative dialogue of discovery lasting most of an afternoon.

As part of the initial definition of the Board of Health self-evaluation process, the team leader and the facilitator worked with the board to formally document the existing evaluation process. This effort culminated in the creation of Policy BH-02-06—Board of Health Self-Evaluation (see Figure 10.2). This policy provided the initial current-state picture of the evaluation process that generated an active discussion on the scope of the project. It was observed that the board performs two evaluation processes: the evaluation of the monthly board meeting at the end of the session and the yearly self-assessment questionnaire. It was decided to restrict the first improvement project effort to the monthly meeting assessment.

Discussion among the Board of Health leadership identified several areas of the monthly evaluation process that were redundant and poorly scheduled, thus wasting time and causing conflicts among board members' calendars. The quality manager and the facilitators initiated a process flow analysis activity that highlighted several areas where tasks could be compressed or eliminated completely. Table 10.2 is a copy of the analysis worksheet identifying met and unmet process customer needs.

IDENTIFY POSSIBLE SOLUTIONS

Meeting schedules were redesigned to eliminate waiting between meetings for reviews, signatures, and reporting. Team learning opportunities were identified as the board leadership assessed the impact that the recommended changes would have on other board members and related stakeholders. Plans were initiated to provide mentoring and some formal training to the whole board once it reconvened after the summer hiatus.

As a team, the Board of Health process improvement members identified the outcomes desired for the project:

- Improve the way the Board of Health works together
- Have a fully functioning Board of Health
- Improve the effectiveness and efficiency of Board of Health meetings

Corporate Policy and Procedure

Section: Board of Health **Policy No.: BH-02-06**

Subject: Board of Health Self-Evaluation

Approved by: Board of Health **Date: September 20, 2011**

Supersedes: New

Reviewed:
Program: July 2, 2011
MCC: N/A
SMT: N/A

1. Purpose

1.1 The Board of Health is committed to ensure that the TBDHU is well governed. The board recognizes that continuous quality improvement for individual members and the collective whole of the members of the Board of Health is an important factor in its ability to ensure that the TBDHU is well governed and operating in the best interests of the community.

1.2 The purpose of this policy is to provide a process for opportunities to examine the individual and collective performance of Board of Health members in order to strengthen overall performance as a governing body.

2. Policy

2.1 Board self-assessment can be defined as "an organized process by which the board regularly re-examines its goals and objectives, structure, processes, and collective and individual performance, and then reaffirms its commitment by adopting new goals and improved methods of operation in a constructive manner."

2.2 The Board of Health self-evaluation process shall allow for consideration of whether:
- Decision making is based on access to appropriate information with sufficient time for deliberations;
- Compliance with all federal and provincial regulatory requirements is achieved;
- Any material notice of wrongdoing or irregularities is responded to in a timely manner;
- Reporting systems provide the board with information that is timely and complete;
- Members remain abreast of major developments among peers; and
- The board as a governing body is achieving its strategic outcomes.

2.3 Board self-assessments can be a helpful tool for boards to evaluate their performance and determine areas that need attention. The benefits of board self-assessments include:
- Identifying strengths and weaknesses;
- Measuring progress toward existing plans, goals, and objectives;
- Shaping the future operations of the board;
- Understanding roles and responsibilities;
- Improving efficient and effectiveness of board meetings;
- Providing insight into decision making;
- Improving board accountability;
- Building trust, respect, and communication among board members; and
- Enabling individual board members to work more effectively as part of a team.

2.4 The Board of Health will be provided with two opportunities to evaluate its performance, which are as follows:
a) Evaluation of Board of Directors Meetings Form, which is completed at the conclusion of each Board of Health meeting. (Attachment 8.1)
b) Questionnaire for Board Members—Self-Assessment for TBDHU Board of Health, which is completed on a yearly basis. (Attachment 8.2)

3. Procedure

Monthly Board of Directors Meeting Evaluation

3.1 A Board of Directors Meeting Evaluation form will be distributed to all board members with their monthly Board of Health meeting agenda package by the executive assistant.

Figure 10.2 TBDHU policy BH-02-06. (*continued*)

3.2 The form will be completed by the board member at the conclusion of the board meeting.
3.3 Upon completion, the form will be submitted to the executive assistant who will collate the results.
3.4 The results will be distributed to all members of the board and the senior management team with the agenda package of the following month.
3.5 The chair of the board will bring forward concerns or recommendations to the board for review and appropriate action, as necessary.

Yearly Self-Assessment Questionnaire

3.6 The Self-Assessment for TBDHU Board of Health form will be distributed to all board members with their June board meeting agenda package.
3.7 Board members are required to complete the self-assessment questionnaire and return it to the executive assistant at the June board meeting.
3.8 The results of the self-assessment questionnaire will be collated and added to the executive committee's summer meeting for review and appropriate action.
3.9 If there are any recommendations from the executive committee, the results and subsequent recommendations will be placed on the September Board of Health meeting agenda for consideration.
3.10 If there are no recommendations, a copy of the results will be distributed to all remaining board members with their September Board of Health meeting agenda package, for information.

4. Scope

4.1 This policy applies to the Board of Health for the TBDHU.

5. Responsibility

5.1 The executive assistant will ensure that:
- A copy of the Board of Directors Meeting Evaluation form is distributed to all board of Health members with their monthly agenda package;
- The results of the monthly meetings are collated and distributed to board members with the next months meeting material;
- A copy of the Board of Health Self-Evaluation Questionnaire is distributed to all Board of Health members with their June board meeting agenda package; and
- The results of the Board of Health Self-Evaluation Questionnaire are collated and put on the next Board of Health meeting agenda for discussion.

5.2 The Board of Health members are responsible for completing the Board of Health Meeting Evaluation form at the conclusion of each meeting and for completing the Self-Assessment Questionnaire in June of each year.
5.3 The chair of the board will bring forward concerns and recommendations for consideration of the executive committee or the Board of Health, as necessary.

6. Definitions

There are no definitions with this policy.

7. References and Related Statements of Policy and Procedure

There are no references with this policy.

8. Attachments

8.1 Board of Health—Evaluation of Board of Directors Meetings
8.2 Questionnaire for Board Members—Self-Assessment for TBDHU Board of Health (Available from the chief executive officer)

Figure 10.2 TBDHU policy BH-02-06. *(continued)*

Table 10.2 TBDHU meeting process flow analysis.

Process/activity	Customer need	Met/ unmet	Requirements	Target/goal	High-level measure
Review minutes	Meeting issue recorded	Met			
Review previous meeting evaluation	Issue evaluation, have evaluations reviewed	Unmet	Motivate members to review evaluations	All members review evaluations	Yes/no
Acquire blank evaluation form	Blank form	Met			
Schedule Board of Health meeting	Meeting scheduled at effective time on calendar	Unmet	Calendar schedule efficient and nondisruptive	Effective calendar schedule	Yes/no
Have Board of Health meeting	Hold meeting	Met			
Is form completed?	Complete form	Met	Completed forms	All members complete forms	14 candid forms submitted
Collect forms	Completed forms	Met			
Analyze input	Results input	Unmet	Review evaluations	Administration reviews, might consider having board review	Yes/no
Collate results	Results produced	Unmet			
Review previous evaluation	Evaluations reviewed	Unmet	Communication of actions	Communication of actions	Yes/no
Take action	Communicate the action that was taken	Unmet	Board awareness of actions taken	Board approval of actions taken	% approval and follow-up

- Improve self-evaluation results over time (based on a Likert scale)
- Have every board member candidly complete the self-evaluation form in a constructive manner
- Improve the overall performance of the health unit

A copy of the completed Board of Health CQI project charter is included at the end of this chapter, in Figure 10.5.

SELECT THE BEST SOLUTION

A review of the existing monthly board evaluation instrument was conducted, as well as the current administrative processes to prepare for Board of Health meetings. After a complete review of the current state, the project scope was defined:

> Scope: Board evaluation instrument (monthly tool), resource allocation (administrative), and board functional efficiency

This scope was the result of a number of conversations held during regularly scheduled TBDHU senior management team meetings, validated with the board chair and team members. In order to maximize engagement, it was agreed that all meetings would be held in person with as many team members in attendance as possible.

The team leader reviewed the minutes of previous Board of Health meetings to collect, analyze, and prioritize data related to problem symptoms. She worked closely with the team facilitator and the CEO to design the best approach for gathering perceptions from the Board of Health team members. In order to identify the best approach for involving the board members, the following objectives were identified to help define the opportunity relative to self-evaluation of board meetings:

- To clearly articulate the evaluation process outcomes
- To create clearly defined expectations
- To collect data and trends over time
- To provide for an opportunity for effective board engagement
- To have evidence of corrective action
- To champion the quality initiative in the organization

In addition, the following success measures were identified:

I. To have a clearly defined board evaluation process

II. To have a clearly defined self-evaluation process including tools

III. To track percentage of evaluations completed

With these identified, the team completed an affinity diagram and drafted a cause and effect diagram for the factors that will contribute to the effectiveness and efficiency of Board of Health meetings. A copy of this quality tool is shown in Figure 10.3.

The improvement team took the symptoms identified in the cause and effect diagram and analyzed them sequentially according to the "fishbone" categories of:

- Materials
- People
- Physical/equipment
- Process/method

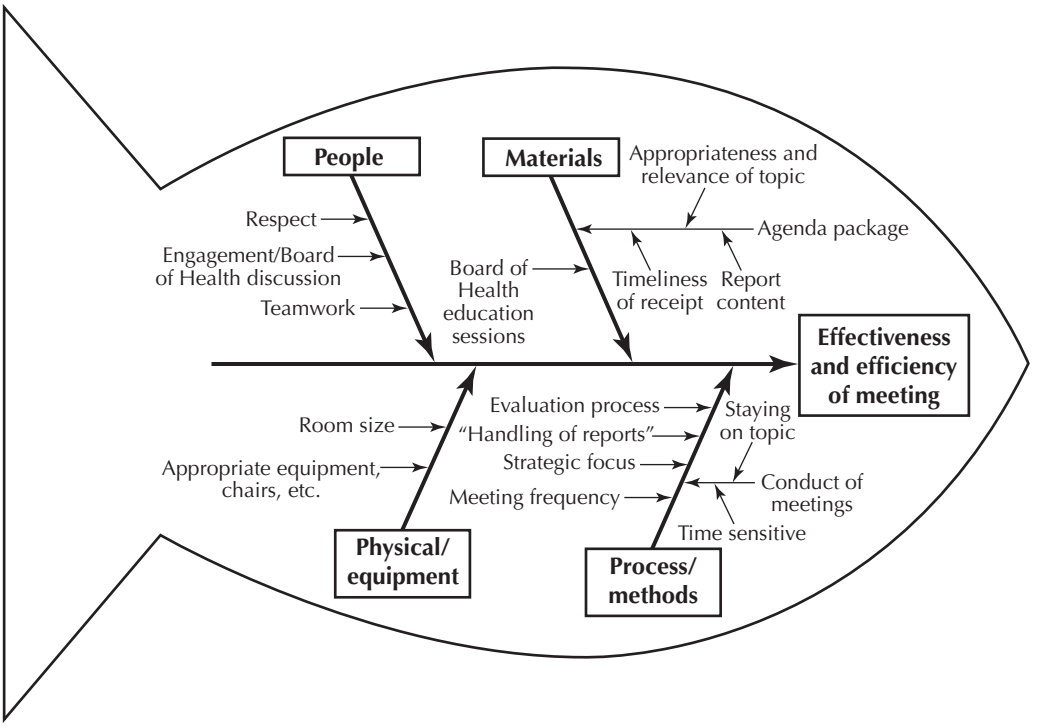


Figure 10.3 TBDHU effective meeting cause and effect diagram.

IMPLEMENT AND DOCUMENT THE SOLUTION

A significant activity led by the team leader and the facilitator was a formal study of each item listed in the cause and effect diagram. The team went through each item with a targeted outcome to develop the change plan, pilot test, and suggested refinements.

Table 10.3 is the resulting action tables created by the project team. The team lead named this process the "deboned" fish to indicate that each of the items listed in the original fishbone was removed from the graphic to be considered and addressed by the improvement team.

This activity is rarely documented in project reports in such a complete format. The reader is encouraged to follow the thought process of the team discussion. The table is arranged by:

- Topic
- Subtopic
- Standard
- Options
- Comments
- Outcome

Reference is made to quality management system (QMS) elements documented by the health unit.

Table 10.3 The "deboned" fish.

