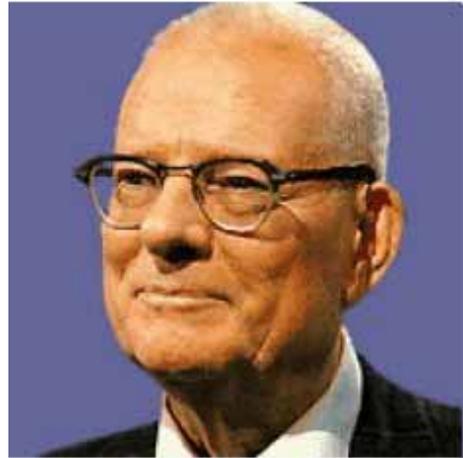


# **Deming Revisited: The Real Quality Model for Commerce**



**Final/Revised**

**Raphael L. Vitalo, Ph.D.  
Vital Enterprises  
Austin, Texas 78729  
January 26, 2020**



<b>Preface</b>	<b>v</b>
<b>Acknowledgments</b>	<b>vii</b>
<b>Introduction</b>	<b>1</b>
The Breath and Depth of Deming’s Thinking	1
How Deming Presents the Details of the Quality Model	6
The Purpose of This Monograph	8
<b>Section 1. The 14 Management Points</b>	<b>11</b>
Overview of the 14 Management Points	11
Detailed Analysis of Deming’s 14 Points	12
Point 1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.	12
Point 2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.	17
Point 3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.	18
Point 4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.	20
Point 5. Improve constantly and forever the system of production and service.	22
Point 6. Institute training on the job.	24
Point 7. Institute leadership (see Point 12 and Ch. 8). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.	28
Point 8. Drive out fear, so that everyone may work effectively for the company (see Ch. 3).	31
Point 9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.	33
Point 10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.	35

## Contents

Point 11. Eliminate work standards that prescribe numerical quotas.	37
Point 12. Remove barriers that rob people of pride of workmanship.	41
Point 13. Institute a vigorous program of education and self improvement.	45
Point 14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.	47
A Summary of Deming's View of the Functions of the Executive as Described in His 14 Management Points	52
Effectiveness	52
Sufficiency	54
Synergy	55
<b>Section 2. The Organization for Improvement of Quality and Productivity</b>	<b>57</b>
Introduction	57
Purpose	57
Organization	57
Responsibilities	59
Reporting Relationships	60
Authority	60
Is the Quality Organization as a Specific Organizational Unit Relevant Today?	61
An Analysis of the Critical Functions of the Quality Organization	62
Is the Quality Organization as a Specific Organizational Unit Relevant Today? The Evidence Says "No"	66
<b>Section 3. Deming's System of Profound Knowledge</b>	<b>67</b>
Introduction	67
The Scope of the System	67
Theory of Organization	68
The Concept of Variation and Its Significance	70
The Challenge Variation Creates	71
Variation, Statistics, and Industry	72
Every Process Must Be Stabilized	73
A Stable System Is <i>Only a First Step</i>	73
Implications	74

Deming’s Theory of Knowledge	75
Distinguishing Between Knowledge and Information	75
Knowledge and Management	76
Implications	78
The Nature of People and Its Significance	78
The Principle of ‘Sameness’ and ‘Differentness’	79
What Is Common to All	79
Deming’s Management Guidance About People	80
The Consequences of Ignorant Management	81
<b>Section 4. The Path of Transformation</b>	<b>83</b>
Introduction	83
Transformational Change	83
Driven by Personal Change	87
The Flow of Transformation	88
Model Versus Practice	89
The Detailed Process	90
<b>Section 5. What’s Wrong With the Quality Model?</b>	<b>93</b>
Introduction	93
One Answer Is, “Nothing”	93
Another Answer Is, “Everything”	94
The Mismatch in Values	94
Competence and Custom	94
The End Result	96
<b>References</b>	<b>97</b>
<b>Appendix A: Deming’s Guidance for Implementing of Executive Functions</b>	<b>103</b>
Exhibit A1. How People Implementing the Executive Functions Realize the Purpose of Effectiveness	103
Exhibit A2. How People Implementing the Executive Functions Realize the Purpose of Sufficiency	105
Exhibit A3. How People Implementing the Executive Functions Realize the Purpose of Synergy	108



I came to prepare this monograph on the work of W. Edwards Deming by way of researching the roots of the Lean Enterprise model. Based on my earlier reading of Deming, it was clear to me that he had a major contribution to the lean model. This judgment was based on four facts. First, Deming's views and the lean model's views concerning the role of executives, managers, and supervisors are essentially identical. Second, Deming taught the leaders of Japanese industry about the quality approach to commerce through the auspices of the Union of Japanese Science and Engineering (JUSE) in the early 1950s. Third, Deming played a pivotal role in enabling the resurrection of Japanese industry to its place of worldwide importance in the post World War II era. Indeed, Japan as a nation recognized Deming's contributions to the resurrection of their industry by extending to him the Second Order Medal of the Sacred Treasure. And fourth, Deming's contributions to the lean model as practiced by Toyota Motor Corporation were personally acknowledged and appreciated by Dr. Shoichiro Toyoda, the son of the founder of the Toyota Motor Corporation and its chairman from 1992–1999. "Everyday I think about what he [Deming] meant to us," said Dr. Toyoda, "Deming is the core of our management" (Toyoda, 1988). As you probably know, the Toyota Production System is often cited as a foundation for the Lean Enterprise model.

As I dug into his works, I discovered an alignment between the Quality approach to commerce and the Lean Enterprise approach that was far broader and deeper than I first presumed. By the time I finished, it seemed to me that Deming's work represents the heart and soul of Lean Enterprise, especially given his understanding of people and their striving to learn, grow, and achieve; his sensitivity to their needs and wants; and his recognition that they possessed an immense pool of untapped and largely ignored creativity. Beyond his understanding of the primary importance of people, other core elements of Deming's thinking confirmed my judgment. These include:

- his anchoring of enterprise on maximizing the delivery of value to customers as judged by customers,
- his view of the absolute synergy between personal development and organizational success,
- his inclusive perspective of whom must benefit from commerce,
- his identification of learning as the engine of success, and
- his continuous pursuit of perfection defined as a 'zero loss function.'<sup>1</sup>

Once a proper understanding of his work is realized, the narrowing of his contribution to the notion of teaching the application of statistical quality control borders on the criminal. Indeed, it was with ever-greater dismay that I recognized how inadequately the totality of Deming's thinking was understood. In its fullness, it represents nothing less than an alternative approach to

---

<sup>1</sup> This judgment of Deming's role seems further supported by the description of the Toyota culture provided by Liker and Hoseus (2007) and their assertion that it is this culture that is the heart of Lean Enterprise. The contents of that culture fully align with the teachings of Deming.

## Preface

commerce. Its breath and depth renders its reduction to process control charts, the use of statistical methods to stabilize processes, or even the application of Plan, Do, Study, Act (PDSA) to make process improvements as worse than a caricature.

For those who value fact over fancy or popular narrative, the facts about Deming's Quality model are essential. Facts allow proper analysis and interpretation. They open up possibilities that do not fit within popular narratives. They enable a correct grasp of the origins of current directions, what new ideas they truly contain, and what past and still valid contributions they have left out. When a body of thought is fully documented, it provides a true student of those ideas a resource essential to understanding the original intent and scope of those ideas. No one seeking to operate from a base of knowledge—which Deming viewed as essential to responsible conduct—would be satisfied with less.

## **Acknowledgements**

Christopher J. Bujak, President of Continual Impact LLC, was a major contributor to this monograph. His review and analysis of its findings stimulated greater inquiry and produced a clearer and more accurate product. His creative ideas advanced the clarification of issues and the development of more significant implications of the research's findings.

I would also like to thank Phyllis M. Virgil, Principal, PMV Consulting, for her valuable review of the manuscript and suggested improvements to its contents. Her earnest study of Deming and appreciation of his contributions has been an invaluable boost to this effort.

Finally, I would like to thank Patricia Bierley for her careful editing of the manuscript and many suggestions for improving its clarity.



## The Breath and Depth of Deming's Thinking

W. Edwards Deming's written works address every element that constitutes a model for conducting commerce. His writing defines the ultimate purpose commerce must serve. It describes the strategic direction and approach an enterprise should use to realize that purpose, the operational focus and methods it should employ, and how it should implement executive functions. Deming defines the ultimate purpose of commerce as maximizing the satisfaction of customer needs and wishes in ways that provide "better living for him in the future" (Deming, 1982a, p. 175). For Deming, the label "quality" means that an offering and its attendant services enabled the customer to realize his/her purposes at least to the degree the customer sought. It also means that the customer was able to install, use, and maintain it in a way that satisfied all the customer's requirements (Deming, 1982a, p. 177).

Deming makes clear, however, that this end of maximizing the quality delivered to customers is to benefit *all stakeholders inclusively*. "The aim proposed here for any organization is for everybody to gain—stockholders, employees, suppliers, customers, community, the environment" (Deming, 2000, p. 51). Deming's vision of a commercial enterprise is of a system comprised of all these stakeholders committed to implementing the quality approach to commerce.<sup>2</sup> This interdependent and dynamic system operates synergistically. Its aim establishes serving the customer as its primary value augmented by other values essential to Quality's communal perspective. These include inclusiveness in thinking, acting, and benefiting; respect for people's inherent striving to learn and achieve and their right to pride of workmanship; action based on knowledge; and learning as the means for realizing success.

### Exhibit 1. The Purpose, Vision, and Values Elements of the Quality Model's Strategic Component

#### Purpose

- To:** Maximize the satisfaction of customer needs and wishes in ways that provide "better living for him in the future"
- For:** Customers, producer, and all other stakeholders
- By:** Continuously improving the enterprise's products and services and the processes that produce them
- So That:** All stakeholders are benefited inclusively

#### Vision

An interdependent and dynamic system organized around a customer and made up of a producer, its suppliers, and all other stakeholders each of whom is aligned on purpose, teamed in their performance, energized by their personal conviction, capable of leveraging learning to continuously improve everything they do, and pioneering forever in the pursuit of maximizing customer value.

#### Values

- ▶ Provide real utility to customers that enhances their lives
- ▶ Be inclusive in thinking, acting, and benefiting
- ▶ Respect people's inherent striving to learn and achieve and their right to pride of workmanship,
- ▶ Act from a base of knowledge not intuition, and
- ▶ Use learning as the means for realizing success.

<sup>2</sup> We use the terms "Quality approach to commerce" and "Quality model" interchangeably. Both refer to the set of knowledge that defines the Deming approach to implementing a commercial enterprise. In almost all aspects, Joseph M. Juran's writings, which provided detailed operational guidance for implementing the technical aspects of the model, are consistent with Deming's model. For one example of where Juran deviated from Deming, see *Section 3. The Path of Transformation*.

## Introduction

The competitive strategy of the Quality model prescribes building an extended value stream<sup>3</sup> committed to improving quality constantly and forever. This extended value stream is composed of all the agents involved in delivering a customer a product or service. It anchors the efforts of the business and the members of its extended value stream in an understanding of customer needs and expectations. It resources, designs, builds, and delivers offerings that satisfy customer values. It continuously improves both its offerings and all its operations in their delivery of quality. The driving intent of continuous improvement is to reduce the loss function in every operation to zero (Deming, 1982a, p. 141).<sup>4</sup> This means optimizing every process's capability by aligning exactly its typical performance with that needed to ensure maximum customer value and eliminating all variability in realizing that target performance. This effort results in offerings that customers "will boast about" (Deming, 1982a, p. 87). The reputation that ensues attracts new customers and expands the business's market share. A zero loss function also elevates productivity and decreases costs. Together, expanded sales, higher productivity, and lower costs combine to increase profitability, sustain employment, expand jobs, and produce opportunities for advancement for all employees.

To sustain this virtuous cycle, the business's competitive strategy must focus not only on delivering quality today, but it must invest in ensuring better quality tomorrow. This means putting resources into uncovering and creating innovations in offerings, methods, and materials that will better serve the future needs of customers. It also means investing in uncovering ways to elevate its contributors' (employees, suppliers, customers, etc.) capabilities so they can reach new levels of achievement and advance to pursue new and more rewarding roles and purposes.

The organizational strategy prescribed by the Quality model is based on the primacy of people aligned to a common goal as the creative agents of success. This means that a business

### Exhibit 2. The Competitive and Organizational Elements of the Quality Model's Strategic Component

#### **Competitive Strategy**

- ▶ Build an extended value stream of people and organizations committed to improving quality as defined by the customer constantly and forever.
- ▶ Anchor every member's efforts in an understanding of customer values and expectations.
- ▶ Resource, design, build, deliver, and continuously improve offerings that maximally satisfy customer needs and expectations.
- ▶ Pursue constantly and forever the reduction of the loss curve in every operation to zero.
- ▶ Invest in ensuring better quality tomorrow.

#### **Organizational Strategy**

- ▶ Recognize the primacy of people aligned to a common goal as the creative agents of success.
- ▶ Eliminate any and all barriers to the free and full expression of people's desire to learn, achieve, and contribute.
- ▶ Eliminate any and all barriers to teaming within and across the extended value stream.
- ▶ Maximize and sustain communication and trust across the extended value stream.

<sup>3</sup> Deming depicts the extended value stream as a "flow diagram" (Deming, 1982a, p. 4) that begins on its left side with suppliers and ends on its right side with customers. He first presented it to the leaders of Japanese industry in 1950 at the Mt. Hakone conference. The term 'extended value stream' was coined by Womack and Jones (2003) and is used in the Lean Enterprise model but the meaning appears, in all its particulars, the same.

<sup>4</sup> The loss function mathematically represents the loss due to the gap between what is produced and what a customer ideally seeks.

must eliminate any and all barriers to the free and full expression of people's desire to learn and achieve and contribute to that goal. It also means understanding that, for people to operate with synergy, all barriers to teaming must be removed, communication must be maximally enabled, and trust across the extended value stream must be established and maintained.

The Quality model's guidance for operations directs it to focus on delivering customers products and service outcomes that delight them. Its prescribed approach is first to involve all contributors in understanding customer values. The people implementing operations use this base of understanding to design quality into every offering and process, make every process stable, optimize every process's capability by reducing its loss function, and improve constantly and forever every activity the enterprise implements and each of its offerings. These five activities are recycled continuously within the operations of *every business function* making each function effective. In this way the operations of every function accomplish the focus defined by the Quality model and collectively realize the strategic aims of the business.

### Exhibit 3. The Quality Model's Guidance for Implementing Operations Within Every Business Function

#### Focus

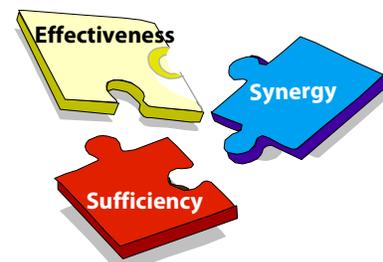
Delivering customers products and service outcomes that delight them and enable their success

#### Approach

1. Involve all contributors in working together to understand customer values.
2. Design quality into every offering and process.
3. Make every process stable.
4. Optimize every process's capability by reducing its loss function.
5. Improve constantly and forever every activity the enterprise implements and each of its offerings.

Most prominent in Deming's writings, apart from the importance of a statistical approach to quality control, are his dictates regarding the performance of executive functions. As defined by Barnard (1968, p. 215), executive functions are "the specialized work of *maintaining* the organization in operation." They keep the organization whole, capable, and moving forward towards its goals. Executive functions must accomplish three purposes: effectiveness, sufficiency, and synergy. *Effectiveness* means that the enterprise is demonstrably advancing toward fulfilling the aim it has defined. The executive activities that relate to effectiveness (e.g., setting goals, developing plans, measuring progress, improving performance) address the technical issues that affect a business's progress toward its goals. *Sufficiency* refers to the presence, engagement, and contribution of cooperative efforts from each person needed to accomplish the business's strategic aim. The executive functions that affect sufficiency engage and involve people needed to achieve the organization's purposes and enable and ensure their contribution to the business. *Synergy* refers to the state in which contributors collaborate with each other such that their individual efforts interact to yield outcomes greater

### The Purposes Executive Functions Must Realize



## Introduction

than the sum of their separate achievements. All three purposes must be realized in order for a commercial enterprise to sustain and succeed. *In essence, an organization's integrity is maintained when it has the people it needs to accomplish its purpose engaged fully and working together in a manner that is advancing its success.* Absent any of these elements, an organization dissipates and its prospects of success evaporate.

Deming's approach to *implementing* executive functions represents a dramatic contrast to that defined by Barnard whose guidance is more or less standard practice in businesses pursuing the traditional profit-driven, financially-focused approach to commerce. The logic of Deming's Quality model makes a different approach a necessity. After all, its purpose is to deliver benefit *inclusively*, not to maximize profit for the business's owners. Its focus is long-term, not near-term. Its means for marketplace success is the superior delivery of value and not the manipulation of markets or the use of any other method of control for establishing what Warren Buffet euphemistically terms "pricing power" (Frye and Campbell, 2011).<sup>5</sup>

Furthermore, its core dynamic for realizing success requires that all contributors generate and leverage learning together to improve both their own performance and that of the business. That factor alone requires that executive functions be implemented in a way that (1) unleashes the capabilities of its people, (2) enables their collaborative efforts, and (3) sustains faithfully the organization's commitment to its purpose. As Deming teaches, the failure to satisfy the first two of these three conditions means learning will not be maximized nor will it be leveraged. The failure to satisfy the third condition means people will doubt ownership's commitment to continuously improving quality as delivered to customers and thereby fall away from investing themselves in that effort. Also, any model whose core dynamic is learning must implement its executive functions in a way that recognizes the primacy of people—the generators of learning—and the need for teaming among them as they strive to accomplish their common aim. Deming used the term "leadership" to encapsulate the approach to executive functions that incorporated an understanding of these fundamental principles. His definition of the term deviates from the traditional. In Deming's view, a person exhibiting leadership operates from a base of knowledge, not instinct; focuses on the long-term, not solely the near-term; and is dedicated to enabling the success of every contributor to the organization.

### Exhibit 4. The Quality Model's Guidance for Implementing Executive Functions

Implement executive functions in a way that:

- ▶ sustains an absolute focus on delivering quality today and better quality tomorrow,
- ▶ ensures the delivery of benefits inclusively to all stakeholders,
- ▶ enables and ensures the success of every contributor,
- ▶ eliminates all barriers to pride of workmanship,
- ▶ eliminates all barriers to teaming across the enterprise,
- ▶ recognizes the importance of using knowledge not intuition as a basis for action,
- ▶ enforces the rule that all problem solving and decision making is evidenced-based, and
- ▶ acts always to support learning and its leveraging as the central means of success.

<sup>5</sup> Pricing power means being able to set prices independent of market conditions. It requires a company to control a marketplace through one or another means thereby compromising the operation of free-market forces.

*Everyone performing executive functions within a business implementing the Quality model must exhibit leadership.* By applying their understanding of people, leaders will seek to remove all obstacles to pride of workmanship— e.g., fear, distrust, ineffective systems, indifference to new ideas, etc. By applying their understanding of dynamic systems, of which a human organization is an example, they will recognize the necessity of teaming and establish it across the enterprise.<sup>6</sup> Any obstacle to teaming—whether it be a deficiency in communication, an internal system that segregates contributors into groups having differential status and privileges, or a focus on numbers not quality—are targets for elimination or correction. Leadership within the Quality model is not distinguished by flashes of insight, deft moves in the marketplace, the display of panache in public forums, or the cultivation of a public image. Rather leadership is about maintaining the integrity of the organization by:

- sustaining an absolute focus on delivering quality today and better quality tomorrow,
- ensuring the delivery of benefits inclusively to all stakeholders,
- enabling and ensuring the success of every contributor,
- eliminating all barriers to pride of workmanship,
- eliminating all barriers to teaming across the enterprise,
- recognizing the importance of using knowledge not intuition as a basis for action,
- enforcing the rule that all problem solving and decision making will be evidence-based, and
- acting always to support learning and its leveraging as the central means of success.

### The Transformation Process

Deming detailed the flow of activities that a business must undertake to move from implementing the prevalent financially-focused, profit-driven commercial model to implementing the Quality model. This guidance sequences the actions that must occur into an order that is necessary for success. All the components of the process are documented throughout his work and the contents of the transformation process itself are consistent with the guidance provided by the best of the empirical research into transformational change. The process emphasizes the essential role of the executive and his or her need for realizing a personal transformation before pursuing an organizational transformation.

Deming's presentation of the workflow for transformation is embedded in his discourses about the 14 management points and his writing about profound knowledge. Later in this monograph, we will provide a flow diagram representing the transformation process that graphically

---

<sup>6</sup> The knowledge of people and systems are two components of Deming's System of Profound Knowledge that is described later in this monograph beginning on page 67.

## Introduction

integrates Deming's thinking. For now, we summarize the process as beginning with ownership and management's mastery of the 14 management points. To accomplish this, they must also master the set of knowledge Deming's refers to as "profound." Absent the mastery of this profound knowledge, the 14 points become empty slogans and management's attempts to implement them will fail. Acting based on this knowledge, management exhibits the qualities of leadership as defined by Deming and acts to eliminate all barriers to quality improvement. Their demonstrated and sustained action to this end establishes their credibility in the eyes of all stakeholders and instills in stakeholders the confidence that investing their energies to further the ends of continuous quality improvement will bear fruit and cause them no harm. To further support their efforts, management eliminates all barriers to teaming and establishes, with the participation of all contributors, goals and plans for guiding the maximization of quality in offerings and operations. This effort is anchored in the continual improvement of everyone's understanding of customer needs. It proceeds by building quality into every offering and operation in its design stage, stabilizing every operation once it is launched, reducing common cause variation and elevating the capabilities of every process, improving the business's supply chain, and investing in innovation. Each of these areas of activity is established and sustained. In each, learning is generated and applied to improve its performance. Across these areas of activities and the enterprise as a whole, learning is recycled into new goals and plans to deliver improved quality tomorrow.

As stated before, the transformation process is first and foremost a personal change initiative, *not* an organizational change initiative. Deming makes clear that mastery of the Quality model is not simply the mental 'on-boarding' of its concept and principles. It is internalizing the new philosophy, making it one's own, acting consistently with its dictates, and taking pride in it. It involves shedding one's conditioning and reestablishing one's connection to his or her intrinsic desire to learn and achieve and experience the pride of workmanship.

### How Deming Presents the Details of the Quality Model

If you are familiar with Deming's thinking from having read his works directly, then you are likely to have two reactions to the summary of the Quality model just presented. Your first reaction is likely to be, "Yes, that seems consistent with Deming's thinking." Your second reaction is likely to be, "But just where does he say all this? I don't recall seeing this presentation in any of his works." Both reactions are legitimate. As this monograph documents, every element of the Quality model described above is directly traceable to Deming's writings. However, nowhere in his works is his thinking presented in such a formal and academic manner. While Deming was recognized as a scholar, he chose a practical approach to the presentation of his ideas both in his writings and his lectures. He offered his ideas in a series of required actions liberally laced with real-world examples of either what he was advising or warning us about. Occasionally, he used a graphic to depict elements of his thinking, their interactions, and consequences. For example, in *Out of Crisis*, he depicts what we refer to as the *extended value stream* in a graphic that shows the

collection of contributors to the production system that generates a business's offering and provides it to its customers (Deming, 1982a, p. 4). On page 3 of the same book he presents a graphic that shows the causal chain from improved quality to realizing business success and providing employment stability and job growth. But these examples are exceptions. Almost always, Deming unfolds his thinking through a presentation of his 14 management points. He uses these 14 points as the framework for introducing *all the remaining elements* of the Quality model. In his book *Out of Crisis* (Deming, 1982a), Chapter 2's overview of the 14 points introduces the reader to the book's remaining contents. The contents of its chapters elaborate the meaning and necessity of each point and supply more detailed knowledge and real-world examples essential for its proper application. The same is true for his earlier work, *Quality, Productivity, and Competitive Position* (Deming, 1982). And, while the structure of *The New Economics for Industry, Government, and Economics* (Deming, 2000) is somewhat different, its Chapter 2 also is used to present the 14 management points although in a different format. Here, Deming contrasts "Present Practice" and "Better Practice." In each instance, the comparison addresses an executive function and each "Better Practice" relates to one or another of the 14 management points.

Deming's use of the 14 points as the vehicle for explaining his thinking is absolutely consistent with his personal learning about the role of management in transforming a business from the traditional approach to the Quality approach to commerce. In essence, *without a transformation in leadership there will be no transformation of the business to the Quality model*. During the early 1940s, Deming undertook what he considered a failed attempt to introduce Shewhart's process control and quality improvement ideas and methods to U.S. industries serving the war effort (Deming, 1982; Walton, 1986). At that time, he suggested to Stanford University that it offer a series of 10-day courses instructing engineers, inspectors, purchasing managers, and others in these ideas. The initiative ultimately trained 31,000 professionals. While it raised consciousness about quality and contributed to the emergence of American Society of Statistical Quality Control, Deming later judged that his intent of affecting the *practices* of businesses had failed. Deming writes, "Brilliant applications burned, sputtered, fizzled, and died out" (Deming, 1982, p.101). A major reason he identified for the failure was that "there was no structure to teach management their responsibilities" (ibid, p. 102) and therefore no way to ensure that the focus on quality became pervasive and persistent within each company. When Deming began his lectures in Japan in 1950, he looked out and recognized once more that he "was not talking to the right people" (Walton, 1986, page 13). While earnest in their intent to learn, the attendees had no decision-making power in their companies. Thus, when he was asked to extend his teaching on quality and process control in Japan, he requested to meet with the association of Japanese chief executives, the *Keidanren*. This Ichiro Ishikawa arranged for him. These chief executives became Deming's major audience and an early version of the 14 management points was the focus of his teaching.

## Introduction

### The Problem With Deming's Approach

The problem with Deming's approach to sharing his thinking is that the Quality model, as just summarized, and Deming's detailed guidance for transitioning a business to its use is largely *invisible*. It is there but not there in Deming's writings and lectures. It is there in the sense that every element of it is directly traceable to Deming's written work. It is not there in the sense nowhere does he present the model in a complete, formally organized manner. The reason, as stated above, is that Deming was focused on changing the way businesses were implemented, not on the more academic intent of developing and disseminating a new model for conducting commerce. For this reason he used the 14 management points to frame the communication of his strategic and executive perspectives and his guidance for transforming a business to the Quality model. He used statistical quality control and the concept of continuous improvement in quality by the repetitive use of the Shewhart cycle (Plan, Do, Check, Act [PDSA]) as his major vehicles for elaborating his approach to operations. His intent was to make the teaching concrete and actionable. To be fair, he gave ample warning that behind these elements was a deeper knowledge—a set of profound knowledge—that needed to be understood fully and integrated into one's personal conduct otherwise the practical guidance he provided would be rendered ineffective—mere empty phrases. He also made it abundantly clear that transforming to the Quality model was not simply an issue of adopting new methods but of internalizing new values and perspectives. The necessary first step to organizational transformation was, for Deming, personal transformation. But, by and large, his warnings and admonitions about the necessity of mastering the set of knowledge he called “profound” never took hold. What people seem to have settled for is to understand his contribution in terms of just 14 simple commands and the remaining practical tools he used to convey the meaning of the Quality approach to commerce. Thus, Deming is identified with promoting Shewhart's statistical approach to quality control and the use of control charts to stabilize processes by eliminating special cause variation. Or, he is identified as the man who pushed the idea of quality (usually undefined) and its continuous improvement as the way to succeed in business. Or, he is identified with the four-step method for testing an hypothesis, extracting learning, and using it to make improvements (PDSA). Or, he is recognized as a management theorist who promoted a high involvement management style. Nowhere is the full breadth and depth of his thinking explicated and treated as a whole.

### The Purpose of This Monograph

It is the purpose of this monograph to correct these distortions of Deming's thinking by providing a detailed analysis and integration of the breadth and depth of his thinking. Only when the full scope of Deming's thinking is appreciated can one properly appreciate his contribution and benefits from his ideas. Also, only then can one correctly evaluate the underlying reasons for the trajectory of quasi adoption and ultimate indifference to those ideas. Finally, only then can one

understand Deming's contribution to other commercial models—especially the Lean Enterprise model.

Section 1 of this monograph focuses on the 14 management points. Each point is presented and its surface meaning identified. Then the content Deming added as he explored each point is analyzed. Some of the content Deming presents proximate to introducing each point. Other elements are spread throughout the remaining chapters of his works. From this analysis, the monograph extracts and records each point's deeper contribution to the Quality model. Special attention is paid to each point's guidance concerning the implementation of executive functions since it is to this element of the model to which they most pointedly speak. At the end of the Section 1, the monograph integrates all of Deming's guidance for implementing executive functions. This integration of his thinking will make clear that Deming's thinking about executive functions, while divergent in its perspective and guidance, is on par in comprehensiveness and significance with that of Chester I. Barnard, the author of the seminal work on the functions of the executive (Barnard, 1968).

Section 2 analyzes Deming's writing about the four bodies of knowledge he identifies as “profound.” It shows how these bodies of knowledge underpin the meaning of the 14 management points. It also presents empirical findings that address the scientific legitimacy of Deming's thinking.

Section 3 integrates Deming's guidance for how a business proceeds in adopting the Quality model. It shows the sequence of actions that must occur and the multiple fronts of activity that must be sustained in parallel. It makes clear that the initial and continuing focus of transformation is in the performance of executive functions, not operations. As Deming bemoaned,

“Somehow the theory of transformation [the adoption of the Quality model] has been applied to the shop floor. Everyone knows about the statistical control of quality. This is important, but the shop floor is only a small part of the total. Anyone could be 100 per cent successful with the 3 per cent [shop floor reference], and find himself out of business.

Ninety-five percent of the changes made by management today make no improvement”  
(Deming, 2000, pp. 37–38).

Section 4 addresses the question, “What's Wrong With the Quality Model?” The question flows naturally once one juxtaposes the completeness and comprehensiveness of the model, the empirical support for its effectiveness, and its lack of adoption in commercial organizations. If the Quality approach to commerce is as good as the evidence suggests, then why is it not broadly embraced and implemented as specified by Deming?



