

# Introduction

# 1

Productivity isn't everything, but in the long run it is almost everything.

*Paul Krugman, Economist*

## The Scene

Beta International, a large manufacturing conglomerate, has made substantial progress in its operations and business performance. A few years ago, Bob Neurath, CEO, set forth a 10-point strategic plan for process improvement that focused on getting back to basics.<sup>1</sup> After all, he reasoned, if we aren't tenacious about getting the basics right, how can we expect to get anything else right? Driven from the top, this focus has yielded substantial gains for the company. Asset performance has improved, unit costs are decreasing, safety performance continues to improve, and market share is increasing in many markets, holding steady in others, and only declining in a few markets that are on strategic watch. Profits have moderately increased in most business units and holding steady in almost all others.

*But, performance is simply not good enough.* Return on capital is only about average in most business units. Intense pricing pressures from foreign competition, particularly Asian manufacturers, are continuing to drive down prices and hold down margins. If downward pricing pressures are stemming from Asia, Bob muses, then there is no doubt that companies like Wal-Mart, with their guaranteed

lowest-price strategy, will only further intensify those pressures. The low margins resulting from these pressures limit Beta's ability to invest in research and development (R&D) for new product and process development, new capital projects that flow from this R&D, as well as strategic acquisitions better aligned to the company's long-term strategy and business objectives. As a result, future market development and the growth that goes with it are likely to be hampered. In summary, the good news is that Beta has returned from the brink of disaster to become at least a mediocre company, maybe even above average in some business units. The bad news is that Beta is still not much better than a mediocre company. Perhaps more importantly, many seem to be satisfied, even pleased, with this. *Bob Neurath is not*. Having taken a step back from the abyss it faced a few years ago, Bob is now ready to move Beta forward more aggressively, creating a much more profitable future for the business. Trying to be all things in all markets only dilutes management focus, thus leading to mediocrity. Bob's expectation, like many corporate leaders today, is that Beta should be first or second in all of its markets or have a clear, measurable path for achieving that position. The company must now move from survival mode to growth mode.

Beyond the "back to basics" focus in all practices for all operations, several of Beta's divisions have tried various improvement tools with varying degrees of success. One division was convinced that Six Sigma would provide substantial gains and achieved substantial improvement in some of its operations, but not others. Another division considered total productive maintenance (TPM) more appropriate and likewise achieved substantial gains in some operations, but not others. Another adopted the Toyota Production System—what has come to be known as Lean Manufacturing—or so they thought. In that division, Bob's characterization is not that they are lean and mean, but rather anorexic and angry. Although improvements were achieved, overall results were less than desired, and on further review, it appears many of the initial results have been lost and they may have left out key strategic and philosophical elements of the system.

Beta's experience has been similar to that of other companies. Various tools or methods are touted as a means for a major step forward but never seem to quite deliver the expected results. For example, Bob Williamson, an industry expert in TPM, estimates that some 60% of TPM programs fail after three years of effort; Jeffrey Liker, an industry expert in Lean Manufacturing, estimates that less than 1% of U.S. companies are truly effectively applying lean principles.

Neil Bloom, an industry expert in reliability-centered maintenance (RCM) estimates that over 60% of all RCM programs initiated are never successfully implemented, with many of the rest only done in a superficial way. RCM is an excellent tool for identifying and minimizing functional failures, is also on occasion called the “resource consuming monster.” Given the limited resources in most companies through downsizing, RCM does not typically get the support it needs to do the analysis or the results end up being stored in binders on a shelf. Root cause analysis has various approaches, including the “5 Whys” supported by Toyota and progressively more comprehensive approaches, but it can also be very resource-intensive, limiting management’s ability to successfully apply it.