	Topic	Subtopic	Standard	Options	Comments	Outcome
Materials						
1	Agenda package	Timeliness of receipt	Section 24(4) of the bylaw: "The chief executive officer in collaboration with the chair shall prepare the agendas, with supporting material, to be delivered to the members of the board preferentially five (5) consecutive days in advance of a regular meeting and 48 hours prior to a special meeting."			Standard to remain the same—approved August 22, 2012
2		Appropriateness and relevance of topic	• All topics are consistent with and relevant to the public health standards and mandate. • Distinguish between operational and strategic. • Reports would relate to governance issues. • Board is well informed on key or sensitive organizational issues. • Requests from individual board members inside the meeting require resolution of board (Section 19(1(a))—Board of Health bylaw)	• Quality management system (QMS) element #13* • Measure against the Ontario Public Health Standards.	• Plan to be put in place for regular reporting of certain data provided to senior management and Board of Health (i.e. surveillance on reportable diseases in health protection) and linked to information session at board. • Topics are strategic. • Screening process for beginning initiative.	Standard discussed and approved—August 22, 2012

3		Report content	Board of Health report writing format process/ templates	• Any resolution to be considered by the Board of Health will be presented in an individual issue report or memo		• Approved August 22, 2012
				• One senior management activity report will be submitted to the board—no individual senior manager reports	• No senior management activity report • Is there a disadvantage to not getting information • Available on website? • Efficiencies–record keeping—easier to produce	• No senior management activity report to the board; approved August 22, 2012
				• Significant issues will be presented to the board in a separate report (not in senior management reports)		Approved August 22, 2012
				• Increase Arial font from 11 point to 12 point • Change to Times New Roman • Point form reports		• Corporate reports and agenda formats to be produced in 12-point font (from 11 point) • No change of font across the organization (take recommendation to communications manager) • Use point form as appropriate

(*continued*)

Table 10.3 The "deboned" fish. *(continued)*

	Topic	Subtopic	Standard	Options	Comments	Outcome
4	Board of Health education sessions		Section 13(1) of the bylaw—Continuing Education and Professional Development for Board Members: "The Board of Health supports for its members continuing education on public health and related community matters." Board of Health Policy BH-02-03—Continuing Education for Board Members Board of Health Policy BH-02-01—Orientation for Board of Health	• Limited to 10-minute presentation for information sessions and reports	• Two questions from each board member on the first round • Time limit on question and answer period	• 10 minutes per presentation on information session • Presentations for board reports do not have 10-minute time restriction • Two questions on the first round—unlimited rounds
				• Copy of presentation to board in package (advance of meeting)		• Approved August 22, 2012
				• QMS element #13*		
				• One information session per meeting	• No limit on information sessions per meeting	• One information session per meeting (does not include presentations for reports)

People						
5	Respect		Section 11 of the bylaw—Code of Conduct			• Approved September 10, 2012
6	Engagement/ Board of Health discussion		Section 11 of the bylaw—Code of Conduct			• Approved September 10, 2012
7	Teamwork			• Increase the number of social events between board members	• Twice per year—information session—over lunch—downstairs—start time 11:30 a.m.—opportunity to mingle • Motivational speaker—staff or management talk about what we do—twice per year—half day • Frame it as board orientation (i.e., standards) • Have on regular board meeting day	• Two sessions per year • Frame in the organizational standards • Will be on the same days as the board meeting • Annual orientation session (orientation process would need to be reviewed separately)
Physical/Equipment						
8	Room size		Survey done on appropriate room February 2008	• Move meetings to auditorium	• Other options not available at this time • Future may provide for physical changes to move	• Remain in boardroom • Would like the opportunity to move brought back at another time • When time presents itself, look at other options
9	Appropriate equipment, chairs, etc.		New chairs purchased – December 2011 New table purchased – December 2009	• Bring back previous boardroom table		• Remains the same • Look at other options when time presents itself

(*continued*)

Table 10.3 The "deboned" fish. *(continued)*

	Topic	Subtopic	Standard	Options	Comments	Outcome
Process Method						
10	Conduct of meetings time sensitive			Length of meeting: • Limited to 10-minute presentation time for information sessions and reports		• 10 minutes per presentation on information session • Presentations for board reports do not follow the 10-minute time limit • Two questions on the first round—unlimited rounds
				• No speaking to directors' reports—questions only		• No directors' reports
				• One information session per meeting		• One information session per meeting (does not include presentations for reports)
				• Current issues: QMS element #13* (connected to appropriateness and relevance of topic)		• All topics are consistent with and relevant to the public health standards and mandate. • Distinguish between operational and strategic. • Reports would relate to governance issues. • Board is well informed on key or sensitive organizational issues. • Requests from individual board members inside the meeting require resolution of board.

11		Staying on topic		• Self-control • Role of the chair	• Orientation process for keeping the board on track	• Chair's responsibility to ensure members stay on topic
12	Evaluation process		BH-02—Board of Health Evaluation Policy (in review)	In progress		• The board will complete a regular evaluation process
13	"Handling of reports"			• One report from all directors (not individual reports—no speaking to the report)		• No directors' reports
				• Moving of closed session to beginning of meeting		• Approved September 22, 2012
				• Removal of new business and other business section of agenda		• Approved September 22, 2012
				• Additional agenda items placed under appropriate section—decisions of the board/ communications for information		• Approved September 22, 2012
				• Any resolution to be considered by the Board of Health will be presented in an individual issue report or memo		• Approved August 22, 2012
				• Significant issues will be presented to the board in one report (not in directors' reports)		• Approved August 22, 2012
				• Identify reason for moving into closed session		• Approved September 10, 2012
				• Identifying that the report is confidential and which sections are confidential		• Approved September 10, 2012

(*continued*)

Table 10.3 The "deboned" fish. *(continued)*

	Topic	Subtopic	Standard	Options	Comments	Outcome
14	Strategic focus			QMS element #13*	• Plan to be put in place for regular reporting of certain data provided to senior management team and Board of Health (i.e., surveillance on reportable diseases in health protection) and linked to information session at board. • Topics are strategic. • Screening process for beginning initiative.	Standard discussed and approved—August 22, 2012
15	Meeting frequency		Section 24 (2) of the bylaw: "The board shall hold a minimum of 10 meetings each year on days to be fixed by the board at the annual meeting, except in a municipal election year. During a municipal election year, the Board of Health will hold a minimum of nine meetings and will not hold a meeting in the month of December of that year."			• Maintained • Approved September 10, 2012

*Quality management system (QMS) element #13—Systematic and measurable approach to data collection, analysis, and reporting, to support strategic program planning.

With the factors that contribute to the effectiveness and efficiency of meetings identified, the team redesigned each "cause" into specific procedures relative to the preparation and conduct of the board meeting processes. The "deboned" fish was created so that resulting improvement procedures could be identified.

DEVELOP AN ACTION PLAN

Table 10.4 shows the activities and timelines recommended by the improvement team to the Board of Health, with a four-month test ("Do") timeline. The action plan is broken down into phases associated with the PDCA cycle: Plan, Do, Check, and Act. Activities are identified by objective and timeline. Measures for evaluation are listed in the section describing current-state analysis.

In addition to the documents described so far, the team created a full storyboard to share with the Board of Health, other process improvement teams, and outside organizations associated with the health unit. A copy of the storyboard is shown in Figure 10.4.

Table 10.4 Implementation activities table.

Board of Health Quality Improvement **Aim: To improve the effectiveness of the board's performance evaluation process** **Subaim #1: To improve the effectiveness and efficiency of the board's meetings**						
PDCA #	**Date**	**Description of PDCA**	**Status**	**Revise**	**Adopt**	**Reject**
#1	8/22/12	**Agenda Package**—timeliness of receipt—five consecutive days prior to regular board meeting	In progress			
#2	8/22/12	**Agenda Package**—report content—report content to be strategic/governance based	In progress			
#3	8/22/12	**Agenda Package**—report content—issue reports and agenda format to be produced in 12-point font	In progress			
#4	8/22/12	**Agenda Package**—report content—use point form as appropriate	In progress			
#5	8/22/12	**Board of Health Education Sessions**—10 minutes per presentation	In progress			
#6	8/22/12	**Board of Health Education Sessions**—questioning limited to two questions/round	In progress			
#7	8/22/12	**Board of Health Education Sessions**—presentation to be included in Agenda Package	In progress			

(*continued*)

Table 10.4 Implementation activities table. *(continued)*

PDCA #	Date	Description of PDCA	Status	Revise	Adopt	Reject
#8	8/22/12	**Teamwork**—two sessions per year	In progress			
#9	8/22/12	**Teamwork**—annual orientation session to be held	In progress			
#10	9/10/12	**Conduct of Meetings**—no director/ activity/standing reports	In progress			
#11	9/10/12	**Conduct of Meetings**—one information session per meeting	In progress			
#12	9/10/12	**Conduct of Meetings—**topics are consistent with and relevant to the public health standards and mandate	In progress			
#13	9/10/12	**Conduct of Meetings—**requests from individual board members inside the meeting require board resolution	In progress			
#14	9/10/12	**Handling of Reports**—closed session at beginning of board meeting	In progress			
#15	9/10/12	**Handling of Reports**—removal of new business and other business section of agenda	In progress			
#16	9/10/12	**Handling of Reports—**additional agenda items placed under appropriate agenda section	In progress			
#17	9/10/12	**Handling of Reports—**individual issue reports required if resolution is to be considered by the Board of Health	In progress			
#18	9/10/12	**Handling of Reports—**significant issues to be presented to the board in separate reports	In progress			
#19	9/10/12	**Handling of Reports**—identify reason for moving into closed session	In progress			
#20	9/10/12	**Handling of Reports**—identify that the report is confidential and which sections are confidential	In progress			
Subaim #2: To improve the effectiveness of the board evaluation tool						
#21	9/10/12	**Evaluation Questionnaire**—revised version per quality project team	In progress			
#22	9/10/12	**Evaluation Questionnaire**—results summarized and reviewed at Board of Health meetings; quarterly	In progress			

Note: "Do" timelines = four months.

Board of Health Self Evaluation Process - Quality Improvement System

Phase 1: Focus

Outcome: Establish the change imperative and guiding principles

1. **Getting Started**

   The Thunder Bay District Health Unit (TBDHU) began its Continuous Quality Improvement Program (CQI) in 2011. By working through a CQI process and establishing its own Project Team, the Board showed its full commitment and leadership to the Quality Initiative.

   Problem/Opportunity Statement: To adopt a continuous improvement Board Evaluation System

2. **Assemble the Team**

   Board members were asked to volunteer to work through the CQI process, and from those who volunteered, team members were randomly selected, ensuring representation from each category of Board members, ie Council, Citizen and Provincial appointees. In addition, the Secretary to the Board and the Chief Executive Officer, who provide direct support to the Board of Health, were included to support the project team.

Team Members	Area of Expertise
Maria Harding	Chair of the Board
Gwen Garbutt	Council Appointee
Beatrice Metzler	Citizen Appointee
Norm Gale	Provincial Appointee
Doug Heath	Senior Management Sponsor
Barbara Moro	Team Leader
Georgina Daniels	Facilitator, TBDHU Quality Lead

3. **Defining the Project Terms**

   Once the team was established, specific project terms were developed including:

   - To improve the effectiveness of the board's evaluation process;
   - To improve the effectiveness and efficiency of the board's meeting;
   - To have a fully functioning Board of Health;
   - Based on Likert scale, self-evaluation results improve over time;
   - Every Board member candidly completes the self-evaluation form in a constructive manner.

Phase 2: Assessment

Outcome: Understand the current situation

4. **Defining the current situation**

   A review of the existing monthly Board Evaluation Instrument was reviewed, as well as the current administrative processes to prepare for Board of Health meetings. Based on a complete review of the current state, the project scope was defined:

   Scope: Board Evaluation Instrument (Monthly tool); and resource allocation (administrative), and board functional efficiency

Phase 3: Negotiation

Outcome: Define real requirements and gaps in performance

5. **Identifying the Current Processes**

   The following objectives were identified to help define the opportunity relative to self-evaluation of Board meetings:

   - To clearly articulate the evaluation process outcomes;
   - To create clearly defined expectations;
   - To collect data and trends overtime;
   - To provide for an opportunity for effective board engagement;
   - To have evidence of corrective action;
   - To champion the quality initiative in the organization.

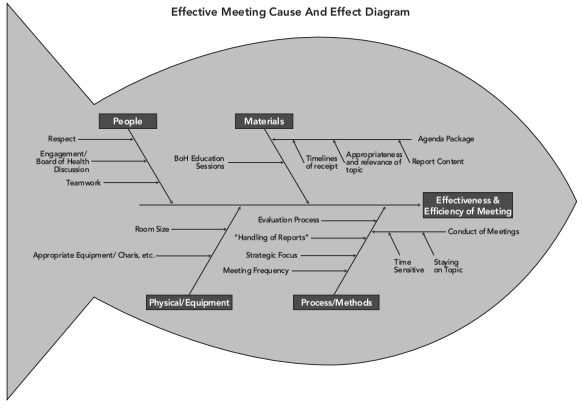
   In addition, the following Success Measures were identified:

   I. To have a clearly defined board evaluation process;

   II. To have a clearly defined self evaluation process including tools;

   III. Percentage of evaluations completed.

   With these identified, the team completed an affinity diagram, and drafted a Cause and Effect Diagram for the factors that will contribute to the effectiveness and efficiency of Board of Health meetings.



Phase 4: Redesign

Outcome: Develop the change plan, pilot testing, refinements

6. **Identify Potential Solutions**

   With the factors that contribute to the effectiveness and efficiency of meetings identified, the team redesigned each 'cause' into specific procedures relative to the preparation and conduct of the Board Meeting processes. The "Deboned Fish" was created so that resulting improvement procedures could be identified.