## Section 1. The 14 Management Points

Deming states that his 14 management points “constitute a theory of management” (Deming, 1982a, p. 97). They define the necessary changes managers must make in how they execute their executive functions if they seek to implement the Quality model. Mastery of these 14 points is so fundamental to adopting the Quality model that Deming designates them as “the basis for transformation” from the traditional American approach to implementing a business to the quality approach (Deming, 1982a, p. 23).<sup>7</sup>

### Overview of the 14 Management Points

Deming’s statement of the 14 points varies in wording across his different publications. He even offers a version of them tailored to the health care industry (Deming, 1982a, pp. 199–203). The essential meaning of each point, however, is stable. Here are the 14 points as presented in his book, *Out of Crisis* (Deming, 1982a), on pages 23–24.

“The 14 points apply anywhere, to small organizations as well as to large ones, to the service industry as well as to manufacturing. They apply to a division within a company.

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership (see Point 12 and Ch. 8)<sup>8</sup>. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company (see Ch. 3).
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.

---

<sup>7</sup> References appear at the end of this monograph beginning on page 97.

<sup>8</sup> Chapter references (e.g., “Ch. 8”) appearing in quotations refer to chapters in *Out of Crisis* (Deming, 1982a) unless otherwise indicated.

## Section 1. The 14 Management Points

10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
11. ["Eliminate work standards that prescribe numerical quotas." Inserted from "Quality and the required style of management" (Deming, 1988). On page 23 of *Out of Crisis* Deming just presents 11a and b.]
  - a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.
  - b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.
12. ["Remove barriers that rob people of pride of workmanship." Inserted from page 77 in *Out of Crisis*. On page 23 of *Out of Crisis*, Deming just presents 12a and b.]
  - a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.
  - b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, inter alia, abolishment of the annual or merit rating and of management by objective (see Ch. 3).
13. Institute a vigorous program of education and self improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job."

### Detailed Analysis of Deming's 14 Points

This monograph analyzes Deming's theory of management using the following process. First, the analyst studied Deming's writing about each management point as he presented each to his readers. Second, he analyzed the content of references Deming directs the reader to for further development of his thinking about a point. Third, the analyst integrated statements Deming made elsewhere in his writings that amplified one or another idea Deming associated with a particular point. The following works were studied: *Elementary Principles of the Statistical Control of Quality* (Deming, 1950), *On Probability as a Basis for Action* (Deming, 1975), *Out of Crisis* (Deming, 1982a), *Quality, Productivity and Competitive Position* (Deming, 1982), *The New Economics for Industry, Government, and Economics* (Deming, 2000), and Deming's journal article addressing Quality and the Required Style of Management-The Need for Change (Deming, 1988).

## Section 1. The 14 Management Points

### Point 1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.

#### Deming's Thinking

Point 1 makes it clear that management's first action is to make the improvement of products and services the persistent aim of the organization and its singular means for realizing business success. In explaining this edict, Deming describes elements of the strategic ends commerce pursues as prescribed in the Quality model. For example, he identifies two of the benefits commerce seeks to realize as: (1) to sustain the enterprise in commerce and (2) to provide jobs.<sup>9</sup> He asserts that these benefits are realized when a business maximizes quality as experienced by the customer. A quality product or service, for Deming, "helps somebody and enjoys a good and sustainable market" (Deming, 2000, p. 2). It satisfies customer needs and wishes and "provide[s] better living for him in the future" (Deming, 1982a, p. 175). The only way to maximize quality as measured by the customer is by continuously improving the enterprise's products and services and the processes that produce them. Note that "improvement" means that each product or service output and every operation of the organization delivers greater value from the customer's perspective. Continuous improvement of products, services, and implementing processes, therefore, is the singular focus that executives must embrace because it is the pathway to realizing the aim of commerce as defined by the Quality model.

#### *The Need for Quality Today and Improved Quality Tomorrow*

Deming further explains that success requires the maintenance of quality today through the regulation of daily operations *and* the delivery of improved quality tomorrow. Satisfying these requirements for sustained improvement over time demands *constancy of purpose*. He makes clear that this "constancy of purpose" must be embraced and exhibited first and foremost by owners. He amplifies this requirement in Points 2, 5, and 14 by declaring that owners and managers must master the 14 points, internalize the new philosophy, make it their own, act consistently with their dictates, and take pride in doing so. In his words, executives who embrace the Quality model "will have the courage to break with tradition, even to the point of exile from their peers" (Deming, 1982a, p. 86). Unless owners and their agents fully own the new philosophy and act on it, the business will not generate the benefits that the Quality model promises.

Deming underscores again the personal level at which adoption of the new philosophy must occur when he states, "The first step is transformation of the individual" and "The individual, transformed, will perceive new meaning to his life, to events, to numbers, to interactions between people" (Deming, 2000, p. 92).

---

<sup>9</sup> Deming expands this list of benefits to be delivered. These expanded benefits are described later in the monograph.

## Section 1. The 14 Management Points

### *Investment Is Essential to Ensure Improved Quality Tomorrow*

Owner and managers that fail to transform themselves and retain, for example, their near-term focus on quick profits—may well realize their end [near-term profit] but, in doing so, they will undermine the competitive position and future success of their companies. For Deming, near-term focus is especially destructive to the pursuit of quality because continuous improvement in quality requires innovation and investment *today* in activities that will only deliver benefits *tomorrow*. The investments Deming sees as critical to long-term success include:

- improving the design of current products and services,
- pursuing new products or services and the use of improved materials,
- developing improved methods and infrastructure,
- investing in uncovering new skill requirements and in training and retraining performers, and
- investing in the discovery of ways to maximize the utility of offerings in the hands of customers and enhancing customer satisfaction with doing business with your company.

### *Constancy Is Essential to Contribution by Stakeholders*

Deming states that an organization’s ability to improve quality is fully realized only when all stakeholders to its aim are fully engaged in its efforts. For this condition to be realized, stakeholders require that the owner’s commitment to improving quality must be unshakable otherwise all “will be skeptical” and the contribution of their best efforts will be withheld (Deming, 1982a, p. 25). “Your customers, your suppliers, your employees need your statement of constancy of purpose—your intention to stay in business by providing product and service that will help man to live better and which will have a market” (ibid, p. 26).

Stakeholders also require reassurances that their contributions to improving quality will not result in harm to them. He states that the organization’s unshakable commitment to quality improvement must be joined with a commitment that *no employee will lose his or her job as a result of the employee’s contributions to improving quality and productivity*. Establishing this last commitment as fact is the first step in removing all barriers that impair full participation by each contributor and deny them the opportunity for “pride of workmanship.”

#### **Pride of Workmanship**

The construct, pride of workmanship, is packed with significance for Deming. It means enabling the person to experience success and growth in their capabilities as a consequence to their investment of effort in doing their work and their striving to learn and advance. This is a critical element in Deming’s thinking. Pride of workmanship, when allowed to occur, sustains the individual’s engagement in the business. It excites people’s energy and further invigorates their intrinsic striving to learn, contribute, and realize new levels of personal success. Deming repeatedly addresses the construct throughout his writings and especially in Chapter 3 of *Out of Crisis* and in management Points 6, 7, 8, 11, and 12.

## Section 1. The 14 Management Points

### Implication's for the Quality Model for Commerce

Point 1's guidance addresses what an enterprise's long-term aim should be and how it must be realized (the Quality model's *strategic component*). It defines the purpose of commerce from the model's perspective, identifies two stakeholders to commerce,<sup>10</sup> and states what benefits must be delivered to each. Point 1 also specifies two conditions that must be satisfied for the model to succeed. The first condition is that ownership and its representatives fully comprehend and embrace the model and are unshakably committed to pursuing the purpose it defines using the approach it specifies. The second condition is that they must publicly commit to ensuring that "no one will lose his job for contribution to quality and productivity" (Deming, 1982a, p. 26). This condition is expanded later, especially in Point 8. There, Deming declares that management must "Drive out fear, so that everyone may work effectively for the company."

Deming's thinking with regard to Point 1 also provides insight into the commercial strategy that adopters of the Quality model must implement. It may be synopsisized as *quality today and improved quality tomorrow*. To build on his statements, one might organize that strategy as (1) adopt and implement the 14 management points, (2) pursue quality today by maximizing the value delivered by each offering and by optimizing the performance of all systems and people in delivering quality, and (3) pursue quality tomorrow by innovating and investing in continuously improving future offerings and the systems and people who will provide them.<sup>11</sup>

Concerning executive functions, Deming's guidance in Point 1 addresses the purposes of effectiveness and sufficiency (Exhibit 1, next page). With regard to *effectiveness*, Deming asserts that owners and managers must fully comprehend and embrace the new philosophy contained in the 14 management points. They must establish the continuous improvement of products and services as their singular focus and as the necessary means by which the enterprise will succeed. With regard to *sufficiency*, Deming specifies that contributors must be convinced that owners and executives are genuinely and unshakably committed to the improvement of quality in all aspects of the organization's existence. Without that conviction, they will not contribute their cooperate efforts to the organization. He also asserts that employees specifically must be free of the fear of loss of employment so that they may participate fully in discovering and implementing quality improvements. Given Deming's statements about the radically different management perspective required for implementing the Quality model and his sense that assent to its dictates must have an personal component, it seems reasonable to infer that adoption of Point 1 requires the presence of ownership and

---

<sup>10</sup> Deming's list of stakeholders expands significantly when he discusses the concept of "systems" in Chapter 3 of his book, *The New Economics for Industry, Government, and Economics* (Deming, 2000). Ultimately, they include all those who may affect the performance of the organization and all those who are affected by that performance. In Deming's words, "The aim proposed here for any organization is for everybody to gain—stockholders, employees, suppliers, customers, community, the environment" (Deming, 2000, p. 51).

<sup>11</sup> Other elements are added to this commercial strategy by later items within the 14 management points. See, for example, Point 4 below.

## Section 1. The 14 Management Points

management who are open to new knowledge and whose personal values align with the intents of the Quality model.<sup>12</sup>

### How Deming Sees the Willingness to Contribute Elicited

The construct “willingness to contribute” to an organization was first introduced by Chester I. Barnard. Once an organization’s purpose is defined, eliciting people’s willingness to contribute represents the next critical hurdle to building an organization. Unless one can

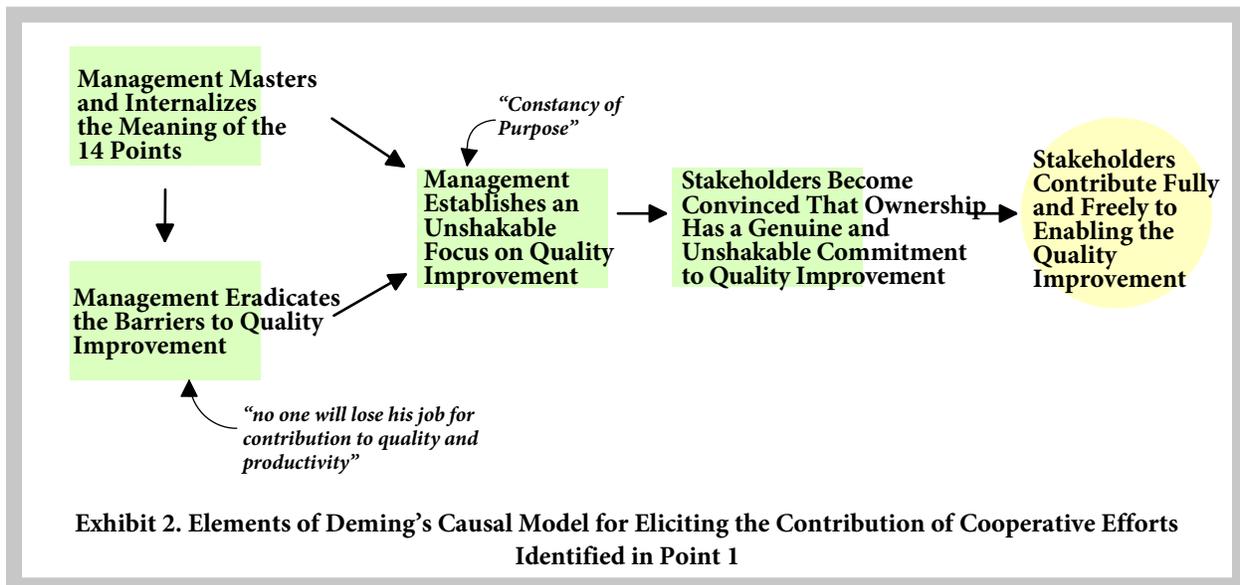
Exhibit 1. Point 1’s Implications for the Quality Model’s Approach to Executive Functions		
Result Affected	Required Activities	Required Resources
<b>Effectiveness</b>	Ownership and management: <ul style="list-style-type: none"> <li>■ master the meaning of the 14 points,</li> <li>■ internalize the new philosophy, make it their own, act consistently with its dictates, and take pride in it, and</li> <li>■ establish the continuous improvement of products and services as the singular focus of the organization.</li> </ul>	Ownership and management who are open to new knowledge and whose personal values align with the intents of the Quality model.
<b>Sufficiency</b>	Ownership and management establish the organization’s commitment to quality as “unshakable” in the eyes of all stakeholders. They: <ul style="list-style-type: none"> <li>■ resolve that no employee will lose his or her job as a result of the employee’s contributions to improving quality and productivity and</li> <li>■ eradicate all other barriers to quality improvement.</li> </ul>	

elicit such willingness from others, no organization can exist. While no one seems to recognize it, Deming’s vision of organization is an answer to Barnard’s. While Barnard shuns intrinsic motivation as a basis for willingness to contribute, Deming defines it as essential. While Barnard does assert that people must “believe” in the merit of the purpose an organization pursues, this state is preferably achieved through “persuasion” and maintained through *quid pro quo* relationships. “*Organization results from the modification of the action of the individual through control of or influence upon one of these categories [the individual’s purposes, desires, impulses of the moment, and alternatives]. Deliberate conscious and specialized control of them is the essence of the executive functions*” (Barnard, 1968, p. 17; italics in the original text). For Deming, willingness to contribute flows from the alignment of one’s personal values and the values and direction of the organization as confirmed by the factual behavior of one’s partners in enterprise.

<sup>12</sup> Consistent with this inference is Deming’s edict that leaders “must be unceasing learner[s]” (Deming, 2000, page 126).

## Section 1. The 14 Management Points

From Deming's writing one can construct a causal model for eliciting the contribution of cooperative efforts from all stakeholders (Exhibit 2, next page). The chain of effect begins with ownership's mastery of the 14 management points and their actions to implement those points. Its immediate effect is to convince stakeholders of the genuineness of the organization's commitment to quality improvement. That conviction frees prospective contributors to invest their energies in enabling the business to improve quality continuously. Based on his writings elsewhere, a critical factor in triggering this last effect is Deming's belief in the inherent striving of people for excellence and the natural alignment of that intrinsic striving to learn and grow with the construct of continuous improvement.



**Point 2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.**

### Deming's Thinking

Point 2 calls owners and managers to recognize the new economic age they have entered and undertake the challenge to transform themselves and their companies to the new approach to commerce that the new age requires. The new economic age Deming referred to was the period beginning in the 1950s when the nations ravaged by World War II recovered to the point that their industries were beginning to compete with those of the United States. After World War II and until that point, U.S. industry was the unchallenged supplier of the world. This unchallenged position led to consistently increasing profits as world demand for products escalated and few alternatives to American sourcing were available. A false sense of invincibility among American industrial leaders set in which, in Deming's view, blinded them to the need to improve. As the industries of other nations came online and began offering alternative products with progressively improving quality at lower prices, the smugness of American industrial leaders represented a prescription for business failure. Deming's remedy

**Section 1. The 14 Management Points**

was the Quality model for commerce. Its requirement, he specified, was that management must study, internalize, and faithfully implement the 14 management points. Deming’s elaboration of Point 2 specifically emphasizes the need for management to rid itself of the mindset that accepts *waste*. That mindset is a product of limited thinking, habit, and a history of no apparent consequences to the presence of waste during the post World War II period when American industry was unchallenged by foreign competition. The presence of waste, even in times where limited competition exists, is not without real consequences even for businesses implementing the traditional, financially-focused, profit-driven approach to commerce. For them, waste adds cost to production and reduces profit. For Deming, waste has far more critical implications. It burdens customers with unnecessary cost and denies them the true utility that they seek and deserve. It frustrates workers because it undermines their striving to produce value and experience pride of workmanship. Its tolerance by management alienates workers from management, undermines engagement, and lulls a business into a complacency that sabotages its future success.

**Implications for the Quality Model for Commerce**

To realize the executive purpose of effectiveness, the organization requires executives who are aware of the new economic age of competition they have entered and are open to new knowledge (Exhibit 3). It needs people whose personal values align with the intents of the Quality model. Such executives must learn what waste is, how it expresses itself, and how to measure

<b>Exhibit 3. Point 2’s Implications for the Quality Model’s Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Effectiveness</b>	Uncover and eliminate waste wherever it exists in order for quality to be realized fully	Executives who are open to new knowledge and whose personal values align with the intents of the Quality model.  Executives who understand what waste is, how it expresses itself, and how to measure correctly its impact on business effectiveness

correctly its impact on business effectiveness. The presence of waste (e.g., search, rework, interruption, inspection) is a major source of common cause variation.<sup>13</sup> And, as Deming repeatedly points out, the elimination of common cause variation is the special responsibility of management since it alone exercises authority over the systems in which it is expressed. Thus, it is the responsibility of executives to uncover and eliminate waste wherever it exists in order for quality to be realized fully. This implication is supported by Deming’s often repeated declaration that it is management’s responsibility to improve the system.<sup>14</sup>

<sup>13</sup> Common cause variation is variability in the performance of a system that appears even when the system is implemented as specified. It can be removed only when the system’s design is modified.  
<sup>14</sup> Deming’s thinking on management’s special responsibility for improving systems is based on two presuppositions that were and still are commonly satisfied, but neither is necessarily true. One is that authority and responsibility is distributed hierarchically in a command and control fashion. The other is that the executive function is performed by a separate segment of employees termed executives, managers, and supervisors. If the business was structured using a vertically integrated teamed approach, system responsibility would be owned by the team responsible for the system. Team

## Section 1. The 14 Management Points

### Point 3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.

#### Deming's Thinking

Point 3 draws executive attention to what Deming saw as a major source of waste—inspection. Inspection consumes resources that add no value to an offering. Perhaps worse, they deflect attention from addressing the real issue—namely, why is inspection needed? As Deming saw it, if the system lacks capability—that is, it cannot reliably produce what you need when you need it—then *fix the system and end the waste of inspection*. Executives must understand this fundamental fact. Unless they are implementing an activity for which current knowledge is insufficient to create a capable system, they must always replace inspection of outputs with improvement of the production system's capability. Otherwise, the business carries the cost of inspection and the costs associated with outputs that fail inspection (e.g., the cost of rework and scrap associated with failed outputs). It also incurs the consequences of such outputs getting through to customers since no inspection process is likely to be perfect. Where inspection is unavoidable (as when the knowledge required for creating a capable system is lacking), then executives must ensure that inspection is done at the right point with minimum total cost (e.g., by ensuring a stable and capable inspection process and using sampling).

#### Implication's for the Quality Model for Commerce

Point 3's guidance clarifies another qualification managers in companies implementing the Quality model need (Exhibit 4, next page). Such executives must comprehend that inspection is waste and that the correct approach to ensuring quality is to build it into the design of every output and process implemented throughout the organization. In later chapters of *Out of Crisis*, Deming explains further how quality is built in. First, it is built in at the design stage by “translating future needs of the user into measurable characteristics” (Deming, 1982a, p. 169). “[It is a necessity] to study the needs of the consumer, and to provide service to product, was one of the main doctrines of quality taught to Japanese management in 1950 and onward” (Deming, 1982a, p. 175). To this end, a cross-functional team uses its understandign of cusotmer-valued feature sets to design products that satisfy the customer values they represent. These designs and their implementing processes are tested and proved in the laboratory and in trial production. Once implemented, the designed system's inherent ability to deliver quality is realized by eliminating special cause variation<sup>15</sup> and stabilizing every process. Finally it is advanced by continuously improving each product's utility as judged by its customer and by enhancing the capability of its production processes.

---

members would collectively implement the executive functions. There would be no separate management class. Nonetheless, Deming's point remains—*whoever has authority over the system has responsibility for improving it*.

<sup>15</sup> Special cause variation is variation in performance due to some event or action that represents a deviation from the correct implementation of a system. Its cause is detectable and correctable through the application of problem solving methods.

**Section 1. The 14 Management Points**

<b>Exhibit 4. Point 3's Implications for the Quality Model's Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Effectiveness</b>	<ol style="list-style-type: none"> <li>1. Build-in quality to every product and process implemented at its design stage.                             <ul style="list-style-type: none"> <li>▪ Continually improve understanding of customer needs and uses</li> <li>▪ Translate the customer's future needs into measurable characteristics</li> <li>▪ Use cross-functional teams to design products and the processes with the features sets that satisfy customers needs and activities.</li> <li>▪ Ensure that, if the state of knowledge dictates a need for inspection, it is done at the right point with minimum total cost (e.g., by ensuring a stable and capable inspection process and using sampling).</li> <li>▪ Prove designs in the laboratory and in trial production.</li> </ul> </li> <li>2. Ensure that the designed capability of each system is realized (i.e., make system stable).</li> <li>3. Enhance the capability of products and the processes continuously post implementation.</li> </ol>	Executives who understand that inspection is waste and that the correct approach to ensuring quality is to build it into every output and process implemented throughout the organization

**Point 4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.**

**Deming's Thinking**

Point 4 directs executives to expand their understanding of the cost of inputs from the simplistic notion of price to the fuller concept of life-cycle cost. It also directs them to change their thinking about supplier relationships from bargaining over price and specifications to teaming for quality. In explaining Point 4, Deming provides the deeper understanding behind this seemingly simplistic guidance. He states that in order for a business to ensure that it delivers quality to its customers, the entire “production line” must be viewed as a system with the single aim of satisfying “the needs of the consumer, present and future” (Deming, 1982a, p. 5). He depicts this system as a “flow diagram” (Deming, 1982a, p. 4) that begins on its left side with suppliers and ends on its right side with customers.<sup>16</sup> For the aim of quality to be realized, a company must engage every component of the system in serving the needs of its customers. Only the system operating as a whole can realize the aim of quality.

<sup>16</sup> In the Lean Enterprise model, this system is referred to as the “extended value stream.”

## Section 1. The 14 Management Points

Point 4, focuses on how a company builds the supply side of this system. Deming asserts that quality and service must drive vendor selection. He states that “total cost” should replace concern about initial cost and he implies that, when an input is functionally effective in contributing to quality, its “total cost,” but perhaps not its initial cost, will be minimized.<sup>17</sup> Following this rubric requires new learning by executives. This learning relates to:

1. how one should evaluate the inputs provided by a supplier,
2. how one should evaluate and choose a supplier, and
3. what type of relationship a business should establish with its suppliers.

### *Evaluating Inputs*

Regarding the evaluation of inputs, Deming states that executives must understand that inputs need to be assessed *functionally* in terms of how well they contribute to the production of a finished product and how well they function within the finished product to deliver customers the utility they seek (delivered quality). He declares that neither an input’s price status *nor* even its conformance to specifications guarantees that it will maximize quality as experienced by the customer. To make this judgment, a business needs to follow each input through the production process and into the customer’s setting, observe its utility in production and in the customer’s use of the offering to which it contributes, and use these observations to judge its true adequacy. Does the input provoke or encounter problems as it passes through the production process? Does it work effectively with the other components of the finished product to deliver the utility customers seek? The answers to these questions are critical to evaluating an input.

### *Choosing a Supplier*

Concerning choosing a supplier, Deming says that when one detects a supplier who delivers a quality input, one needs to conduct *additional assessments* before committing to using that supplier. His guidance for these additional assessments is twofold. First, the selecting company should establish the degree to which the supplier has adopted the Quality model and is practicing that model within its own business. Unless the supplier is also implementing the 14 management points, for example, a buyer can have no confidence that the quality of the inputs received will be consistent. Second, the buyer must evaluate the supplier’s engineering and production capabilities (Deming, 1982a, pages 39–41). This evaluation is needed since a buyer’s input needs will change over time as the buying company adjusts its outputs and processes to better serve its customers. Therefore one needs to have suppliers who can adjust their outputs to meet the new requirements of the firms they supply.

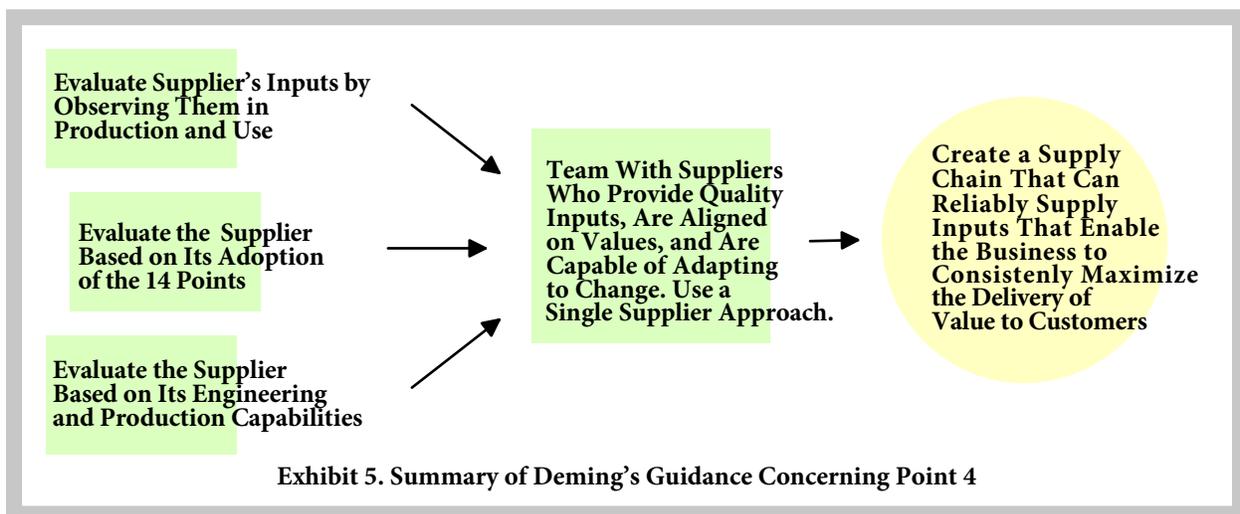
---

<sup>17</sup> Deming’s thinking that the greater the utility of an input in delivering quality, the lower its total cost is to the producer is predicated on the existence of a free marketplace. Where perfect competition exists, companies compete to deliver the best quality (as Deming defines ‘quality’) to customers at the lowest price. Choice and the intelligent decision making by consumers drive this direction. The seller cannot pass on to the buyer the cost of poor quality and remain competitive. But, where sellers have power over buyers, the seller may force the buyer to assume *all* the costs associated with poor quality. In this situation, the business’s initial cost for an input is its total cost since any cost associated with the failure of the input is passed to the customer and thereby externalized.

## Section 1. The 14 Management Points

### *Type of Relationship*

In speaking about the type of relationship a business should establish with its suppliers, Deming asserts that a business should form a single source, long-term relationship with each input supplier who passes its evaluation. Essentially, the business should welcome each such supplier as a team member in its effort to maximize the delivery of value to the business's customers. As team members, both the business and its suppliers will work together to improve each other's understanding of what is needed, enhance the supplier's processes that produce the needed input, and improve the buyer's processes that transform that input into the business's final offering. Exhibit 5, next page, summarizes Deming's thinking as presented in Point 4.



### **Implication's for the Quality Model for Commerce**

The expanded meaning of Deming's Point 4 is that the aim of commerce cannot be realized unless management, as part of its commercial strategy, establishes an effective extended value stream composed of member businesses that work together as a team to deliver quality to customers. The left side of this extended value stream is made up of the business's supply chain. Its members must be populated by businesses whose management has mastered the 14 points and who are conducting their businesses in a manner consistent with their dictates. Such businesses become partners in the pursuit of quality both today and into the future. Building an effective supply chain—and, by extension, an effective extended value stream—is a key activity within the Quality model's strategic component. Also by extension, criteria similar to those applied to evaluating prospective supply chain members should be applied to evaluating all other members. At a minimum, every member must possess executives who have mastered and implement the 14 management points.

## Section 1. The 14 Management Points

### Point 5. Improve constantly and forever the system of production and service.

There are six different textual versions of management Point 5. The version of Point 5 that appears above is taken from page 49 of *Out of Crisis* (Deming, 1982a). It is different from that used on page 23 (ibid). There, Point 5 reads: “Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease cost.” Two earlier versions are: “5. Find problems. It is management’s job to work continually on the system (design, incoming materials, composition of material, maintenance, improvement of machine, training, supervision, retraining)” (Deming, 1982, p. 17) and “Constantly and forever improve the system of production and service” (ibid, p. 30). A fifth version of Point 5 appears in a later Deming journal article on quality (Deming, 1988a). It reads, “5. Improve constantly and forever the system of production and service. It is management’s job to work continually on the system.” *All statements underscore that improvement must be continuous and never ending. Three explicitly state that it is management’s responsibility for improving the systems within which people work.* Four out of five versions omit the text “and thus constantly decrease cost.” Since Deming considered the relationship of quality and cost to be important and generally misunderstood, why did he omit it four times in these five versions? We suspect that the omission of the phrase may reflect Deming’s desire not to suggest that the Quality model’s aim is cost reduction. To do so might inadvertently reinforce what Deming concludes is the commonly held but factually incorrect notion that business success can be realized by focusing on cost reduction.

#### Deming’s Thinking

Point 5 declares the primary imperative of a commercial organization is to *deliver quality today and improved quality tomorrow continuously and forever*. This means that every business must engage in the “continual reduction of waste and continual improvement of quality in every activity [subprocess, work team, individual performer]” (Deming, 1982a, p. 49) within every one of its functions. Improving a system means reducing its loss function by elevating its capability to deliver value to customers. Improvement efforts must address the system’s activities and their sequencing; incoming materials; composition of materials; workplace layout and maintenance; improvement of machines and their maintenance; and the improvement of the training, supervision, and retraining of the people who implement it. The approach is to uncover ways to eliminate waste that expresses itself in common cause variation and to elevate affirmatively the typical value the system produces by modifying its design. Each new iteration of a business activity uses the learning developed from its last iteration to improve its delivery of quality. This cycle of learning and its use to improve performance occurs across the enterprise and its extended value stream.