## The Response

Bob’s response to this lack of consistency and “constancy of purpose” (Deming) in applying these tools, beyond a certain amount of chagrin, was to form a senior-level steering team to review each tool and make a judgment about its efficacy and efficiency. Some questions being asked were: (1) under what circumstances do we apply each strategy or tool? (2) what are each tool’s advantages and disadvantages? (3) are they compatible and/or supportive? (4) do some require other related tools to be used in conjunction for maximum results? and (5) when are they incompatible? These fundamental questions need answers in order to develop a strategy for their application that could align the organization toward a common set of goals within all of Beta’s various operating units.

Bob also demanded an annual market review to ensure proper alignment of the manufacturing plants’ strategy to the marketing and product mix strategy (and vice versa). The review needed to identify the major steps needed for assuring growth in all markets. He agreed with Michael Treacy’s view in *Double Digit Growth*<sup>2</sup> that growing market share required Beta to do most, if not all, of the following seemingly straightforward activities:

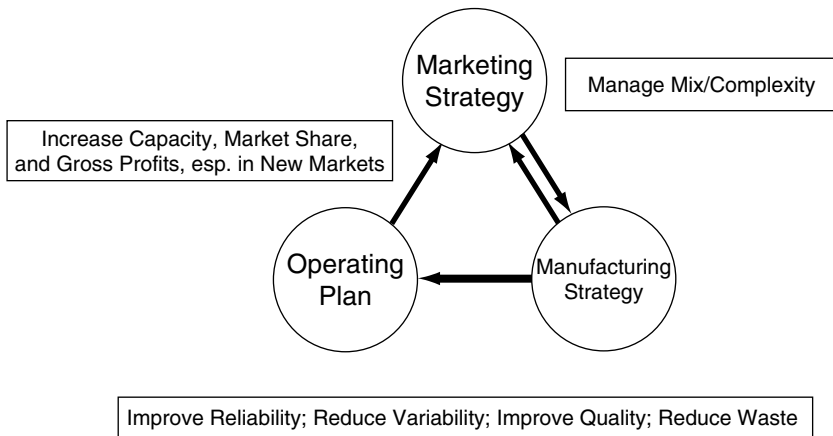
1. Keep the customers that you already have by creating incentives for them to stay or obstacles to their departure.
2. Take business from your competition by making your products more attractive.
3. Go to where the growth is by anticipating those growth areas.

4. Enter adjacent markets by adapting your products to those markets.
5. Invest in developing new product lines, markets, and customers.

These principles need to be applied at Beta, along with the models for rationalizing and optimizing products, customers, and markets outlined by Christopher<sup>3</sup> and Moore<sup>1</sup> to better manage those products, customers, and markets and, particularly, to align these to the manufacturing capability. Both recommend a routine analysis of customers and products and their contribution to the business. The model used by Christopher suggests dividing customers and products into A, B, and C categories. For example, the A list is the 20% of customers who provide 80% of profits and/or volume or the 20% of products that provide 80% of profits and/or volume. The A list must be sustained and built over time. The B and C lists require either development or elimination. Both Christopher and Moore offer models for optimizing customers and products.

Bob will continue to use the model shown in Figure 1-1 to help align the marketing and manufacturing strategies.<sup>1</sup>

The marketing department will manage product and customer mix and complexity within the product range. They will work with manufacturing to understand the implications of their decisions on the manufacturing function, particularly as it relates to quality, cost, and



Source: *Making Common Sense Common Practice*, Elsevier Butterworth-Heinemann Books, Boston, MA, & London, England

Figure 1-1. *Aligning the Marketing and Manufacturing Strategies.*

delivery. This communication will be a two-way street with business decisions based on what is best for the business overall and not on a single given function. The plants work to improve quality, cost, and delivery through improved reliability and stability as well as reduced variability and waste. This should increase capacity and gross profits and allow the pursuit of additional market share without having to make additional capital investment.