Figure 10.4 Board of Health self-evaluation process quality improvement system storyboard. *(continued)*

Board of Health Self Evaluation Process - Quality Improvement System

Phase 4: Redesign continued

Outcome: Develop the change plan, pilot testing, refinements

Topic	Sub-Topic	Standard	Options	Comments	Outcome
MATERIALS					
1. Agenda Package	Timelines of receipt	Section 24(4) of the by-law: "The Chief Executive Officer in collaboration with the Chair shall prepare the agendas, with supporting material, to be delivered to the Members of the Board preferentially five (5) consecutive days in advance of a regular meetings and forty-eight (48) hours prior to a special meeting."			Standard to remain the same – Approved August 22, 2012
2.	Appropriateness	• All topics are consistent and relevant with the public health standards and mandate. • Distinguish between operational and strategic. • Reports would relate to governance issues. • Board is well informed on key or sensitive organizational issues • Requests from individual Board Members inside the meeting require	• QMS Element #13* • Measure against the Ontario Public Health Standards	• Plan to be put in place for regular reporting for certain data provided to SMT and Board of Health, i.e. surveillance on reportable diseases in Health Protection, and linked to information session at Board. • Topics are strategic. • Screening process for beginning initiative.	Standard discussed and approved – August 22, 2012
3.	Report Content	Board of Health Report writing format process/templates.	• Any resolution is to be considered by the BOH will be presented in an individual issue report or memo		Approved August 22, 2012
			• One SMT Activity report will be submitted to the Board – no individual Senior Manager reports	• No SMT Activity Report • Is there a disadvantages of not getting information • Available on website? • Efficiencies – record keeping – easier to produce	No SMT Activity Reports to the Board, approved August 22, 2012
			• Significant issues be presented to board in separate report (not in SMT Reports)		Approved August 22, 2012
			• Increase Arial font to 12 pt or change to Times New Roman • Point form reports		• Corporate Reports and Agenda formats to be produced in 12 pt • No change of font (Bring recommendation to Communications Manager) • Use point form as appropriate
4. Board of Health Education Sessions		Section 13(1) of the by-law – Continuing Education and Professional Development for Board Members: "The Board of Health supports for its members, continuing education on public health and related community matters." Board of Health Policy BH-02-03 – Continuing Education for Board Members Board of Health Policy BH-02-01 – Orientation for Board of Health	• Limited to 10 minute presentation time for information sessions and presentations to reports	• Two questions on the first round • Time limit on question and answer period?	• 10 Minutes per presentation on information session • Presentations to Board Reports do not have 10 minute time restriction • Two questions on the first round – unlimited rounds
			• Copy of presentation to board in package (advance of meeting)		Approved August 22, 2012
			• QMS Element #13*		
			• One information session per meeting	• No limit on information sessions per meeting	• One information session per meeting (does not include presentations to reports)
PEOPLE					
5. Respect		Section 11 of the By-law – Code of Conduct			Approved September 10, 2012
6. Engagement / BoH Discussion		Section 11 of the By-law – Code of Conduct			Approved September 10, 2012
7. Teamwork			• Increase the number of social events between Board members	• Twice per year – Information Session – over lunch – downtown – start time 11:30 a.m. – opportunity to mingle • Motivational speaker – staff or management talk about what we do – twice per year – half day • Frame it as board orientation, i.e. standards • Have on regular board meeting day	• Two sessions per year • Frame in the organizational standards • Will be on the same days as the board meeting • Annual orientation session (Orientation process would need to be reviewed as separately)
PHYSICAL/EQUIPMENT					
8. Room Size		Survey done on appropriate room February 2008	• Move meetings to Auditorium	• Other options not available at this time • Future may provide for physical changes to move	• Remain in Board Room • Would like the opportunity to move brought back at another time • When time presents itself look at other options
9. Appropriate Equipment / Chairs, etc		New Chairs purchased – December 2011 New Table purchased – December 2009	• Bring back previous board room table		• Remains the same • Look at other options when time presents itself
PROCESS METHOD					
10. Conduct of Meetings	Time Sensitive		Length of Meeting: • Limited to 10 minute presentation time for information sessions and presentations to reports		• 10 Minutes per presentation on information session • Presentations to Board Reports do not follow the 10 minute time limit • Two questions on the first round – unlimited rounds
			• No speaking to directors reports – questions only		• No directors reports
			• One information session per meeting		• One information session per meeting (does not include presentations to reports)
			• Current Issues: QMS Element #13* (Connected to appropriateness and relevance of topic)		• All topics are consistent and relevant with the public health standards and mandate. • Distinguish between operational and strategic. • Reports would relate to governance issues. • Board is well informed on key or sensitive organizational issues. • Requests from individual Board Members inside the meeting require resolution of Board.
11.	Staying on Topic		• Self Control • Role of the Chair	• Orientation process for keeping the board on track	• Chairs responsibility to ensure members stay on topic
12. Evaluation Process		BH-02 - Board of Health Evaluation Policy (in review)	In Progress		• The board will complete a regular evaluation process
13. Measure Effects	"Handling of Reports"		• One report from all Directors (not individual reports – no speakers to the report)		• No directors reports
			• Moving of Closed Session to beginning of meeting		Approved September 22, 2012
			• Removal of New Business and Other Business Section of agenda		Approved September 22, 2012
			• Additional agenda items placed under appropriate section – Decisions of the Board/ Communications for Information		Approved September 22, 2012
			• Any resolution is to be considered by the BOH will be presented in an individual issue report or memo		Approved September 22, 2012
			• Significant issues be presented to board in one report (not in director reports)		Approved September 22, 2012
			• Identify reason for moving into closed session		Approved September 22, 2012
			• Identifying that the report is confidential and which sections are confidential		Approved September 22, 2012
14. Strategic Focus	Measure Effects		QMS Element #13*	• Plan to be put in place for regular reporting for certain data provided to SMT and Board of Health, i.e. surveillance on reportable diseases in Health Protection, and linked to information session at Board. • Topics are strategic. • Screening process for beginning initiative.	Standard discussed and approved – August 22, 2012.
15. Meeting Frequency		Section 24 (2) of the by-law: "The Board shall hold a minimum of ten meetings each year on days to be fixed by the Board at the Annual Meeting except in a Municipal Election year. During a Municipal Election year, the Board of Health will hold a minimum of nine meetings and will not hold a meeting in the month of December of that year."			• Maintained • Approved September 10, 2012

Phase 5: Implementation

Outcome: Dramatically Improved performance

7. Progress

The following activities and timelines were recommended to the Board of Health, with a four (4) month test ("Do") timeline.

Cycle	Objective(s)	Activities	Timelines
Plan	• Define Quality Improvement Opportunity; • Collect and Analyze data • Suggest Changes for Improvement Opportunity	• Team Charter • Cause & Effect Diagram • Deboned Fish	June to November, 2012
Do	• Implement changes to test Improvement	• Implement Changes	January – April, 2013
Check	• Measure Effects • Determine Next Steps	• Review P.D./C./A Cycle and document measures	June, 2013
Act	• Standardize Changes to achieve Quality Improvement • Document Project and Results	• Standardize changes by establishing procedures; OR • Continue to evaluate; OR • Suggest other changes to achieve Quality Improvements	Effective September, 2013

8. Lessons Learned

The team identified lessons learned through the Core Process Redesign (CPR) process. The following highlight some key themes identified that contributed to the success of the project outcomes:

I. **Focus**.

   i. Scope. The team stayed focused on the scope of the project, and continued to refine it, which facilitated the completion of the project.

   ii. Customers. Continuing to stay focused on the 'clients' , ie the Board of Health, facilitated achieving the project outcomes.

II. **Teamwork**. Team success was maximized with members being respectful of each other, engaging in open, honest communication of the processes and issues, and taking ownership of their respective ideas/suggestions.

III. **Tools**. The Team Charter, the Cause and Effect diagram, and the Deboned Fish assisted working through each aspect of the project.

IV. **Timelines**. Although project completion timelines were exceeded, the time to thoroughly discuss the items was time well-spent.

Figure 10.4 Board of Health self-evaluation process quality improvement system storyboard. *(continued)*

EVALUATE THE EFFECTIVENESS OF THE IMPROVEMENT

As a culmination of the improvement project, the team identified lessons learned through the process improvement and redesign pathway process. The following items highlight some key themes identified that contributed to the success of the project outcomes:

I. Focus.

   i. Scope. The team stayed focused on the scope of the project and continued to refine it, which facilitated the completion of the project.

   ii. Customers. Staying focused on the "client" (i.e., the Board of Health) facilitated achieving the project outcomes.

II. Teamwork. Team success was maximized with members being respectful of one another, engaging in open and honest communication of the processes and issues, and taking ownership of their respective ideas/suggestions.

III. Tools. The team charter (Figure 10.5), the cause and effect diagram, and the deboned fish assisted the team in working through each aspect of the project.

IV. Timelines. Although project completion timelines were exceeded, the time to thoroughly discuss the items was time well spent.

1. Team Charter:		
2. Team Name:	**3. Version:** II—6/8/12	**4. Subject:** Board of Health Quality Improvement System
5. Problem/Opportunity Statement: To adopt a continuous improvement board (evaluation values operation) system		
6. Team Sponsor: Doug Heath		**7. Team Leader:** Barb Moro
8. Team Members: Maria Harding, champion Gwen Garbutt, team member Beatrice Metzler, team member Norm Gale, team member Georgina Daniels, facilitator		**Area of Expertise:** Chair of the board Council appointee Citizen appointee Provincial appointee TBDHU quality lead
9. Process Improvement Aim (Mission): • To improve the effectiveness of the board's evaluation process • To improve the effectiveness and efficiency of the board's meeting • To have a fully functioning Board of Health • Based on Likert* scale, self-evaluation results improve over time • Every board member candidly completes the self-evaluation form in a constructive manner *Likert = sum of an evaluative assessment		

Figure 10.5 Team charter. (*continued*)

10. Scope (Boundaries):

In Scope:
- Board evaluation instrument (monthly tool)
- Resource allocation (administrative) and board functional efficiency

Out of Scope:
- Peer to peer or individual evaluations
- Annual self-assessment instrument

11. Customers (Primary and Other):	**Customer Needs Addressed:**
• Individual Board of Health members • Individual senior management team members	• Board effectiveness and efficiency • Transparent processes

12. Objectives:
- To clearly articulate the evaluation process outcomes
- To create clearly defined expectations
- To collect data and trends over time
- To provide for an opportunity for effective board engagement
- To have evidence of corrective action
- To champion the quality initiative in the organization to the Board of Health

13. Success Metrics (Measures):
- To have a clearly defined board evaluation process
- To have a clearly defined self-evaluation process including tools
- Percentage of evaluations completed

14. Considerations (Assumptions/Constraints/Obstacles/Risks):
- Consideration—Ontario Public Health Organizational Standards (meet the mandate of the organizational standards)
- Risk—That the process will not be accepted

15. Available Resources:	**16. Additional Resources Required:**
• Ontario Public Health Standards (OPHS) • Ontario Public Health Organizational Standards • Other boards • Program evaluator	• Administration

17. Key Milestones:

Having a regular meeting schedule	
Final report to the board in September 2012; *Revised to December, 2012*	
Charter completed by end of day June 8, 2012	
Current process documented by July 31, 2012	

18. Communication Plan (Who, How, and When):
- Board of Health, report to the board, Fall 2012
- Senior management meeting

Figure 10.5 Team charter. *(continued)*

19. Key Stakeholders: • Presenters at the Board of Health meeting • Health unit staff	**Area of Concern (as It Relates to the Charter):** • Keep the team accountable

Board of Health Team Charter Sign-Off

Barbara Moro, Team Leader	Date Approved	Comment(s)
Doug Heath, Team Sponsor	Date Approved	Comment(s)
Maria Harding, Team Champion	Date Approved	Comment(s)
Norm Gale, Team Member	Date Approved	Comment(s)
Gwen Garbutt, Team Member	Date Approved	Comment(s)
Beatrice Metzler, Team Member	Date Approved	Comment(s)

Figure 10.5 Team charter. *(continued)*

The Board of Health self-evaluation improvement project was one of five pilot projects initiated to support the development of the TBDHU QMS. All five initial projects have completed the implementation phase. Several of the projects are still being monitored, with minor adjustments initiated as data are collected over time and analyzed for better outcomes.

Thunder Bay has initiated a second series of improvement projects focused on high-priority goals of the health unit. It continues to support the project teams with initial quality training. Senior and middle management receive periodic quality and leadership training to enhance their ability to support the culture of quality improvement now growing within the TBDHU.

NOTE

1. "Bloom's Taxonomy," *Wikipedia*, accessed September 20, 2013, http://en.wikipedia.org/wiki/bloom%27s_taxonomy.

Chapter 11
A NASA Space Coast Kaizen Model

INTRODUCTION

Several NASA field centers have adopted Lean-Six Sigma (LSS) as a process improvement strategy, using an eight-step methodology in their pursuit of operational excellence. NASA's LSS discipline accomplishes steps in the traditional DMAIC approach within a somewhat compressed time frame. NASA's Kennedy Space Center (KSC) in Titusville, Florida, is pursuing a careful and deliberate implementation of LSS, as described in this chapter.

> We don't refer to . . . (the eight steps) . . . in an acronym; we just do them—and we do some of them outside the chronological boundaries of an "event" (what some might call the blitz). We normally do steps 3–5 during the 3-day event, but a successful LSS project involves significant work beforehand and extensive follow-up, both requiring dedicated engagement of senior managers (Champions and Sponsors). This, of course, applies to all successful process improvements . . . all the time, everywhere.[1]

The notion this conveys is that improvement projects seeming to have a relatively minor scope or short duration nonetheless require adequate prework and follow-up if they are to be successful.

Figure 11.1 illustrates how NASA's eight steps correlate to the traditional five-step DMAIC process espoused by Six Sigma practitioners.

LSS Black Belt and Green Belt facilitators and senior managers perform significant prework during the first two Define steps. Steps 1 and 2 focus on the scope and priority of the improvement opportunity and develop a viable charter, laying the groundwork for a successful project. KSC's LSS practitioners routinely do extensive planning in advance of each improvement project. These two steps reinforce the roles of the champion(s), the sponsor(s), and the team leader. KSC's LSS leadership team uses extensive prework planning as a precursor to each of its projects. The team lead normally has the most "skin" in the targeted process and is responsible for reporting the organization's progress in implementing the resulting LSS improvement project recommendations to the sponsor. NASA Black Belt and Green Belt facilitators take the lead in moving the LSS project through

John Adkisson, LSSBB, PMP ATP, FE, ASQ Senior Member, NASA engineer

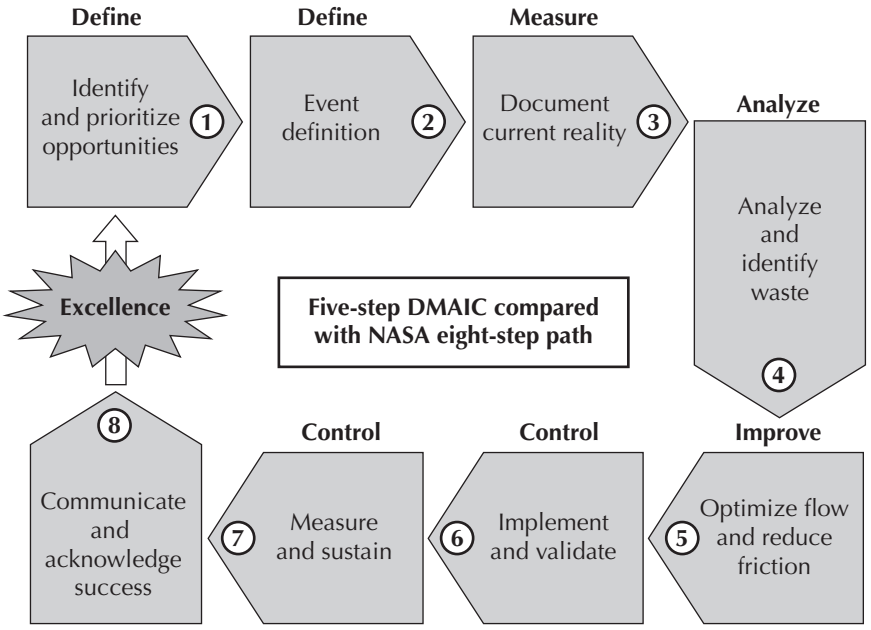


Figure 11.1 The NASA Operating Excellence Path and DMAIC.

the Operational Excellence path. The facilitators focus on the effective use of project management techniques, process improvement and data analysis tools, and a smooth flow of LSS project activities to achieve desired outcomes.