Deming further states that “everyone in the company must attack the improvement of quality” and “It will not suffice to have brilliant successes here and there” and “In short, efforts toward the improvement of quality must be total” (Deming 1982, p. 103). Deming makes clear, however, that each person’s *opportunity* for making improvements is limited by his or

## Section 1. The 14 Management Points

her scope of authority. Since Deming was surrounded by enterprises that were hierarchically structured, he concluded that the “lion share of [responsibility for] improvement in any process or activity must come from action by management” since management controlled the systems within which people worked (Deming 1982, p. 31). But, understand clearly, Deming did *not* mean that the discovery and implementation of improvements to the system would only issue from management—just the *authority* required to invest effort in conceiving and implementing improvements. The making of quality improvements from Deming’s perspective was *everyone’s* job and the wealth of improvement ideas and expertise, in his experience, was located in the people implementing the system itself.

### Implication’s for the Quality Model for Commerce

Point 5 clarifies that a never ending process of learning permeates a business implementing the Quality model. It sums up the Quality approach to commerce’s competitive strategy as *quality today and improved quality tomorrow continuously and forever*. It identifies *striving for perfection* as the major activity that dominates the Quality approach to operations. At the strategic level, quality today and improved quality tomorrow continuously and forever ensures that the business remains competitive across time, adjusting as needed to environmental changes (e.g., new technologies, new political and economic contexts) and market conditions. And, at the operations level, it guides day-to-day activities toward realizing ever higher levels of quality by leveraging learning from researching customer values into better conceived products and services and better designed implementing processes. Learning from testing new products and processes ensures that they have the capability to deliver what customers seek. Once implemented, learning from problem solving aberrations in performance stabilize the work processes and outputs. Once stabilized the continuous elimination of waste and improvement in quality elevates the capabilities of every process (minimizing its loss function). Learning is also leveraged to build the capabilities of people, enhance features of current products, and innovate new products to better meet customer needs. In this manner, daily operations progressively bring about the Quality model’s long-term ends.

#### A Capsule View of How a Business Transforms Itself to the New Philosophy

In Deming’s relatively brief expansion of Point 5 in *Out of Crisis* (pp. 49–52), he literally identifies almost all the major activities a business must implement to transform itself to the “new philosophy.” Each receives little more than a sentence, but together the activities depict the flow of transformation a business must implement. Rather than address this transformation process within the context of discussing Point 5, we focus on it in *Section 3: The Path to Transformation* since its proper elaboration draws from all Deming’s work, not just his thinking about management Point 5.

### Point 6. Institute training on the job.

Alternative statements of Point 6 are “Institute a vigorous program of education and retraining” (Deming, 1988) and “Institute modern methods of training on the job” (Deming, 1982, pages 17 and 31). Only the last version of Point 6 with its qualifier “modern methods” suggests the real

## Section 1. The 14 Management Points

direction of Deming's thinking. The issue for Deming is not the mere presence of training, but the presence of *effective* training.

### Deming's Thinking

Deming asserts that the “greatest waste in America is failure to use the abilities of people” (Deming, 1982a, p. 53). He shares the contents of his interviews with workers from various industries across the decades of his training and consulting to support his judgment. In these interviews, front-line workers and mid-level managers repeatedly share their frustrations and disappointments with the barriers to success they encounter in the workplace. In each instance, they express a keen grasp of a problem that undermines effective or efficient performance. They appreciate its impact on the business and have well founded ideas for how to eliminate the barriers. Yet, their efforts to have the matters they identify resolved are rebuffed or, most frequently, simply ignored. Their words make clear the demoralizing effects of being trapped in systems they know are flawed but are powerless to correct. Deming offers the contents of these numerous interviews as evidence that people possess a pool of energy and intelligence they wish to contribute but are blocked from contributing by the actions of management and the systems they control (see especially Deming, 1982a, pages 79–81).<sup>18</sup>

### *Ineffective Training—A Key Source for Wasting People's Talents*

It is the absence of effective training that Deming identifies as the cause for the failure of businesses to benefit from this pool of untapped capability. He declares, that training “must be totally reconstructed” (Deming, 1982a, p. 52). That reconstruction must address:

- what is taught to managers and front-line workers,
- how teaching is done, and
- how the work setting must change to permit employees to transfer and capitalize on what they learn from training.

### *What Training Should Teach Managers*

Deming describes the expertise that training must deliver to management. Given his assumption of a hierarchical distribution of authority and responsibility—the key learning managers must acquire includes:

- knowledge of the company and its end-to-end approach for delivering value to its customers;

---

<sup>18</sup> Based on our analyses of each man's work, both Deming and Barnard are poorly understood by most professionals who describe their thinking. As stated earlier, Deming's contribution is often truncated to using statistics to control processes or products and to issuing 14 points to guide management. Sometimes the distortion is even worse. An example is the writing of Peter Drucker who reportedly referred to Deming as “totally obsolete” (Denning, 2013) yet revealed in his writing a complete lack of understanding of Deming's thinking. In his book, *Managing in the Next Society*, he characterizes Deming as viewing people as less important than systems. Lumping Deming with Taylor and Ford, he states that “what made the people productive was the system ...” “The system is productive because it enables individual workers to perform without much knowledge or skill. In fact, on the assembly line (but also in Deming's Total Quality Management) greater skill on the part of an individual worker is a threat to a coworker and to the entire system” (Drucker, 2002, pp. 124–25). In point of fact, the core of Deming's model is people's inherent striving to learn and achieve. It is their drive and intelligence that conceives improvement ideas, that creates capable systems, and that supersedes each system with a more capable one. And it is the waste of people's knowledge that he declares “the greatest waste in America.”

## Section 1. The 14 Management Points

- knowledge about variation including its inherent presence in all processes, its sources and detection, and its mathematical and graphical representation;
- skill in detecting the type of variation being observed (common versus special cause);
- understanding of the proper locus of responsibility for addressing common and special cause variation,
- skill in removing the causes of special cause variation;
- skill in enabling people to experience success and achievement (*pride of workmanship*) including how to detect and remove barriers to pride of workmanship;
- skill in eliminating common cause variation and raising the capabilities of systems; and
- the disposition to use their learned leadership skills.

Learning about the company is required to understand the organizational system within which all people operate and for which management is responsible. Deming judged that training must deliver this knowledge because most managers no longer rise from line worker roles in the business's various functions and therefore lack the base of experience from which they could build their knowledge of the business. Knowledge of variation—its detection, causes, consequences, and methods of removal—is critical since, without it, one cannot correctly understand the source of the variability he or she is observing and therefore cannot act to improve the performance it reflects.

For Deming, the latter function—improving performance—is the essence of leadership. It has two critical components. The first enables the success of people in their jobs. It then works with them to stabilize processes and, once stabilized, optimize each process's capabilities. Thus, leadership training must include education that prepares managers to understand people and teach people the skills they require to experience success and achievement (pride of workmanship). Managers also require the skills that enable them to detect and remove barriers to pride of workmanship and establish and maintain teamwork so that each person's success amplifies the success of his or her colleagues. In Deming's view, "*A leader, instead of a judge, will be a colleague, counseling and leading his people on a day-to-day basis, learning from them and with them*" [italics added] (Deming, 1982a, p. 117).

### *What Training Should Teach Front-Line Workers*

Front-line workers require training in the following areas. Each element of this training equips the worker to contribute as a *thinker*, not just a *doer*.

- The customer values their work must satisfy - Having this knowledge enables the worker to understand the relationship between his or her activities and the delivery of customer value. This understanding provides a background for making good decisions with respect to executing that work. It also equips the worker to generate and evaluate ideas for improving how the work being performed could deliver greater value.

## Section 1. The 14 Management Points

- The contents and expectations associated with their roles. These include what each job is responsible for producing (outputs and the standards each must satisfy), how it is to be done, with what tools and other resources, and how this work must be coordinated with others - This knowledge enables the worker to guide his or own performance toward the objectives set by the process the worker is contributing to. It enables workers to assume responsibility for controlling the quality of their own work<sup>19</sup> and guiding their progressive development of increasing expertise in doing that work. With greater ownership by the worker of his or her activities and results comes increased pride of workmanship. This pride enlivens engagement and the making of ever greater contributions to quality improvement.

Deming makes the point that teaching these contents requires that management establish consistent standards for performance for each role; otherwise, there will be no stable content for training to teach.

Deming's position on the need for everyone to participate in improving quality implies other training content in addition to that listed above. This content includes the knowledge and skills needed to participate in the measurement, representation, and analysis of performance data; the detection of problems and opportunities; the remediation of problems and exploit of opportunities; and the development, testing, and implementation of improvements that elevate system capabilities. Since this participation requires working in teams, one must infer that the skills required to work with others effectively are also essential content for training.

### *How Training Should Be Implemented*

Deming states that training must be delivered multi-modally—meaning that instruction should use audio, visual, and kinesthetic (doing) approaches. Deming observes that people differ in terms of which medium best communicates knowledge and skill to them and that effective training must incorporate all these media to ensure that it responds to people's different learning approaches.

### *How the Work Setting Must Change to Support Learning*

Deming clarifies that, for training to be effective, the work setting to which the trainee returns must be modified to permit the application of the trainee's new learning so that it can produce improved success through its use. Here, Deming refers to Point 12 of his management guidance. It specifies that barriers to "pride of workmanship" must be removed. One key meaning of this phrase is that the systems within which front-line workers perform must enable their success and not retard it. If, for example, a worker is trained to perform a job in one way but returns to a work setting that demands another approach, the person's training is

---

<sup>19</sup> This concept of self-managed quality aligns perfectly with the Toyota Motor Company's extended meaning of the lean concept of Jidoka. While Jidoka is usually interpreted as referring to autonomation, Toyota expands the meaning of this term to encompass every performer's personal responsibility to check each of their outputs for defects and to make no more if a defect is detected until the source of the defect is understood and eliminated.

**Section 1. The 14 Management Points**

wasted and the learner’s desire to elevate his or her performance is smashed. Or, if the customer values the worker is taught to satisfy as his or her priority concern are overridden by a local manager’s concern for speed or volume of output, the consequences for training and the worker are the same.

**Implication’s for the Quality Model for Commerce**

Making training effective enables both the executive purposes of effectiveness and sufficiency. Its immediate result is to enable the contribution of every person to the enterprise. Training people in job skills engages their focus on their work, equips them to contribute, and opens to them the opportunity for pride of workmanship. It allows them to experience the gratification of growth and achievement thereby intensifying their energy and investment in the enterprise. In these ways, training impacts the executive purpose of sufficiency. It also indirectly impacts the purpose of effectiveness in that engaged and enabled people perform their work successfully thereby accomplishing the goals of the organization. Absent training that is properly focused, effectively implemented, and supported in the workplace, people will not be prepared to perform their roles successfully. As a consequence, their morale is dashed, their energy diminished, and their ability to contribute compromised. Exhibit 6 summarizes these implications.

<b>Exhibit 6. Point 6’s Implications for the Quality Model’s Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Effectiveness and Sufficiency</b>	Make training on the job effective. <ul style="list-style-type: none"> <li>■ Train management and front-line workers in the knowledge and skills needed to succeed in their roles (see list on pages 25–27).</li> <li>■ Use all modalities in training to ensure that it responds to people’s different learning styles.</li> <li>■ Modify the work settings so that managers and front-line workers can successfully apply what they learn in training.</li> </ul>	None addressed

**Point 7. Institute leadership (see Point 12 and Ch. 8). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.**

A slightly different statement of this point is, “7. Adopt and institute leadership. The responsibility of supervision must be changed from sheer numbers to quality. Improvement of quality will automatically improve productivity” (Deming, 1988).

## Section 1. The 14 Management Points

### Deming's Thinking

Point 7 declares that the job of management is “leadership,” not supervision. Deming sees the supervision practiced during his time as oversight exercised by people who lack sufficient understanding of the work being done to enable anyone to perform it well. Although he does not make the comparison, his view of supervision is very much like his view of inspection. Both focus on detecting failure, not preventing it. Neither acts to enable better performance. Each uncovers undesired performance, assigns responsibility for it to a performer, and requires the performer to correct it *whether or not the source of failure is within the power of the performer to correct*. Indeed, supervision, as described by Deming, thwarts improvement by frequently tasking people with responsibility for correcting deficiencies whose causes they have no authority to affect. Such tasking dooms the person to failure and that demoralizes them and undermines their ability to contribute.

In contrast, Deming sees leadership as focusing on enabling success and thereby elevating people's energy and engagement. Indeed, Deming declares that the aim of leadership is “to improve the performance of every man and machine, to improve quality, to increase output, and simultaneously to bring pride of workmanship to people” (Deming, 1982a, p. 248). For Deming, leaders enable success by:

- knowing the work they supervise,
- setting the focus on continuous improvement,
- understanding the sources of improvement, and
- acting to enhance people's capabilities so that they can succeed.

He sees people as the most important sources of business improvement because no system improves without the action of the people who manage and implement it. When he states “bring pride of workmanship to people” he means enabling and supporting people's individual success. This requires leaders to master and apply the profound knowledge concerning the nature of people (see *The Nature of People and Its Significance*, beginning on page 75).

For Deming, pride of workmanship applies to all people—front-line workers *and* managers alike. Two different sets of leadership actions bring pride of workmanship. One set focuses on the person and the second on the system within which he or she works.

#### *Leaders Enable Personal Success*

The first set of leader actions build-in the likelihood of every individual's personal success by:

- selecting people based on their skills,
- “creating for everybody interest and challenge, and the joy of work” (Deming, 2000, page 125),
- training them in the performance of their jobs,

## Section 1. The 14 Management Points

- supporting them in stabilizing their individual performance at a level that matches the capabilities of the system within which they work, and
- sustaining their efforts to grow in capabilities by moving them to new jobs when their achievement in their current job asymptotes (Deming, 1982a, p. 249).
- encouraging people to study, advance their learning in new areas, and “continue their education in colleges and university for people who are so inclined” (Deming, 2000, page 126).

These actions ensure that people assume roles they can succeed at, are prepared with the knowledge and skills needed to succeed, are supported in effectively applying those skills on the job, and are provided the opportunity to advance their learning in new jobs when they have completed their learning in their current jobs.

### *Leaders Elevate System Capabilities*

The second set of actions addresses the systems within which people work. These actions remove the barriers to personal success that are not under the worker’s control. They include:

- detecting when system factors (process design, machine, tools, input materials, workplace layouts, etc.) are retarding worker success,
- uncovering what system changes will remove the barriers to success and improvement, and
- acting with workers to improve the system by eliminating waste and elevating its capabilities.

By taking these steps, leaders free the full expression of each individual’s talents in fully realizing the business’s goals. They also energize every contributor’s participation in continually raising the capabilities of each system thus improving the quality the business delivers to its customers. In Deming’s thinking, *there is an absolute convergence between enabling personal success and realizing business success*. He sees an inherent synergy between freeing people to contribute, learn, and advance themselves and improving the capability of systems to deliver quality to customers.

### **Implication’s for the Quality Model for Commerce**

Exhibit 7, summarizes Deming’s guidance for replacing supervision with leadership. This guidance relates to achieving the executive purpose of sufficiency by redefining management’s role from supervision to leadership. In his words, “A leader, instead of a judge, will be a colleague, counseling and leading his people on a day-to-day basis, learning from them and with them” (Deming, 1982a, p. 117). Point 7 details the activities management must execute to make this transition and thereby engage and enable the contribution of effort from every employee.

## Section 1. The 14 Management Points

<b>Exhibit 7. Point 7's Implications for the Quality Model's Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Sufficiency</b>	<ul style="list-style-type: none"> <li>■ Replace supervision with <i>leadership</i>. “A leader, instead of a judge, will be a colleague, counseling and leading his people on a day-to-day basis, learning from them and with them” (Deming, 1982a, p. 117)</li> <li>■ Build-in personal success for every individual by:               <ul style="list-style-type: none"> <li>▪ selecting people based on their skills,</li> <li>▪ “creating for everybody interest and challenge, and the joy of work” (Deming, 2000, page 125),</li> <li>▪ training them in the performance of their jobs,</li> <li>▪ supporting them in stabilizing their individual performance at a level that matches the capabilities of the system within which they work,</li> <li>▪ sustaining their efforts to grow in capabilities by moving them to new jobs when their achievement in their current job asymptotes (Deming, 1982a, page 249), and</li> <li>▪ encouraging people to study, advance their learning in new areas, and “continue their education in colleges and university for people who are so inclined” (Deming, 2000, page 126).</li> </ul> </li> <li>■ Build-in workplace success for every worker by:               <ul style="list-style-type: none"> <li>▪ detecting system-caused performance problems or limitations in results produced,</li> <li>▪ uncovering what system changes will remove the barriers to success and improvement, and</li> <li>▪ acting to improve the system by eliminating waste and elevating its capabilities.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Managers trained in the meaning of leadership <i>and</i> in the contents specified in Point 6:               <ul style="list-style-type: none"> <li>▪ knowledge of the company and its end-to-end approach to delivering value to its customers;</li> <li>▪ knowledge about variation including its inherent presence in all processes, its sources and detection, and its mathematical and graphical representation;</li> <li>▪ skill in detecting the type of variation observed;</li> <li>▪ understanding of the proper locus of responsibility for addressing common and special cause variation,</li> <li>▪ skill in how to detect and remove the causes of special cause variation;</li> <li>▪ skill in enabling people to experience success and achievement (<i>pride of workmanship</i>) including how to detect and remove barriers to pride of workmanship;</li> <li>▪ skill in eliminating common cause variation and raising the capabilities of systems; and</li> <li>▪ the disposition to use their learned leadership skills.</li> </ul> </li> </ul>

### Point 8. Drive out fear, so that everyone may work effectively for the company (see Ch. 3).

#### Deming's Thinking

While fear or anxiety may elevate some types of routinized performance, the empirical evidence supports the conclusion that it undermines more complex human performance like

## Section 1. The 14 Management Points

problem solving (Derakshan and Eysenck, 2009; Northern, 2010). Socially engendered fear also undermines working together with others as the fearful person will operate in a guarded manner looking to defend him- or herself from whatever social threat the person perceives. The workplace of a business implementing the Quality model is *never* routinized because it always engages people's minds in imagining ways to improve quality and in testing and implementing better ways to deliver greater quality to its customers. And the workplace of a business implementing the Quality model is absolutely dependent on the unfettered working together of all contributors. Without it, there is limited sharing of information and ideas. The continuous improvement of quality requires the full participation of all contributors in sharing freely their observations, interpretations, and recommendations about current operations and how they may be bettered. It also requires contributors to be open and receptive to new information and ideas. Whenever fear develops in contributors, whether intentionally or unintentionally, it typically results in a narrowing of perspectives and a resistance to change in an effort to reduce the complexities of the situation they face and the added danger those challenges may represent.

Indeed, for Deming, fear is the greatest obstacle to human and organizational development as it denies the expression of what he sees as people's natural desire to extend themselves in the pursuit of learning and growth. Unless fear is removed and people feel secure, Deming asserts, improvement in quality cannot be realized. For Deming, "secure" means "not afraid to express ideas, not afraid to ask questions" (Deming, 1982a, p. 59). It also means being receptive to new knowledge and willing to assume the risks associated with investing one's resources in developing it. When managers punish risk-taking, either intentionally or unintentionally, workers avoid initiating new ideas or trying new methods. Consequently, the business fails to benefit from their intelligence and talent. This loss constitutes a "waste of knowledge" and creates an insurmountable barrier to improving constantly and forever.<sup>20</sup>

### Implication's for the Quality Model for Commerce

The management guidance in Point 8 explains a requirement that must be satisfied for the purpose of *sufficiency* to be realized (Exhibit 8, next page). The elimination of fear is necessary to enable the full and free contribution of every contributor to the enterprise. Point 8 also implies that management itself requires confidence in its ability to learn, grow, and succeed in their roles. Otherwise, their fear of change will incline them to shrink from recognizing problems with current operations and resist new improvements that may require redefining systems, processes, or roles. To implement Point 8, managers must be proficient in getting and giving information and ideas in ways that keep people working together. Any failure to comprehend what others share or to interact constructively with others will neutralize

<sup>20</sup> Deming's causal logic is somewhat incomplete here. While executive actions and the reinforcement systems they create can punish initiative and thwart contribution from people who are *extrinsically* motivated—which includes most people—they do not operate in the same way with people who are *intrinsically* motivated—at least, not in adults. Rather than be subjugated to fear, such people are more likely to leave a manipulative setting to join or create one where they can pursue the values they personally hold. In either case, the outcome for the business is the same—loss of opportunities for quality improvement within the company where fear exists. Thus, Deming's basic point stands.

## Section 1. The 14 Management Points

any intent on their part to involve workers in improving the business. Following the same line of reasoning, managers also need proficiency in the skill of processing information correctly. This entails being able to analyze, organize, and use information to make evidence-based decisions. Finally, they need to be able recognize people’s feelings, understand their causes, and avoid actions that inadvertently provoke fear or otherwise thwart their contribution and success.

<b>Exhibit 8. Point 8’s Implications for the Quality Model’s Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Sufficiency</b>	Drive out fear so that everyone may work effectively for the company	Executives who: <ul style="list-style-type: none"> <li>■ recognize the corrosive effects of fear on continuous improvement;</li> <li>■ have confidence in their ability to learn, grow, and succeed in the face of any problems or challenges to status quo that new ideas present; and</li> <li>■ are skilled in:               <ul style="list-style-type: none"> <li>▪ getting and giving information and ideas,</li> <li>▪ evidenced-based decision making and problem solving, and</li> <li>▪ recognizing people’s feelings, understanding their causes, and avoiding actions that inadvertently provoke fear or otherwise thwart their contribution and success.</li> </ul> </li> </ul>

**Point 9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.**

### Deming’s Thinking

Point 9 directs executives to establish teaming across functions so that all relevant areas of expertise are applied to maximize quality as delivered to customers. The conception, design, production, and delivery of an output that provides utility to customers within their use settings present a multifaceted challenge. Not only must the right features be defined for the output but also they must be producible reliably in a manner that does not destroy their ultimate value. This means that potential problems related to the choice of the materials, the processes employed to transform them, and the preparedness of workers to implement these processes must be anticipated. Also, the interaction between elements of an output and the fit between what is produced and the customer’s setting and manner of use must be anticipated. Anticipating this variety of issues requires the integrated efforts of different areas of expertise. The aim of quality, therefore, can only be achieved if the contributors who work from their different disciplines *work together*. They must communicate with each other, share their

## Section 1. The 14 Management Points

different sets of information and knowledge, and shape their individual contributions so that they advance the goal of quality by enabling each other's efforts. Enterprise is a *teamed* effort in the Quality model. The sum of the independent contributions of workers, work units, or business functions (engineering, purchasing, marketing, etc.) will not be adequate to accomplish its end. Unless the people who implement the various functions that address the different facets of enterprise team together, their individual efforts will not succeed in enabling the business's success. Their independent contributions must be integrative. They must work

### Deming's Perspective on Teaming Across the Enterprise

Deming asks rhetorically, "Why waste knowledge?" He continues, "No company can afford to waste knowledge. Failure of management to breakdown barriers between activities . . . is one way to waste knowledge. People that are not working together are not contributing their best to the company. People as they work together, feeling secure [cites Point 8] in the job [,] reinforce their knowledge and efforts. Their combined output, when they are working together, is more than the sum of their separate abilities" (Deming, 1982, pp. 352–53).

Deming's guidance implies that he sees the organization as a open, dynamic system although he does not use those terms. Such a system accomplishes its purpose by the real-time interactions of the people that power it. Its success depends on fully recognizing all elements that constitute the system and enabling their interdependent performance in the service of their common goal. Deming's ideas about systems and the nature of the organization specifically in Chapters 3 and 4 of his work, *The New Economics* (Deming, 2000), are fully consistent with this interpretation.

synergistically with each other; otherwise, they undermine the success of the whole. While each function may produce the best apparent result from its perspective, it may in fact undermine the success of the whole. Delivering and improving quality requires that everyone understand the interdependence among their individual contributions. "People in research, design, sales and production must work as a team ... ." Teamwork means having a common aim, communicating with each other in the service of realizing that aim, accomplishing one's responsibilities in a manner that enables the success of other teammates, and working to stimulate and support each other's growth in capability.

### Implication's for the Quality Model for Commerce

Exhibit 9 summarizes Deming's guidance for creating the conditions for teamwork in the pursuit of quality. His guidance in Point 9 educates managers about the importance of synergy among contributors within the Quality model and what is required to achieve it. Synergy requires the removal of barriers to sharing information and ideas. It requires that all contributors align their efforts in the service of the common goal of quality and recognize that the common goal is only achievable when everyone works as a team. It is management's responsibility to understand and educate all contributors about this requirement.<sup>21</sup> It also requires that management break down barriers to full and free communication between people,

<sup>21</sup> Again, do not presume that Deming's ideas require that the executive functions be implemented by a separate set of employees designated as supervisors, managers, or executives. His thinking is fully applicable to any arrangement for implementing executive functions even one that fully distributes their implementation across all employees as is done in fully autonomous teams.

## Section 1. The 14 Management Points

work groups, and functions and create forums such as cross-functional teams that enable people to pool their different perspectives in the service of their common aim. It requires that managers succeed in driving out fear (Point 8), since fear fosters a focus on self and action to protect self. Still further, it means management must be able to detect and act to eliminate any system or feature of a system (e.g., appraisal, incentives, or rewards) that pits one person against another thereby undermining teamwork (Points 10 and Point 11).

<b>Exhibit 9. Point 9's Implications for the Quality Model's Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Synergy</b>	<ul style="list-style-type: none"> <li>■ Drive out fear so that everyone may work effectively for the company (Point 8).</li> <li>■ Remove barriers to collaboration between all activities within the business.</li> <li>■ Ensure that everyone understands that achieving the common goal requires teamwork across all contributors.</li> <li>■ Ensure that people have the knowledge and skills needed to work as a team with each other.</li> <li>■ Ensure that forums are established wherein people can relate with each other within and across functions to share information and ideas, solve problems, and otherwise stimulate and support each other in the pursuit of their common aim.</li> </ul>	Executives who: <ul style="list-style-type: none"> <li>■ are skilled in building, leading, and participating in teams,</li> <li>■ can detect internal systems or features of systems that undermine teamwork, and</li> <li>■ act to eliminate them.</li> </ul>

Not explicitly stated by Deming, but certainly implied by his edicts, management must ensure that all contributors, including themselves, possess the knowledge and skills needed to work as a team with each other and apply those capabilities at all times.

**Point 10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.**

Elsewhere, Deming provides a different wording for this point: “10. Eliminate numerical goals, posters and slogans for the workforce that ask for new levels of productivity without providing new methods” (Deming, 1988). The meaning appears to be unchanged—do not distract workers with empty statements and false objectives. Such statements and actions only reveal to workers management’s ignorance of what is really required for the business to succeed and sow contention and dissent.

## Section 1. The 14 Management Points

### Deming's Thinking

Deming is repeatedly outraged by management placing upon workers the burden that belongs to them. A specific example is calling upon front-line workers to fix problems of production that are expressions of common cause variation (i.e., natural expression of the system *as defined by management*) and not special cause (local deviations in process or operator specific errors). Only management can fix system-caused problems since management reserves to itself control over the factors that constitute the system. Even when slogans and campaigns for better performance are targeted at lower-level managers who, presumably, have control over the systems immediately below them, there is no effort to provide the recipients the training and tools they need to improve the system. Thus, these exhortations and demands seed frustration and discontent as, in Deming's eyes, they place the recipient in a "no win" situation.

In expanding on Point 10, Deming assigns special contempt for the indecency of using emotional techniques to evoke either shame or pridefulness to drive performance. He states that these efforts undermine human striving and teamwork. In *Out of Crisis*, he offers a number of quotations from workers that explain why. He summarizes his contempt for these motivational initiatives in this comment,

"Do it right the first time.' A lofty ring it has. But how could a man make it right the first time when the incoming material is off-gauge, off-color, or otherwise defective, or his machine is not in good order, or the measurement instrument is not trustworthy? This is just another meaningless slogan, a cousin of zero defects" (Deming, 1982a, p. 66).

Deming sees these exhortation as "cruel jokes" whose only result is "fear and mistrust of management." He especially ridicules the use of goals and targets (see Point 11, below) with front-line workers that demand improved results when it is clear that a process is *stable*—meaning, it is delivering what it is capable of delivering—and therefore its improvement requires management authority to alter its design. Front-line workers do not possess this authority in command and control type, hierarchical organizations.

Deming also decries management's woeful understanding of what constitutes effective communications. He states that managers imagine that their slogans and excited urgings are "persuasive" and "give people something to work toward." Deming clarifies that effective communication is not judged by one's intent or personal satisfaction with its content and form, but by its effect. What does the recipient do with it? "How does the instruction work in practice?", he asks (Deming, 1982a, p. 70).

### Implication's for the Quality Model for Commerce

Point 10's guidance relates to eliminating actions that undermine the achievement of both *sufficiency* and *synergy*. The former ensures the flow of contributions of cooperative efforts by performers. The latter ensures that all contributors work together so that the cumulative

## Section 1. The 14 Management Points

effect of their individual efforts is greater than their sum. Demoralization of personnel detracts from effort and mistrust creates barriers between people that compromise synergy. Issuing slogan, exhortations, and targets that cannot be acted upon do both. Deming’s guidance implies, but does not state, that executives in companies seeking to implement the Quality model must be able to:

- target their communications to people who are capable of acting on them,

**How Deming Judges the Effectiveness of Communication**

For Deming, a communication’s effectiveness is not judged by what the author intended or the mere fact that it occurred but by the effect it produces. Communication is judged effective only when its recipient receives and is able to act on its content correctly. This means that the communication must be constructed in a manner that allows its recipient to verify its meaning and, if it directs an action, provides the resources required to take that action (e.g., authority or access to required resources). Communication must be instructive and must empower the person so that he or she can action on that instruction. In *Chapter 9* of his work, *Out of Crisis* (Deming, 1982a), Deming asserts that the only way to grasp what an idea means is to see or imagine it in action. In other words, the idea must be expressed in observable and measurable terms. Only then can a recipient use its content to guide his or her action. Equally important, only then can one detect whether the action taken by the person receiving the communication is consistent with its intended meaning. It is the “record of what happens on application” that confirms or disconfirms the effectiveness of communication (Deming, 1982a, page 176).