Bob also agrees with Bossidy and Charan's contention that: (1) the world is awash in capital creating overinvestment and excess capacity; (2) China and India are attracting much of that capital with their large markets and cheap labor; and (3) when combined with the Wal-Mart/Home Depot business model for driving down prices, costs must follow downward.<sup>4</sup> Most importantly, Beta must compete in that environment. Beta must become more productive, reduce its waste and system/supply chain cycle times, and use its inherent advantages. It would also require Beta to take stronger positions in the Chinese and Indian markets, both in terms of products and customers, as well as potential manufacturing capability to address those markets and perhaps others worldwide. Clearly, this will all be challenging.

Bossidy and Charan's model for doing this is shown in Figure 1-2. They suggest that we must fully understand our business's external realities: Are we in a growing or declining market? What is happening to prices in those markets? What is happening to our customer base? Are we in the middle of a major structural shift? They also suggest that

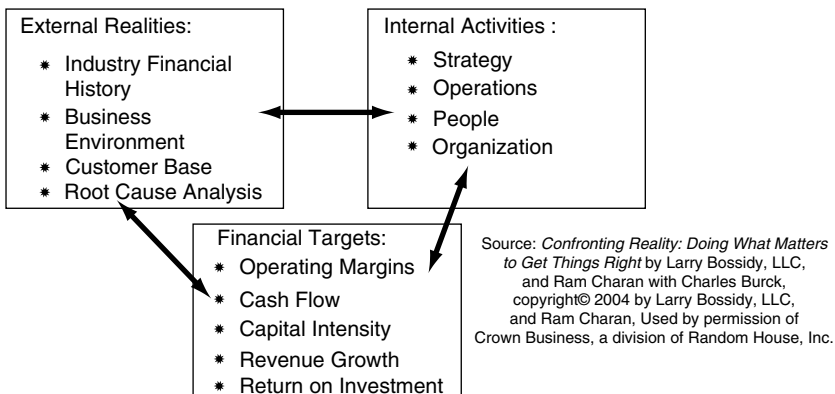


Figure 1-2. *The Business Model.*

we understand our internal activities relative to our external realities. Is our strategy aligned with market realities? Are our operations efficient enough to address those? Are we as executives engaging our people in supporting our improvement? Is our organizational structure aligned to meeting our objectives? And, are we meeting our financial targets in light of all this, routinely iterating and improving our performance relative to the external realities and internal activities?

Bossidy and Charan offer a number of suggestions and case studies in addressing these issues, something that Beta must adopt to be more effective in managing its business.

## The Tools

An initial review of the tools and strategies being used in various Beta operating units revealed that the following were applied to some significant degree, sometimes in conjunction, but at other times independently from one another. That is, different plants or functions were applying one tool or the other without coordinating their application. In any event, the most common tools and strategies being applied were found to be:

- Lean Manufacturing
- Kaizen
- Total Productive Maintenance
- Six Sigma
- Supply Chain Management
- Reliability-Centered Maintenance
- Predictive Maintenance
- Root Cause Analysis

Some, such as Lean Manufacturing and Kaizen, included the use of tools of Total Quality Management/Assurance (TQM/A), 5S, quick changeover, and other techniques. Others, like Six Sigma, included the use of statistical process control techniques and design of experiment (DOE). A summary of the steering team's initial findings regarding each of these is provided next.

## Lean Manufacturing

At its heart, *Lean Manufacturing* focuses on the elimination of waste in all forms. Categories of waste include excess inventory, wait and delay times, off-spec product, and so on. Several of Beta's operating units have adopted or, more accurately, adapted the Toyota Production System, or what has come to be called Lean Manufacturing, as a model for improving their manufacturing performance. This has been done with mixed results: some plants have gotten better, others have stayed about the same, and some have actually gotten worse. It also appears that the process manufacturing plants in Beta's operations have had more difficulty applying lean principles. They have less ability to meet demand or do "pull" production, and therefore, they tend to "push" production. This tendency to "push" generally relates to a lower ability to operate efficiently, if at all, at production rates that are much below design or to the difficulty and risk in shutting down and starting up the plant over short periods of time. But this condition also provides for level flow, a key Lean Manufacturing condition. For example, at an oil refinery, you cannot simply stop producing from one day or one shift to the next, so the times for applying "pull" to your production and level your flow tend to stretch into weeks or even months. The process plants have also tended to be inherently leaner than batch and discrete plants; they don't or cannot carry a lot of intermediate stocks to compensate for disruptions. And, as pointed out earlier, they have a fairly level production flow, a key advantage in applying lean principles. The process manufacturers generally also had better reliability, better operating and maintenance practices, and better plant management support for manufacturing excellence.<sup>1</sup> After all, in many process plants, if one step in the process fails, the entire plant often goes down. So, there is a lot of pressure to keep the plant running and implement the correct practices. Whereas in a discrete plant, if one machine fails, then it often happens that people believe that loss can be somehow "made up." Unfortunately, once time is lost, it is lost forever.