NASA LSS projects normally come in five variations:

- Process improvement kaizen (PIK)—improve an existing process (bulk of NASA events).
- Process development kaizen (PDK)—create or refine a poorly documented/understood process using kaizen improvement and Design for Six Sigma (DFSS) concepts.
- Value stream mapping (VSM)—tackle a comprehensive work flow involving a series of integrated processes. VSM can spawn follow-on LSS improvement projects to address subsystems or smaller-scope processes embedded within the VSM work flow.
- Just do it!—the proper or most appropriate solution becomes obvious during the first two steps.
- "Six S"—apply Sort, Set in Order, Shine, Standardize, Safe, and Sustain steps to upgrade a sloppy or hazardous work environment.

The following example illustrates a generic application of the NASA Operational Excellence path to a specific PDK project. Note that NASA uses the distinguishing prework activities in conjunction with a modified three-day kaizen blitz. This preference for getting team members together for a focused period of time is facilitated by prework tools and activities described in this project story.

UNDERSTAND AND DEFINE THE PROBLEM/OPPORTUNITY

The first requirement in the NASA PDK flow is to understand the situation and engage the champion(s) and the sponsor(s) to become staunch advocates in ensuring a successful project.

Figure 11.2 shows a NASA kaizen event prework checklist that identifies the activities and timing for planning a successful process improvement. Note that the job aid includes suggested timing of the prework in anticipation of the team meeting face-to-face for steps 3, 4, and 5 of the Operating Excellence path in Figure 11.1. Some of the timing may need to be adjusted due to the availability of personnel. The checklist is detailed to allow for contingencies such as personnel schedules, room availability, data gathering delays, and coordination with union or contractor representatives. The timing in the checklist in Figure 11.2 is a best-case scenario, recognizing that busy schedules and resource constraints may need to be taken into account. The flexibility applied to complete these prework activities can bear a striking resemblance to the sort of flexibility embraced by Modular Kaizen.

The first event on the prework checklist is the initial champion and sponsor meeting. Five primary roles must be filled for an LSS event to succeed: champion, sponsor, team leader, coach/facilitator, and team members, as identified in Figure 11.3.

The champion is a senior member of management, usually a director who can remove obstacles and motivate the team to accomplish its task during the event. The champion should also be a strong, known supporter of process improvement and LSS principles and tools. The more senior the champion, the more credibility he or she brings to the project. Champions often have budget and staffing authority and are usually directly affected by the discomfort and stress associated with the less than optimal targeted process.

A sponsor is typically a manager who "owns" and has organizational responsibility for the targeted process. Sponsors should have sufficient organizational and budget authority to implement team recommendations and a commitment to making things happen following the event. The team should be able to forge ahead in its efforts to improve the system without undue delay in waiting for approvals.

In addition to serving as project advocates, champions and sponsors normally take responsibility for making sure project results are communicated to other programs or core areas where the ideas may be applicable. They should also take on as action items the disposition of improvement opportunities the team has identified that fall outside the original project scope or exceed individual team members' implementation authority.

The lead facilitator or coach is a well-trained and experienced LSS Black Belt or Master Black Belt. The following are major characteristics and attributes of the lead facilitator:

- Expert in LSS tools and methods
- Typically a Black Belt or higher
- Coaching/facilitation support
  - "First filter" for events
  - Mentoring

Each team has an approximate time in event minus weeks (E-#) format and a brief description.	
Timing	**Item**
E-5	Initial champion and sponsor meeting • Identify area for pre-event exploration • Draft event charter and targets • Identify team lead and team member candidates
E-4	Schedule event: reserve room and invite team members
E-4	Check tool kit, replace supplies as needed
E-4	Obtain charge number for event, determine if/how much overtime is authorized
E-4	Secure commitment from champion and sponsor to participate in update and final briefings
E-4	Pre-event exploration by belts • Map process (NA) • Estimate scope and potential achievements • Evaluate production requirements and the potential impact on customers • Take appropriate actions to minimize negative impacts such as disrupting product schedules
E-3	Coordinate with champion and sponsor for event kickoff
E-3	Determine and coordinate participation by union-represented (contractor) employees
E-3	Identify team members • In-process (hands-on voters) • Cost analyst • Customers • Suppliers/support functions (e.g., tool services, production control, IT). Determine if they should be on the team or on stand-by as subject matter experts. • Outside eyes
E-3	Coordinate workroom • Same room all week • Overhead projector with laptop interface • Telephone available • Lots of wall space • Not too small • Flip charts with plenty of paper available
E-2	Final champion and sponsor meeting • Review results of exploration • Finalize charter and project targets • Verify sponsor commitment to participate in update and final briefing
E-2	Contact team members for process walk interviews • LSS familiarization if they haven't already had it • Expectations: event schedule (room, start times, etc.)
E-2	Contact 6S coordinator for pre-event and post-event 6S evaluations
E-2	Contact photographer to arrange for team picture if required
E-2	Alert resource and support functions (NA) • Subject matter experts • Facilities/maintenance • Quality • Product engineering • Planning • Safety/environmental

Figure 11.2 KSC kaizen event prework checklist.

Source: Excerpted and modified from the *NASA Change Agent's Guide*, revision 1 (January 17, 2006).

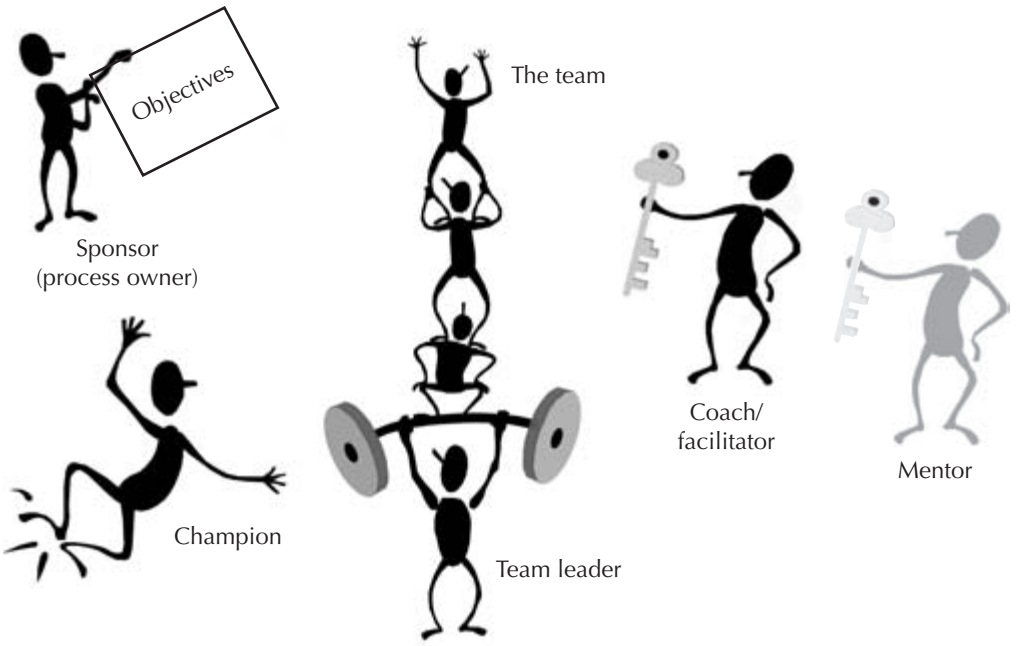


Figure 11.3 The key players form effective improvement teams.

- Coordinate between related event teams
- Help sponsors
  - Establish strategic improvement plan
  - Scope events

The lead facilitator is a coach with extensive experience who also serves as a mentor to help a new coach or facilitator develop his or her skills. The lead facilitator can copilot the first event/project or two to help the new facilitator gain confidence, and provide one-on-one critique and support of the new facilitator's skills. As the new facilitator gains sufficient skill and confidence, the mentor will recommend awarding a Green Belt or Black Belt credential as appropriate.

The team leader is an especially important player. This individual should ideally have extensive involvement in the normal execution of the targeted process and should exhibit the following functional capabilities:

- Link the project/event goals to identified customer value(s)
- Serve as a full-time participant
  - Help the coach/facilitator keep team focused on objectives
  - Document event results and team recommendations
  - Follow up and report on the implementation plan after the event

Ideally, the team leader should be a frontline supervisor in the targeted process with positional authority in the project area. He or she is expected to "catch the ball" on implementing the team's recommended changes and manage completion of implementation tasks following the event.

The team leader also manages adoption of the new, improved standard work process developed during the event in order to achieve and hold the gains the champion, the sponsor, and the team members want to enjoy. Team leaders periodically update the sponsor on the organization's progress toward adopting the improved process and accomplishing the steps in the implementation plan.

During the prework the team leader can aid the facilitator, the champion, and the sponsor in developing a workable charter for the project/event. During the three-day event itself, the team leader essentially serves as an ordinary team member, although there may be barriers that fall within his or her span of control that he or she is able to overcome without having to go to the sponsor or process owner.

An initial recommendation regarding who should serve as team members is made during the prework period. The champion and the sponsor, assisted by the facilitator and the team leader, assess the problem or issue and attempt to assign personnel who are most familiar or involved with the targeted process and who have the skills and abilities to recommend improvements. Selection criteria for team members usually include the following:

- Green Belts and Black Belts
- Individuals from the work area who touch or work with the current process
- Individuals familiar with customer's needs and desires
- Internal partners
- Suppliers
- Outside eyes willing to question waste
  - Program/functional representatives
  - Support
  - Etc.

Most teams consist of 6–10 active participants. Observers should be limited to only one or two and preferably should not be allowed. Someone who wants to gain LSS experience should be a team member, even if he or she is external to the process. A well-balanced team should consist of at least two-thirds membership from people involved in the process on a day-to-day basis. These participants should be the workers in the process, not its managers. Having managers participate, as either team members or observers, tends to inhibit candor and honest dialogue.

The team could have up to one-third of its members from outside the process. These outside eyes can include customers, suppliers, and others willing to ask questions about how "we've always done it."

If the customer of the process (the individual or organization that receives the process output) is not represented directly, someone who is at least knowledgeable of the customer's concerns should be there. It is always best to put the real customer on the team whenever possible.

Suppliers to the process, both internal and external, are often useful, especially when the process provides a service. Partner companies, external suppliers, and providers of support services can also be helpful.

It is customary for the LSS facilitator to anticipate the selection of the team leader and core team members early on. Researching the schedules of those with

critical skills, along with knowing the demands put on these individuals, is important for avoiding anxiety over the availability of key players.

The formal champion and sponsor kickoff briefing engages these individuals in addressing and obtaining closure on the following:

- Explain why they are being asked to sponsor the event
- Explain the mission of the kaizen team in process improvement
- Mention what is in and out of bounds (the specific project scope)
- Explain why the project objectives are important in solving key problems
- Ask them to encourage the team to push against old perceptions and recommend real changes where warranted

Another item addressed during the briefing is the drafting of an initial project charter. NASA LSS leadership prefers to work with senior management to draft the charter as early as possible. The charter serves as a foundation for capturing management expectations and desired outcomes.

NASA LSS practitioners at KSC developed a planning job aid to support the event prework preparation. Although the checklist illustrated in Figure 11.2 recommends a time frame for prework activities, each situation is different and must be tuned to the availability of key personnel and resources, as with Modular Kaizen. Figure 11.4 was developed by a KSC team leader as a working document to assist the facilitator in setting the specific timeline for a kaizen project. This preplanning highlights the critical role of the lead facilitator (LSS Black Belt or Master Black Belt). Although the culture of continuous improvement recognizes the importance of team member empowerment, it also understands the critical contribution of a focused individual commissioned by senior management to provide oversight of the project.

Once event participants are identified, KSC's LSS facilitators turn to the task of interviewing each of the team members. The face-to-face process walk interview of individual kaizen team members by the facilitators (belts) is a crucial part of KSC LSS project preparations. The interview takes about 30–45 minutes, occurs ideally about a week to 10 days before the 3-day event, and is aimed at accomplishing three important objectives:

1. Start developing a working relationship with each team member and put the member at ease by introducing him or her to the LSS kaizen process.
2. Get the team member to start thinking in terms of process steps and his or her role in the overall process.
3. Elicit problems or issues associated with the process from each team member to encourage critical thinking and to assist the facilitator in making notes for future reference.

The pre-event planning interviews and process walk activities gather initial process flow descriptions and data as well as issues and disruptions observed related to the process.

Data gathering occurs during the face-to-face participant interviews. Although the formal current process map is validated during the three-day event (blitz segments of the PDK), the facilitator uses questions in Figure 11.5 to prompt input from each of the team members working the process. It is expected for the current

Task		Start	Finish	Assigned to	Status	Notes
Initial planning						
1	Meet with champion and sponsor					
2	Draft initial project charter					
3	Identify event participants					
4	Identify process walk participants					
5	Determine event location					
6	Schedule event: reserve rooms, send calendar invites to participants					
Process walk						
7	Schedule process walks					
8	Identify current-state data to gather					
9	Collect current-state data					
10	Walk current process					
11	Document current process					
Finalize charter						
12	Update event charter					
13	Final champion and sponsor meeting					
Pre-event planning						
14	Assemble event supplies					
15	Set up room (U-shape tables)					
16	Get event supplies					
17	**Conduct event**					
Follow-up						
18	Sponsor and team lead agree on status reporting, etc.					