- generate useful communications—i.e., ones in which ideas are expressed in operational terms and include all the content needed for the recipient to act on them,<sup>22</sup> and
- assess whether a communication has been successful.

Exhibit 10, summarizes Deming’s guidance with regard to Point 10.

<b>Exhibit 10. Point 10’s Implications for the Quality Model’s Approach to Executive Functions</b>		
Result Affected	Required Activities	Required Resources
<b>Sufficiency and Synergy</b>	<ul style="list-style-type: none"> <li>▪ Establish effective communication across the enterprise.</li> <li>▪ Eliminate communications that exhort or demand behavior the recipient of the communication is not capable of performing.</li> <li>▪ Evaluate a communication by its effects, not its intent.</li> </ul>	Executives who: <ul style="list-style-type: none"> <li>▪ target their communications to people who are capable of acting on them,</li> <li>▪ can form a useful communication, and</li> <li>▪ can assess whether a communication has been successful.</li> </ul>

### Point 11 Eliminate work standards that prescribe numerical quotas.

In *Out of Crisis*, Deming lists just subpoints Point 11a and 11b of management Point 11. However, elsewhere he does precede these subpoints with the statement recorded above (“Eliminate work standards that prescribe numerical quotas” (Deming , 1982, page 40)). We include the

<sup>22</sup> Deming expands on the meaning and importance of operational definitions in Chapter 9 of his work, *Out of Crisis* (Deming, 1982a).

## Section 1. The 14 Management Points

statement here since it frames the contents of these subpoints. As you read Deming’s explanation of Point 11, you will hear echoes of the thinking he expressed in Points 6, 7, 8, and 10.

### Deming’s Thinking

*11a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.*

Deming states that a “quota is a fortress against improvement of quality and productivity” (Deming, 1982a, p. 71). Quotas or their surrogates (work standards,<sup>23</sup> rates, targets, etc.) have these defects.

- They make a demand but provide no means that enable a person to do a better job.
- They create a fixed end point for achievement rather than reinforce the notion of continuous improvement.
- The data they generate (below, at, or above expectation) provides no useful information from which knowledge can be developed and improved methods devised.
- They undermine pride of workmanship as hitting a target becomes what counts, not the substance of what one does or the manner in which one does it.<sup>24</sup>
- Depending on how they are defined, they may also result in unwanted behaviors—e.g., increased poor quality or outright deception. They may also establish aims that are contrary to the business’s purposes. For example, giving sales people a work standard that demands they process 25 customer calls per hour, be courteous, and not rush customers. Deming notes that the first element of the standard is tracked as it is easily measured. The latter elements are typically not because they are hard to measure. To these facts Deming asks rhetorically, “Which guides performance?”

#### How a Critical to Quality (CTQ) Metric and a Work Standard Differ

Why is it useful to have CTQ metrics but not work standards? Is not a CTQ metric a type of target since it specifies the state a feature of a process or product should exhibit? Yes and No. For Deming, work standards are arbitrarily defined and absent of any guidance as to how one might satisfy their demands. A CTQ metric operationalizes a customer value. It is not arbitrarily specified by management. It makes what a customer seeks observable and measurable. It supplies workers the information about customers seeks and whether they whether they have produced a customer-satisfying outcome. For example, a customer desires “softness” in a seat cushion. By working with customers, one uncovers that a seat cushion that displaces 1" per X pounds of weight applied satisfies that customer value. That CTQ educates the worker to what a customer desires. Using this CTQ metric a worker can evaluate whether a seat cushion he or she produced satisfied the softness requirement of customers. While CTQs are not arbitrary and do equip the worker with actionable information, they do not themselves contain the guidance one might use to produce the result they describe. In that sense they do share something in common with traditional work standards or goals.

<sup>23</sup> Deming’s use of the term “work standards” does not refer to work standards in the form of written guidance for how a process is to be performed. His use of the term refers to *criteria for judging a worker’s performance absent such guidance*. If guidance were present, a work standard would enable success and not be just a demand for some result.

<sup>24</sup> Walton reports that piecework was especially contemptible to Deming as he personally witnessed its affects on people during his work in factories. She reports him stating that, “Piecework is man’s lowest degradation” (Walton, 1986, p. 6).

## Section 1. The 14 Management Points

*11b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.*

Point 11b applies the same reasoning expressed by Deming in Point 11a to managers. Can this be correct? After all, managers do have authority over the systems that govern worker performance and they are “managers.” That role presumably means that they know how to solve problems and improve systems by analyzing information. To appreciate Deming’s meaning here, one needs to understand the state of management in commercial organizations as he perceived it. Managers did not understand variation and its causes and therefore could not detect what action was required to improve performance. Was the performance they sought to improve a limit of the capability of the system in place? Was it actually a reflection of an operating aberration and therefore not reflective of the system’s designed capability? Managers also lacked—and research suggests still *do* lack (Mintzberg, 1992; Pfeffer and Sutton, 2006)—the knowledge and skills needed to make evidenced-based decisions and systematically analyze information to solve problems. Given this perspective, and its empirical support, the same reasoning and negative consequences shared in Point 11a with regard to front-line workers apply to managers. They too need “leadership,” as defined by Deming, in order to succeed.<sup>25</sup>

With managers, however, Deming identifies an added negative consequence to just assigning them goals. It is that this act by their superiors teaches them that merely setting a goal accomplishes one’s managerial responsibility. It does not model leadership. Hence, the business ends up with lower tiers of managers not capable of demonstrating leadership and thereby incapable of advancing the success of the enterprise. As well, since they are mimicking the behavior of their superiors, they are secure and satisfied in their own performance. And, since the lower tiers are the models for entry level managers, a self-perpetuating system of executive ineptness is erected.

*Is Deming’s Thinking About Goals and Targets Supported by Research?*

There does seem to be an error in Deming’s argument that numerical targets and goals mean nothing unless a method for accomplishing them is also provided—at least if we take his words *literally*. There is research to support that just having an explicit goal improves performance as measured by the degree to which the goal is achieved (Locke and Latham, 2002). Add feedback and a person’s performance further improves. One explanation proposed by researchers is that goals focus attention and focused attention organizes human performance. Focused, organized performance has a better chance of accomplishing an end than unfocused performance. Actually, this outcome would be expected given Deming’s sense that people have an intrinsic drive to learn and improve. Intrinsic motivation implies self-initiated processing to devise better ways to reach a goal once the goal is known.

---

<sup>25</sup> Of course, Deming’s observations, especially given their empirical support (Mintzberg, 1992; Pfeffer and Sutton, 2006), do provoke an interesting question, “If management is inept, who then provides the leadership people implementing an enterprise need?” If you answer, “an outside consultant,” then who will be competent enough within the business to detect this need and select a proper consultant?

**Section 1. The 14 Management Points**

Of course, if *the goal is wrongly specified* (reduce cost 10% but the critical need is to improve quality) or *requires capabilities the person is denied* (like authority to make system changes when system changes are needed), then setting a goal, *without providing “leadership,”* has the effects Deming describes. It drives behavior toward unhelpful ends. It produces resentment, undermines morale, alienates workers, and may even result in acts of deception that create apparent gains where none really occur. Indeed, Deming was not against *goals* per se. He wrote, “An individual will of course have his goals. A man may set his heart on a college education. He may resolve to study harder to pass a course or an examination. I resolve to finish this chapter before morning: I give myself a deadline. Goals are necessary for you and for me, but numerical goals set for other people, without provision of a road map to reach them, have effects opposite to effects sought. They generate frustration and resentment.” As Deming further states, the message such goals carry “is that management is dumping their problems on the work force.” He adds, sardonically, “Why advertise the helplessness of management?” (Deming, 1982, pp. 38–40).

**Implication’s for the Quality Model for Commerce**

Point 11 primarily relates to accomplishing the executive purpose of *effectiveness* (Exhibit 11). While it contains many ideas similar to those in Point 10, which relates to *sufficiency*, Deming’s emphasis here is that goal setting, on its own, is an ineffective approach to improving business performance. Clearly, the negative consequences of simply setting goals extend

<b>Exhibit 11. Point 11’s Implications for the Quality Model’s Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Effectiveness</b>	To realize success, executives must: <ul style="list-style-type: none"> <li>■ set the focus on continuous improvement and not on reaching numerical targets,</li> <li>■ correctly diagnose what source of variance is restraining current performance,</li> <li>■ devise plans that will produce improved performance, and</li> <li>■ enable people’s efforts to make improvements.</li> </ul>	Managers trained in the meaning of leadership and in the skills specified in Point 6 (see Exhibit 7, pages 30–31 for details).

the beyond failure to improve the business’s success to the erosion of the social fabric needed for an enterprise to succeed. And, this secondary consequence does echo the concerns Deming addressees in Point 10. Nonetheless, Deming’s emphasis with regard to Point 10 seems to be much more on the psychological impact of these false management practices as opposed to its ineffectiveness in advancing the business toward commercial success. In Point 11, the emphasis is reversed. Point 11 also reinforces the importance of Point 7, which tells us to replace traditional supervision with leadership. Leadership, for Deming, guides a business to success by providing not only clarity about direction but *the means by which it can be realized*.

## Section 1. The 14 Management Points

### Point 12. Remove barriers that rob people of pride of workmanship.

As stated before, pride of workmanship results from being able to produce quality results and grow in one's capabilities. While "quality" may be viewed from many perspectives (Deming, 1982a, Chapter 6 and 7), the singularly most important perspective is that of the customer. Thus, a quality result means "A product or service [that] ... helps somebody and enjoys a good and sustainable market" (Deming, 2000, p. 2), one that satisfies customer needs and wishes and "will provide better living for him in the future" (Deming, 1982a, p. 175). The pride of workmanship that flows from producing results that deliver measurable value for their users fuels one's continued striving for excellence by bolstering one's sense of self-efficacy (Bandura, 1994, 1997). It also establishes skills and proficiencies in the performer that make him or her capable of new levels of achievement. One's sense of growing in capability fuels further the individual's striving for even greater proficiency and achievement. Denying people the opportunity to experience pride of workmanship, therefore, undermines learning and achievement by demoralizing contributors. Simply put, *it kills the spirit within*. As Deming states, "Barriers and handicaps rob the hourly worker of his birthright, the right to be proud of his work, the right to do a good job" (Deming, 1982a, p. 77). Deming further asserts that these "barriers must be removed from two groups of people. One group is management" and the "other group is hourly workers" (ibid).

#### Deming's Thinking

*12a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.*

Deming uses the contents of numerous conversations with front-line workers to clarify what barriers rob people of their pride of workmanship. These conversations poignantly reveal the inner desire of people to produce something of value and the pain and frustration they experience by being denied the opportunity to do so. The barriers reported in these conversations include:

- not being informed as to what is acceptable workmanship and not responded to when that information is requested,
- being provided inconsistent definitions of acceptable workmanship or being subject to the inconsistent application of the same definition by different inspectors,
- being treated as a commodity by management—something to be acquired when needed, used, and then discarded,<sup>26</sup>
- being provided no guidance about one's job or being given guidance so complex it confuses workers rather than clarifies what they are expected to do, and
- being pressed with demands to keep producing outputs even when workers report problems with input materials or machines that cause the outputs produced to be defective.

---

<sup>26</sup> Deming reports the condition of some 40 workers at one company as "... management may hire them at the price posted, or may not, depending on need. If not needed next week, they go back on the market" (Deming, 1982a, p. 77).

## Section 1. The 14 Management Points

To this last example, Deming asks rhetorically, “How can [the worker experience pride], when the machine is out of order, and no one responds to his pleas to have it adjusted?” (Deming, 1982a, p. 78).

Management’s initiation and subsequent renegeing on programs intended to better involve workers, empower their participation, and provide them an opportunity to improve performance is a still worse source of demoralization. Deming asserts that participation in such initiatives disintegrates as workers find “themselves unwilling parties to a cruel hoax, unable to accomplish anything, for the simple reason that no one in management will take action on suggestions for improvement” (Deming, 1982a, p. 85). He characterizes these false initiatives as “smoke screens” and labels them “devastatingly cruel devices.”

*12b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, inter alia, abolishment of the annual or merit rating and of management by objective.*

Deming sees the annual performance rating, merit pay, pay-for-performance, and management by objectives as corrupting management since they introduce factors that undermine people’s natural striving for success, erode teamwork, and misdirect human effort. His guidance is simple—abolish them! As Deming sees it, all they do is create “management by fear” and reinforce behaviors that are “devastating” (Deming, 1982a, p. 102). Using the observations of an unnamed source, he sums up the effects of these systems as nourishing short-term performance, annihilating long-term planning, building fear, demolishing teamwork, and nourishing rivalry and politics. He lists many reasons for these judgments. They include that such systems:

- focus on end results and not on “leadership to help people,”
- engender fear that focuses managers on ensuring their own survival thereby undermining teamwork,
- reinforce “doing well in the system” and not *improving* the system,
- fail to understand the role of common variance in affecting the results achieved by a person operating within a system,<sup>27</sup>
- fail to account for the positive or negative affects on a manager’s performance that contextual variables have (e.g., the people that work with the manager—supervisees, colleagues, supervisors; the geographical region in which the manager works; the infrastructure that supports the manager’s performance), and
- foster adjustments in personal performance that amount to tampering since they are based on feedback that may not reflect upon anything the recipient is doing since it does not account for the effects of common variance.

<sup>27</sup> Deming points out that assigning credit to an individual for an observed performance only makes sense when that performance falls outside the limits of achievement attributable to the system the performer was implementing *and* was not due to some contextual variables that affected the performance. Essentially, for crediting purposes, a person’s performance must distinguish itself as an instance of special cause variation assignable to the personal action of the worker. Only then does the observed result merit crediting (Deming, 1982a, pp. 109–15).

## Section 1. The 14 Management Points

Deming does offer his remedy for these ills. He advises that the annual performance review be replaced by providing all managers with “education in leadership” (Deming, 1982a, p. 116). By this he means implement Points 6 and 7 as described above (pages 24–31).

He also advises the following additional steps.

- More carefully select people in the first place - Build in success for the person and the business by ensuring that people hired have the capabilities needed to succeed in the job for which they are hired.
- Better train and educate workers after selection - Implement Point 6 so that workers can acquire the workplace-specific knowledge and skills they need to succeed.
- Determine pay for people within the system based on the performance of the system - Tie worker performance to level of performance exhibited by the work team and adjust it for the capabilities of the system within which they are working.
- Provide performance-assisting interviews —“three or four hours at least once a year” — not to criticize but to provide help to each individual in his or her efforts to improve personal performance. In other words, implement Point 7.
- Use data to understand and improve systems and managers’ performance and not to rate or rank managers. Again, implement Point 7.

### *Is Deming’s Thinking Off-the-Mark?*

On the face of it, Deming’s condemnation of management by objectives, merit pay, and other performer-focused evaluation systems seems off-the-mark. Yet, as we will see below, he makes very pointed and fact-based criticisms of their typical construction and use. There is research to support many of his claims. For example, research into pay for performance systems in education, as commonly designed, has repeatedly revealed teachers and administrators “gaming” the system to obtain the rewards and not improving their performance (Pfeffer and Sutton, 2006, pp. 23–24; more recently see Guillum and Bellow, 2011; Vogell, Judd, and Torres, 2011). Yet, such systems when stripped to their essentials are *feedback systems* and Deming does endorse providing feedback to performers. As well, research into intrinsically motivated performers—the exact type of performer Deming deems essential to a quality-focused enterprise—reveals that they thrive on *factual feedback* about their performance in relation to whatever they are striving to achieve (Deci, Koestner, and Ryan, 1999). Can it be that such a feedback system is inherently corrupting as Deming suggests? Adding weight to this query is the observation that every negative Deming raises about these systems seems to target an element of their design, a feature that is modifiable as opposed to some quality that is inherent and unalterable. For example, he decries that the systems target short-term results and ignore measuring and crediting the development of people and system capabilities. But that is correctable. He also decries their poor construction with regard to defining levels of

## Section 1. The 14 Management Points

achievement to credit. They fail to appreciate the difference between common and special variation and thereby reward or punish people for outcomes that are simply predictable based on the capabilities of the systems they implement. He indicts them as well for not providing the recipients of the evaluation assistance in improving their performance or for undermining teamwork by pitting one worker against another by focusing on individual performance or by using the method of forced ranking (upper 10% versus lower 10%). Once again, these practices are correctable. Indeed, as a consultant, I have participated in building systems that target performance features that address both outcomes achieved in terms of final results and the method by which the results were produced. These systems used indicators that registered the growth in capability and achievement of the people supervised and the capabilities of the systems for which the managers were responsible. These atypical performance management systems also used multiple points of measurement so that both slope and direction of improvement were addressed. They corrected for the contribution to personal performance made by contextual variables—e.g., the economy, the learning capabilities of the people being supervised, the performance capabilities of the systems implemented. These approaches included the participation of the manager in their definition, tracking, and final assessment. And, at every step, they provided assistance to the manager in improving his or her performance by helping the manager root cause obstacles to better performance, extract learning, and apply that learning to advancing future success.

What would Deming say of a system with the characteristics just defined? I am not sure. On the one hand, I imagine he would say that the system I just described was a *leadership enabling system*, not a merit pay or pay-for-performance system and therefore it fit his model. On the other hand, I imagine that, before he would judge what I described as acceptable to his model, he would ask me, “Are its ratings used to issue external rewards that are intended to motivate achievement?” And if I said, “Yes,” I imagine that he would respond, “Then it is still corrupting because it externalizes the motivation for achievement thereby undermining people’s intrinsic striving to learn and excel” (Deming’s concept of “gold star” schedule; Deming, 2000, especially Chapter 6).

*“Our prevailing system of management has destroyed our people. People are born with intrinsic motivation, self-respect, dignity, curiosity to learn, joy in learning. The forces of destruction begin with toddlers—a prize for the best halloween costume, grades in school, gold stars—and on up through the university. On the job, people, teams, and divisions are ranked, rewarded for the top, punished for the bottom. Management by Objectives, quotas, incentive pay, business plans, put together separately, division by division, cause further loss, unknown and unknowable.” (Deming, 2006).<sup>28</sup>*

### Implication’s for the Quality Model for Commerce

Deming’s guidance for Point 12 is summarized in Exhibit 12, next page. It primarily relates to

<sup>28</sup> Deming thoughts are echoed in the short story, *Gold Star Schedule* written by R.R. Carkhuff (Carkhuff, 1976). To be fair, Deming does allow that monetary reward for performance outside the system may be possible without adverse effects *if it is joined with some more satisfactory recognition* (Deming, 1982a, p. 117). On the other hand, the overwhelming preponderance of his writing is consistent with the perspective described in the quote reported above.

## Section 1. The 14 Management Points

accomplishing the executive purpose of *sufficiency*. Pride of workmanship is essential to sustaining people’s contribution of cooperative efforts. The consequences of its absence include absenteeism, turnover, poor quality, and low productivity. “He that feels important to a job will make every effort to be on that job. He will feel important to the job if he can take pride in his work and may have a part in improvement of the system” (Deming, 1982a, p. 83).

### Point 13. Institute a vigorous program of education and self improvement.

Point 13 directs a business to go beyond job training for one’s current position (Point 6) to support the personal development of every worker. Programs of this nature support people in acquiring knowledge and skills that enhance their abilities to think, relate, and perform more

<b>Exhibit 12. Point 12’s Implications for the Quality Model’s Approach to Executive Functions</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Sufficiency</b>	<ul style="list-style-type: none"> <li>■ Abolish performance management systems that create barriers to pride of workmanship, undermine a focus on continuous improvement, compromise people’s intrinsic striving to learn and grow in capability and achievement, distract management from their role as leaders, impede teamwork, or otherwise compromise the aims and method of the Quality model.</li> <li>■ Ensure that managers act as leaders not judges and work as colleagues with the people they supervise, counseling them on a day-to-day basis, enabling their success, and learning from them and with them.</li> <li>■ Implement:               <ul style="list-style-type: none"> <li>▪ more careful selection of people in the first place,</li> <li>▪ better training and education after selection,</li> <li>▪ determine pay for people within a system based on the performance of the system (perhaps similar in concept to gainsharing),</li> <li>▪ provide performance assisting interviews —“three or four hours at least once a year”—not to criticize but to provide help to each worker in his or her efforts to improve personal performance, and</li> <li>▪ use data to understand and improve systems and the manager’s performance and not to rate or rank people.</li> </ul> </li> </ul>	<p>Executives who possess and apply the knowledge and skills of leadership as defined in <b>Required Resources</b>, Exhibit 7, pages 30–31 with the following additions.</p> <ul style="list-style-type: none"> <li>■ Knowledge of:               <ul style="list-style-type: none"> <li>▪ the importance of setting the focus on continuous improvement,</li> <li>▪ people’s intrinsic desire to achieve valued outcomes and grow in capability, and</li> <li>▪ the significance of their intrinsic striving for achieving quality.</li> </ul> </li> <li>■ Skill in detecting systems or actions that deny people pride of workmanship and undermine their intrinsic striving to learn and grow in capability.</li> </ul>

## Section 1. The 14 Management Points

effectively. These capabilities enrich their contribution to the business by preparing them to undertake new, more challenging roles and to generate ever better ideas for how the business can improve. These programs nourish people's inherent striving to learn and grow and energize further their engagement in and contributions to the business.

### Deming's Thinking

Deming asserts that, "What an organization needs is not just good people; it needs people that are improving with education" (Deming, 1982a, p. 86). The foundation of his thinking is that "advances in competitive position will have their roots in knowledge" (ibid). But Deming's promotion of self-improvement is not solely related to producing sustained organizational success. It is essential for personal fulfillment—sustained pride of workmanship. He states, "People require in their careers, more than money, ever-broadening opportunities to add something to society, materially and otherwise" (ibid). In essence his formulation is this: Education and self-improvement enhance one's knowledge and with enhanced knowledge, a person elevates his or her capability to contribute to improving a business committed to the Quality model. In such a setting, the individual's enhancement in capability satisfies his or her personal striving for growth and desire for ever greater opportunity "to add something to society, materially and otherwise." The natural expression of the individual's personal values and increased competence supports the business's improvement. This yields for the person increased pride of workmanship and increased opportunities to contribute as a result of the business's growth. *A virtuous cycle of personal growth, increasing contribution, commercial success, and expanded opportunities to grow further and increase one's achievements is established. Once again we see Deming's conclusion that there is an absolute convergence between enabling personal success and realizing business success.*

The correctness of this formulation rests, in part, on people being intrinsically motivated to be effective and to produce measurable benefits for others as well as themselves. It also requires that the business is implementing all the remaining management points. Specifically, the organization must remove the barriers to the expression of each person's intrinsic striving to learn and excel and support the person's efforts to succeed and contribute. Whether Deming's assumption about people's intrinsic striving for mastery and contribution is true is an empirical question. Clearly, there is research to support the existence of such people and that these people do possess the qualities Deming describes (Deci, Koestner, and Ryan, 1999; Gagné and Deci, 2005; Gibbs, 1980; Wilson, G. 2006). His assertion that people require "more than money" in their careers and that new learning, achievement, and advancement energize performance and motivate greater contribution is well supported by multicultural research (Herzberg, 1987). As well, his thinking about people's intrinsic striving to learn and grow in capability is supported by esteemed personality theorists such as Abraham Maslow, Gordon Allport, and Carl Rogers, among others. And, as previously cited, the effects of success in learning and achievement on subsequent striving and achievement is supported by at least

## Section 1. The 14 Management Points

four decades of empirical research on the construct of self-efficacy and its impact on performance (Bandura, 1994, 1997). Irrespective of its empirical credentials, however, and whether or not Deming’s thinking about the internal makeup of people is *universally* true, it is clear that such people are required to implement the Quality model.

### Implication’s for the Quality Model for Commerce

Point 13 guides managers to promote, facilitate, and otherwise support people’s striving to improve themselves (Exhibit 13). In Deming’s words, a manager in a Quality organization models continuous learning and,

“... encourages his people to study. He provides, when possible and feasible, seminars and courses for advancement of learning. He encourages continued education in college or university for people that are so inclined” (Deming, 2000, page 126).

Such a manager understands that the opportunity for self-improvement and deepening one’s knowledge is essential to nourishing people’s inherent striving to learn, grow, and achieve. It is also essential to attracting and retaining the type of person needed to implement the Quality model. Thus, no organization seeking to implement the Quality model will attract and retain the people it needs unless it implements a vigorous program of education and self-improvement.

<b>Exhibit 13. Point 13’s Implications for the Quality Model’s Approach to Executive Functions</b>		
Result Affected	Required Activities	Required Resources
<b>Sufficiency</b>	Promote, facilitate, and otherwise support people’s striving to improve themselves as the opportunity for self-improvement and the deepening of one’s knowledge is essential to: <ul style="list-style-type: none"> <li>■ attracting and retaining the type of person needed to implement the Quality model and</li> <li>■ improving quality constantly and forever.</li> </ul>	Executives who possess and apply the knowledge and skills of leadership as defined in <b>Required Resources</b> , Exhibit 7, pages 30–31, and expanded in Exhibit 12, page 45.

The guidance provided in Point 13 is essential to realizing executive purpose of sufficiency. With sufficiency realized, the business has the people it needs to succeed in commerce. Thus, advancing the purpose of sufficiency also advances the purpose of effectiveness. Having people who are continuously elevated in their competence and achievement enables the business’s continuous quality improvement and drives sustained business success.

### **Point 14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody’s job.**

The version of Point 14 reproduced above is taken from *Out of Crisis* (Deming, 1982a, p. 24). It is more expansive than Deming’s three other statements of Point 14. They read, “14. Create a

## Section 1. The 14 Management Points

structure in top management that will push every day on the above thirteen points” (Deming 1982, 1988) and “14. Take action to accomplish the transformation” (Deming, 1982a, p. 86).

Point 14, as presented in *Out of Crisis*, is actually composed of a set of statements that comment on the transformation of management and of a business to the “new philosophy” that Deming prescribes. Deming numbers the list of advice indicating that there is an intended sequence to their use, but the items themselves do not represent an action plan *per se*. Some items are comments about what will happen, a few are direct statements of actions one must take, and others are facts one should be aware of. I transformed this list of seven statements into a set of actions, while keeping the essential content each communicates. My purpose is to make the guidance they contain more coherent and useful to someone seeking to understand Deming’s view of the path of transformation from the prevalent approach to business to the Quality approach.<sup>29</sup> The seven statements follow in their modified form.

### Deming’s Prescription for Transforming to the New Philosophy

1. Educate management about the 14 points and the deadly diseases and barriers to implementing the Quality model explained in Chapter 3 of *Out of Crisis* (Deming, 1982a).
2. Internalize the new philosophy. Management must make it their own. They must act consistently with its dictates and takes pride in doing so. They “will have the courage to break with tradition, even to the point of exile from their peers” (Deming, 1982a, p. 86).
3. Educate a “critical mass of people” about the new direction, why it is necessary, and how broadly it will impact the business (“[it] will involve everybody”). “Enough people in the company must understand the 14 points, the deadly diseases, and the obstacles of Chapter 3”; otherwise, management is helpless to effect the transformation. Thus, apart from ownership and its representatives, a sufficient number of nonmanagement employees must internalize the new philosophy and make it their own for the transformation to succeed.

Deming then includes the following statement: “This whole movement may be instituted and carried out by middle management, speaking with one voice” (Deming, 1982a, p. 87). On the face of it, this statement appears patently incorrect based on Deming’s teachings elsewhere. Given that the scope of transformation encompasses all of what constitutes the organization, Deming repeatedly states that change begins with ownership and its top representatives (board of directors, president or CEO; Point 1). Middle management does not have the authority to impact everywhere and everyone. Also, as he states repeatedly, the highest levels of leadership *must visibly lead and be involved in the transformation*. For example, in *Out of Crisis*, he chides the president of a company for imagining that he could delegate responsibility for the transformation. He remarks, “The president’s supposition that he can resign from his obligation to lead improvement of quality is a glaring

---

<sup>29</sup> Section 3 The Path of Transformation will address the process of adopting the Quality model in greater detail.

## Section 1. The 14 Management Points

fallacy” (Deming, 1982a, p. 127). In *The New Economics* Deming states, “Accountability for quality rests with top management” ... “It cannot be delegated” (Deming, 2000, p. 35). Finally, it is contrary to Deming’s learning from his work during World War II and his considered approach to transforming Japanese industry to the Quality model by focusing on the highest level executives in Japanese companies. Perhaps Deming’s statement about middle management means that he believes that they may be able to manage the detailed work that effects the changeover. No other interpretation appears valid.

4. Map the production value stream.<sup>30</sup> While Deming *does not* use this precise language, his next step in the transformation may reasonably be described using this phrase that is employed in the Lean Enterprise model, a progeny of the Quality approach to commerce. Deming states that “every activity, every job is part of a process” and that mapping these processes represents the enterprise’s “theory” about how it generates the product or service delivered to the ultimate customer. He explains a process as a sequence of stages through which work passes. In each stage, inputs change state and are passed to the next stage. All stages must operate together as a whole. “Each stage works with the next stage and with the preceding stage toward optimum accommodation, all stages working together toward quality that the ultimate customer will boast about” (Deming, 1982a, p. 87). Note that he accepts the notion of “internal customer”—the recipients of the output from a prior stage. Thus, each downstream function in a business is the ‘internal customer’ of the upstream function that provides it its inputs. Deming differentiates the *real* customer as the “ultimate customer” and identifies him or her as “the most important part of the production line” (ibid, p. 5). It is the ultimate customer who determines the effectiveness of the final offering a business produces.