The concept of Lean Manufacturing first came to be more widely known with the book, *The Machine that Changed the World: The Story of Lean Production*.<sup>5</sup> This book is an excellent review of the history of the development of Lean Manufacturing, primarily at Toyota, but is scant on the details of the methods for achieving it. More recently, two books—*Running Today's Factory: A Proven Strategy for Lean*

*Manufacturing*<sup>6</sup> by Charles Standard and Dale Davis and *The Toyota Way*<sup>7</sup> by Jeffrey Liker—have provided a much clearer description of Lean Manufacturing principles and, more importantly, how to apply them. We will discuss these principles more in later chapters.

Unfortunately, the apparent behavior of many of Beta's managers, as evidenced by the performance at their manufacturing plants, suggests that the books by Liker and Standard and Davis have not been widely read or practiced. For example, and over-simplifying a bit, after one management team's trip to a plant reputed to be excellent at Lean Manufacturing, the team returned to their plant thinking that the lean plant did not have much inventory or people. So, the following reasoning surfaced: If we reduce our people and inventory, we will be lean too. Of course, this ignored the "hidden" processes and systems that were in place at the lean plant that allowed them to have less inventory and fewer people to accomplish the same result. The consequence of this thinking was that as costs went down (in the short term) so did delivery performance and quality, to the chagrin of many customers.

One of the major issues that must be addressed is the understanding (or lack thereof) that Lean Manufacturing is *not* focused on head-count reduction. Lower head count per unit of output is a consequence of applying lean principles, and yet it seems that many managers even at very high levels still believe that reducing head count will result in a lean company. There is a large body of evidence, some of which is discussed in later text, which states the contrary. It is essential to fully understand lean principles. An analogy which may help is to recognize that "lean" and "fit" are two very different concepts. Olympic athletes are "fit," which would typically give them a "lean" appearance. Anorexic people are "lean," but hardly "fit," and we certainly do not want an anorexic company. Another analogy is Gary Hamel's; he coined the phrase "corporate liposuction" to describe how some companies use cost cutting to become "lean" in the short term, only to suffer significant deterioration in performance over the long term.<sup>8</sup> Finally, Deming stated, "Your system is perfectly designed to give you the results that you get," a very self-evident statement, and yet very profound. A corollary to Deming's statement would be: If you reduce the resources available to your system without changing its basic design, then system performance will decline. Before we take a brief look at the other tools being employed by Beta, let us have a look at the concept of cost cutting and its efficacy.

## Cost Cutting—Does it Work?

Data from studies of companies that have engaged in cost cutting and particularly head-count reduction supports the corollary to Deming's quote. For example, in one study the following data were reported for several hundred companies that engaged in cost cutting through layoffs or downsizing over a period of about five years<sup>9</sup>:

- Only 50% showed profit improvement.
- Only 34% showed productivity improvement.
- Some 86% experienced a serious decline in morale.

Similar research conducted by the U.S. Conference Board<sup>10</sup> on companies using a downsizing strategy reported that:

- 30% actually experienced increased costs.
- 22% terminated the wrong people.
- 80% reported a collapse in morale.
- 67% showed no immediate productivity rise.
- 50% showed no short-term increase in profits.