Figure 11.4 KSC kaizen event planning worksheet.

state in a PDK event that the answers may not be consistent among participants. The pre-event gathered data are used in the early part of the face-to-face blitz portion of the project to generate questions, identify possible waste, and encourage brainstorming for the next phases of future process definition.

NASA can also use the two checklists in Figure 11.6 to differentiate data gathering between the two major process categories: manufacturing and transactional/office work. This prework checklist can be used along with or in place of the one shown in Figure 11.5.

Figure 11.7 represents one revision level of the project charter. The event description, issue statement, and other high-level expectations are developed by the champion, the sponsor, and the LSS facilitators as soon as practical and before

What is the start trigger? (Signals the person to start work on the process step.)

What are the completion criteria? (Signals the person that the work is complete.)

How many times are work items sent back for more action?

How much time is spent waiting for the process step to be worked on?

How much time is spent actually working on the process step?

How many workers perform this process step?

How many approvals are required in this process step?

Who are the approvers?

How many times does identical action occur within the process step?

What tools or databases are used to complete the process steps?

What are the databases used for (needed to manage and store data)?

List the top three defects generated at this process step:

1.
2.
3.

Figure 11.5 Gather data for each step in the process flow.

For each process step, gather the following data:	
Manufacturing	**Transactional/office**
Trigger:	Trigger:
Completion criteria:	Completion criteria:
Lead time:	Cycle time:
Cycle time:	Touch time:
Takt time:	Takt time:
Number of people:	Number of people:
Work in process (WIP) pieces:	Number of approvals:
Change over time:	Items in in-box:
Distance item travels:	Percent rework:
Distance people travel:	Number of iterations (cycles):
Percent rework:	Number of databases:
Other:	Reformatting:
	Other:

Figure 11.6 Checklist for gathering data specific to process industry type.

Event description
Conduct a process development kaizen for KSC's SAA development process to improve collaboration, integration, and efficiency on behalf of SAA customers.

Event dates: October 25–27, 2011, 8:30 AM to 5:00 PM
Location: KARS-1 conference room

Issue statement
The current SAA process at KSC involves coordination with multiple organizations, including KSC directorates, NASA headquarters, and external partners. Survey respondents have indicated the process should be improved in terms of timeliness, efficiency, and guidance/training available to agreement initiators and developers.

Co-champions: Kelvin Manning (AA-B), Russell Romanella (AA-C)
Co-sponsors: Jerry Stubbs (CC), Sandy Massey (GG), Marie Reed (AA-D), FoL team

Commandments and monuments
- Adhere to all current statutes and regulations
- Follow Agency Space Act Agreement policies/directives

Team lead: Penny Chambers (CC)
Team members: Alan Alemany, Nicole Delvesco, David Miranda, Vijay Shravah (FoL), David Cos, Tracy Lee Belford (AA-D), Karen Lucht (FA), Terry Lambing, Irma Granell (GG), Janet letchworth (GP), Tracey Kickbusch (IT), Tim Bass, Gary Beatovich (LSP), Luke Roberson, Hetal Shah (NE), Krista Jensen (OP), Laura McDaniel (SA), Sheryl Chaffee (TA)
Coaches/facilitators: Rey Diaz, Lisa Stephany, Lori Hicks, John Adkisson

Objectives
- Develop a streamlined SAA process for KSC
- Improve integration of process activities between organizations
- Clarify roles and responsibilities
- Examine guidance and training for initiators and participants
- Improve visibility to enable advocates and participants to tract SAA development progress

Scope
- Begins when a prospective partner approaches KSC and a decision has been made to create an SAA
- Ends when the SAA is approved and signed

Consider established agency IT tools such as SAAM software as well as organizations and personnel involved

Preliminary project plan
Project definition: 09/23—event
- Form team
- Finalize charter
- Brief champions/sponsors and get charter approval
- Walk process, gather data
- Prepare for event

Day 1: 10/25, 8:30–5:00
- Kickoff
- As-is process map
- Customer and value
- Sources of waste and value
- As-is time value calculation

Day 2: 10/26, 8:30–5:00
- Brainstorming improvements
- Cause and effect analysis
- Additional brainstorming
- PICK charting

Day 3: 10/27, 8:30–5:00
- To-be process map
- To-be time value calculation
- Implementation plan/schedule
- Champion/sponsor out-brief

Assumptions
- SAA process stakeholder survey results provide descriptions of perceived improvement opportunities
- Participating KSC organizations may have individual process flows that contribute to or influence overall SAA development

Team guidelines
- Kaizen team decisions will be made by consensus
- Kaizen team members will have an equal voice
- All improvement ideas will be considered
- Kaizen team members are expected to devote 100% of their time during the event

Reporting requirements
Kaizen process improvement recommendations will be provided to the FoL team for consideration/inclusion in their project report and to the kaizen champions/sponsors for their consideration going forward.

Figure 11.7 Draft KSC PDK charter.

team participants are fully identified. Additional information is added to the charter as core team members achieve better definition and analysis of the situation.

Generic high-level goals are also introduced during the early team-forming stage for each NASA LSS project, including:

1. A new, more effective process that will work for everyone
2. An implementation plan
3. A completion report

Illustrations of the results of the team activities relative to the project goals above are shown in Figures 11.11, 11.16, and 11.18 later in this chapter.

Elements of the project charter are verified, changed, or added as required during the prework or planning period. An example of the agenda for the three-day kaizen blitz is provided in Figure 11.8. The lead facilitator, usually an LSS Black Belt or Master Black Belt, reviews the agenda, but makes clear that subjects and timing are flexible depending on what unfolds. The agenda is used primarily to keep the event on track. The only timeslot that is normally unchangeable is the out-brief, since this event has been verified on the champion's and sponsor's executive calendars.

NASA is committed to team member involvement in process improvement. A very early discussion by the facilitator and core team members establishes ground rules for team activities. Figure 11.9 is the set of ground rules decided on by the PDK project to improve and better define the process for creating a KSC Space Act Agreement (SAA).

<table>
<tr><th>Time</th><th>October 25</th><th>October 26</th><th>October 27</th></tr>
<tr><td rowspan="9">8:30 AM to
5:00 PM</td><td>Sponsor kickoff</td><td rowspan="2">Confirm sources of waste and value</td><td rowspan="3">To-be process mapping (continued)</td></tr>
<tr><td>Introductions/overview</td></tr>
<tr><td>As-is process mapping</td><td rowspan="2">Brainstorming (generate, categorize, and prioritize ideas)</td></tr>
<tr><td>Lunch</td><td>Lunch</td><td>Lunch</td></tr>
<tr><td rowspan="3">As-is process mapping (continued)</td><td>Cause and effect analysis</td><td rowspan="2">Develop implementation plan</td></tr>
<tr><td rowspan="2">Brainstorming (based on cause and effect analysis)</td></tr>
<tr><td rowspan="2">Prepare for out-brief</td></tr>
<tr><td>Customer and value</td><td>Pick charting</td></tr>
<tr><td>Sources of waste and value</td><td>To-be process mapping</td><td>Out-brief and management comments</td></tr>
</table>

Figure 11.8 Sequence and relative timing of kaizen blitz event.

• Be active, timely, and present • Laptops, cell phones, and PDAs turned off except during breaks • Nonattribution (what's said at KARS-1 stays at KARS-1)	• Everyone is responsible for our success • Decisions made by consensus • Think process, not people • One person speaks at a time • Be supportive of all ideas

Figure 11.9 Ground rules for team activities.

The facilitator is sensitive to the preferences of all team members when establishing team ground rules. Consensus on operating expectations provides a strong level of comfort for a newly formed team. The process by which the NASA facilitator leads the ground rules discussion is as follows:

- Capture ground rules on a large poster and display the poster
- Have a team member write down the ground rules as they are discussed
- Ask the team members if they agree to these and if they would like to include more (this may be a good time to practice thumb voting; see Figure 11.10)

A champion and sponsor event kickoff briefing covers project goals and objectives and enables management to help motivate the team toward a successful outcome. After the kickoff, the facilitator quickly moves through team introductions into the current-state process mapping and validation. Figure 11.11 summarizes the guidance given by the Master Black Belt facilitator for an actual mapping exercise, which would include flows, responsibility swim lanes, process task steps, and linkages. This map will be captured into an editable software file once consensus is achieved. The PDK activity is intended to document a process that has not yet been formalized. The prework team interviews conducted by the facilitator provide a basis for making selected inquiries to help the team accurately map and understand the existing process. Once the team is face-to-face in the blitz workroom, all the individual process descriptions are brought together. Inconsistencies, options, conflicts, and questions are analyzed and resolved during the first day of the blitz segment of the project. NASA LSS experience has shown there are normally three versions for any given work process:

1. The version captured in formal documents that describes how the process works
2. The version heard when process owners/workers tell someone how it works
3. The version seen by an observer watching the process in action

Current process maps revealed during NASA LSS events appear to be a combination of elements from all three of these versions, incorporating workarounds, steps inadvertently omitted, and informal steps done "behind the scenes."

Facilitators focus on four general areas to gain a thorough understanding of how the current process truly works. Before performing a value analysis of individual process steps, the following discussions are held with the team members:

- Process steps: Ask team members who and what triggers them to get started in each of the process steps they perform, what specific inputs they receive and

- **Thumbs up** indicates team member agrees with the specific idea and will support it through implementation when the event is over.

- **Sideways thumb** indicates team member may not like the specific idea but will support it through implementation when the event is over.

- **Thumbs down** indicates team member does not like the specific idea and will not support it through implementation when the event is over.

Figure 11.10 Guidelines for thumb voting.

Map of how the process is done today . . .

- Team members will map all the process steps they currently do—outlining the inputs requiring them to perform an activity, the activity that is accomplished, and what happens next
- The combined process map will provide the team with a visual way to identify areas for improvement

Figure 11.11 Guidance for developing the current-state process map.

when, what is the actual process they perform, and what they hand off at the end of their process steps and to whom.

- Labor hours: Ask team members how long it takes them to perform each of their process steps (time will be further broken down to determine their hands-on involvement versus waiting time while they are doing something else). Note that this is typically a best guess because people don't routinely measure this.
- Cycles and iterations: Ask team members how many times they are triggered to do the same process steps in a given year and what is their best guess as to why the cycle/iteration is being repeated (e.g., mistakes/rework, additional or special requests, or revisions).
- Tools: Ask team members to identify the tools (IT systems and others) they use to accomplish the process steps. Is any reformatting required?

Functional process map (as-is or current reality)

Shows not only the linear sequence of activities but also the responsible functions for each activity.

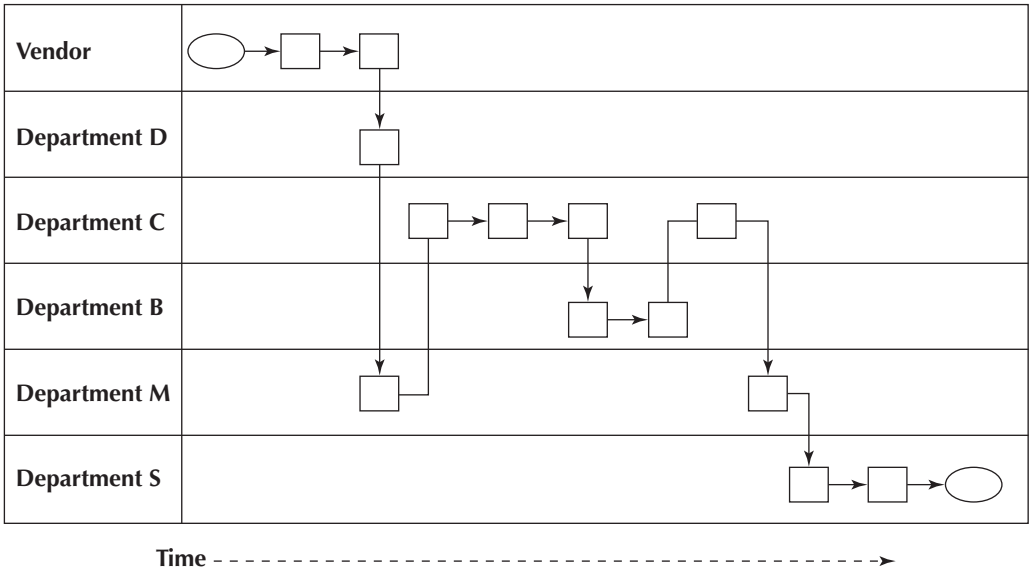


Figure 11.12 Sample format of process map (deployment flowchart).

The final format for the current-state process map is shown in Figure 11.12. This is a template illustration and not the final map for the SAA project. That map is comprehensive enough to be illegible without enlargement outside the bounds of this text.

COLLECT, ANALYZE, AND PRIORITIZE DATA

For each step in the process, the team is asked to consider the following types of questions:

- What do you do for each step in this process?
- How often are things "sent back" for more information?
- What are the impacts of the defects to the customer, to the rest of the process flow?
- How long does it take to process each step?
  - Are multiple items processed simultaneously? Which ones?
  - Does processing at this step depend on multiple other activities? Which ones?
  - Does the information need to be changed/re-entered between databases?

- Are any reviews/sign-offs required before moving to the next step? From whom are these sign-offs and reviews required? What level?
  - Are the reviews/sign-offs contractually required?
  - Are the reviews self-administered? What does each sign-off represent?

These questions are designed to identify areas of duplication, waiting, waste, or error. Since the SAA process had not been formally documented before this project, there were a number of different perspectives to be shared among stakeholders and team members.

The NASA project charter does not list process customers. The team is guided through this conversation in an iterative cycle while discussing value and waste. Discussion of internal and external customer perceptions, requirements, or demands is critical for effective analysis of improvement opportunities. The following questions are asked to assess customer needs:

- Who is the customer?
- What is the product or service being created?
- What does the customer value in this process?