Each value stream, for Deming, has two parallel threads of activity. One, accomplishes the technical work of transforming inputs into outputs. The other is continuous improvement. These parallel threads of activity occur within and across the components of the value stream. Both require collaboration among people within and across stages *and* across interconnected value streams. When people implement the continuous improvement thread of their responsibilities, they apply the Shewhart cycle as their means for uncovering and testing improvements, making changes, and extracting learning (Exhibit 14, next page). The learning they generate becomes the knowledge they apply to improve the

---

<sup>30</sup> Please note that the terms “value stream” and “extended value stream” have different meanings. A value stream is the end to end process that generates a specified output from a given set of inputs. The process maps the flow of work under the direct control of the business. Each value stream is the center of a larger system, the extended value stream. The representation of an extended value stream incorporates the role of entities outside the business itself (suppliers, regulators, the community, customers, etc.) whose cooperation is essential to commercial success. It is represented in Deming’s discussion of the organization as a system (Chapter 3, *The New Economics for Industry, Government, Education*) and in his famous wall chart of “production viewed as a system” (Deming, 1982a, p. 4). While we use the lean terms to refer to these distinct constructs, their meaning corresponds exactly to Deming’s thinking.

Section 1. The 14 Management Points

**Exhibit 14. Deming’s Different Representations of the Shewhart Cycle**

Deming consistently represents the four-stage Shewhart cycle as plan, do, study, and act and sees it as a systematic process for uncovering “learning, and for improvement of a product or process” (Deming, 2000, p. 131).<sup>1</sup> In his earlier works, he refers to it as the “Shewhart Cycle.” Later, he labels it the “PDSA Cycle.” He states that he began teaching the process in 1950 during his lectures in Japan. Deming’s presentation of the cycle varies across his books. However, in the main, his view of the cycle seems akin to a process for conducting an experiment or a pilot to test a proposed improvement idea. In *this* use, PDSA appears to belong in the *Action* phase of problem-solving’s three generic stages (Explore, Understand, and Act)<sup>2</sup>. In the *Action* phase, a chosen change is planned, executed, evaluated and either accepted, modified and implemented, or rejected. Stage 1, the *Explore* stage of problem solving, identifies the performance to be improved (activity or result, key feature). It describes through observation, measurement, and discussion what is happening, where, when, with whom or what, and with what effects. Stage 2, the *Understanding* phase, sets a goal for improvement, uncovers the reasons for the current state, generates ideas for how to improve that state and achieve the goal, and selects the best alternative to implement.

In PDSA Description 1, below, Step 1 Plan begins with an improvement idea in hand and builds a plan for investigating it (Deming 2000; pp. 132–33). This is the point of departure for the *Action* stage of problem solving. In PDSA Description 2, Deming does expand the content of Step 1 Plan somewhat (Deming, 1982a; pp. 88–89), but still leaves it lacking most of the activities that occur in the *Explore* and *Understand* stages of problem solving. For example, he seems to suggest setting a goal as part of Step 1 Plan (“What could be the most important accomplishment of this team?”) and possibly doing additional data gathering. Yet, here too, the early activities of describing the observed performance and identifying a component and feature to improve are not detailed. Thus, even PDSA Description 2 seems to best describe a method for evaluating a proposed change and thereby fits within the *Action* phase of problem solving.<sup>5</sup>

PDSA Description 1 <sup>3</sup>	PDSA Description 2 <sup>4</sup>
<b>Step 1 Plan</b> - “Someone has an idea for the improvement of product or process.” A plan for testing the idea is generated.	<b>Step 1 Plan</b> - “What could be the most important accomplishment of this team? What changes might be desirable?”
<b>Step 2 Do</b> - “Carry out the change or the test (preferably on a small scale).”	<b>Step 2 Do</b> - “Carry out the change or test decided upon, preferably on a small scale.”
<b>Step 3 Study</b> - “Study the results. What did we learn? What went wrong?”	<b>Step 3 Study</b> - “Observe the effects of the change or test”
<b>Step 4 Act</b> - “Adopt the change, or abandon it, or run through the cycle again.”	<b>Step 4 Act</b> - “Study the results. What did we learn? What can we predict?”

<sup>1</sup> Shewhart’s original formulation of the process referenced by “PDSA” used three stages—specification, production, and inspection. “The three stages represent a dynamic scientific process of acquiring knowledge” (Shewhart, 1939, p. 45). He likens specification to a scientific hypothesis, production to an experiment, and inspection to testing the hypothesis and seeing if it has merit (ibid, p. 149).

<sup>2</sup> Carkhuff, R.R. (1973). *The art of problem solving*. Amherst, MA: Human Resource Development Press.

<sup>3</sup> Deming, W.E. (2000). *The new economics: For industry, government, education* (2nd edition). Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study, 131–33.

<sup>4</sup> Deming, W.E. (1982). *Out of crisis*. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study, 88–89.

<sup>5</sup> While both Shewhart and Deming viewed PDSA as an hypothesis testing method that measures the effects of an action and extracts learning (knowledge), others have elaborated PDSA’s steps into a full blown problem solving process. The healthcare industry especially seems to have taken this direction. Some, like the Institute for Healthcare Improvement retain its original use (see <http://www.ihl.org/IHI/Topics/Improvement/ImprovementMethods/HowToImprove/testingchanges.htm>), but most expand its planning step to include more elements of the Explore and Understand stages of a full problem solving process. See, for example, <http://nnphi.org/CMSuploads/Story%20Board%20-%20CMDHD-81079.pdf> and [http://www.phf.org/resourcestools/Documents/ABCs\\_of\\_PDCA.pdf](http://www.phf.org/resourcestools/Documents/ABCs_of_PDCA.pdf). Also, Liker and Convis detail how Toyota maps its entire A3 problem solving format to PDSA (Liker and Convis, 2011).

## Section 1. The 14 Management Points

system's real-time performance and the business's planning for future performance. Once done, the process of uncovering and implementing improvements is continuously recycled. Thus the continuous improvement thread operates within, between, and across all the stages of each value stream and across all value streams "constantly and forever."

Deming states that, initially, the focus of improvement efforts may be on the operations within a single stage, but issues are always resolved with attention to and participation of the people who implement activities with which the target operation interfaces. Later, the focus may be on the interaction between stages. Deming's statements about focus do not appear to be a prescription so one should be careful not to interpret them as declaring that one begins with making improvements within a stage and then expands to make improvements across stages. A more logical approach is to improve the structure of the value stream as a whole and then focus within each stage, as restructuring the value stream may well eliminate a stage or redefine what occurs within it.

5. Construct an organization to guide the "continual improvement of quality, as recommended in Chapter 16" (Deming, 1982a, p. 88). Deming repeats this edict in statement 7 below. Here, once stated, he shifts his focus to the topic of using the Shewhart cycle as a guide for making improvements. He states that the Shewhart cycle is useful for "improvement at any stage [within a process]" and for "finding a special cause detected by statistical signal." He depicts the cycle (see Exhibit 14, Description 2, prior page), repeats what he stated in statement 4 (above), and adds that before a decision on using a suggested improvement is made, multiple tests of the idea under different conditions may be implemented. He also clarifies that testing may be done on paper using mathematics or through use of a simulation. It need not require actual, live implementation of the idea.
6. Involve everyone in improving every process and product. Deming's actual words are, "Everyone can take part in a team" (Deming, 1982a, p. 89). While his wording seems more an observation than a prescription, its rephrasing as a step is absolutely consistent with the totality of his teachings and with the remaining text of Point 14. To this author, his statement means that improvement teams should be open in membership to include front-line workers from within the stage being improved and from other stages who either affect or are affected by its performance. Participation should also extend to staff persons. Cross-functional membership seems preferred as Deming made clear in Point 12. The relationship of these local improvement teams to the quality organization referred to in statements 5 and 7 is clarified in Chapter 16 of *Out of Crisis* and discussed below.

"Embark on construction of organization for quality as described by Fig. 61 on page 467, and accompanying text" (Deming, 1982a, p. 90). This guidance repeats what he directed in statement 5 (above). In both instances, he refers the reader to Chapter 16 of *Out of*

## Section 1. The 14 Management Points

*Crisis* for additional guidance. In statement 5, his advice shifts to describing the Shewhart cycle and how it can be used to guide improvement efforts. In statement 7, after directing once again that the organization be established, his advice shifts to describing how teams—presumably the teams cited in statement 6—should organize themselves with regard to defining their focus and preparing themselves to proceed in accomplishing it. He states that each team should have a defined aim or goal and clarity with regard to its scope of activity and authority to make decisions. “By working in this way, everyone will see what he can do and what only top management can do” (Deming, 1982a, p. 90). He then includes a list of clarifying questions that each team should answer. These questions ask what organization the team serves, where the team fits within it, the team’s immediate and ultimate customer, and the parties who supply it resources. The text then moves on, somewhat inscrutably, to address typical problems related to input materials although the teams to which earlier statements refer are not limited to addressing input issues. Hence the connection of the ending and earlier content remains unclear to this analyst.

### A Summary of Deming’s View of the Functions of the Executive as Described in His 14 Management Points

Executive functions maintain the organization as a whole and forward moving enterprise as it pursues its long-term aim. To this end, they must accomplish three purposes: effectiveness, sufficiency, and synergy. *Effectiveness* means that the enterprise is demonstrably advancing toward fulfilling the aim it has defined. *Sufficiency* refers to the presence, engagement, and sustained contribution of cooperative efforts from all the people needed to accomplish the business’s aim. *Synergy* refers to the state in which the individual efforts of contributors interact to yield outcomes greater than the sum of their separate achievements. *An organization’s integrity is maintained when it has the people it needs to accomplish its purpose engaged fully and working together in a manner that is advancing its success.* Absent any of these elements, an organization dissipates.

Deming provides detailed guidance for the Quality model’s approach to implementing executive functions. Until Deming, Barnard (1968) stood alone as offering the most comprehensive perspective on how executive functions should be implemented. Barnard’s perspective fits the traditional approach to commerce used by almost all businesses. Deming witnessed in practice that traditional approach and decried for its impact on people, other than owners, and for its inability to succeed in a world where competition in quality and price were expanding (see Deming, 1982a, pp. 101 and 130).

#### Effectiveness

Deming’s guidance for accomplishing the purpose of effectiveness places full responsibility on those who control the definition of the systems that guide the organization’s operation and

## Section 1. The 14 Management Points

direction. He declares that these individuals—the organization’s owners and their agents (executives, managers, and supervisors)—must adopt the new philosophy, the Quality approach to commerce. That philosophy sets the aim of the organization as maximizing value as experienced by its customers and uses continuous improvement, driven by learning, as its means for success. It commits itself to accomplishing its aim in a manner that benefits all its stakeholders inclusively. It assigns responsibility for the transformation of the business to the Quality model at the top, with ownership and its chief executive officer. It may not be delegated. To succeed, however, that responsibility must be undertaken by all parties implementing executive functions. Their first step is to master the 14 management points. To do this they must also study and integrate into their thinking and performance that set of knowledge Deming designates as “profound” including the theory of organization, the concept of variation and its significance, the theory of knowledge, and the nature of people (psychology). This mastery is not simply the on-boarding of concepts. It requires them to internalize the new philosophy, make it their own, act consistently with its dictates, and take pride in it. Once grasped, they must act to transform the systems and setting that make up the organization so that it supports the Quality approach to commerce. This means:

- acting from a base of knowledge,
- using evidenced-based decision making and problem solving,
- eliminating waste wherever it exists in order for quality to be realized fully,
- building in quality to every product and process implemented at its design stage,
- ensuring that the designed capability of each system is realized (i.e., make system stable), and
- enhancing continuously the capability of products and the processes to deliver quality to customers post implementation.

Deming further details what is required to implement his guidance. In essence, one needs people in executive roles who are:

- open to new knowledge and whose personal values align with the intents of the Quality model;
- understand what waste is, how it expresses itself, and how to measure correctly its impact on business effectiveness;
- recognize that inspection is waste and that the correct approach to ensuring quality is to build it into every output and process implemented throughout the organization; and

## Section 1. The 14 Management Points

- trained in the meaning of leadership, in the knowledge and skills specified in Point 6 (pages 24–28) and extended in Point 7 (pages 28–31), and be disposed to use their learned leadership skills.

Exhibit A1, in Appendix A beginning on page 103, integrates in one place Deming’s guidance for how to realize the executive purpose of effectiveness.

### Sufficiency

Deming’s guidance for realizing sufficiency begins with owners and executives establishing their constancy of purpose in pursuing the new philosophy. The credibility of their pursuit is essential to eliciting from all stakeholders their contributions to realizing the aims of the Quality model. Absent constancy of purpose, the announced new aim of the organization will be understood as another passing fad. Credibility of intent is established by acting on it. It begins with resolving that no employee will lose his or her job as a result of the employee’s contributions to improving quality and productivity. It proceeds by replacing supervision with leadership. As defined by Deming leadership focuses on enabling people’s success. As an expression of leadership, executives will:

- drive out fear so that everyone may work effectively for the company,
- eradicate all other barriers to quality improvement, and
- model learning unceasingly,
- “create for everybody interest and challenge, and the joy of work” (Deming, 2000, page 125),
- build-in personal success for every individual by:
  - selecting people based on their skills,
  - making training on the job effective,
  - supporting each person in stabilizing his or her individual performance at a level that matches the capabilities of the system within which they work, and
  - sustaining each person’s efforts to grow in capability by moving people to new jobs when their achievement in their current jobs asymptotes (Deming, 1982a, p. 249).
- encourage people to study, advance their learning in new areas, and “continue their education in colleges and university for people who are so inclined” (Deming, 2000, page 126).

Further, leadership will build-in workplace success for every worker by:

- detecting system-caused performance problems or limitations in results produced,

## Section 1. The 14 Management Points

- uncovering what system changes will remove the barriers to success and improvement, and
- acting to improve each system by eliminating waste and elevating its capabilities.

Exhibit A2, in Appendix A beginning on page 105, integrates in one place Deming's guidance for how to realize the executive purpose of sufficiency.

### Synergy

Deming's guidance for realizing synergy begins with removing barriers to collaboration between people across all activities within the business. This requires ensuring that everyone understands that achieving the organization's common goal requires teamwork across all contributors. It demands that people have the knowledge and skills needed to work as a team with each other and, if lacking, that these capabilities be developed in them. It also requires that executives must create forums wherein people can relate with each other within and across functions to share information and ideas, solve problems, and otherwise stimulate and support each other in the pursuit of their common aim. In support of effective teaming, executives must eliminate divisions between people and ensure that effective communication across the enterprise is established. They must detect and root out systems or actions that engender fear, pit one person against another, or hinder effective communications.

Exhibit A3, in Appendix A beginning on page 108, integrates in one place Deming's guidance for how to realize the executive purpose of sufficiency.

**Section 1. The 14 Management Points**

## Section 2. The Organization for Improvement of Quality and Productivity

### Introduction

Establishing a Quality organization as a separate function within a business is a critical component in Deming's guidance to any business seeking to transform to and sustains itself in implementing the Quality approach to commerce. As you will see, the organization Deming envisioned has *no similarity* to the typical "quality organization" as implemented in most businesses. Using the contents of Chapter 16 of *Out of Crisis* (Deming, 1982a, pp. 465–74), this section will describe Deming's thinking about the Quality organization. Afterwards, we will take up the issue of whether Deming's judgment about the necessity for such an organization remains valid. Exhibit 15, beginning on the next page, presents a profile of the Quality organization.

### Purpose

The purpose of the organization for quality is to provide leadership in all statistical matters in the service of continuously improving quality businesswide. On the one hand, it ensures the proper application of statistical theory and methods to detecting opportunities for improvement and evaluating improvement ideas and, on the other, it acts as a clearinghouse that gathers, integrates, and disseminates the knowledge generated by improvement efforts.

### Organization

Deming saw this quality organization as a permanent component of the business, not as a transitional component that embeds quality improvement knowledge and capability into the normal activities of every member of the business and then passes out of existence. He specifies that the head of this organization should be a highly qualified professional statistician with at least a master's degree in statistical theory, experience in industry or government, authorship of papers on the theory and practice of statistical methodology, and demonstrated ability to teach and lead top management. This person also must be someone dedicated to continuously improving his or her own education.

The head of the Quality organization is supported by statisticians who are located at every workplace within each business function. While Deming states that these distributed statisticians ideally would possess the same qualifications as the head of the Quality Organization, he allows that this is unrealistic. In fact, he states that these front-line support statisticians might be qualified by self-study. Indeed, he reports that, in Japan during the 1950s, hourly workers were taught to understand, construct, and use control charts and that engineers were educated in advanced statistical theory (Deming, 1982a, p. 489). Thus these supporting statisticians could be developed from front-line workers and engineers trained in statistical theory and the tools of statistical quality control.

The selection and supervision of the supporting statisticians is a joint responsibility of the head of Quality and the head of the function within which each works. The head of Quality has absolute authority over selection and development with respect to their statistical expertise. The local

## Section 2. The Organization for Improvement of Quality and Productivity

### Exhibit 15. Deming's Quality Organization<sup>1</sup>

#### Purpose

To provide leadership in all statistical matters in the service of continuously improving quality businesswide

#### Responsibilities

1. Ensure the proper application of statistical knowledge and methods to accomplishing quality improvement.

This responsibility includes the following tasks: (a) establish a network of statistical advisors and locate them in every workplace within each business function to support employees in uncovering missed opportunities for improvement and wrong practices and in evaluating the effectiveness of quality improvement ideas; (b) provide statistical leadership to this network of advisors by education, training, coaching, and feedback; and (c) evaluate each network member's performance in all matters statistical.

2. Manage the knowledge derived from the quality improvement efforts of employees.

This responsibility includes the tasks of gathering, organizing, storing, and disseminating throughout the company knowledge derived from the quality improvement efforts implemented across the company.

3. Leverage the knowledge derived from the quality improvement efforts of employees.

This responsibility includes the following tasks: (a) develop and disseminate tools and guides that assist people in implementing the knowledge derived from the quality improvement efforts implemented across the company and (b) provide guidance to the organization concerning the use of this knowledge and the continuing development of its people and processes in the application of statistical expertise to quality improvement activities.

4. Work with universities to provide education in statistical theory and methods, and to provide examples of applications.

#### Reporting Relationships

- Head of the Quality Organization reports directly to President or CEO of company
- Dotted line relationship from each of the President's staff to the Head of the Quality Organization
- Dotted line relationship from every major department head or function chief in the company to the Head of the Quality Organization
- Dotted line relationship from the head of every subordinate organization within each function to the Head of the Quality Organization through the head of each function

#### Authorities

- Decide all matters related to statistics
- Participate in any activities he/she chooses
- Sit in on any and all meetings of the President or CEO or his or her staff
- Question any activity and expect a responsible answer to any question raised
- Self-task his or her activities
- Decide the correctness of any application of statistics within the company
- Evaluate and provide feedback to anyone fulfilling a role incorporating advising on statistical applications or performing statistical work
- Select anyone fulfilling a role incorporating advising on statistical applications or performing statistical work with regard to their appropriateness for that work in conjunction with the head of the function within which the person shall work

*Continued...*

## Section 2. The Organization for Improvement of Quality and Productivity

### Exhibit 15. Deming's Quality Organization<sup>1</sup> (continued)

#### Qualifications for Head of Organization

- A master's degree in statistical theory or its equivalent
- Work experience in applying statistical theory in industry or government
- Authorship of papers on the theory and practice of statistical methodology
- Demonstrated ability to teach or lead top management toward constant improvement of quality and productivity

<sup>1</sup> Derived from Chapter 16, Organization for Improvement, in Deming, W.E. (1982a). *Out of crisis*. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study.

manager, however, must also find the person acceptable to him or her. The local manager oversees the person's role in generating procedures and analyses in support of business management but the head of the Quality organization (also referred to as the head of statistical methodology) oversees the person's statistical work and is the sole judge of the fitness of that work.

Together, the head of Quality and his or her team of local 'statisticians' support the activities of the quality improvement teams populating each work unit within the business. This support includes assisting the teams in using statistical methods to:

- uncover, diagnose, and improve processes and products and to capitalize on missed opportunities for improvement and
- correct wrong practices in the improvement of quality.

The head of the quality organization leads this network of statisticians providing education, training, coaching, and feedback and by evaluating each network member's performance of statistical activities.

### Responsibilities

The organization accomplishes its purpose by fulfilling four major responsibilities.

1. Ensure the proper application of statistical knowledge and methods to accomplishing quality improvement.

This responsibility includes the following tasks: (a) establish a network of statistical advisors and locate them in every workplace within each business function to support employees in uncovering missed opportunities for improvement and wrong practices and in evaluating the effectiveness of quality improvement ideas; (b) provide statistical leadership to this network by education, training, coaching, and feedback; and (c) evaluate each network member's performance in all matters statistical.

2. Manage the knowledge derived from the quality improvement efforts of employees.

This responsibility includes the tasks of gathering, organizing, storing, and disseminating

## Section 2. The Organization for Improvement of Quality and Productivity

throughout the company knowledge derived from the quality improvement efforts implemented across the company.

3. Leverage the knowledge derived from the quality improvement efforts of employees. This responsibility includes the following tasks: (a) develop and disseminate tools and guides that assist people in implementing the knowledge derived from the quality improvement efforts implemented elsewhere in the company and (b) provide guidance to the organization in the use of this new knowledge and the continuing development of its people and processes in the application of statistical expertise to quality improvement activities.
4. Work with universities to provide education in statistical theory and methods, and to provide examples of applications (Deming, 1982a, p. 468).

### Reporting Relationships

The head of the quality organization reports directly to the President or Chief Executive Officer. He or she also has descending “dotted line” relationships to the President’s staff, every major department head or function chief in company, and, through the head of each function, to the head of every subordinate organization within each function. These dotted line relationships reflect the authority of the head of the Quality organization as regards the application of statistical expertise and the need for collaboration between the quality organization and every level of leadership within the business. Concerning technical areas, the function leader has superior expertise and authority. He or she advises and must sign-off on actions by the Quality organization that affect technical performance. Concerning the use of statistical knowledge, the relationship is reversed. In all areas, however, it is expected that the head of the Quality organization will operate in a collegial manner with all other business leaders.

### Authority

Deming states that, as the head of the Quality organization, the organization’s leader “will have authority from top management to be a participant in any activity that in his judgment is worth his pursuit” (Deming, 1982a, p. 466). In addition, this person, by virtue of his or her role, has the following specific authorities.

- Decide all matters related to statistics
- Participate in any activities he/she chooses
- Sit in on any and all meetings of the President and the President’s staff
- Question any activity and expect a responsible answer to any question raised
- Self-task his or her activities

## Section 2. The Organization for Improvement of Quality and Productivity

- Decide the correctness of any application of statistics within the company
- Evaluate and provide feedback to anyone fulfilling a role incorporating advising on statistical applications or performing statistical work
- Select anyone fulfilling a role incorporating advising on statistical applications or performing statistical work with regard to their appropriateness for that work in conjunction with the head of the function within which the person shall work

### Is the Quality Organization as a Specific Organizational Unit Relevant Today?

Clearly, Deming was convinced about the importance of statistical expertise for detecting and solving quality problems. He was equally convinced that one needs advanced education in statistical theory to lead an organization in applying statistics to business improvement. Thus, he saw every business adopting the Quality model as *requiring* a distinct functional organization made up of people schooled in statistics and headed by a chief statistician. These local statisticians plan and execute the *enumerative* work of statistics that supports the people implementing the various technical work of the business in managing their system (e.g., production, purchasing, human capital management, information technology). Enumerative work includes such activities as operationalizing measures, designing measurement methods, establishing control charts, and detecting a possible change in a process' behavior. Reciprocally, the local statisticians require the support of the technical performers to do this enumerative work as only the people with technical expertise can educate them about what characteristics of a process or product are important to measure. The statistician's outputs—for example, a run chart or a control chart—are used by these technical performers in their analysis of the state of their processes and in the performance of their quality improvement efforts. Additionally, it is the workers within each function that solve quality problems. It is they who generate and implement quality improvements in teams using problem solving and experimentation. These people possess the technical expertise specific to the functions within which they work (the teams in statement 6, page 51–52). Only that expertise provides the substantive knowledge needed to solve problems and make improvements. Hence, they correct systems that are going awry and they generate, prove, and implement quality improvements. In the *analytical* work of understanding system dynamics and testing improvement ideas, the statistician *supports* each team's efforts. They educate and advise each team, *as needed*, on the relevance and proper use of statistical methods to accomplishing its work. Thus, quality improvement for Deming is a bottom-up activity implemented by the people with technical expertise in each business function with the support of people with statistical expertise when needed.

## Section 2. The Organization for Improvement of Quality and Productivity

### Deming's Quality Organization and Six Sigma's Belt System

Some people can almost (stress *almost*) see the roots for SixSigma's™ black belt thinking when they read about Deming's concept of the Quality organization. Especially his statement, "It is obviously essential to have on the line, where the action is ... people with knowledge of statistical theory, to find the sources of improvement, and wrong practices that other people can miss" (Deming, 1982a, p. 469). And further, "What should be the qualifications of these people? Preferably, the same as for the leader [of the Quality organization], but in practice something less" (ibid). After reading his statements, one's mind might run to the thought, "Maybe not 'black belts' but 'green' or 'yellow' belts?" [My comment, *not* Deming's.] In fact, however, Deming would absolutely deplore the "belt system" implemented in SixSigma™ as he did the entire notion of Six Sigma Quality.<sup>1</sup> As reported earlier, Deming specifically identified that "taking quality control away from everybody else" was a major failure of people trained in statistical quality control during World War II. In practice, the appropriation of improvement efforts to an elite group of specially trained individuals reinstates a Taylorist approach to implementing improvement (e.g., projects selected from above, led by the 'belted one,' assisted—when needed—by front-line workers under the 'belted one's' direction). For Deming, this elitist orientation robs every other employee of pride of workmanship in the pursuit of quality improvement, fails to fully engage the knowledge and capabilities of all contributors, and denies them the opportunity to grow in contribution through ownership of improvement efforts (Burns, 2008, 2008a). In essence, the elitist approach of Six Sigma™ creates waste and undermines the quality improvement effort.<sup>2</sup>

<sup>1</sup> Deming states that "Conformance to specification, Zero Defect, Six Sigma Quality, and other nostrums all miss the point" in that they show no understanding of the loss function and that the edicts of any of them can be satisfied by simply "widening the specifications" (Deming, 2000, p. 226).

<sup>2</sup> For additional discussion of this issue, see Burns (2008a).

### An Analysis of the Critical Functions of the Quality Organization

To answer the question posed about the current relevancy of the Quality organization, let us review its two critical functions. The first is to ensure the correctness of the statistical expertise applied by every contributor within the enterprise and the second is to function as the clearinghouse for the knowledge developed from business improvement efforts.

#### Maintaining Statistical Excellence and Delivering Statistical Support

Clearly, maintaining excellence in the application of a set of knowledge ought to be assigned to someone truly expert in that knowledge. But what level of expertise is required? How prevalent is that expertise across various professional disciplines? Does its availability to a business require an entire organization devoted to it? Our perspective is that, in most if not almost all commercial enterprises, the requirement for an in-house, statistical organization headed by a scholarly level statistician is not appropriate. Here is our logic.

- The dissemination of statistical expertise once considered exceptional now commonly occurs across a wide variety of professions.

As Diamond writes in the introduction to his book, *Information and Error An Introduction to Statistical Analysis* (Diamond, 1959), the statistical knowledge and the variety of statistical techniques that *every psychologist* possesses and applies in performing his or her professional research in 1959 "were esoteric novelties twenty years ago" (ibid., p. v). Since 1959, that statement could be extended to say that a good deal of the methods applied

## Section 2. The Organization for Improvement of Quality and Productivity

today by the typical social science researcher did not exist in the 1920's and '30s. Statistical training has spread across professions ranging from nursing to natural and social scientists, to engineers, program evaluators and administrators, and even to management consultants. Further, training programs in the statistical knowledge and tools needed to implement the quality model are available on the internet, from in-house quality training programs, from off-the-shelf training materials, and self-instructional texts. Even the execution of complex statistical methods is automated and readily available for use on personal computers.<sup>31</sup> Finally, we have more than 40 years of actual experience with the correct application of enumerative (descriptive) statistical knowledge and methods by front-line workers in a broad array of industries. As mentioned above, Deming himself relates this fact. Over the past decades, applications of total quality management at the operating level have all involved training front-line workers in statistical methods for measuring performance, visually representing measurements, calculating descriptive statistics, establishing process control limits, and using basic comparative statistics. Pocket guides, web-based step-by-step instructions, and commonly available software supporting the performance of these tasks are readily available.<sup>32</sup> Based on this information, Diamond's assertion that what was once esoteric in now commonplace seems irrefutable.

- Most businesses do not need what today would be considered sophisticated expertise in statistics to pursue quality improvement.

The requirements for establishing and maintaining a measurement system, stabilizing processes and products, and eliminating common cause variation (minimizing the loss function) do not need unusual levels of statistical expertise as measured against the level of expertise taught to a variety of professions and available through easily accessible training programs. The most common process measures (cycle time, throughput, rework rate, value added ratio,<sup>33</sup> accident/incident rate, takt<sup>34</sup> time) require no more skills than counting and basic arithmetic. Furthermore, there are available industry-specific and industry-general methods for measuring these process features (see for example, the process observation guidance provided in the *Kaizen Desk Reference Standard*, Vitalo, Butz, and Vitalo 2003).

As to process improvement efforts, an InsideSixSigma study published in 2007 revealed that the most used statistical tools applied were essentially the seven basic tools of quality.

---

<sup>31</sup> The author of this monograph designed a fully automated quality control software system to manage the training function for an organization with more than a million and a half workers. It described current performance, compared observed to expected performance, uncovered factors affecting performance, generated alternative actions to improve performance and either presented those actions to a human for final decision making or chose the alternative with the best predicted likelihood for success. This system was designed in 1985 and leveraged the statistical procedures embedded in Statistical Package for the Social Sciences (SPSS).

<sup>32</sup> For example, see a list of these resources at: <http://www.vitalentusa.com/links/links.php#meas>.

<sup>33</sup> The the proportion of total cycle time consumed by operations that add value. It is common to find this proportion to be between 5% and 15% at the beginning of a lean initiative.

<sup>34</sup> The rate at which a unit of product must exit a work process to satisfy customer demand.