They also pointed to another concern: the loss (or delay) of technology that results from the inevitable cutbacks in R&D staff during tough times. They found that six months after a layoff, there was an increase in share price relative to market indices, but that after three years, share prices had declined relative to market indices.

As previously noted, Hamel refers to cost cutting as “corporate liposuction” (all kinds of unpleasant images also come to mind with this well-chosen metaphor). He defines this as a condition in which earnings growth is more than five times the sales growth, generally achieved through cost cutting. In a review of 50 Fortune 500 companies engaged in corporate liposuction, 43 suffered a significant downturn in earnings after three years. Hamel points out that growing profits through cost cutting is much less likely to be sustainable and must be balanced with sales growth through

efforts such as innovation, new product development, and process improvement.<sup>8</sup>

And finally, Morris, Cascio, and Young reported that in a study of 3,628 companies reviewed over a 15-year period.<sup>11</sup>

- “Employment downsizers don’t improve financial performance.”
- “...those with the largest layoffs exhibited the largest decreases in ROA [return on assets].”
- “One striking aspect of downsizing is that the impact on profitability is negligible relative to the magnitude of the layoffs.”
- “...not only did they fail to increase their return on assets, but they experienced a continued decline on their return.”

This is not an all-inclusive data set since others have reported similar findings. In summary, cost cutting is highly problematic in reducing costs and/or improving overall performance.

The aforementioned text does not imply that cost cutting never applies. From the previous data, cost cutting is not likely to lead to prosperity. However, it may work some of the time, and it has a great deal of uncertainty associated with it. Not all of the companies studied suffered as a result of their cost cutting. So, when does it work? Perhaps under the following circumstances<sup>1</sup>:

- If the company is near bankruptcy, and you have no choice but to “stop the bleeding” to survive.
- If the company is a bloated bureaucracy, and you must strategically address your cost structure before lean, mean competitors begin taking your market share.
- If you are faced with intransigence in employees, unions, and so on and/or need to get people’s attention about improving productivity to assure a sustainable competitive position.
- In specifically targeted situations (e.g., obvious waste or when two companies with redundant functions or roles merge and consolidation is needed). These benefits may be

slight, however, and may be overwhelmed by the difficulty of effectively integrating the cultures of two organizations and aligning the new organization to a common strategy and set of goals.

- In a severe market disruption or downturn (e.g., 10%–20%) reducing industry volume, or when dramatically new technology that eliminates the need for a given product.

Some of these may overlap, or they may all be present in a given business. So we need to ask whether these may apply and to what degree. Further, not surprisingly, Morris, Cascio, and Young also reported that downsizing is most likely to work when it includes a major restructuring of physical assets. Cost cutting has a place, but the risk of cost cutting on the overall system performance must be considered. Costs and business results are a consequence of our business system design, that is, our processes.

## Why Do Executives Persist in Cost Cutting?

The data suggest that *at best* cost cutting provides a 50% chance of improving company performance (*at worst*, 14%). Why then, is cost cutting viewed as one of the primary means of improving financial performance even if it has a low probability for success? It may be necessary under specific circumstances, but often it is not. So, why do senior managers often persist in enforcing cost cutting? Possible reasons include:

- Executives don't view layoffs as a possible admission of personal failure. (Then, why were all of those people on the payroll in the first place?)
- It demonstrates a bias for action.
- It is easy and simple, and it does in fact sometimes work.
- It does not require a lot of leadership skill; anyone can cut costs by 5% and expect employees to get the job done for 5% less.
- It can pressure people into being creative about doing their jobs more efficiently and eliminate waste, and that can sometimes work.

- “Everybody does it”; it is a generally accepted practice that is often warmly received on Wall Street with its focus on quarterly results.
- Executives are overconfident in believing they can beat the odds.
- It at least represents competitive parity, since most companies seem to do it. (But don’t we want a competitive advantage?)
- When combined with a restructuring of physical assets and business strategy, it is more likely to work.
- Executives have never personally experienced a layoff. Perhaps if they had, they might have greater empathy for the pain they are causing.
- Perhaps most importantly, they often don’t fully appreciate that costs are a consequence of your business system design. If you don’t change your fundamental business system design, which can take years, but you remove resources from the system, performance will most likely decline.