Teams analyze, categorize, and color-code each process step as follows on the basis of the customer's perspective:

- Green = value added
- Yellow = non value added but required
- Red = non-value-added waste

The non-value-added process steps are further categorized. *Non-value-added* is defined as action or inaction that keeps required activities from taking place in a timely manner. NASA uses the acronym DOWNTIME:

D	Defects (producing defects)
O	Overproducing (producing too much or too soon)
W	Waiting (wait time/queue time)
N	No injuries
T	Transportation (unnecessary movement)
I	Inventory (too much/uncontrolled inventory)
M	Motion (unnecessary movement)
E	Excessive processing (too many steps to complete a job)

This is a resequencing of the traditional 7 lean wastes, with the addition of an eighth waste of safety (no injuries).

The team leader and the facilitator work together during the preplanning stage to identify additional measures appropriate to the project specifics. The collection and analysis activities prepare the team for a full study of the current-state process. Since the current state is not yet formally defined or stable, this analysis is

approximate, at best. Additional guidance for the facilitator and the team leader is given in the facilitator's guide:

- You're going to need some numbers. Gather real data—this is your chance to truly understand what's happening. Be prepared to ask second- and third-order probing questions to get real answers.
- Use preprinted data box sheets to capture data and post as an aid.
- These boxes are not inclusive; the team should select a reasonable quantity of metrics and capture them together.
- Don't shortcut this step, but remember that you are collecting data for "process steps" and not each individual step in the process.
- The result will be a high-level representation that can be used to identify areas where detailed analysis is warranted.

Again focusing on customer needs, brainstorming is used to identify what is wrong with the way the process is executed today. Once ideas are generated through brainstorming, the team divides into subteams and analyzes what the major causes are for the previously brainstormed effects and what it can do about them. The team uses a cause and effect analysis matrix as shown in Figure 11.13. NASA teams use tools and techniques such as Ishikawa fishbone diagrams, 5 Whys, failure modes and effects analysis, and functional block diagrams as appropriate to ferret out root causes of identified problems.

Team divides into subteams and analyzes what the causes are for the previously brainstormed effects and what it can do about them.			
Step 1:	**Effect:** (from brainstorm)		**Step 2:** What can the team do to manage these? List the action plan for each:
Causes related to ***people***		Causes related to ***plant (i.e., tool)***	
Causes related to ***policies***		Causes related to ***procedures***	

Figure 11.13 Cause and effect analysis matrix.

IDENTIFY POSSIBLE SOLUTIONS

The cause and effect analysis feeds into a prioritization matrix for possible solutions to the problems brainstormed by the team. Figure 11.14 illustrates a PICK chart, by which items are sorted as to whether the improvement idea is *p*ossible, recommended for *i*mplementation, identified as a *c*hallenge to be further studied, or *k*illed. Those solutions that are easy to implement and judged to have a big payoff are the highest priority for consideration.

SELECT THE BEST SOLUTIONS

Figure 11.15 is the list of potential solutions brainstormed by the SAA project team. These solutions were sequenced and scheduled into an implementation plan as reflected in Figure 11.16. Notice the priority given to the tasks in Figure 11.16. The implementation plan was analyzed as to strategic impact from very high to low priority. The foundational process ownership and senior leadership support are set as very high priority. Developing processes and defining working groups and related accountability is given a priority of high. Finally, operational tasks are assessed as medium to low priority as the project gains traction and are generally assigned to responsible parties with appropriate implementation authority.

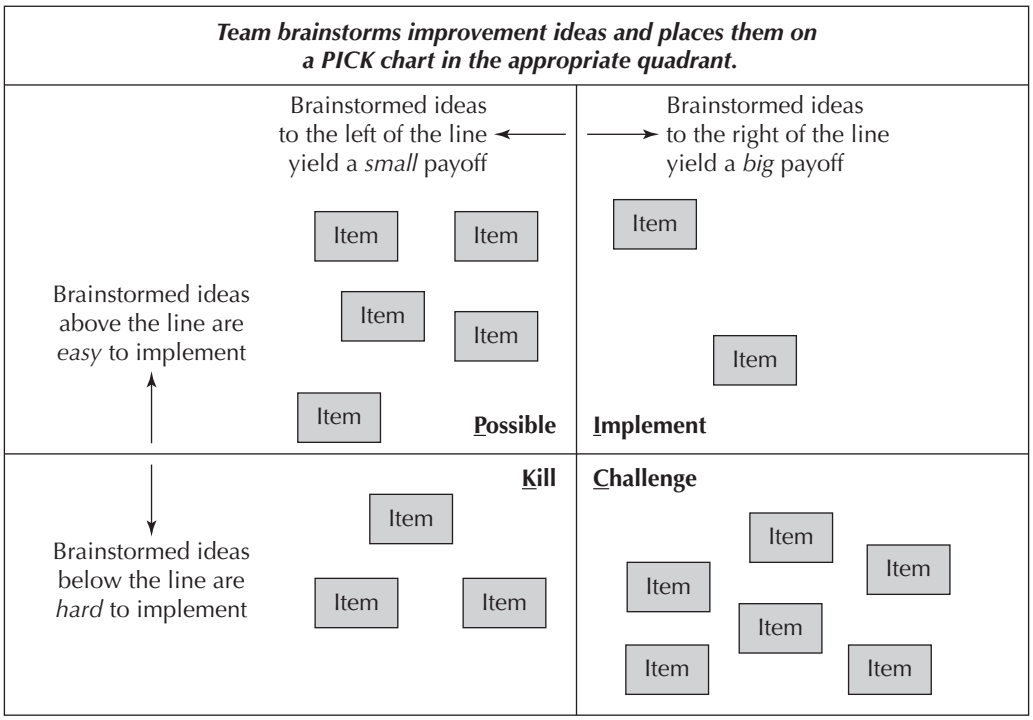


Figure 11.14 PICK chart for categorizing potential improvement ideas.

Top ideas: Big payoff, easy to implement	
Category	**Brainstorming solution**
Abstract	Distribute abstract to organizations via courtesy copy as a communication tool
Process guidance	Document which SAAM Points of Contact (POCs) are held accountable
Process guidance	Document the different organizations' SAAM POCs and their roles and responsibilities for each section of the process
Process guidance	Education: develop training materials (e.g., Kennedy Documented Procedure [KDP] doesn't say who to go to with questions)
Process guidance	Increase the roles of the organization's SAAM POCs
Process guidance	Train initiators with output of SAAM questions
Resources	Establish SAAM super-user within each organization (organization SAAM POC)
Resources	Establish full-time KSC agreements manager position
Resources	Create agreements specialist position to provide backup to agreements manager
SAAM	Organizations can print output from SAAM weekly
SAAM	Have capability to query for outstanding reviews in SAAM

Figure 11.15 Solutions categorized by type and listed by implementation priority.

Prioritization	Action required	Person(s) responsible
Very high	For new process to work, overall buy-in is required (delegations, working group SAA empowerment, clear roles and responsibilities, organizational commitment, reduction of cultural conservatism)	Foundations of Leadership (FoL)
Very high	E-router will continue to be used for draft review. Expand it to include final directorate concurrence on the final version of the agreement; the last signatories on this final e-router concurrence will be CC before being sent to center director or his/her delegate	Agreements manager and SAAM technical POC (GRC)
High	Establish SAA POC and working group, define membership (e.g., legal, agreements manager, and KSC SAA directorate representatives), and develop charter (establish roles and responsibilities)	Champions and sponsors

Figure 11.16 Implementation plan.

Prioritization	Action required	Person(s) responsible
	Working group (standing committee and membership) • Legal • Agreements manager • SAA directorate POCs Agreement team (ad hoc per agreement) • Same as working group unless delegated or not needed (this decision is made by working group individual members) • Initiator • Partner	
High	Establish delegations of authority (at center level and at directorate level)	Champions and sponsors
High	Develop SAA thresholds based on criteria (complexity, visibility, dollar amount) and roles and responsibilities for the group	Working group
High	Develop training materials/education for all stakeholders in the new process (e.g., road show, dedicated briefing)	Champions, sponsors, working group
High	Full-time support and back-up to KSC agreements manager	Champions and sponsors
High	Organizations refine internal processes to align with center process (e.g., EPR)	Champions and KSC SAA directorate representatives
High/medium	Establish and document roles and responsibilities of all SAA process stakeholders (initiators, legal, agreements manager, KSC SAA directorate representatives, finance office)	Working group
Medium	Establish quarterly SAA POC meeting for lessons learned	Working group
Medium	Establish generic concurrence timelines based on true priorities	Working group
Medium	Review metrics on SAA process timeline, their purpose (look for opportunities to show success), and their intended target	Champions and working group
Medium	SAAM (i.e., the tool) familiarization and training for SAAM directorate POCs and other working group members	Legal and agreements manager
Low	Analyze the benefits and drawbacks of using "code names" in SAAM; present analysis to AA-D management	AA-D and legal
Low	Explore SAAM features, especially regarding the review process (e.g., query generation)	SAAM technical POC (GRC)

Figure 11.16 Implementation plan. *(continued)*

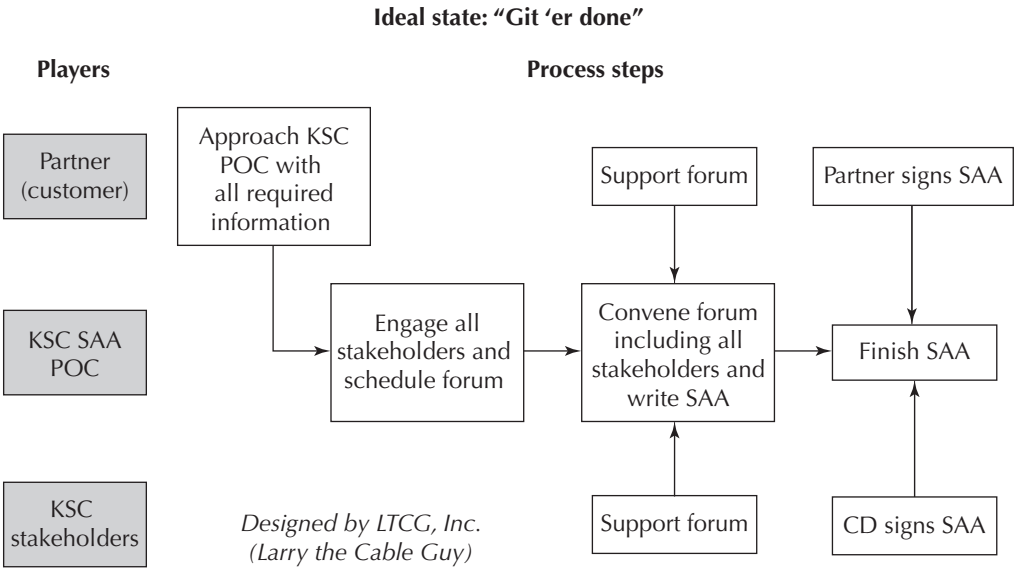


Figure 11.17 Initial draft of future-state process for implementing SAA at KSC.

Improved process maps are developed for all activities that reflect solutions recommended by the NASA LSS teams. Figure 11.17 documents the flow for a portion of the establishment of points of control (POC) and responsibility for creating a new SAA and obtaining center director (CD) sign-off. Note that the team engages in a bit of humor to keep motivation high. Because it is an internal process, there is no staid guideline for labeling the "ideal state" for the targeted process. Figure 11.17 is documented courtesy of Larry the Cable Guy.

The major results of the SAA PDK are listed as:

- Streamlined process (15 steps)
- Improved front-end planning
- Early stakeholder integration
- Parallel reviews and approvals
- Clear roles and responsibilities
- Increased training and education
- Consolidated review process

DEVELOP AN IMPLEMENTATION PLAN

The implementation plan as itemized in Figure 11.16 includes actions recommended by the LSS team. Each of the actions required will be broken down into detailed tasks under the responsibility of the person(s) identified in the rightmost

column of the implementation plan. As noted in a few of the SAA PDK implementation plan items, some of the resources involved must be:

- Working group (standing committee and membership)
  - Legal
  - Agreements manager (SAAM)
  - SAA directorate POCs
- Agreement team (ad hoc per agreement)
  - Same as working group unless delegated or not needed (the individual members of the working group make this decision)
  - Initiator
  - Partner

Action items shown in the implementation plan include steps for making general improvements in those business areas that affect the targeted process plus specific steps that serve as prerequisites for adopting the improved process. These prerequisite steps are considered enabling measures because of their role in facilitating improved work flows. Each new activity should align with or support one or more of the original objectives spelled out by the champion and the sponsor in the project charter.

IMPLEMENT THE SOLUTION

Some actions are implemented immediately, depending on priority assigned, as seen in Figure 11.16. Others in the medium to low categories are scheduled for exploration and implementation based on availability of resources and analysis of benefits and drawbacks.

The future state depicted in Figure 11.18 reflects the business environment that will result from accomplishing actions recommended by the implementation

Current state	**Future state**
• Unclear roles and responsibilities • A multitude of duplicate reviews and rework (steps) • Lack of training and education • Serial process and approvals	• Clarified roles and responsibilities • SAA working group and agreement team • Consolidated communication and reduced rework (15 steps) • Early stakeholder integration • Increased delegation of authority and empowerment • Increased training and education of stakeholders • Parallel approvals

Figure 11.18 Current state compared with future state.

plan and adopting the improved process and work flows. This comparison enables the LSS team to communicate anticipated benefits to champions and sponsors.

EVALUATE THE EFFECTIVENESS OF THE IMPROVEMENT

NASA faces the same challenges that many organizations contend with in capturing and quantifying explicit, tangible benefits realized by implementing LSS project results. Hard category benefits include dollar cost savings associated with reduced use of labor hours and other resources. Soft category benefits might include shorter cycle times, less rework, and a more collaborative work flow resulting from the LSS team's process improvement experience. Hard benefits are easier to identify and measure in manufacturing and service delivery processes, while soft benefits generally accrue to transactional and business work flows. Most of the NASA LSS projects completed to date at KSC have yielded both hard and soft benefits, yet the agency's accounting and finance systems have made it difficult to precisely capture resource savings. Reduced cycle times and improved working relationships might not lend themselves to easy quantification, but these benefits often have very significant value, especially for the people who do the work.