## Section 2. The Organization for Improvement of Quality and Productivity

- The cause-and-effect (a.k.a., "fishbone" or Ishikawa diagram)
- The check sheet
- The histogram
- The Pareto chart
- The scatter diagram
- Control charts

These tools stand in contrast with more advanced statistical methods such as acceptance sampling, statistical hypothesis testing, design of experiments, multivariate analysis, among others. The same InsideSixSigma study reported that these advanced methods were used less than 4% of the time. Yet, even for these advanced methods there are simple guides to enable the performance for most of applications as well as "go by" examples of their use. Finally, if a complex problem does emerge, one can readily purchase the statistical expertise needed for the specific purpose to be accomplished.

- As to business improvement *methods*, there are social and observational approaches to problem detection that do not require statistical expertise. One social approach is documented by Deming himself. I am referring to his reporting of the discoveries he made as he spoke with line staff about the barriers to performance they experienced, why they were present, what had been tried to remove them, how those efforts had succeeded, and, where they failed, what was needed to successfully remove them. Consider also the Lean Enterprise approach of waste detection as an observational means for uncovering opportunities for process and workplace improvement. Line personnel trained to reliably detect instances of waste (hazard, inspection, interruption, inventory, motion, rework, search, setup, travel/transport, unnecessary processing, and wait) record specific observations of waste occurring in correctly executed work processes and measure their impact on factors such as cycle time or rework rate. When waste is detected, the line worker, either individually or as part of a team, applies a problem-solving approach (e.g., A3 problem solving) to uncover the cause of the waste, generate and select a solution to removing it, plan and implement the solution, and then re-evaluate the process to see if the waste was removed and the performance improved. This process constitutes what is referred to as a Kaizen event. There are other widely available problem detection and problem solving training programs that teach how to uncover, describe, and measure performance problems, analyze their root causes, generate problem solutions, select the best solution, and implement and evaluate the chosen solution. Companies such as Xerox, Motorola, and many others developed these programs when they introduced their quality initiatives back in the 1980s. Off-the-shelf training programs and guides and web-based instruction are also available. None of these programs require the use of exceptional levels of statistical expertise to make business improvements.

## Section 2. The Organization for Improvement of Quality and Productivity

### Barriers, Problems, Opportunities—A Comparison of Statistical and Non-Statistical Language

Clearly Deming emphasizes statistical concepts as he expresses his insights and recommendations for realizing organizational effectiveness. In contrast, terms like ‘barriers to success,’ ‘problems,’ and ‘opportunities for improvement,’ may be more familiar to you especially if your background is in organizational psychology, management consultancy, and other professional fields that approach the improvement of business performance from a social science perspective. In these disciplines, ‘barriers,’ ‘problems,’ and ‘opportunities’ are usually uncovered by direct observation of business operations or from verbal reports of other people’s observations. Both approaches—the statistical and the non-statistical—are complementary and should never be exclusionary. In companies that measure the behavior of their processes and the utility of their outputs, barriers, problems, and opportunities can also be inferred from the results of measurements by means of statistical analysis. They are reflected in deviations of observed values from expected values, in changes in the slope or direction of a series of values, or in changing patterns of values that describe groups of measurements. Each such numerical representation is an instance of variation. As Deming points out, not all variation signals a meaningful event—i.e., one that requires special action. And, not all variation that does signal a meaningful event signals a problem. Sometimes, variation signals opportunity. It depends on the metric. Clearly if you are measuring the dimension of a part that must snugly fit into another part, both measurements that are too large and too small signal problems. On the other hand, if the metric reflects customer satisfaction, a spike in results might signal an instance of improved performance that, if studied, could yield insights into how to produce sustained improvement in customer satisfaction over time. It is also true that the same factual performance problems and opportunities can be uncovered using different methods and described using different language. Indeed, some observations of problems need no statistical test to reveal. If I am observing a process that is being performed correctly to standard as documented by both my observations and the written work standard, any rework I see must be *a function of the process as designed* (common cause variation) and require a change in the process to correct. Why then the apparently singular emphasis on statistical concepts and method for improving processes? Deming’s background in science and mathematics provided him a framework of knowledge that enabled him to use statistics to see variation and discern when it might signal a performance problem or opportunity. During the greater span of his professional career, these methods had little penetration into the management of businesses despite the added utility they offered. Hence, his emphasis on statistical methods and language. As a general rule, however, the more methods of detection one uses, the less likely problems and opportunities will go undetected. This too is consistent with Deming’s perspective. His lengthy reports of conversations with workers is ample evidence of his respect for the value and importance of people’s observations and ideas in the service of detecting and addressing problems and opportunities. And, as he makes clear repeatedly, while charts, graphs, and numbers may uncover signals of problems or opportunities that elude direct observation, only people with business expertise can discern their meaning and devise effective ways to respond to them.

### The Gathering, Organizing, and Disseminating of Business Improvement Methods and Solutions

Concerning the gathering, organizing, and dissemination of business improvement *solutions*—this ‘knowledge management function’ falls more closely within the expertise of a librarian than a statistician. While these functions, as implemented in businesses today, suffering from the common illness of no one being able to distinguish knowledge from information both as Deming taught and as epistemology has historically maintained (Wilson, 2002)—they have in fact been implemented in a variety of ways other than through a Quality organization headed by a masters or doctoral level statistician. And there is absolutely no empirical or logical basis for arguing that a statistician better understands the distinction between knowledge and information than any other graduate trained professional. *All*, based on my direct experience in

## Section 2. The Organization for Improvement of Quality and Productivity

teaching this distinction at the graduate level, *are equally ignorant of it*. Furthermore, the correction of this deficiency is easily accomplished and requires no reference to the domain of statistics *nor even a post secondary level education* to grasp.

### Is the Quality Organization as a Specific Organizational Unit Relevant Today? The Evidence Says “No”

Given our analysis, it is not possible to agree that a statistically rooted Quality organization, as specified by Deming, is really needed, at least in most businesses. Given the broad spread of statistical expertise and the mostly usual and customary measurement issues that occur in commercial organizations, especially in service industries, it is hard to grasp why Deming imagined that a department for leadership in statistical methodology was needed in every business. Surely, statistical expertise of a high level may need to be available to ensure proper practice and to maintain and elevate the training of internal personnel, but a department dedicated to statistical methodology as a *universally defined requirement* seems excessive. Perhaps the answer is that Deming observed during the formative period of his ideas such ignorance about statistics and its proper application and that his experience in the manufacturing industry exposed him to sufficiently challenging enumerative and analytical statistical challenges, that he judged such a depth of expertise in statistical theory was required internally. Yet, one finds it hard to imagine how, as a master statistician, he could not stratify the universe of businesses into sectors with different degrees of need with regard to statistical expertise. Or, perhaps it was that statistics was so central to how he understood the world and expressed what he saw, that he could not imagine other ways the same realities he perceived could be observed and understood without recourse to statistical knowledge as their primary conceptual framework and language.

## Section 3. Deming's System of Profound Knowledge

### Introduction

The knowledge that Deming labels “profound” defines the concepts and principles every leader must incorporate as theirs and apply as they view their organization and guide it to success. In his words, “It provides a map of theory by which to understand the organization that we work in” (Deming, 2000, p. 92). It also provides the knowledge needed to engage, involve, and enable the success of people contributing to the organization. Deming judged that integrating this knowledge into one's thinking is *transformational* in itself. Hence, his labeling of it as “profound.”

“The individual, transformed, will perceive new meaning to his life, to events, to numbers, to interactions between people” and “he will apply these principles in every kind of relationship with other people” (ibid, p. 92).

The knowledge encompassed within this system is the foundation for the 14 management points that, essentially, are applications of it. With this knowledge, managers have a base of principles that enable them to evaluate their decision making and action as they attempt to transform their organizations to the “new philosophy” (the Quality approach to commerce). Without a personal grasp of this knowledge, the 14 management points become a set of empty slogans since the person attempting to apply them lacks the understanding needed to appreciate their meaning and importance. In contrast, he asserts that having personally integrated the system of knowledge, the necessity and substance of the 14 points is revealed. The phrase “personally integrated” the system of profound knowledge means that you know its contents (concepts, principles, operations, etc.), see the connection between this content and issues you address in your life, and can find within your experience or within the body of science available to you, a sufficient basis to be convinced of its utility in dealing with those issues. Operationally, this might be evidenced by being able to reproduce the content for others, describe examples of its application in the real world, present evidence that acting consistently with its dictates produces results that one seeks, and demonstrate its use in one's decision making and problem solving. The personal integration of this system of knowledge enables the individual to become a model and agent for adopting the new philosophy and provides others the opportunity to acquire that knowledge from him or her by seeing it in action and witnessing its effects. As Deming states, such a person will demonstrate the following qualities.

- “Set an example,
- Be a good listener, but will not compromise [on basic principles and common aim],<sup>35</sup>
- Continually teach other people,
- Help people pull away from their current practice and beliefs and move to the new philosophy without a feeling of guilt about the past” (Deming 2000, p. 93).

### The Scope of the System

The knowledge contained within the system of profound knowledge includes:

<sup>35</sup> As you recognize from the presentation of Deming's thinking thus far, he does not mean “will not compromise” that the individual obstinately holds to his or her initial perspective. This understanding is further reinforced by his thinking about the nature of an organization (see page 68).

### Section 3. Deming's System of Profound Knowledge

- a theory of organization,
- the concept of variation and its significance,
- a theory of knowledge, and
- the basic principles that reveal the nature of people and the source of their striving.

Deming makes the point that these different subsets of knowledge operate together to provide the perspective needed to manage an organization. Each component enables a better appreciation of the other and, together, they enable a person to understand the dictates of the Quality approach to commerce. This is why Deming refers to this collection of knowledge as a “system.” All components work interdependently to accomplish a single aim—enabling an individual to lead a business using the Quality model.

#### Theory of Organization<sup>36</sup>

Deming views an organization as a system—more precisely, an open and dynamic system. An open system is one that continuously interacts with its environment. How that interaction unfolds is critical to its accomplishment of its purpose. A dynamic system is one in which the elements of the system interact with each other to produce novel yet coherent structures of behavior that accomplish a common aim. The actions of these elements are not pre-programmed but generated in real time based on the purpose being pursued and the inputs received. A team working together to resolve its members' different perspectives about the best course of action to pursue to accomplish their common goal is an example. Through dialogue they recognize each members' perspective, find common ground, analyze their differences, explore alternatives, and generate a solution that turns out to be quite different from any single idea originally put forward. The final action is coherent as measured against the end the team seeks to accomplish and satisfying as measured against the concerns of each participant yet is different from any of the elemental ideas offered by individual members. Dynamic systems have the quality of *emergence*—meaning, they generate novel responses that advance the system's aim but are not reducible to the sum or differences between individual elements.<sup>37</sup>

In Deming's words, a human organization is a “network of interdependent components that work together to accomplish” an aim (Deming, 2000, p. 95). Within a human system, like a commercial organization, people are the critical “wherewithal.” Across the organization, they must function as a team calculating their individual performance so that it maximizes the performance of the organization as a whole.

<sup>36</sup> Deming's followers refer to the ideas discussed here as his theory of system or system's theory. It is true that Deming labels the chapter in which he presents these ideas, *Introduction to a System* (Deming, 2000, pp. 49–91). Nevertheless, his actual topic is the nature of a commercial organization not the construct of “systems” in a general sense. He does not, for example, identify the variety of systems that exist (e.g., natural and artificial; physical and logical; within physical - inanimate and animate; etc.). He does not clarify that many subtypes of systems do not possess key features he describes the organization as possessing (i.e., being open and dynamic). He is solely concerned with using the qualities of all systems and of a selected subtype of system to clarify the nature of a human organization. Hence, I chose to title the section, “Theory of Organization.”

<sup>37</sup> Deming uses the statistical concept of non-additivity to represent the dynamic nature of people operating within an organization. By this he means the result produced by them is a function of each individual and the interaction between components (Deming, 2000, pages 129–131).

### Section 3. Deming's System of Profound Knowledge

This requires that people are aligned to a common goal, effective in giving and getting information, proficient in systematically using information and knowledge to solve problems and make decisions that account for all inputs. Otherwise, the organization fails and its existence ends. To produce the best performance, there must be unimpaired interconnectivity between people and the free flow of information. When people encounter differences in their perspectives about a course of action, they must resolve these differences by finding solutions that have the maximum utility for accomplishing the organization's purpose, not any one person or group's purpose.

Deming writes that "The fruits of [collaboration] will be impaired if not demolished if one party drops out ... to follow a path of selfish reward" (ibid, 97–98).<sup>38</sup> Deming also points out that as organizations grow in complexity (size and interdependence among constituents), the need for communication and collaboration between people also grows. As the responsibility for maintaining the organization is an executive function, this means that as organization's grow in complexity the exercise of this function becomes more demanding.

One way to grasp the importance of profound knowledge in Deming's perspective is to recognize and reflect on this knowledge about organizations as being open, dynamic systems. For example, applying that knowledge allows one to grasp the meaning and significance of the phrase "*maintaining the organization*" and the importance of the executive purposes of *sufficiency* and *synergy*. No open, dynamic system can exist unless it has an integrating aim and the elements required to accomplish that aim. Hence, unless an aim is defined, all the components required to accomplish it are present, and each component is contributing to accomplishing the aim of the system (the definition of *sufficiency*)—the system cannot exist. As well, unless these components operate *interdependently* to accomplish the organization's aim (the definition of *synergy*), the organization will fail to accomplish its purpose. That knowledge also provides the understanding from which the necessity of implementing various management points flows. For example, Points 6 and 7 emphasize enabling the success of every contributor. If the organization is a dynamic system whose success is the cumulative and integrative accomplishment of all contributors, then the effectiveness of every contributor must be assured. Similarly, Points 8 and 9 remove barriers to working together. In a dynamic system, barriers to collaboration are the death knell to successful interdependent performance.

Deming's thinking about an organization shares certain features with that of his predecessor Barnard. Both view the organization as an open system. An organization is both a system within itself and a member of a still larger system that include entities outside itself with whom it must interact effectively in order to succeed. Barnard termed this larger system, the cooperative system.<sup>39</sup> This author has referred to it in Deming's thinking as the extended value stream. Both

---

<sup>38</sup> Deming's vision of collaboration mirrors that of Mary Parker Follett (1995), although this analyst has not found any mention of Follett in Deming's writings. Both seek integrative solutions to differences in ideas about objectives and means. The key for them is that all parties align to a common purpose and set of values, recognize the value in each party's idea, understand what is different, and work to together to arrive at a solution that integrates the separate contributions of each idea in a manner that best serves the common goal.

<sup>39</sup> See Barnard (1968) pages 65, 78, 98–99, 240 and elsewhere.

### Section 3. Deming's System of Profound Knowledge

include in that 'larger' system all the stakeholders to commerce (e.g., customer, suppliers, regulators, community). Both grasp that an organization must be cognizant of all its stakeholder and engage them in the pursuit of its purpose if it is to succeed. In almost all other critical matters, however, Deming represents an alternative theory of organization to Barnard's. Barnard's organization is not emergent. Indeed, he advises the executive on the necessity to orchestrate its performance. Communication in Barnard's organization is equally as vital a construct as in Deming's theory, but Barnard advises that it be managed to ensure that it advances adherence to the organization's direction. While Deming's writing specific to the nature of the organization is quite circumscribed—when his entire work is analyzed from the perspective of a theory of organization and executive functions—his thinking about organization and executive functions is as substantial as Barnard's. The difference is that Barnard's theory fits well the prevalent financially-focused, profit-driven commercial model while Deming's is fully aligned with the Quality commercial model as well as its progeny, the Lean Enterprise model.

#### The Concept of Variation and Its Significance<sup>40</sup>

Variation refers to the observed differences in the measured value of some feature of a process or product across instances of its occurrence. Thus, given a sufficiently precise measurement instrument, successively produced #2 steel screws almost never have precisely the same tread or exactly the same dimensions. The differences may be exceedingly small and of no matter as to utility as judged by customers, but variation will be present.

Variation occurs in the operating characteristics of processes of a certain type and in the features of their outputs. A process is a series of activities that take initial inputs and transform them into some output. Some processes are purely cognitive in nature—like arithmetic. Other processes are instrumental in nature—that is, they involve the performance of observable behaviors that manipulate physical inputs. Processes can also be characterized by the certainty of the result each produces. Fixed processes produce *exactly* the same output whenever they are supplied the same inputs and are performed correctly. Thus, for example, the addition process of arithmetic yields the exact same result (e.g., 4) each time it is supplied the same inputs (2, 2). Other processes—termed random processes—do not. They may produce the same *type of output*—for example, an automotive assembly line always yields an assembled vehicle—but not exactly the same output in all its features *even when* (1) the input materials are the same, (2) the process is executed as defined, and (3) the process is producing the same make, model, etc. Each unit of output will differ from the other on some number of features to some degree. These processes are called *random* because, despite how well we define them, there remains within them factors we, as yet, do not recognize. Consequently, we cannot predict the effects of these factors nor control them. *Since these undetected factors remain uncontrolled*, they affect the process's operation and outputs and

<sup>40</sup> This section addresses the commercial implications of Deming and Shewhart's perspective on variation. Both men's perspectives on variation had deeper roots and far wider implications than commerce. For them, the shift from a world of certainty to one of probability represented a total revision in one's world view (*weltanschauung*) with implications far more profound than commerce alone.

### Section 3. Deming's System of Profound Knowledge

produce, over time, variation in results that we recognize only after the fact. This type of variation that is essentially inherent to the process as currently designed is termed *common cause variation*. The processes implementing almost all activities contributing to human commerce fall into the random category. Depending on our level of knowledge, the accuracy and comprehensiveness with which we specify the processes, and the care we take in installing them we can reduce this common cause variation—but we have no empirical evidence to suggest that we will ever eliminate it totally.<sup>41</sup>

Complicating matters more, some of the variation that occurs in the operating features of a process or in the features of its outputs are *not* due to any factor inherent in the process as defined. They are merely the fallout of “stuff that happens.” A bad batch of inputs makes it through inspection when, if the inspection had been implemented as designed, they would have been detected and refused. A key contributor takes ill and is substituted for by someone less experienced who makes errors that otherwise would not have occurred. An undetected power surge occurs sufficient enough to throw off the performance of a delicate machine in the production line. Any of these events adds variation to the performance of a process resulting in greater divergence between observed and expected performance. This added variation is *special* in the sense that its cause is not built into the process's design but happens as a consequence of events external to the process's design. This variability is called *special cause variation*.

#### The Challenge Variation Creates

The immediate impact of commercial processes being random and not fixed is that we never know the exact values that will describe their operation (e.g., cycle time, reject rate) nor the exact values of each feature of the outputs they generate. A stable random process only produces a consistent *pattern of results*, not precisely the same result every time. An unstable random process, one that is buffeted by unprevented “stuff that happens,” does not even do that. Such a process is out of control and what you get is what you get. Clearly, in large scale businesses mass producing outputs or delivering volume service outcomes at a pace responsive to demand, such special cause variation is costly and—assuming competition exists—may result in abject failure. One cannot simply rework or reject components and move on without mounting costs nor apologize repeatedly to customers for interrupted service and continue in business. Given the reality of variation, how does one answer the following questions and rationally conduct a business?

- How do you represent what you can supply customers by when and where?
- How do you know what the useable yield of your processes will be?
- How do you calculate cost, set prices, and establish budgets?

---

<sup>41</sup> There is, however, considerable evidence that we can improve processes over time. Hence, while perfection may be out of reach, continuous improvement “constantly and forever” is worth pursuing.

### Section 3. Deming's System of Profound Knowledge

- How do you eliminate variation and improve your organization's operations and outputs so you can win more business and grow?

The answers to these questions depend on your understanding of variation, its types, and their requirements for elimination or reduction. Hence, Deming's insistence that one element of an executive's profound knowledge system must be knowledge of variation.

#### Variation, Statistics, and Industry

The good news about stable random processes is that they do produce a *consistent pattern* of results. This pattern can be enumerated, represented as a distribution of values, described quantitatively, and it can be used to predict future performance *under certain conditions*. The field of statistics provides us the knowledge and tools to do these tasks. If we can predict future performance, even if only with a certain degree of accuracy, we can set goals, make plans, and calibrate improvement. If for example, we can reasonably predict that 99% of all outputs from Process A will satisfy customer expectations, we know the process's likely yield and have one element with which to calculate what we can say that we can deliver.

There are four conditions under which we can reliably set goals, make business plans and promises to customers, and improve processes. *All four conditions must be satisfied.*

- First, one must have a *documented process*. Without a written guide for how the process is to be implemented, there is no process per se. There is only whatever is being done, by whoever is doing, at whatever time it is happening. The likelihood of any of these being consistent across time, place, and performer is zero. One cannot teach what is not recorded. No one can even verify that what is being done is correct without the constant reference criterion that a written work process description provides.
- Second, the system must be *installed as designed*. This means that the resources specified as required for the correct implementation of the system (people, machines, input materials, workplace setting, etc.) are in place and meet specifications. If this condition is failed, then whatever is occurring *is not the process as designed* but something other and no one can say what that is since it is not what has been documented.
- Third, the system must be *operated as designed*. If the system is not executed consistently as designed, it cannot be stable. Rather, it is again relegated to an unknown performed in varying ways with unpredictable results.
- Fourth, instances of special cause variation must be detected, their causes understood, and action taken to prevent their occurrence in the future. This application of problem solving triggered by instances of special cause variation progressively frees a system of "stuff that happens."

### Section 3. Deming's System of Profound Knowledge

The first three conditions—documentation, correct installation, and the correct operation of a process—do not necessarily need statistical expertise to accomplish. Together, they accomplish the standardization of a work process. The fourth condition, process stabilization, does require the application of statistical expertise to accomplish it.

#### Every Process Must be Stabilized

A stable process is one whose pattern of performance is solely a function of its design. Statistical theory and methods enable one to describe the pattern of results a process produces, evaluate its stability over time, and detect instances of performance that are sufficiently unusual to raise suspicion that they are due to a special cause—meaning, some event that is not part of the process as designed. This detection of possible special cause variation, for Deming and Shewhart, signals people to initiate focused problem solving to uncover the root cause of the deviation and prevent its future occurrence. Sometimes the signal a statistical analysis triggers of a possible instance of special cause variation is incorrect and the unusual performance is simply a rare instance of values that do occur. This means that the observed performance, while rare, is in fact part of the process's natural pattern of performance and an expression of common cause variation. In those cases, there is no special cause and no fix is required to sustain stability. Other times, the signal-triggered problem solving uncovers a special cause and leads to action to prevent its future occurrence thus reestablishing the process's inherent pattern of performance and safeguarding stability going forward. This just described activity of detecting and eliminating special cause variation is the meaning of statistical quality control—using statistics to establish a stable system.

#### A Stable System Is *Only a First Step*

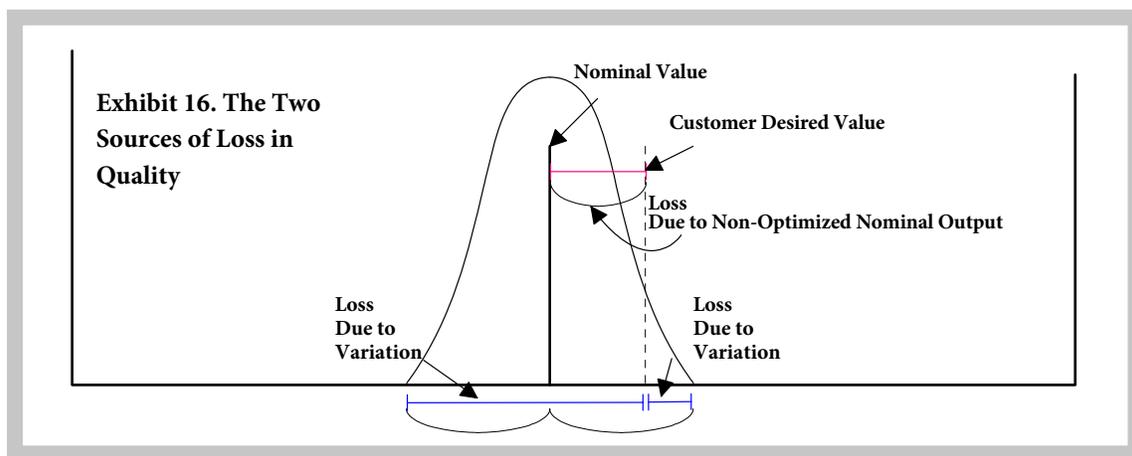
A stable system *is the end* that statistical quality control realizes *but it is not the end* that Deming's Quality approach to commerce seeks. The end that Quality seeks is to minimize the loss function describing the gap between a process's performance and that performance which would maximally satisfy customer values. Nonetheless, to reach the goal of Quality requires that statistical quality control be realized first. As Shewhart and Deming taught, unless a process is stable it cannot be improved. For one thing, until it is stable one has no clear picture of what the process is truly capable of producing because its typical result and/or pattern of results varies and is inflated by extraneous factors. Achieving stability, however, does *not* improve the system. This Juran clarified and Deming credited him for the insight (Deming, 1982a, p. 338). Stabilizing the process merely allows the process's true capabilities to express themselves (voice of process) by eliminating extraneous factors that mask its capability. Without information about a process's capability, you have no basis for knowing whether improvement is even required let alone whether any change you make produced improvement.<sup>42</sup>

---

<sup>42</sup> This is why Deming terms making changes in a system “tampering” when you do not know the source of the variation you observed.

### Section 3. Deming's System of Profound Knowledge

Improving the process means making it able to produce a more desirable typical outcome with less variation (Exhibit 16). In Deming's terms, it is minimizing the *loss function*. Loss is represented by any gap between the observed values of performance and that value representing the best satisfaction of customer values. Any deviation from achieving the most desired result *every time* yields waste and therefore loss. Here too statistical knowledge and tools have a contribution to make, but that contribution is only supportive in nature. Statistical knowledge will not uncover factors hidden in the process's design that might affect its behavior nor imagine ways to eliminate or control those factors. These tasks require the creative contribution of knowledgeable workers using other, non-statistical methods (e.g., using creative thinking exercises like shifting perspective or transferring knowledge from one field to another). Statistics, however, does enable us to test the influence of hypothesized factors on a process's behavior as well as estimate the potential benefits a proposed change might deliver.



#### Implications

- Without a knowledge of variation you will not appreciate the challenge you face in leading a business and your need for statistical expertise to meet that challenge.
- Without a knowledge of statistics, you have no way of representing the performance of commercial processes over time and therefore no possibility of understanding what they can produce, with what degree of likelihood, how fast, and at what cost.
- Without the knowledge of statistics you may not reliably detect when a process may be going out of control and therefore act to prevent that occurrence and the loss of resources and customer satisfaction and loyalty it may cause.
- Without a knowledge of the types of variation that a process may evidence, one cannot detect the source of problematic performance (internal to process as designed or a result of an external factor) and therefore will not be able to take the appropriate action to eliminate it.

### Section 3. Deming's System of Profound Knowledge

- Without knowledgeable and engaged contributors skilled in problem solving one cannot effectively respond to statistical signals suggesting the possible presence of special cause variation.
- Without knowledgeable and engaged contributors skilled in process improvement one cannot effectively elevate the capabilities of stable processes and accomplish the goal of quality improvement.

#### Deming's Theory of Knowledge

Deming's theory of knowledge refers to his thinking about the nature and importance of knowledge and its significance to managing a business. To understand his perspective, we first need to clarify what Deming means by knowledge and how he distinguishes it from information.

#### Distinguishing Between Knowledge and Information

Knowledge refers to ideas (concepts, principles) that one can use to describe and analyze behavior and situations, explain why an observed event has occurred, and predict what will be observed the next time such an event occurs. The term “accurate account,” for example, is a label we apply to describe a person's voiced description of some event when it coincides with verifiable observations of the event. It does not apply to just one person's description or the description of just one particular event, but to *all* instances of accounts that satisfy its definition. Using this label allows us to characterize information provided to us in a way that is important to understanding its usefulness. The concept of “accurate account”—that is the label *and* its meaning—is an example of knowledge. Another example is the principle that objects at rest stay at rest unless acted upon by a force. It tells us that when we see a tree still and then swaying, we should look for the action of another factor (e.g., wind) operating on the tree. In essence, the principle predicts the presence of some factor we may not immediately detect. Another is the rule that people with motive, method, and opportunity are those most likely to have committed a crime. This set of characteristics (labels and meaning) and their relationship to one's likelihood of committing a crime is also a chunk of knowledge. It guides us in identifying suspects during a criminal investigation. Still another instance of knowledge that is commonplace in manufacturing is a set of work instructions—for example, the instructions for completing the monthly maintenance of a machine. If written properly, it details the goal of maintenance, the sequence of steps one must implement to achieve that goal, and supporting knowledge to ensure that you did the maintenance correctly. As with all knowledge, this guide is useful for maintaining any instance of the machine it specifies, any month of the year, by and qualified person. In each of the above examples, knowledge distinguishes itself by having utility either in making judgments, predicting factors at play, or guiding our conduct toward realizing a goal. It also has the quality that it is useful not just once or in one particular moment or situation—but repeatedly at different times given similar situations.

### Section 3. Deming's System of Profound Knowledge

Information, on the other hand, is anchored in time and place. It is, for example, the content of the statement a person makes when he or she describes some event. It tells us only about that event. In fact, a good way to think of information is as news. It reports about a person, place, thing, or activity at a given time. For example, Matthew M. lived at 1816 Sutphin Boulevard, Jamaica, N.Y. during all of 1990. This fact tells us where Matthew M. lived during the specified period. Unlike knowledge, this information has *fixed* utility. It only reports about Matthew M.'s residence for one period of time. You can repeat what it says but you cannot use it to describe some other person or Matthew's residence at some other time. In itself, it has no utility beyond sharing a specific fact of experience. Nonetheless, information has great importance. Indeed, our modern approach to science proceeds from the systematic collection and analysis of information. This initial activity first yields suspicions about basic concepts and principles that might organize and characterize important features of things and activities and ultimately explain events. Through experiments we test our suspicions by gathering more information and we analyze that information statistically to determine whether our suspicions (hypothesizes) are supported in the context of those experiments with a specifiable degree of confidence. Progressively, we build systems of ideas that we accept as having a reasonable validity. These ideas form models we can use to describe, predict, and control phenomenon. Thus, the methodology of science generates knowledge from information.