Unfortunately, however, the data suggest strongly that, as in Las Vegas, the odds are inherently against these senior managers and built into the systems already established in the company, which, in turn, suggests that changing the business system design is a better strategy. Initial impressions of other tools Beta has used to “change their business system design,” again with mixed results, are provided below.

## **Kaizen**

Kaizen is a Japanese word literally meaning change for the better, or, more appropriately, continuous improvement.<sup>12</sup> As with the other tools, the results of using Kaizen in the various operations were mixed. Several of Beta’s plants have employed Kaizen events and have seen dramatic improvement shortly after the event. However, these improvements appear to have been short lived, since within a few months of the event, performance was near what it had been before. If Kaizen means continuous improvement, why hasn’t Beta sustained these improvements and gotten even better using Kaizen? Beta must not be applying Kaizen properly.

## Total Productive Maintenance

Several of Beta's plants have used TPM,<sup>13</sup> again with mixed results. Some encountered union resistance to TPM, who referred to it as "operators doing maintenance work" or expressed negative feelings toward yet another Japanese technique. Still others, particularly the process plants, had difficulty using TPM because it seemed to be more suited for plants where the operator had autonomy over a specific, localized process, like a machining operation versus having autonomy over an area, such as the oxidation process in a chemical plant that had numerous pieces of equipment spread over a large geographic area.

Other plants did fairly well in using TPM. These plants seemed to be the ones where maintenance was defined as maintaining the plant or process function, not just on fixing things. These plants referred to TPM as "total productive manufacturing" about maintaining the plant and/or equipment function, not just repairs or preventive maintenance (PM). These plants also seemed to view it as a support tool for Lean Manufacturing, not just another stand-alone tool. "When should we use TPM?" Bob asked.

## Six Sigma

Several of Beta's operating units have adopted the Six Sigma<sup>14</sup> tool for improvement. This tool uses concepts similar to Deming's plan, do, check, act, or more specifically DMAIC—define, measure, analyze, improve, control—on core processes and key customers. One author has described Six Sigma as "SPC on steroids." While it is literally a statistical term that characterizes your quality having <3.4 defects per million for a given product or process specification, it has become a methodology for reducing the variability of processes such that the result is greater quality and consistency. It also stresses simultaneously achieving seemingly contrary objectives (i.e., being stable and innovative, seeing the big picture and the details, and being creative and rational). At one of Beta's plants, they have been very successful applying it, with cost reductions of over 15%, but at another, the results have been dismal—over \$1M spent with little or nothing to show for it. The question of course is "Why the difference?" Bob Neurath is determined to find out.

## Supply Chain Management

Most of Beta's plants were using some sort of supply chain management tool,<sup>3,15</sup> yet again with mixed results. In some cases, using supply chain principles was viewed as putting pressure on suppliers to provide lower costs (primarily through lower prices), better quality, and better delivery performance. In some cases, this included vendor stocking. These plants seemed to be getting good results, that is, they would report big savings in supply and raw material costs, but somehow those savings seemed to evaporate when the financial statements came together. For example, the vice president of purchasing in one of the divisions reported saving \$200M in lower supply costs, but the gross profits and operating costs for that division hardly budged. The vice president provided very detailed lists of prior costs and volumes for certain supplies and current costs for the same material, demonstrating the savings. Apparently these savings were being offset by increased operating and maintenance costs, since the overall profitability had not changed. They were not getting any worse, but they were not getting any better either, which really meant they were getting worse.