Figure 11.19 is a template from the NASA Change Agent's Guide, which was created to assist facilitators and team leaders in finalizing the project with

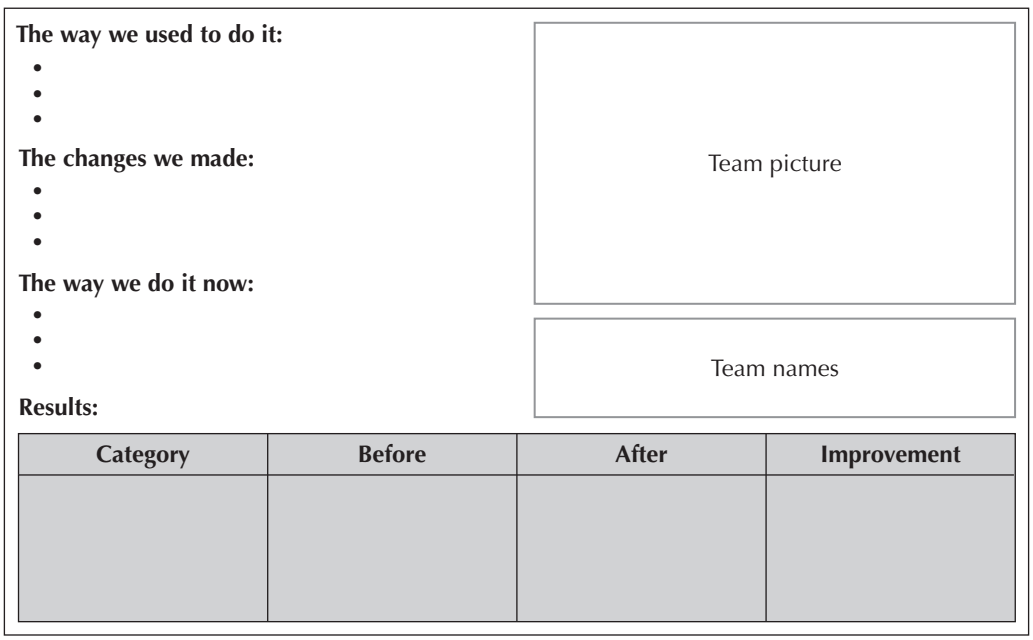


Figure 11.19 Event completion report template.

champions and sponsors. Specific information related to the SAA PDK is listed below.

The way we used to do it:

- Cumbersome
- Convoluted process
- Unclear roles and responsibilities
- Multiple review and approval cycles
- Serialized

The changes we made:

- Streamlined the process
- Clarified roles and responsibilities
- Built in efficiencies by combining tasks
- Identified resources
- Improved communication

A typical out-brief to champions and sponsors includes the following information:

- Integrated current state
- Main areas for improvement
- Cause and effect analysis
- Ideal state
- PICK chart
- Future state
- Implementation plan
- Completion report

This chapter includes the above out-brief illustrations, which were shared with the champions and the sponsors of the project.

Figure 11.20 is a summary of the observations shared with the lead facilitator and the team lead after the out-briefing for the SAA PDK project.

- Excellent open discussion and engagement by team members
- Facilitators helped the team maintain focus
- Extreme contrast between "as-is" and "to-be" processes
- Did not address existing process review (EPR) process (internal to finance) and other directorate internal processes (potential future kaizen events)

Figure 11.20 Summary of sponsor observations from final briefing.

This feedback, along with associated documentation, was incorporated into a final report containing the KSC Foundations of Leadership's SAA process improvement recommendations, dated January 17, 2011. KSC's Foundations of Leadership (FoL) team was the primary sponsor for this project and did an exceptional job of integrating the SAA PDK results into its work. Also, champions and other sponsors have actively supported team members' efforts to accomplish actions called for in the implementation plan going forward.

NOTE

1. John F. Adkisson, interview with the author, July 3, 2012, Titusville, Florida.

Appendix

Personalized Case Study Worksheets: "Ready Healthcare" Example

PERSONALIZED CASE STUDY WORKSHEET 1

Core Priorities

- What is your most pressing organizational need at this time? (Current state)

  The healthcare system must move from a physician-centered focus to a patient-centered focus.

- How is it impacting your organization's:
  - People? The staff, administration, and clinical personnel are confused as to who the most important customer is. The skill base is excellent. Not all members of the organization are working toward the same long-term goals.
  - Processes? Procedures are either not documented adequately or not followed effectively because of poor communication and follow-through. Processes are more than adequate to meet JCAHO and other industry-required standards. Internal quality controls show that more can be done to improve customer service and end-user results.
  - Performance? Performance in individual departments is tracked, measured, reported, and improved according to existing procedures. A systemic approach to organizational improvement is required to move the hospital system to a new level of excellence.
  - Culture? The culture is a combination resulting from the merger of two very strong historically successful healthcare systems. Physicians wishing to use resources more effectively to support the community healthcare needs established one system over a century ago. The other system evolved from a highly structured religious healthcare organization that retains much of the traditional expectations of its heritage. Both systems have an excellent reputation and strong local loyalty.
  - Morale? Morale is mixed within the various communities of the organization. Recent economic conditions have dictated a "do more with less" atmosphere that has put an especially heavy strain on the resources of the system. Nursing staff is spread thin, physicians are asked to cover more patients, administrative areas are required to cover more responsibilities, and training is limited to only those areas of urgent need. Although the attitude of the employees is one of complete dedication, there is obvious strain on the ability of the organization to meet current customer needs.
  - Stakeholders? Most of the external customers—patients, family members, and general community observers—have not been affected by the increased pressures on the organization. Internal process owners and senior leaders are more than aware of the challenges and exposures created by the current economic and staffing situations. The board of directors, the executive office, and direct reports have identified major areas of concern and are working to address a priority of issues.

- "If I had my way, the future state of my organization would be…"

  The organization would work from a consistent, integrated performance excellence model that allows for continuous improvement as well as breakthrough changes to meet the needs of an increasing customer and technological base.

- What is your plan to move the organization to this future state?

  Identify and integrate a performance excellence model that encompasses the major areas of the organization. Use metrics, benchmarking, and quality techniques to identify, document, and improve major processes within the organization. Implement a continuous strategy of planning, training, implementation, measurement, and feedback that will guide the complete healthcare system to breakthrough levels of customer service and stakeholder delight.

- What major obstacles stand in the way of this future state?

  Personnel resources are stretched thin in the areas of planning, measurement, training, quality, and day-to-day implementation. Commitment to the goal of excellence is high. The ethic of the staff, physicians, administrative leadership, and general services personnel is strong. Communication to support an integrated system of process identification, documentation, and improvement is weak. Making time to address these long-term issues will be a challenge.

- If you do not have a workable plan, how soon do you need one?

  A plan exists in the form of an organizational model. Benchmarking has been done with other leading healthcare systems within the United States. Some leadership training has been delivered and a pilot measurement and improvement project has been launched.

PERSONALIZED CASE STUDY WORKSHEET 2

Your Involvement Strategy

Whom do I need to involve in this improvement process?

Name	Department	Reason for involvement
James Brown	Chairman	Senior executive
Mary Pat Johnson	Nursing	Head of Nursing Services
John Shattuck	Ready HC Hospital	Location manager
Pat Jarrett	County Medical Center	Location manager
Simon Hewett	Finance	CFO of system
Marion Fisher	Organizational Excellence	Senior project manager
Ready HC champions	Varied	Quality steering team

How can I involve them?

Initial involvement is in deciding on the charter for the improvement project. All are aware of the importance of top-management involvement and have been vocal in "direct report" meetings about the need to appeal to a broader and more consistent audience within the community.

Each member of the senior staff is committed to improving the hospital system but is not sure how to go about it.

Some benchmarking with two other hospitals has already been done. A review of those outcomes should interest the senior management. The next step is to choose where the best starting place is for action.

What is "in it" for the organization? How will it benefit from the improvement or change?

The organization is in a highly competitive market. The senior management and the employees will benefit from better organizational success, higher customer satisfaction, and increased revenues over expenses.

The system is not-for-profit, so it is a matter of reducing expenses while increasing revenues *and* goodwill that should keep the leadership targeted on this initiative.

What is "in it" for the department?

Each department has been downsized or otherwise has done more with less over the last several years. The recent merger of the two hospital systems has further strained working conditions and relationships inside the hospitals.

Finding more effective ways to do things and balancing scarce resources among the many parts of the system can only make life better for all of us.

What is "in it" for the individuals?

Name: James Brown	Benefit: CEO looks for increased community reputation, increased revenues and better funding, decreased expenses, better employee morale.
Name: Mary Pat Johnson	Benefit: Nursing needs better retention of nurses and better ability to hire new nurses. Higher quality of care to patients.
Name: John Shattuck	Benefit: Location manager wants higher employee morale, better community reputation, increased occupancy, better employee retention and skill balance.
Name: Pat Jarrett	Benefit: County location manager seeks better resource availability, to be more competitive in rural location, retention and skill increase, higher quality of service to patients.
Name: Simon Hewett	Benefit: CFO wants more revenues and fewer expenses, better community goodwill, higher occupancy, less waste.
Name: Ready HC champions	Benefit: Champions want to improve the organization across the whole system. Better working relationships among the service lines. Better implementation of tasks at the daily operations level.

What is "in it" for me?

Marion Fisher: Organization excellence of the whole system; increased reputation in the community and healthcare industry; improved quality of operations overall; higher recognition from JCAHO and other auditing bodies; personal satisfaction.

My next steps are:

1. Participate fully in this class.
2. Take ideas home and present to senior management.
3. Identify current opportunities for improvement.
4. Keep top management involved in the improvement process.
5. See what other resources are available to help from ASQ.
6. Join Health Care Division of ASQ for newsletters and ideas.
7. Read *Executive Guide to Improvement and Change*.
8. Increase my skills in project management and leadership.

PERSONALIZED CASE STUDY WORKSHEET 3

Team Charter

2. Team Name:	**3. Version:**	**4. Subject:**
CSE Pilot	A	Customer-focused transition and improvement
5. Problem/Opportunity Statement: The healthcare system must move from a physician-centered focus to a patient-centered focus.		
6. Team Sponsors:		**7. Team Leader:**
James Brown, CEO, and Simon Hewett, CFO		Marion Fisher
8. Team Members:		**Area of Expertise:**
Erin Russell		Diagnostic center leadership
David Klapp		Marketing and communications
Carolyn Kleef		Case management
Doris Little		Service line director, senior management liaison
Eli Harrison		Human Resources VP
9. Process Improvement Aim (Mission): Implement a proven method for integrating stakeholders, including physicians, nurses, employees, and patients, into an effective team for meeting customer needs and expectations.		
10. Scope (Boundaries): The complete healthcare system, including two full-service hospitals, a county day-hospital, emergency centers, rehabilitation and home healthcare, laboratories, diagnostic and surgery centers.		
11. Customers (Primary and Other):		**Customer Needs Addressed:**
Patients and families		Effective healthcare and surrounding support
Internal customers of the healthcare system		Work environment and opportunities for growth
12. Objectives: • Identify what a patient-centered focus should be • Involve the correct people in the cultural change • Assess current priorities for meeting customer needs • Choose priority areas for improvement		

(*continued*)

13. Success Metrics (Measures):	
Satisfaction of primary external customers Satisfaction and retention of employees	Increase in revenues and occupancy across system

14. Considerations (Assumptions/Constraints/Obstacles/Risks):

Top management at the executive offices in another state will support this effort. No new leadership will be added in the short term to support this pilot. Additional workload at the department and service-line levels will add stress to an already uncomfortable environment for the short term.

15. Available Resources:	**16. Additional Resources Required:**
Quality steering team is committed to this pilot.	Further training on hiring and employee retention
Director of Organizational Excellence has reasonable budget for planning and training.	Commitment of department heads to involve already busy employees in improvement efforts
Existing service-line budgets, although tight, are flexible enough to rebalance some resources for effectiveness.	Increased I/T support for data gathering and reporting of measures and progress information

17. Key Milestones:	**Date:**
First stage: Ensure basic service competency	6/30/04
Second stage: Raise service level to one of true excellence	12/31/04
Third stage: Differentiate care experience to excellence at "local level"	12/31/05

18. Communication Plan (Who, How, and When):

Orient senior managers and direct reports on benefits, objectives, and goals—Fisher, direct-report meeting, 1/15/04

Planning session with key stakeholders and champions—senior management, special planning session, 2/1/04