#### Knowledge and Management

Goal setting and planning are essential executive functions. Without them, effectiveness in one's endeavors is not reliably achievable. Prediction is critical to both these activities. Prediction allows us to anticipate what resources our businesses will need, when market conditions may turn, and what competitors are likely to do in response to our business efforts. This is why Deming states categorically the "Management is prediction" (Deming, 2000, p. 101). Information is useless as a means for prediction. It only tells about the past. But, if one applies science, you can probe its meaning, extract from it ideas that may explain what affected the past, test those ideas, and develop credible principles that explain documented past events thereby turning information into knowledge. The knowledge you derive does relate to the future not just the past. It does provide a basis for prediction and permits one to adjust predictions based on changes in the state of factors the knowledge identifies as controlling outcomes. Prediction, therefore, requires knowledge and managers must understand what knowledge is and how it is developed, verified, refined, extended, and used. Indeed, the development, validation, refinement, extension, and application of knowledge are central to the successful accomplishment of all executive functions.

The importance of knowledge is equally critical to solving a current performance problem. Yes, information about what has occurred to date, when, where, how frequently, and how it compares to what is needed to occur is vital to deriving a proper correction. But, a solution is focused on making the performance different *going forward*. For that, one needs to understand what the

### Section 3. Deming's System of Profound Knowledge

information can tell us about root causes and possible solutions. Only existing knowledge applicable to the problem being solved or new knowledge derived systematically can guide the correct use of information to answer these questions and formulate a corrective action.

Deming's logic, therefore, is simple enough. His differentiation of knowledge from information is consistent with epistemological thinking extending back centuries. Yet, the distinction between knowledge and information is almost universally unrecognized or ignored in mass media and in business literature. Indeed, most "knowledge management systems" are little more than information systems (Wilson, 2002). As well, research into management decision making suggests that managers neither use the contents of information management systems nor knowledge to make decisions (Keen, 1981; Mintzberg, 1992; Pfeffer and Sutton, 2006). The most prevalent methods used by business people in executive roles are biologically-based (Mintzberg, 1992; Pfeffer & Sutton, 2006). They include reflexive action triggered by a stimulus (e.g., layoffs in reaction to a bad earnings report or outlook), uncritical imitation of other people's behaviors (e.g., adopting Six Sigma™ because it "brought success to Motorola or GE"<sup>43</sup>), following the advice of people one "trusts," or acting on one's "gut feeling" or personal convictions, unsupported by empirical information. While solutions using these methods have the virtue of speed ("fire, ready, aim"), they bring dangers, especially in contexts that change. There is no built-in mechanism for testing the appropriateness of a reflexively repeated prior solution before one executes it. Biologically based action also undermines involving others in decisions. For example, there is no way to explain one's choice except to say "It feels right" or perhaps to assert that it worked before but without being able to provide any *verifiable* information about when, where, how well it worked, and whether the conditions that applied then apply now. Consequently, biological methods, when applied, are arbitrary—meaning, they are determined by chance, whim, or impulse, and not by reason or principle. Clearly, using such singleton-based problem-solving and decision making methods disallows involvement. When replicated by managers and supervisors across the business, it generates a tangle of actions, some fortuitously beneficial, others disastrous, and very many interfering with each other. Finally, such methods restrict the development of future leaders as all they can learn from current leaders is to salute and execute the decisions of their superior and, when their turn comes, to react reflexively, imitate others, or "go with their guts."

For all these reasons, Deming asserts the absolute need for management to understand the distinction between knowledge and information and the requirement for them to act from a basis of knowledge. His admonishment about the need for a transformation in leadership concerning

---

<sup>43</sup> It certainly can be argued that Total Quality Management as promulgated by Juran and other high involvement, information-based problem solving strategies brought success and recognition to Motorola, but not Six Sigma™. As Ramias (2005) points out, "Motorola won the [1988] Baldrige Award not because of its formal Six Sigma program that kicked off in 1987 but because it had made truly awesome improvements in both quality and cycle time over the preceding 8 years. Those achievements were a result of all the TQM and BPI [the business process improvement method developed by Rummler] efforts going on..." (2005, p. 2). In fact, Ramias writes, "As a formal program, Six Sigma was barely in place when the Baldrige Award was obtained" (2005, p. 2). As to General Electric, its leap to distinction beginning in the early 1990's was triggered by process mapping, the application of "workout" sessions, and "best practice" benchmarking (Schaninger, Harris, & Niebuhr, 1999). Six Sigma™ was not introduced until the late 1990's after Jack Welch had already devised the revenue ballooning strategy of using cash from GE's "real economy" businesses to resource its new engine of success—its financial services group.

### Section 3. Deming's System of Profound Knowledge

their recognition of the importance of knowledge and the need to act from a base of knowledge remains as relevant today as it was in 1950 when he lectured the leaders of Japanese industry.

#### Implications

- Anyone who cannot distinguish between information and knowledge cannot properly perform executive functions.
- The performance of executive functions can only be based on knowledge since executive functions always look forward and, therefore, must predict future conditions.
- Since knowledge operates on information, executive functions require a fully functional information system to provide people the content they need to build up knowledge, test its utility, refine it, and extend its utility.
- Given that most people performing executive functions do not use information and cannot distinguish between information and knowledge—they are making decisions based on other criteria. Hence, Deming's notion that quality requires a revolution in management.

#### The Nature of People and Its Significance

How anyone could imagine that he or she could lead a business without a proper understanding of people becomes incredible after a simple reflection about the nature of commerce. *Commerce is the exchange of resources between people.* It is a personal and social event. At a personal level, each individual decides whether to engage in commerce, to what end, what he or she will exchange, with whom, and under what circumstances. At the social level, people must connect with potential partners in commerce, engage them in considering an exchange of resources, and involve them in making that exchange. Prior to that moment, people must shape their offering or its presentation so that it at least appears to satisfy the requirements of the person with whom they seek to have commerce. These personal and social aspects of commerce are as essential to its occurrence as any technical aspect specific to producing an offering or delivering it to customers. Further, the social dimension of commerce that occurs between a business and its customer represents just the central element of the cluster of social activity that creates the necessary setting for that transaction to occur. Included in this surrounding context are instances of interactions that occur within and between every person or group that contributes to the ultimate exchange between a business and its customer. Just a few examples are the commerce that occurs between the business and its employees concerning their employment; its suppliers concerning receiving their needed inputs; and the communities within which the business operates, its regulators, and any other entity that seeks something from the business in exchange for providing something the business needs. Even if one intends to use pure power (force or some other form of manipulation) to avoid having to deal with people in a personal way, oppression and exploitation are themselves ways of relating and their successful application requires an understanding of people.

### Section 3. Deming's System of Profound Knowledge

Thus, Deming's edict that every executive must possess a foundation of expertise in psychology is both straightforward and self-evident—if not fully ignored in practice. Recall that executive functions have the purposes of effectiveness, sufficiency, and synergy. While the latter two are obviously about human relationships, effectiveness also requires an understanding of psychology. Goals, plans, and their deployment across a organization demands effective communication between and among the contributors to the business. As Deming points out, effective communication is measured by its result, not its intent. Unless the communication is shaped to enable effective action and is delivered in terms the recipient can understand and act on, it is not effective. Deming states that the only objective test of effectiveness is what the recipient does subsequent to the communication with regard to that communication: “How does the instruction work in practice?” (Deming, 1982a. p. 70). The principles of communication specific to ensuring its effectiveness are fully within the domain of psychology. Unless these principles are understood and applied, communication fails and with it so does the accomplishment of the goals and plans it was intended to deploy.

#### The Principle of ‘Sameness’ and ‘Differentness’

For Deming, people possess features that are common to all but are expressed differently in each person. Hence, the paradox that, while the whole of humanity shares universal qualities (sameness), it is also characterized by diversity (differentness). This means that effective action in relation to any one person requires you to first understand *that* individual and to personalize the application of the psychological knowledge he or she is applying. This principle is of fundamental importance to the performance of executive functions. It has two corollaries. The first is that one size *never* fits all. This judgment flows naturally from the recognizing differentness. The second corollary is that the keener and more energized the response one seeks from another—the more specific and detailed one's understanding of that person must be. The reason for this second corollary is that the deeper the investment one needs from another, the greater the effort one seeks, and the more persevering it must be, the greater the connection the other person must feel between what you seek that person to do and what the person experiences as valuable to do. This connection energizes the other person's drive to make and fulfill such a commitment. Also, since for Deming the end is always success for both parties, the keener must the initiator's grasp be of what the other person *can do* since to elicit effort that cannot succeed is worse than not to elicit that effort at all.

#### What Is Common to All

The common features of human makeup that affect behavior are people's motivation, learning, capabilities, and limitations. For Deming, there are four principles one must grasp to understand these features and their impact on behavior.

1. People “are born with a need for relationships with others” (Deming, 2000, p. 108).

### Section 3. Deming's System of Profound Knowledge

2. Only relationships that are typified by respect and esteem are experienced positively.
3. People possess an “inherent inclination to learn” and a striving for mastery (ibid).
4. Success through learning builds self-esteem and self-esteem enables continued striving for excellence.

The first principle appears self evident after one reflects on the facts that conception, birth, early survival, and the childhood development of people, at the very least, are all interdependent activities that can be accomplished no other way. Beyond that, research suggests that human contact is essential to a person's ongoing well-being. For example, research indicates that, in adults, “the magnitude of risk [to health] associated with social isolation is comparable with that of cigarette smoking and other major biomedical and psychosocial risk factors” (House, 2001, p. 273).

Concerning the second assertion, there is an enormous amount of research establishing the conditions required for positive human relationships to occur.<sup>44</sup> The vast expanse of this literature supports the finding that dimensions such as respect, empathy, and genuineness are essential core conditions for positive human relationships.

The third foundation principle is supported by the simple observation of the child's spontaneous striving to learn and develop his or her capabilities at least from birth forward and, of course, a wealth of research from the field of developmental psychology. This intrinsic striving to acquire knowledge and skill is joined by a satisfaction resulting from mastery.

As to the fourth principles, success feeds self-esteem and continued striving, almost four decades of research stimulated by the work of Bandura supports the conclusion that mastery builds self-esteem and the experience of self-efficacy and that these qualities fuel continued striving (Bandura, 1994, 1997).

#### Deming's Management Guidance About People

These basic principles express themselves throughout Deming's management guidance. Fundamentally, “Good management helps to nurture and preserve these innate attributes of people” (Deming, 2000, p. 108). Effective managers establish relationships of trust based on respect for each individual and strive to understand each individual's frame of reference. They ensure that people have the opportunity to succeed, to learn, and to grow, and thereby to experience “pride of workmanship.” Based on Deming's understanding of human psychology, personal learning and successful striving are the springboards for innovation and innovation is essential to continuous improvement. The summative expression of his thinking about human psychology may be in his edict that we need to replace supervision with leadership and unless people performing the executive functions evidence leadership, no success in the pursuit of quality can be realized.

---

<sup>44</sup> The span of research supporting these assertions extends back more than 50 years. Its sources include research on counseling and psychotherapy, marital relations, education, child development, and organizational relationships among others. See, for example, Truax and Carkhuff (1967), Carkhuff and Berenson (1967), and Carkhuff (1969; 1983) and the many studies each cites.

## Section 3. Deming's System of Profound Knowledge

### The Consequences of Ignorant Management

Leading a business in the absence of profound knowledge means operating from ignorance. Despite whatever commercial model one is implementing, operating from ignorance predicts failure in free marketplaces. Such behavior is made more egregious by the fact that the knowledge one needs is both readily available and not difficult to master. Deming makes clear that the consequences of operating from ignorance in the implementation of the executive function has both pragmatic and moral dimensions.

Pragmatically, it undermines effectiveness since, without knowledge, trustworthy prediction is not possible and therefore goal setting and planning will fail. It also undermines effectiveness since ignorance of variation will disallow correct action to ensure that systems are stable and optimized. With regard to a business implementing the Quality approach to commerce, it undermines sufficiency and synergy since, without mastery of the knowledge Deming designates as profound, executives will fail to recognize the necessity of teaming across the enterprise and the removal of obstacles to the pride of workmanship and trust among all contributors. Thus, executive actions will occur that frustrate people's experience of pride of workmanship, erode their striving for excellence, and eradicate their willingness to contribute. Executive inaction or dismissal of concerns will have similar effects. Deming recognized that the disrespect inherent in ignoring people's feedback about problems, the reflexive dismissal of their ideas for correcting problems, and the pressure to continue performance when correct performance was not possible all result in tearing the social fabric between people engaged in commerce and breeding suspicion and distrust. The ultimate outcome is discord, not synergy.

On the moral side, Deming appreciated that life's experiences may be for better or worse. They may enhance or retard the development of people's innate qualities and their ability to express them. He recognized that, as a consequences of life's experiences, people's inherent striving for learning and improvement and desire to contribute could be diminished and potentially erased. Such experiences can begin at the earliest times in one's life. As he states, one's "Family environment may shatter at an early age dignity, self-esteem, and thereby shatter also intrinsic motivation." And he adds, "Some practices of management ... complete the destruction" (Deming, 2000, p. 108). Deming sees this undermining of human spirit as corrupt. He has special contempt for those in executive roles who announce new initiatives to expand participation and pursue improvement by better respecting and benefiting from the knowledge of line workers and then thwart these ends by refusing to make improvements that threatened management's privileged positions. He characterizes such initiatives as "smoke screens" and labeled them "devastatingly cruel devices" (Deming, 1982a, p. 85).

He had similar contempt for people's efforts to manipulate others by replacing their intrinsic motivation to learn and achieve with extrinsic motivation. He saw this activity as beginning from an early age, especially in school, and being continued throughout life and especially in the

### **Section 3. Deming's System of Profound Knowledge**

workplace. While Deming recognized that extrinsic motivation may help a person develop behaviors that in turn build self-esteem, he warned that “total submission to extrinsic motivation leads to the destruction of the individual” (Deming, 2000, p. 109).

Deming's recognition of the need for profound knowledge in the performance of the executive functions is present in every one of his 14 management points. It underpins his teachings about the “diseases and obstacles” that infect businesses, compromise their success, and inflict injury on their members (Deming, 1982a, page 97). He terms a similar set of factors the “Forces of Destruction” (Deming, 2000, page 122).

## Section 4. The Path of Transformation

### Introduction

Two facts dominate Deming's perspective on the transition of a business from the traditional to the Quality approach to commerce. The first is that the change is transformational in nature. The second is that it begins within the individual.

### Transformational Change

Deming makes clear that the adoption of the Quality approach to commerce requires a “transformation.” By that he means it radically alters the organization in every way that is meaningful to commerce. If anyone doubts that Deming meant *radical change*, read his statement on the back cover of *The New Economics* (Deming, 2000). There he writes that his work “is dedicated to people who suffer under the tyranny of the current management style.” Throughout human history, the response to tyranny has always been revolution. If this sounds extreme, consider just four additional facts. The Quality model:

- reverses the aim of enterprise,
- turns upside down the role of the executive,
- replaces competition with collaboration, and
- rejects the accepted grounds for a person's willingness to contribute to accomplishing the organization's goals.

### Reverses the Aim of Enterprise

As Friedman (1970) has argued, the single responsibility of a corporation under the traditional approach to commerce is to maximize profit for its owners. The supreme court provided support for this notion in its ruling in the case of *Dodge v. Ford Motor Co.* (1919). It concluded, “A business corporation is organized and carried on primarily for the profit of the stockholders. The powers of the directors are to be employed for that end” (*Dodge v. Ford Motor Co.*, 1919). This perspective is commonly accepted as the standard of conduct for officers and directors of commercial organizations (Henderson, 2007). The ultimate aim of a traditionally implemented enterprise is to maximally benefit its *owners*. This aim acknowledges self-aggrandizement as the basic motive for commerce, a position consistent with the capitalist model where the impetus for commerce is self-interest. Self-interest then becomes the touchstone for business decision-making and action. Nonetheless, some may argue that realizing the end of self-interest is best served if one benefits others as well. Indeed, the Supreme Court ruling in *Dodge v. Ford Motor Co.* permits directors to apply such reasoning. This perspective is sometimes referred to as the ‘rational self-interest’ argument. But the argument that rational self-interest modifies the expression of pure self-interest—the fundamental basis of capitalism—fails in a reality where asymmetries prevail. The concept of asymmetries refers to the situation where one party in a commercial transaction has an advantage over the other party. The presence of asymmetries affects the balance of control in such transactions. Two

## Section 4. The Path of Transformation Knowledge

examples of asymmetries are the information producers have and can choose to share or not share with buyers and the differential wealth producers usually possess and can use to influence the social, political, and economic conditions within which commercial transactions occur. Asymmetries also exist with regard to one's need to conclude a transaction. For example, the consumer's perceived need for a lifesaving drug is far more intense than the pharmaceutical company's need to complete a particular transaction. In settings where asymmetries favor one or another party, the pursuit of self-interest by that party may proceed unconstrained by concern for other "stakeholders" for long periods of time. Indeed, it is quite possible to maximize self-benefit while minimizing the benefiting of others when one can exert such control. Thus the presence of asymmetries nullifies the moderating effect of rational self-interest. Consider, for example, the tobacco companies' multiple decade-long withholding of information about the detrimental effects of nicotine and cigarette addiction and their campaign to discredit others who attempted to disseminate that information (Brandt, 2007; Leonnig, 2005; Los Angeles Times, 1998). Their actions were guided by their intent to protect revenues and the profits they generated. And, even today, those actions continue to reap significant business success (Dugan, 2011). Indeed, if the asymmetries extend to the political and judicial systems, it is quite possible to defraud people about the contents of agreements made (Martin and Powell, 2010), have money they invest disappear (Amed and Protes, 2012), use the power of the state to take private property for personal gain (Campoy, 2012; *Kelo v. City of New London*, 2012), collect debts without proper documentation to support that a debt even exists (Nasirpour, 2011; Silver-Greenberg, 2012), and otherwise exploit transactions with others with essential impunity. In settings where persistent asymmetries exist—as in the real world of commerce—it is quite possible for exploitation to yield the highest gains.

Irrespective of these facts, the rational self-interest argument fails because the *focus on others is based on benefit to self*. It is fundamentally a *quid pro quo* arrangement in which "I do x only if I get y." At any point that the promised benefit to self fails to satisfy the required sacrifice entailed in benefiting others, the primary aim of benefiting self prevails. When there is only one seat left on the lifeboat, what choice does the person whose fundamental aim is self-interest make?

In contrast, Deming declares that the aim of commerce is to benefit another—the customer—by maximizing the delivery of value to him or her. Value is determined by the utility of what one delivers. A quality product and service "will help man to live better" (Deming, 1982a, p. 26). "Quality should be aimed at the needs of the consumer present and future" (ibid, p. 5). A quality offering is one that provides "better living for him in the future" (ibid, p. 175). Indeed, Deming declares that the entire "production line" must be viewed as a system with the single aim of satisfying "the needs of the consumer, present and future" (ibid, p. 5).

## Section 4. The Path of Transformation

Yes, Deming does see this aim as leading to business success. In fact, he specifies that the utility being delivered to customers must have “a market”—meaning that someone does need and will enter into commerce to obtain it. But if that condition were failed, there would be no customers to serve to begin with. But no, in the Quality approach to commerce, the pursuit of maximizing the delivery of value to customers is not undertaken on a *quid pro quo* basis with the real end being self-interest. If it were, there would be no constancy of purpose as required in Deming’s Management Point 1 in the presence of asymmetries. Self-interest could be served without undertaking the uncertainties associated with correctly understanding another’s needs, conceiving a offering that maximally meets those needs, bringing to market a product that is faithful to that conception, winning the attention of prospective customers, supporting them it using the offering successfully, and devising ways to ensure that future versions of the offering adjust to the customer’s changing needs with even greater success.

Even more to the point, business success for Deming is *not the maximization of owner profit* but the benefiting of *all stakeholders inclusively*. “The aim proposed here for any organization is for everybody to gain—stockholders, employees, suppliers, customers, community, the environment” (Deming, 2000, p. 51). The aim of commerce in the Quality model is *communal benefit*. Unlike capitalism, the Quality model *does* affirmatively incorporate social responsibility and its commitment to serving customers is absolute!

*[Please note that the above analysis of the self-interest aspect of capitalism and its expression in the real world is not a polemic against capitalism as a commercial model. Neither is the description of the Quality model’s different aim meant to promote it as superior. Each is a recognized and systematically defined approach to commerce. The point here is that they are radically different.]*

### Turns Upside Down the Role of the Executive

In the traditionally run corporation the executive has an exulted status replete with special privileges, special pay and termination benefits, and special reward systems. He or she is credited as the highest level contributor, the party with the insight and expertise needed to guide the conduct of business and detect and exploit opportunities for success. The organization works in support of the executive to realize the goals he or she sets and implement the plans the executive defines for accomplishing them. By this standard, the Quality organization is upside down. Deming’s definition of leadership—i.e., those qualities an executive must demonstrate within the Quality approach to commerce—puts the executive in the service of the people who produce value. These are the contributors who transform inputs into outputs that benefit its customers. Status differences—indeed, any feature that divides people into separate groups—are anathema. The role of the executive is to ensure the personal success of every contributor, not vice versa. As you have read, the executive must ensure the delivery of benefits inclusively to *all* stakeholders, enable the success of *every* contributor, eliminate all

## Section 4. The Path of Transformation Knowledge

barriers to pride of workmanship, eliminate all barriers to teaming across the enterprise, employ knowledge not intuition as a basis for action, enforce the rule that all problem solving and decision making be evidence-based, and act always to support learning and its leveraging as the central means of success. He or she will be “a colleague, counseling and leading his people on a day-to-day basis, learning from them and with them” (Deming, 1982a, p. 117).

### Replaces Competition with Collaboration

In traditionally run commercial organizations, competition is believed to hone one’s business sense and skills. Employees compete for promotion to positions of higher economic value and social status. It is maintained that competition keeps the best and brightest moving to the top. Indeed, forced ranking programs are used to identify and remove the bottom ‘x%’ of performers in an organization *independent of their absolute level of performance*. Divisions compete for sway in decision making and for resource allocations. Division heads compete for their share of the bonus pool. The principle of capitalism operates as fully within the organization between its members as it does at the level of the organization. Indeed, this understanding has led to a new formulation of the nature of the firm as being a “nexus of contracts” influenced by principal-agent asymmetries (Foss, Lando, and Thomsen, 1999). Each individual (at least those “in the game”) seeks personal advantage through the means that are available to him or her. At lower executive levels, this typically translates into being identified as accomplishing the agenda of the individual’s boss since it is the boss that most often controls the trajectory of the individual’s career. At upper levels, this may involve leveraging information or other resources controlled by the party either by withholding it or by using it to extract advantages in negotiations with other parties.

The Quality approach to commerce replaces competition with collaboration. It views the organization as a dynamic system in which the *integrative contributions* of all contributors are needed for success. It demands teamwork to succeed. It requires the free and full sharing of information and ideas. Divisions between people, work teams, or work units corrupt collaboration as they block the flow of information and ideas. In an organization implementing the Quality model, the common goal trumps any personal agenda.

### Rejects the Accepted Grounds for Willingness to Contribute

As discussed earlier, the accepted basis for contribution within a traditional organization is a *quid pro quo* exchange between the organization and the individual. The contribution of cooperative efforts must be *induced*. As Barnard asserts, “Strictly speaking, an organization’s purpose has directly no meaning for the individual. What has meaning for him is the organization’s relation to him—what burdens it imposes and what benefits it confers” (Barnard, 1968, pp. 88–89). Willingness to contribute, he states, must be induced through the use of incentives or persuasion or a mix of the two. “An organization can secure the efforts necessary to its existence ... either by the objective inducements it provides or by changing minds.

## Section 4. The Path of Transformation

... We shall call the process of offering incentives [objective inducements] ‘the method of incentives’; and the method of changing subjective attitudes ‘the method of persuasion’” (Barnard, 1968, p. 141). “The contributions of personal efforts which constitute the energies of organizations are yielded by individuals because of incentives. The egotistical motives of self-preservation and self-satisfaction are dominating forces; on the whole, organizations can exist only when consistent with satisfaction of these motives, unless, alternatively, they can change these motives” (Barnard, 1968, p. 139). Barnard acknowledges that organizations can be formed based on a convergence of like values between people who seek to pursue together a common goal. He terms these “spontaneous organizations” (Barnard, 1968, p. 102). But he sets aside these occurrences as “aberrations.” He asserts that the notion of an organization formed by people whose intrinsic motives are aligned and support a common purpose is unnecessary and an unwise basis for forming a theory of organization.<sup>45</sup>

What Barnard dismisses as ‘aberration’, Deming requires as the basis for organization. What Barnard embraces as necessary and appropriate—extrinsic motivation—Deming abhors as corrupting and destructive of people’s inborn striving to learn and achieve. For Deming, willingness to contribute flows from the alignment of one’s personal values and the values and direction of the organization. Intrinsic motivation implies self-initiated processing to devise better ways to reach a goal. It requires no inducement, just the opportunity to express itself.

### Driven by Personal Change

For Deming, the adoption of the Quality approach to commerce begins with personal transformation. He understands that the organization simply reflects the people who determine its existence—what they know, what they value, and what they are capable of realizing. Thus, he declares that owners and managers must master the 14 points and the system of profound knowledge that gives them meaning. The new philosophy must be *internalized* by owners and managers. They must make it their own, act consistently with their dictates, and take pride in doing so. In his words, executives who embrace the Quality model “will have the courage to break with tradition, even to the point of exile from their peers” (Deming, 1982a, p. 86). Unless owners and their agents fully own the new philosophy and act on it, the business will not realize the improvement of competitive position that the Quality model promises nor secure its long-term success. Deming makes the personal aspect of the transformation absolutely clear when he states, “The first step is transformation of the individual” and “The individual, transformed, will perceive new meaning to his life, to events, to numbers, to interactions between people” (Deming, 2000, p. 92). This transformed individual will be a model and agent for adopting the new philosophy. He or she will provide others the opportunity to learn the new philosophy from seeing it in action and witnessing its effects—not solely from the study of its ideas. As reported earlier, Deming states that the transformed individual will “set an example; be a good listener; continually teach other

---

<sup>45</sup> See Barnard’s statements on pages 137–38 (Barnard, 1968). For a detailed analysis of Barnard’s thinking, see Vitalo (2010).

## Section 4. The Path of Transformation Knowledge

people; and help people pull away from their current practice and beliefs and move to the new philosophy without a feeling of guilt about the past” (Deming 2000, p. 93). According to Clements (2011), Deming’s emphasis on the adoption of the Quality model as representing personal change distinguishes his perspective from that of Juran’s. He states that Deming’s “System of Profound Knowledge represents transformation, a new paradigm. Juran’s work gives glimpses of a new paradigm, but it is quite possible to embark on the Trilogy without really addressing the transformation of management style.” Clements believes that one could implement Juran’s detailed, technocratic approach with the perspective of making improvements “within the existing paradigm” (Clements, 2011, p. 16). A key reason for his judgment is that Juran does not share Deming’s perspective on the importance of intrinsic motivation nor seem to appreciate “how people behave differently when motivated extrinsically as against intrinsically” and how essential intrinsic motivation is to realizing the transformation that Deming describes.

### The Flow of Transformation

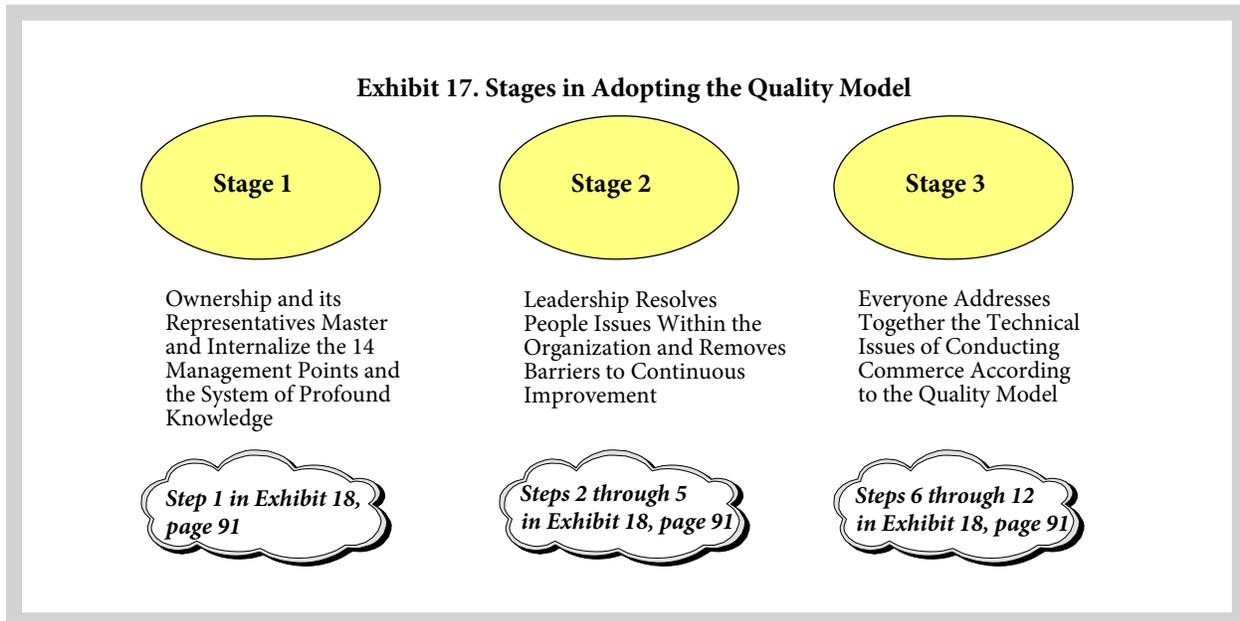
The movement through the transformation process passes through three stages the order of which is as critical to success as the proper implementation of each stage.

- The *first stage* addresses ownership and its representatives, the people who implement executive functions.
- The *second stage* addresses action by ownership and its representatives to resolve people issues within the organization and the remove all barriers to continuous improvement.
- The *third stage* addresses all people working together to implement commerce according to the Quality approach (Exhibit 17, next page).