The divisions that seemed to be doing better in using supply chain principles appeared to view the supply chain more holistically and literally; it is a supplier, a manufacturer, and a customer, working as a team in a supply chain to optimize "chain" performance. They reviewed the entire "chain" and used process mapping to predict the chain's performance in areas like business system cycle times, inventories, distribution requirements, costs, risk/delays, and so on, working to optimize the chain, where savings were shared among chain members. Others also took a more holistic view, looking to consolidate suppliers and work in greater partnership with them, and in doing creating a more detailed review of customer requirements and rationalizing certain customers and/or products. Bob Neurath wanted to know more about so-called "best practice," particularly the best sustainable results in applying supply chain principles.

## Reliability-Centered Maintenance

Still other Beta plants were using RCM as a principal means of improvement, once again with mixed results.<sup>16</sup> After some time, a few plants just considered it too burdensome to have 5–10 guys sitting

in a room analyzing and endlessly debating equipment, system functions, and failure modes for *all possible* functions and failure modes (managers sometimes failed to send the requested people for the analysis); then having to prioritize all the failure modes using a criticality analysis; and then developing tasks for addressing the most critical failure modes. The real “kicker,” however, was often *not* doing what resulted from the analysis because of limited resources, existing operating rules, union objections, state regulations, and so on. What is the point, they seemed to ask, in spending all this time and money doing the analysis, when we aren’t going to do what it tells us we should do? Many times the analysis ended up as big notebooks on a shelf with little further action taken.

But, other plants seemed to be doing well using RCM. These seemed to take a more focused approach, often limiting their analysis to known failures in critical equipment that were causing the biggest problems to the plant. Since the primary objective of RCM is to *preserve system function*, they reasoned that the greatest benefit would come from analyzing those failures where the greatest loss of function had occurred and then being very disciplined about eliminating or managing the failure mode. Bob wondered, when should we be using RCM, and how do we make sure we use the results to get better business results? Should we use RCM preferentially to TPM, or vice versa? When?

## Predictive Maintenance

In trying to understand predictive maintenance, Bob asked, “does predictive maintenance let you predict the time when a machine is going to fail so you can plan around that failure?” Unfortunately, the answer is no. Predictive maintenance will not allow you to predict the timing of a failure with any accuracy. Then why is it called predictive maintenance? As with so many things, the answer seems to have been lost in history and happenstance. Predictive maintenance can more accurately be characterized as a sophisticated inspection that allows you to understand the condition of your equipment, whether or not a defect is present, and whether the defect is severe enough to require timely action. And, in general, we can also apply a simple rule—combining severity of condition and consequence of failure will allow us to judge our priority for action. The greater the severity and the greater the consequence, the higher the priority will

be. Which of the predictive maintenance tools is best? As you might expect, it depends. What are the most common and consequential failure modes associated with the machine? What is their notional frequency? Answers to these questions will allow us to better select the appropriate monitoring tool and frequency of data collection and trending.

How has Beta fared in applying predictive technology? Here the answer is pretty clear—very poorly. A good benchmark is that about 50% of all corrective maintenance should be done as a result of some form of condition monitoring or inspection, including operator tasks, the result of which is used to plan and schedule the work so as to minimize the consequence (maintenance cost and production downtime losses) of the pending failure.<sup>1</sup> At Beta, typically 40%–50% of all maintenance is done reactively, and this is better than it had been. That is, it is typical that less than a week’s notice is available before the maintenance must be done, and nearly 10% of the time it is an emergency—the maintenance must be done *now*. Clearly, Beta has failed to apply these tools effectively. And, even at those plants that do a somewhat better job with predictive maintenance or condition monitoring, their planning and scheduling capability is pretty poor, so the equipment runs to failure anyway. There just seems to be a lot of opportunity here.