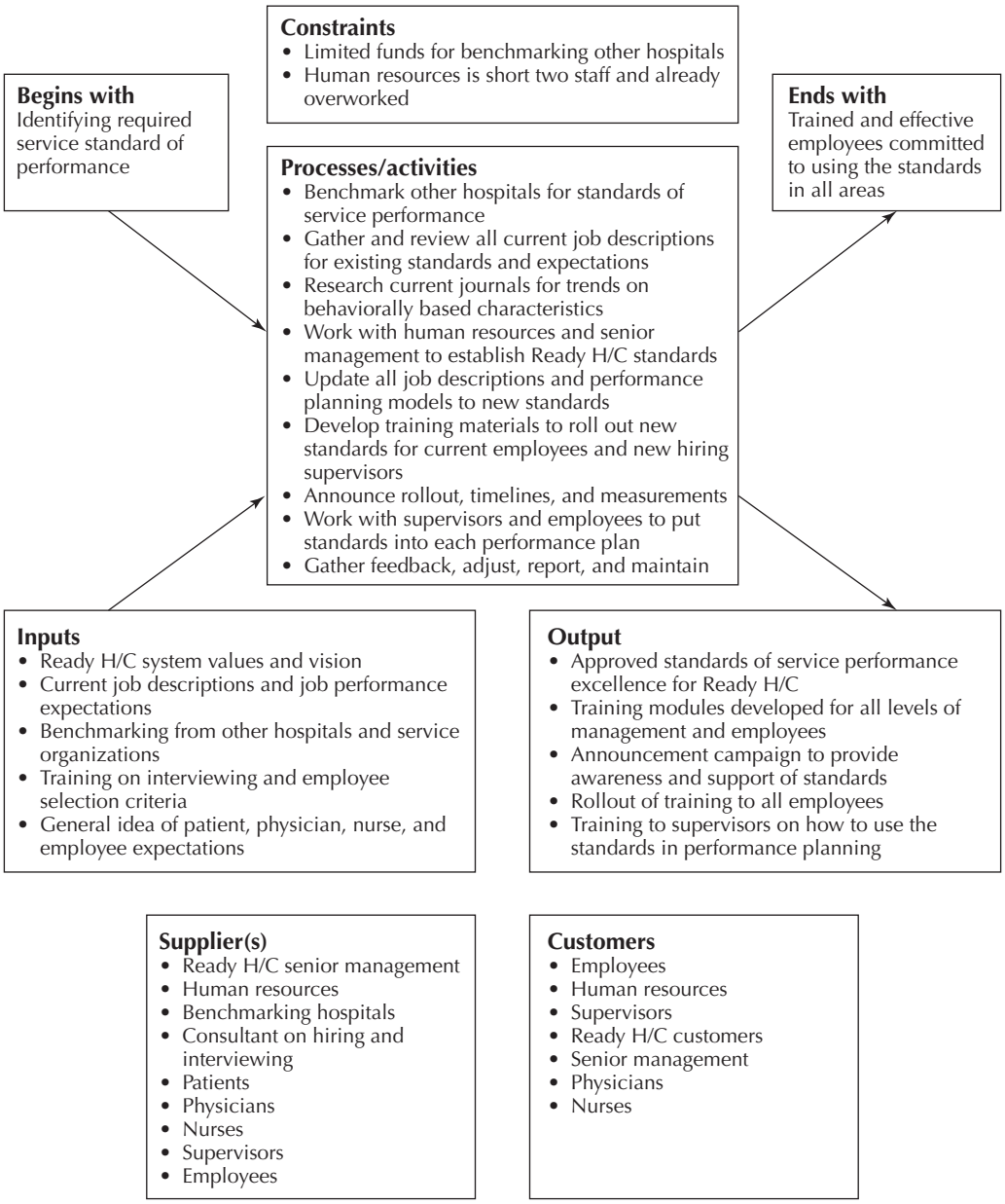
Announcement message and individual service-line meetings—CEO/CFO, then service-line managers, 2/15/04

Training on first-stage competency standards begins—Director of Service Excellence and consultant, off-site, 3/1/04

19. Key Stakeholders:	**Area of Concern (as It Relates to the Charter):**
Ready hospital senior management	Resources required, disruption to operations
Ready H/C system employees	More work to do, changing procedures
Patients and families	Disruption of care and longer wait times
Physicians and nurses	Loss of individual control, more paperwork or meetings

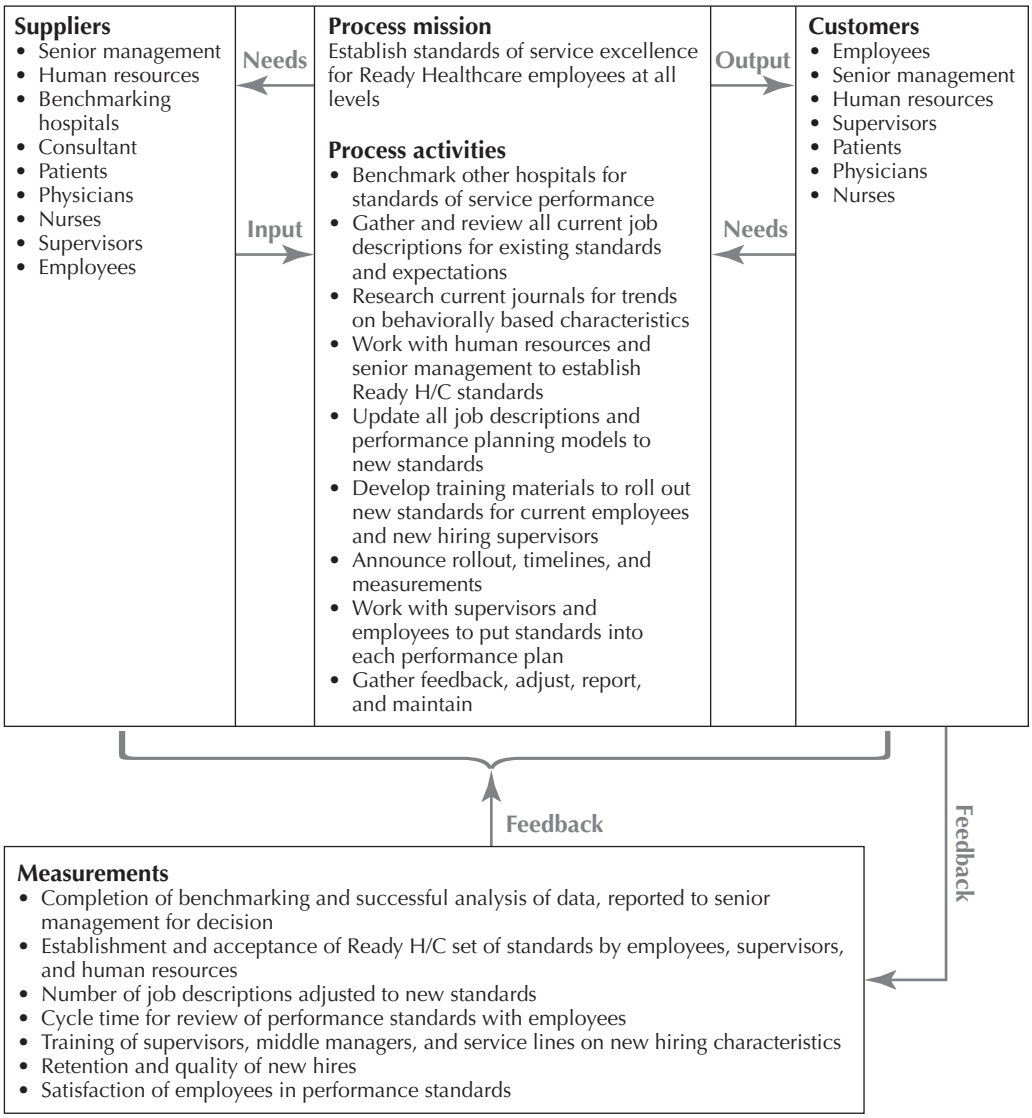
PERSONALIZED CASE STUDY WORKSHEET 4

High-Level SIPOC Collection Form



PERSONALIZED CASE STUDY WORKSHEET 5

Business Process SIPOC Feedback and Measurements Form



PERSONALIZED CASE STUDY WORKSHEET 6

Core Process Drill Down

Process/activity	Customer need	Met/ unmet	Requirements	Target/goal	High-level measure
Benchmark other hospitals for standards of service performance	What works and what doesn't, senior management	U	Documented performance standards with related effectiveness reports	Two hospitals or services benchmarked and reported to senior management	Date of completion and report to senior management
Gather and review all current job descriptions	Know what job descriptions exist	U	Copies of all Ready H/C job descriptions	List of all job descriptions for system	Number of job descriptions updated, date back to human resources
Research journals for trends on behaviorally based characteristics	What are the successful characteristics to hire?	U	Identify characteristics	Set of characteristics in alignment with values	Characteristics approved by senior management, human resources, and employees
Work with human resources and senior management to establish Ready H/C standards	Set of standards for all employees at all levels	U	List of standards, definition of standards	Published list	Date list is available to management
Update job descriptions and performance planning models to new standards	Job descriptions support standards	U	All job descriptions updated, performance and planning models modified to new standards	Job descriptions updated, formatted, and in human resources	Date and number of job descriptions updated
Develop training materials for standards for current employees and hiring supervisors	Skills for exhibiting or interviewing for desired characteristics	U	Supervisors and employees exhibit behaviors to meet standards	Materials developed, training scheduled, attendees scheduled	Materials accurate and done, training schedule in place, all employees scheduled by date
Announce rollout, timelines, and measurements	Awareness and top-level management commitment	U	Rollout content, dates, times, locations, and measures to be used	Content written and approved, schedule and measurements set	Feedback from employees and other stakeholders

(*continued*)

Process/activity	Customer need	Met/ unmet	Requirements	Target/goal	High-level measure
Work with supervisors and employees to put standards into each performance plan	Set employee and manager expectations	U	New performance plans in place for employees	All new plans in place by 9/30/04	Number of plans in place per quarter, all by 9/30/04; Level 1 feedback of process
Gather feedback, adjust, report, and maintain	Pilot team members and senior management project need	U	Frequent feedback and data for in-flight adjustments	At least monthly data and reports to management	Level of acceptance. Completion to plan

PERSONALIZED CASE STUDY WORKSHEET 7

Develop the Initial Change Plan

Process/activity	Target	Items to be measured	Conditions/testing
Benchmark other hospitals for standards of service performance	Two hospitals or services benchmarked and reported to senior management	Date of completion and report to senior management	Use only "world-class" in process benchmarking
Gather and review all current job descriptions	List of all job descriptions for system	Number of job descriptions updated, date back to human resources	Consolidate all different forms, only one description for each job title
Research journals for trends on behaviorally based characteristics	Set of characteristics in alignment with values	Characteristics approved by senior management, human resources, and employees	Use well-known professional society and academic sources
Work with human resources and senior management to establish Ready H/C standards	Job descriptions updated, formatted, and in human resources	Date list is available to management	Must be validated through human resources and service line directors
Update job descriptions and performance planning models to new standards	Published list	Date and number of job descriptions updated	KISS and validate through human resources
Develop training materials for standards for current employees and hiring supervisors	Materials developed, training scheduled, attendees scheduled	Materials accurate and done, training schedule in place, all employees scheduled by date	May use consultant familiar with our culture and current values
Announce rollout, timelines, and measurements	Content written and approved, schedule and measurements set	Feedback from employees and other stakeholders	Use internal website for easy access to standards, weekly review meeting on progress with senior management
Work with supervisors and employees to put standards into each performance plan	All new plans in place by 9/30/04	Number of plans in place per quarter, all by 9/30/04: Level 1 feedback of process	Track weekly, provide mentoring and support to supervisors by steering team
Gather feedback, adjust, report, and maintain	At least monthly data and reports to management	Level of acceptance, completion to plan	Provide feedback from all levels of management, report to director's meetings

PERSONALIZED CASE STUDY WORKSHEET 8

Focusing on Implementation

- The process improvement model that best fits my organization's culture is:

  The process improvement model that fits best is a modification of the Malcolm Baldrige National Quality Award (MBNQA) model.

- What are the most attractive benefits of using this model for process improvement?

  The MBNQA model offers an integrated view of the organization as an integrated system. It recognizes the community environment in which the hospital system operates. It provides focus on all three areas of a system: human, technical, and business. It also provides for measurement, feedback, and learning.

- Using worksheet 9, create a process map (high-level flow) of how your processes and activities from worksheets 4–7 fit into your chosen model. Use figures from *The Executive Guide to Improvement and Change* or another reference, if desired, to identify and map your chosen process.

PERSONALIZED CASE STUDY WORKSHEET 9

Tools for Implementation Based on Model "Baldrige Modified"

Process step	Activity	Tool	Information to be gained
Benchmark other hospitals for standards of service performance	Benchmark Pensacola Presbyterian	Benchmarking	World-class customer service
Gather and review all current job descriptions	Collect all job descriptions used in system	Communicate with human resources	What descriptions are out there, how may different versions
Research journals for trends on behaviorally based hiring (BBH)	Review major academic and business journals	Literature search	The most appropriate characteristics for customer-focused organization
Work with human resources and senior management to establish Ready H/C standards	Identify performance excellence standards	Team skills and consensus	Standards and levels of expectation
Update job descriptions and performance planning models to new standards	Writing and formatting job descriptions	Written communication, team communication, and consensus	Standardized job descriptions effective to new culture
Develop training materials for standards for current employees and hiring supervisors	Needs analysis and course development	Systems approach to education, instructional systems development	Effective package for skills transfer
Announce rollout, timelines, and measurements	Plan and design announcement materials	Market analysis	Feedback on acceptance level of organization
Work with supervisors and employees to put standards into all performance plans	Coach and advise at line-management level	Mentoring and coaching	All employees comfortable with performance plan in place
Gather feedback, adjust, report, and maintain	Data gathering, analysis, and reporting	Measurements, written communication, reporting	Quantitative and qualitative data for process improvement

PERSONALIZED CASE STUDY WORKSHEET 10

Standards of Performance Excellence

Action, step, or task	To whom assigned	Begin date	End date	Outcome	How measured
Benchmark other hospitals for standards of service performance	Marion Fisher	1/10/04	3/31/04	Report on best practices from other hospitals	Completed report, usable benchmark performance standards
Gather and review all current job descriptions	Human resources	1/10/04	2/10/04	All job descriptions located and numbered	Listed and numbered
Research journals for trends on behaviorally based hiring	Consultant	3/31/04	4/30/04	Interview questions for each performance standard	BBH questions and guidelines approved
Work with human resources and senior management to establish Ready H/C standards	Marion Fisher and consultant	4/1/04	4/30/04	Establish standards for Ready H/C system	Standards approved and published
Update job descriptions and performance planning models to new standards	Human resources	3/15/04	5/1/04	Consistent job descriptions using new standards	Completion and availability to system
Develop training materials for standards for current employees and hiring supervisors	Consultant and VP of human resources	3/31/04	4/30/04	Training package	Package approved and printed
Announce rollout, timelines, and measurements	James Brown, CEO	2/1/04	2/1/04	Commitment and awareness	Do it and document
Work with supervisors and employees to put standards into all performance plans	Human resources, Marion Fisher, and service line managers	5/1/04	9/30/04	All new performance plans in place	Number of plans in place, feedback from all
Gather feedback, adjust, report, and maintain	Marion Fisher	1/10/04	12/15/04	Data for improvement	Various

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Note: Page numbers followed by *f* refer to figures; those followed by *t* refer to tables.

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