## Root Cause Analysis

Beta’s use of root cause analysis tools has been, to be kind, spotty. There does not seem to be a mindset in the company for getting to the root cause of problems. Most seem to be doing well to simply put counter measures in place to get through a given day and have little time to solve problems to root cause. Granted, some plants have had a few people trained in one method or another. A few plants even have a person trained as a facilitator in root cause analysis. But there does not appear to be a consistent process for when to do such an analysis, what method to use, or how to track any results. Bob reasoned that having a systematic process for: (1) the criteria for when to do root cause analysis, (2) actually doing the analysis, and (3) assuring the results were implemented and sustained, was critical to the future success of the business. He had heard that Toyota tended to shun the more complex root cause analysis tools, favoring a simple

5 Whys approach. In fact, it seemed too simple to him, but he was open to being convinced.

## Other Tools

Thus far, this chapter has discussed the tools and strategies most commonly used in Beta's operations. There was a smattering of other tools in use at various plants. These included The Manufacturing Game®, Kepner Tregoe®, and several others. These are briefly discussed in Appendix C.

One tool that Beta will continue to use, but will not be discussed in this book in any detail beyond this section, is benchmarking, which according to Dr. Jack Grayson,<sup>17</sup> involves “seeking out another organization that does a process better than yours and learning from them, adapting and improving your own process....” Benchmarking, then, involves emulating the processes and practices of the other companies to improve yours so that you can improve performance as measured against benchmarks. Benchmarking is a continuing process, requiring constant attention to the latest improvement opportunities and the achievements of others. Benchmarks, on the other hand, have come to be recognized as those specific measures that reflect a best in class standard. Best practices, as the name implies, are those practices that are determined to be the best for a given process, environment, circumstance, and so on, and allow a company to achieve a benchmark level of performance for a given performance measure.

Be cautious about using benchmarks. Benchmarks (the numbers) don't tell you anything about the learning (e.g., the systems, processes, and practices that went into achieving a particular level of performance). Achieving a benchmark level of performance requires considerable learning—your processes and practices have to be exceptionally good. Simply obtaining a comparative set of numbers from other companies and then making arbitrary decisions about achieving those may actually be detrimental. For example, arbitrarily reducing spare parts to achieve a “world class” level of spares in the store room could dramatically affect plant performance in a negative way to the detriment of the overall business. If the processes are right, then the measures will improve. Four additional cautions about using benchmark data are: (1) there is considerable scatter in the data used in benchmarking, so it may be difficult to pick the

“right one” for you; (2) benchmark data is constantly changing as plants improve their processes; (3) no single benchmark should be used to make decisions—the performance measures tend to be interdependent and all the relevant measures must be considered in light of the company’s overall business goals; and (4) variables related to product mix, location, process design, and so on, will affect benchmarks. So, considerable judgment must be used in applying benchmarking principles. A table of nominal benchmark data for manufacturing operations is provided by Moore<sup>1</sup>, and a process for performing benchmarking studies is provided in *The Benchmarking Management Guide*.<sup>18</sup>

## Summary

It seemed to the steering team that all the tools would work, if consistently and properly applied, and that most all had certain elements in common. For example, typical goals were: (1) to minimize costs by reducing waste, in all its forms—excess inventory, poor quality, downtime, and so on; (2) to assure consistency and/or reduce the variability in plant processes; (3) to eliminate defects in the processes at their source or at least to better manage those defects; and (4) to use teams to apply the tools. Still, the question on the table—which tool was best under what circumstance?

Perhaps more importantly, there were other issues that needed to be addressed beyond the tools and strategies. A concern for the steering team was the fact that some studies suggested that cost cutting did not work very well and often was not sustainable. As one of them suggested, our costs are the consequence of our business system design, our processes and practices, and we need to improve those. It also seemed that the businesses and plants that made the most progress had better “leadership,” better alignment to their goals, better teamwork, and more disciplined performance measurements, and somehow they had managed to get their people engaged in changing the organization. What were the processes that needed to be put in place to address these fundamental issues? Bob felt that the leadership of the organization must provide clear direction as to the strategy, the tools, and the goals, to assure its alignment to those practices. Otherwise, the organization would get less-than-optimal results. In fact, they could be counterproductive. The importance of organizational alignment is discussed in the next chapter.

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