In Stage 1, leadership studies the 14 Management Points and the System of Profound knowledge that underpins it. They master its contents, experience value in its thinking, appreciate its implications for themselves as individuals and a business leaders, recognize the changes they must make to implement it, and assent to doing so. In the next stage, leadership removes all barriers to contribution and working together since these prevent the formation of an organization dedicated to quality improvement (Stage 2). This requires that ownership and its representatives embody the qualities of leadership, as defined by Deming; demonstrate constancy of purpose; remove any fear of loss of employment as a result of quality improvements; eliminate divisions between people and groups; and establish, across the enterprise, teamwork that is aligned around the common purpose of maximizing the delivery of value to customers. When properly done, these steps will require them to modify their organizational structure, human capital management systems, intracompany communication systems and practices, methods of vendor selection and relationships, and other administrative elements of the business. In the third stage, all contributors to the enterprise focus their collective efforts on conducting the business in a manner consistent with the dictates of the Quality model and strive to improve those efforts constantly and forever (Stage 3). This work involves establishing mechanisms for learning about customer

## Section 4. The Path of Transformation

values and translating them into knowledge that guides business planning, product development, production, improvement of the extended value stream, investment in innovation, and the continuous improvement of all these activities.



### Model Versus Practice

Note the differences between the progression of the transformation process as envisioned by Deming and its usual implementation. In my experience, such installations typically begin with Quality “seminars” for executives. These seminars are *didactic* at best, conveying the concepts of quality and the operating-level methods used to improve quality. The issues of radical personal change and the potential conflicts between the demands of the Quality approach and the personal values and methods used by executives and the special benefits they experience in their own roles are never confronted and resolved. Neither is there a thorough review of the business’s strategic direction as represented in its goals, marketplace actions, key result areas, and bonus-triggering performance indicators. Specifically, no check is made of the alignment between these facts and the actual dictates of the Quality approach to commerce. The working through of the implications for personal change and redirection of corporate action at the strategic level, therefore, is not uncovered, confronted, and resolved. Rather, the usual next step in the introduction of Quality is to choose some operating area in which to install its concepts and statistical quality control methods, train employees in the use of the seven basic tools of quality improvement and in quality improvement techniques, establish quality improvement teams, identify problems for resolving, and apply problem solving to that end. Yes, measures of process performance are introduced, control charts established, and the stability of processes is monitored. But, all the focus is on the 3% of real opportunity, as Deming describes it, whereas the 97% embedded in executive

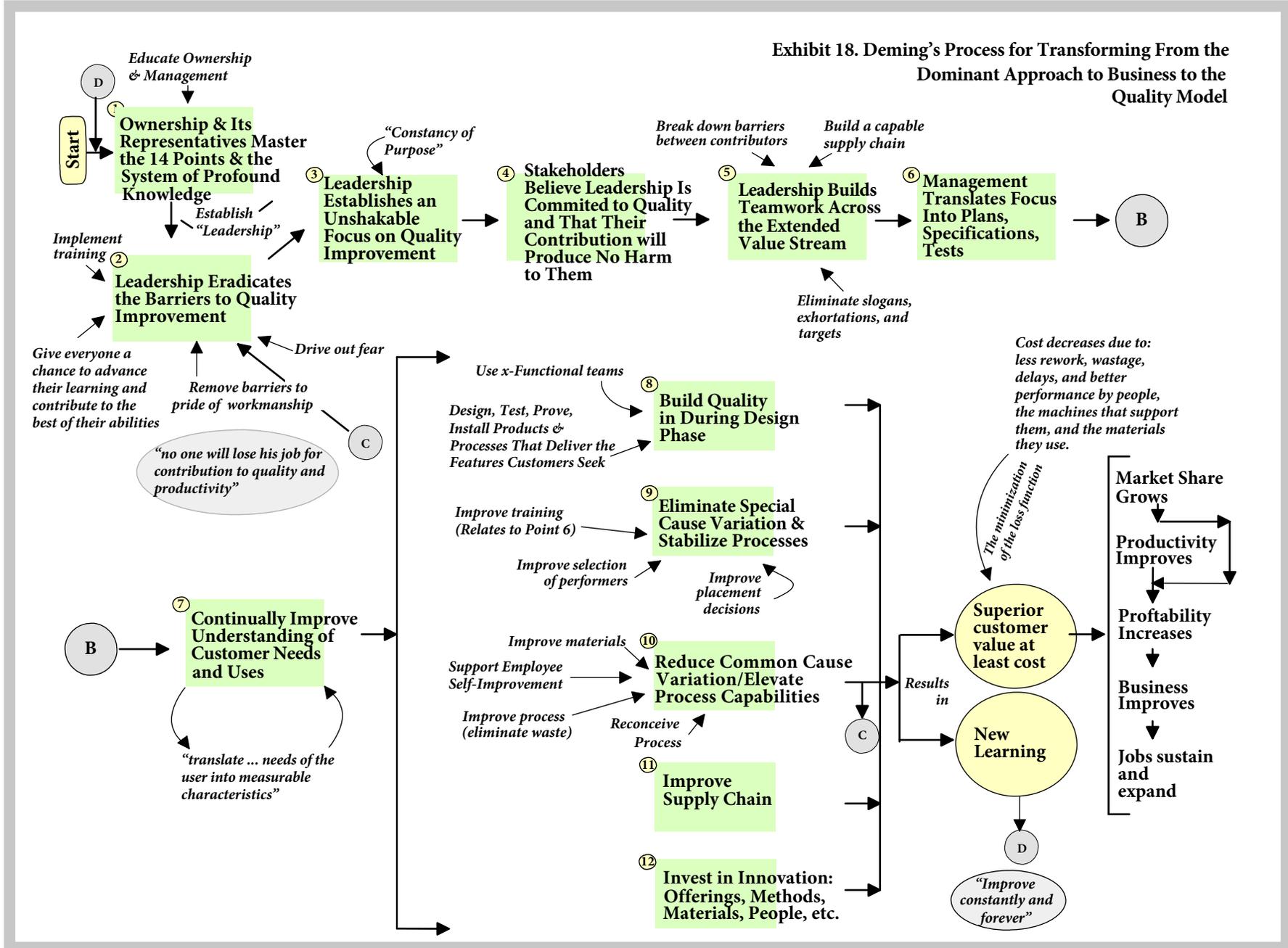
## **Section 4. The Path of Transformation Knowledge**

decision making is left untouched (Deming, 2000, p. 37). Also, all the focus is on the paraphernalia of Quality (e.g., control charts, the use of descriptive techniques like Pareto charts) and not on the substance of the Quality philosophy as revealed practically in its 14 management points and theoretically in the set of knowledge Deming defines as profound.

### **The Detailed Process**

Exhibit 18, next page, maps the flow of action that accomplishes the transformation of a business from the prevalent financially-focused, profit-driven commercial model to implementing Deming's Quality model. Each step in the process has been fully explored in this monograph and requires no additional comment here.

Exhibit 18. Deming's Process for Transforming From the Dominant Approach to Business to the Quality Model





## Section 5. What's Wrong With the Quality Model?

### Introduction

The title of this section is obviously meant to be provocative, but it does point to an interesting question—why is the Quality model not implemented as Deming prescribed it on any scale across commercial organizations today? Deming introduced the Quality model more than 60 years ago in Japan. Before that, he tried to introduce it—at least the statistical quality control aspect of it—in the United States. But, by his own assessment, it failed. It was adopted in Japan and credited with enabling that country to turn around its entire industrial sector. Twenty-one presidents of Japan's leading commercial organizations took seminars from Deming,<sup>46</sup> embraced his new philosophy, and changed their companies. Soon after, Japan began to outperform the U.S. and the rest of the world in its manufacturing sectors. Many Japanese CEOs credited Deming and his thinking for their new found success. The country itself awarded him a significant national honor (the Second Order Medal of the Sacred Treasure) in recognition of his contribution to the country's economic resurrection. It was not until the 1970s that Deming's model achieved significant attention in the U.S. despite the U.S. industrial sector's growing performance problems. Yes, there subsequently emerged a number of prominent companies that embraced some of the dictates of the Quality model—Xerox, Motorola, Ford, GE, among others. Yes, each claimed great gains from its application. But none truly transformed their executive functions and administrative systems as dictated in Stage 2 of transformation. By inference, one can conclude that neither were the goals of Stage 1 accomplished as executives who internalize the new philosophy *do* complete Stage 2 of the transformation. The changes made in U.S. commercial organizations occurred predominantly at the operating level. As stated above, Deming acknowledged this fact (Deming, 2000, p. 37). There is something profoundly odd about all this. The industries of another country adopt a commercial model created in the U.S. by a recognized scholar that enables them to outperform U.S. companies, yet U.S. companies fail to adopt it? Thus the question, “What is wrong with the Quality model?”

### One Answer Is, “Nothing”

One reasonable answer is, “Nothing.” Deming's Quality model is a well-formed system for conducting commerce. As you have seen in this monograph, it is comprehensive and it provides actionable guidance for focusing, organizing, and implementing commerce. The system is internally consistent. The key elements underpinning the system—the knowledge called profound—have deep and broad scientific support. There is empirical evidence from research using objective performance data and incorporating controls for confounding variables that its application does deliver superior business results.<sup>47</sup> Yet, despite this empirical support for the Quality approach to commerce's effectiveness and the advantages produced by the kind of organization it creates, few if any commercial organizations embrace its approach to commerce except in

---

<sup>46</sup> Walton (1986, page 13).

<sup>47</sup> See, for example, Abdemoula, Musa, and Alawad, 2011; Bu, Tang, and Tian, 2012; General Accounting Office, 1991; and Hendricks and Singhal, 1997, 1999).

## Section 5. What's Wrong With the Quality Model?

restricted ways at the operating level and only with the ultimate intent of reducing costs and elevating profits.

### Another Answer Is, “Everything”

An alternative answer is the everything is wrong with the Quality approach to commerce when judged against the values, competencies, and customs that drive the people in charge of most businesses. These are the very people who decide what approach to commerce a company will take. The answer to “What's Wrong With the Quality Model?” expresses the fundamental dilemma that all transformational change programs face. It is that the people who must initiate and sustain transformational change are precisely the ones who benefited most from the system that is to be replaced.

### The Mismatch in Values

In general, today's companies remain hierarchical in structure with the performers in the higher-level roles holding the greater responsibility and authority. These performers commonly establish compensation and reward systems that provide them differential pay and benefits. These monetary benefits are typically one or more orders of magnitude greater than received by nonmanagerial employees—at least for the top two tiers of executives. Executive roles accrue special status to their incumbents in other ways as well. This status is conveyed by titles such as “President,” “Chief Executive Officer,” “Vice President,” “Senior Manager,” among others. It is communicated by office location, size, and decor and commonly by having special places to meet, eat, and recreate. Typically, this package of artifacts and material benefits played a significant role in attracting and retaining the holders of these roles. Such performers are, in general, extrinsically motivated. They sought the reinforcements offered by the setting within which they work and were rewarded by a similar set of people who preceded them. In essence, the succeeding waves of people who make it to the top and occupy positions in the top executive tiers of such firms value the status and special privileges and rewards that the existing system delivers. The adoption of the Quality approach to commerce means the individuals in power must find a totally new and different basis for motivation and reward. They must replace the acquisition of status, privilege, power, and special monetary gains with the rewards of learning, the satisfaction offered by enabling others to succeed, and the realization of measurable results in the marketplace. In Deming's terms, they must rediscover the intrinsic basis for striving present in all of us and relinquish the extrinsic basis that has replaced it. Such an exchange would seem, on the face of it, extremely unlikely.

### Competence and Custom

The competency set and management style of the people in power within traditional commercial organizations is also a mismatch with what is required using the Quality approach to commerce.

## Section 5. What's Wrong With the Quality Model?

Also, the basis for movement upwards on the executive ladder is discrepant between these types of firms. As to competence and advancement in executive roles, the empirical evidence suggests no relationship between these factors if one assumes that the competency set being referred to relates to producing successful organizational performance. In practice, almost all leaders are chosen using subjective judgments. They are promoted based on their perceived contribution as judged by the person doing the selection. Unfortunately, “perceived contribution” has a consistently low relationship to objective measures of the results actually produced by a performer. The average correlation coefficient for this relationship is approximately .27. This means that the subjective judgment of others accounts for less than 8% of the true variance in the results people produce as measured by objective methods (Heneman, 1986). After considering three converging directions of research on the relationship between executive career success and organizational effectiveness—Kaiser, Hogan, and Craig conclude, “The research described ... illustrates how having a successful career in management is not the same as leading an effective group, team, or organization” (2008, p. 103). They go on to conclude that the judgment of a negligible relationship between career success and leadership effectiveness is further supported by the lack of relationship between executive compensation and performance and the absence of *any* relationship at the middle management levels between career success and the performance of the teams led by the elevated manager. ‘Contribution’, therefore, when judged subjectively and specifically as related to selecting and elevating managers, is at best a euphemism for something else—perhaps how well the person has supported the selector’s decisions and actions or simply the degree of comfort the selector feels with the person. Thus, contrary to the notion that the best and brightest rise to the top in modern corporations, research indicates that elevation to executive roles has nothing to do with competence in generating superior organizational performance. In contrast, within a Quality organization, the only basis for holding a role and advancing to new levels of responsibility is one’s measurable performance in advancing the goals of the company not the agenda of one’s superior. Yes, performance includes both behavior *and* results—but behavior and results are related and both are judged objectively, not subjectively. And yes, everyone is supported in succeeding either in the role they hold or in a replacement role should such a role offer the person a better chance to contribute. But, ultimately, one must contribute and that contribution is judged using observable and measurable behavior and results

As to custom as expressed in the usually applied management style, the comparison between what an executive does within a traditionally run business and a business implementing the Quality model also uncovers great discrepancies. As described in Section 3, the Quality model inverts the role of executive (see pages 85–86). It also diffuses the executive’s focus and responsibility. He or she may no longer hone in on the portion of company that he or she controls seeking to ensure that it maximizes its status in the eyes of superiors. Every executive’s responsibility is to promote the success of the whole not just the part that he or she controls.

## Section 5. What's Wrong With the Quality Model?

Consider as well the contrast between the executive decision making skills the Quality model requires and the approach that most in-place executives use. In our earlier discussion of the role of knowledge in implementing the executive role (see *Knowledge and Management*, pages 76–78), we clarified that the Quality model requires the use of information- and knowledge-based decision-making and problem-solving methods. Only these methods permit participation by others, are explainable and teachable to others, and allow consistency in performance across an organization. Each of these features is essential to implementing the Quality approach to commerce. As stated earlier, the most prevalent decision-making methods used by business managers are, however, biologically-based (Mintzberg, 1992; Pfeffer & Sutton, 2006). These methods include reflexive action triggered by a stimulus, uncritical imitation of other people's behaviors, following the advice of people one "trusts," or acting on one's "gut feeling" or personal convictions unsupported by empirical information. Biologically-driven decision making is simply inadequate for the implementation of the Quality approach to commerce for all the reasons articulated earlier. Yet, biologically-based decision making is the custom and privilege of the executive. In fact, it is part of the mystique that enhances their status and justifies their special rewards. Moreover, it is the decision making approach most executives are competent and comfortable in doing.

### The End Result

In summary, one might conclude that everything is wrong with the Quality model when its required values, competency set, and customs are compared to what prevails in businesses implementing the traditional approach to commerce. Its value base is enabling the success of others. The foundation for action is knowledge, not instinct, intuition, or one's favorite "go-to" expert's advice. Its implementation turns upside down and inside out the very systems and artifacts that maintain the rewards that executives have striven to realize. Worse, the criteria of performance it establishes is empirical, not based on satisfying the expectations of one's superior. How do people who have striven for the status and rewards they hold and who have earned them by working within the boundaries defined by those who last held them—people who research suggests lack the competencies required to implement a different approach—change the rules of the game and, in that act, place all that they have worked for in jeopardy?

## References

- Abdemoula, E.; Musa, E.A.; & Alawad, I.K. (2011). The impact of implementation of Total Quality Management on plants' productivity: Evidence from poultry processing plants- Saudi Arabia- Central Region. *International Journal of Engineering Science and Technology*, 3 (5), 4426–33. Retrieved August 21, 2012, from [http://scienceandnature.org/IJEMS-Vol2%283%29-July2011/IJEMS\\_V2%283%295.pdf](http://scienceandnature.org/IJEMS-Vol2%283%29-July2011/IJEMS_V2%283%295.pdf)
- Ahmed, A. & Protess, B. (2012, August 15). No criminal case is likely in loss at MF Global. *New York Times*. Retrieve August 16, 2012, <http://dealbook.nytimes.com/2012/08/15/no-criminal-case-is-likely-in-loss-at-mf-global/>
- Bandura, A. (1994). Self-efficacy. In V.S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, 71-81). New York: Academic Press. Retrieved February 21, 2012, from <http://www.des.emory.edu/mfp/BanEncy.html>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: NY, W.H. Freeman and Company.
- Barnard, C.I. (1968). *The functions of the executive*. Cambridge, MA: Harvard University Press.
- Brandt, A.M. (2009). *The cigarette century: The rise, fall, and deadly persistence of the product that defined America*. Basic Books, New York: NY.
- Bu, X; Tang, J.; & Tian, R.G. (2012). Quality award and market performance: An empirical investigation about Chinese stock market. *Journal of Applied Business and Economics*, 13(3), 25–35.
- Burns, A.D. (2008). Six Sigma lessons from Deming, Part 1. Retrieved February 22, 2012, from <http://www.qualitydigest.com/inside/six-sigma-article/six-sigma-lessons-deming-part-1>
- Burns, A.D. (2008a). Six Sigma lessons from Deming, Part 2. Retrieved February 22, 2012, from <http://www.qualitydigest.com/inside/six-sigma-article/six-sigma-lessons-deming-part-2>
- Campoy, A. (2012, August 10). Pipeline tests land rights. *The Wall Street Journal*. Retrieved August 16, 2012, from <http://online.wsj.com/article/SB10000872396390444900304577581541426799290>
- Carkhuff, R.R. (1969). *Helping and human relations*. (2 Vols.) New York: NY, Holt, Rinehart, and Winston, Inc.
- Carkhuff, R.R. (1973). *The art of problem solving*. Amherst, MA: Human Resource Development Press.
- Carkhuff, R.R. (1976). Gold star schedule. Chapter in B.G. Berenson (Ed.), *Belly to Belly. Back to Back. The militant humanism of Robert R. Carkhuff* (17–19). Amherst, MA: Human Resource Development Press.
- Carkhuff, R.R. (1983). *Interpersonal skills and human productivity*. Amherst, MA: Human Resource Development Press, Inc.

## References

- Carkhuff, R.R. & Berenson, B.G. (1967). *Beyond counseling and psychotherapy*. New York: NY, Holt, Rinehart, and Winston, Inc.
- Clements, N. (2011). Juran & Deming. Prism Consultancy. Retrieved January 6, 2012, from <http://www.prismconsultancy.com/ComparingDemingandJuran.pdf>
- Deci, E.L.; Koestner, R.; & Ryan, R.M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, 125 (6), 627-668.
- Deming, W.E. (1950). *Elementary principles of the statistical control of quality. A series of lectures*. Tokyo, Japan: Nippon Kagaku Gijyutsu Kenmei.
- Deming, W.E. (1975). On probability as a basis for action. *The American Statistician*, 29(4), 146-152.
- Deming, W.E. (1982). *Quality, productivity and competitive position*. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study.
- Deming, W.E. (1982a). *Out of crisis*. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study.
- Deming, W.E. (1988). Quality and the required style of management - the need for change. *Journal for Quality and Participation*. Retrieved December 18, 2007, from <http://deming.eng.clemson.edu/pub/den/files/reqstyle.txt>
- Deming, W.E. (2000). *The new economics: For industry, government, education* (2nd edition). Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study.
- Deming, W.E. (2006). Letter sent to Peter Senge concerning Senge's book. In Senge, P. (2006). *The fifth discipline*. New York: Random House Business Book, p. xii.
- Denning, S. (2013). Management: Evolution or revolution? *Forbes Magazine*. Retrieved January 26, 2014, from <http://www.forbes.com/sites/stevedenning/2013/11/11/management-evolution-or-revolution>
- Derakshan, N. & Eysenck, M.W. (2009). Anxiety, processing efficiency, and cognitive performance. New developments from attentional control theory. *European Psychologist*, 14(2), 168-176. Retrieved August 5, 2012, from [www.iapsych.com/articles/derakshan2009.pdf](http://www.iapsych.com/articles/derakshan2009.pdf)
- Diamond, S. (1959). *Information and error. An introduction to statistical analysis*. New York, NY: Basic Books.
- Dodge v. Ford Motor Company (1919). Dodge v. Ford Motor Company, 170 N.W. 668 (Mich. 1919). Retrieved January 27, 2014, from [www.businessentitiesonline.com/Dodge%20v.%20Ford%20Motor%20Co.pdf](http://www.businessentitiesonline.com/Dodge%20v.%20Ford%20Motor%20Co.pdf)
- Drucker, P.F. (2002). *Managing in the next society*. New York, NY: Truman Talley Books.

## References

- Dugan, E. (2011, May 25). The unstoppable march of the tobacco giants. *The Independent*. Retrieved August 16, 2012, from <http://www.independent.co.uk/life-style/health-and-families/health-news/the-unstoppable-march-of-the-tobacco-giants-2290583.html>
- Follett, M. P. (1995). Constructive conflict. In Graham, P. (Ed.). *Mary Parker Follett profit of management* ( 67–87). Washington, DC: Beard Books.
- Foss, N.J.; Lando, H.; & Thomsen, S. (1999). The theory of the firm. Retrieved January 24, 2014, from <http://encyclo.findlaw.com/5610book.pdf>
- Friedman, M. (1970, September 13). The social responsibility of business is to increase its profits. *The New York Times Magazine*. Retrieved February 9, 2011, from <http://www.colorado.edu/studentgroups/libertarians/issues/friedman-soc-resp-business.html>
- Frye, A. & Campbell, D. (2011, February 18). Buffett says pricing power beats good management. *Bloomberg News*. Retrieved April 21, 2011, from [http://www.bloomberg.com/news/2011-02-18/buffett-says-pricing-power-more-important-tan-good-management.html](http://www.bloomberg.com/news/2011-02-18/buffett-says-pricing-power-more-important-than-good-management.html)
- Gagné, M. & Deci, E.L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331–362. Retrieved January 27, 2014, from [http://www.selfdeterminationtheory.org/SDT/documents/2005\\_GagneDeci\\_JOB\\_SDTtheory.pdf](http://www.selfdeterminationtheory.org/SDT/documents/2005_GagneDeci_JOB_SDTtheory.pdf)
- General Accounting Office (GAO) (1991). Management practices: US companies improve performance through Quality efforts. GAO, National Security and International Affairs Division, Washington, DC. Retrieved August 21, 2012, from [http://gpsinc.us/files/GAO\\_91-190.pdf](http://gpsinc.us/files/GAO_91-190.pdf)
- Gibbs, M.E. (1980). The effects of extrinsic rewards on work performance, job satisfaction and intrinsic motivation. (Doctoral Dissertation, Texas Tech University). Retrieved February 21, 2014, from <http://repositories.tdl.org/ttu-ir/bitstream/handle/2346/12332/31295000046499.pdf?sequence=1>
- Guillum, J. and Bellow, M. (2011, March, 30). When standardized test scores soared in D.C., were the gains real? *USA Today*. Retrieved February 21, 2012, from [http://www.usatoday.com/news/education/2011-03-28-1Aschooltesting28\\_CV\\_N.htm](http://www.usatoday.com/news/education/2011-03-28-1Aschooltesting28_CV_N.htm)
- Henderson, M.T. (2007). Everything old is new again: Lessons from Dodge v. Ford Motor Company. John M. Olin Law & Economics Working Paper No. 373, Chicago: The University of Chicago. Retrieved August 14, 2012, from <http://ssrn.com/abstract=1070284>
- Hendricks, K.B. & Singhal, V.R. (1997). Does implementing an effective TQM program actually improve operating performance? Empirical evidence from firms that have won quality awards. *Management Science*, 43 (9), 1258-74.

## References

- Hendricks, K.B. & Singhal, V.R. (1999). Don't count TQM out. *Quality Progress*, April 1999, 36–42. Retrieved August 21, 2012, from <http://www.texas-quality.org/SiteImages/125/Reference%20Library/Awards%20and%20Organizational%20Success%20-%202.pdf>
- Heneman, R.L. (1986). The relationship between supervisory ratings and results-oriented measures of performance: a meta-analysis. *Personnel Psychology*, 39, 811-826.
- Herzberg, F. (1987). One more time: How do you motivate people? *Harvard Business Review*, September-October, Reprint 87507 (entire). Retrieved August 8, 2012, from [http://www.facilitif.eu/user\\_files/file/herzburg\\_article.pdf](http://www.facilitif.eu/user_files/file/herzburg_article.pdf)
- House, J.S. (2001). Social isolation kills, but how and why? *Psychosomatic Medicine*, 63(2), 273-274. Retrieved August 13, 2012, from <http://www.psychosomaticmedicine.org/content/63/2/273.full.pdf+html>
- Kaiser, R.B.; Hogan, R.; & Craig, S.B. (2008). Leadership and the fate of organizations. *American Psychologist*, 63(2), 96-110. Retrieved August 21, 2012, from [http://www.hoganassessments.com/\\_hoganweb/documents/FateofOrgs\\_AmPsych2008.pdf](http://www.hoganassessments.com/_hoganweb/documents/FateofOrgs_AmPsych2008.pdf)
- Keen, P.W. (1981). Information systems and organizational change. *Communications of the ACM*, 24 (1), 24–33.
- Kelo v. City of New London. (2012, August 12). In Wikipedia, The Free Encyclopedia. Retrieved 14:21, August 16, 2012, from [http://en.wikipedia.org/w/index.php?title=Kelo\\_v.\\_City\\_of\\_New\\_London&oldid=507084850](http://en.wikipedia.org/w/index.php?title=Kelo_v._City_of_New_London&oldid=507084850)
- Los Angeles Times (1998, January 16). Big tobaccos lies. *Los Angeles Times*. Retrieved August 16, 2012, from <http://articles.latimes.com/print/1998/jan/16/local/me-9038>
- Leonnig, C.D. (2005, June 8). Tobacco escapes huge penalty. *Washington Post*. Retrieved August 16, 2012, from <http://www.washingtonpost.com/wp-dyn/content/article/2005/06/07/AR2005060702019.htm>
- Liker, J. & Convis, G.L. (2011). *The Toyota way to lean leadership: Achieving and sustaining excellence through leadership development*. New York: NY, McGraw-Hill
- Liker, J. & Hoseus, M. (2007). *The Toyota culture: The heart and soul of the Toyota way*. New York: NY, McGraw-Hill.
- Locke, E.A. & Latham, G.P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-Year Odyssey. *American Psychologist* 57 (9), 705-717. Retrieved May 21, 2012, from <http://faculty.washington.edu/janegf/goalsetting.html>
- Martin, A. & Powell, M. (2010, December 17). Two states sue Bank of America over mortgages. *New York Times*. Retrieved August 16, 2012, from <http://www.nytimes.com/2010/12/18/business/18mortgage.html>
- Mintzberg, H. (1992). The manager's job: Folklore and fact. In John J. Garbarro (ed) *Managing People and Organizations*. Harvard, MA: Harvard Business School Publications.

## References

- Nasirpour, S. (2011, May 16). Confidential federal audits accuse five biggest mortgage firms of defrauding taxpayers. *The Washington Post*. Retrieved August 16, 2012, from [http://www.huffingtonpost.com/2011/05/16/foreclosure-fraud-audit-false-claims-act\\_n\\_862686.html](http://www.huffingtonpost.com/2011/05/16/foreclosure-fraud-audit-false-claims-act_n_862686.html)
- Northern, J.J. (2010). *Anxiety and cognitive performance: A test of predictions made by cognitive interference theory and attentional control theory*. Unpublished doctoral dissertation. Graduate College of Bowling Green State University. Retrieved August 5, 2012, from [http://etd.ohiolink.edu/view.cgi?acc\\_num=bgsu1276557720](http://etd.ohiolink.edu/view.cgi?acc_num=bgsu1276557720)
- Pfeffer, J. & Sutton, R.I. (2006). *Hard facts Dangerous half truths & total nonsense*. Boston, MA: Harvard Business School Press.
- Shewhart, W. (1939). *Statistical method from the viewpoint of quality control*. Washington, DC: The Graduate School, The United States Department of Agriculture.
- Silver-Greenberg, J. (2012, August 12). Problems riddle moves to collect credit card debt. *The Wall Street Journal*. Retrieved August 16, 2012, from <http://dealbook.nytimes.com/2012/08/12/problems-riddle-moves-to-collect-credit-card-debt>
- Toyoda, S. (1988). Statement about the significance of Deming for the management approach of the Toyota Motor Company. In Burns, A.D. (2008a). Six Sigma lessons from Deming, Part 2, *Quality Digest*. Retrieved February 22, 2012, from <http://www.qualitydigest.com/inside/six-sigma-article/six-sigma-lessons-deming-part-2>
- Truax, C.B. & Carkhuff, R.R. (1967). *Toward effective counseling and psychotherapy*. Chicago, IL: Aldine Publishing Company.
- Vitalo, R.L.; Butz, F.; & Vitalo, J.P. (2003). *The kaizen desk reference standard*. O'Fallon, MO: Lowry Press.
- Vogell, H.; Judd, A.; & Torres, K. (2011, July, 5). Mayor: a complete failure of leadership in APS in testing scandal. *The Atlanta Journal-Constitution*. Retrieved February 21, 2012, from <http://www.ajc.com/news/mayor-a-complete-failure-999870.html>
- Walton, M. (1986). *The Deming management method*. New York, NY: The Berkley Publishing Group.
- Wilson, G. (2006). The effects of external rewards on intrinsic motivation. Retrieved November 18, 2013, from <http://www.abcbodbuilding.com/rewards.pdf>
- Wilson, T.D. (2002). The nonsense of 'knowledge management.' *Information Research*, 8(1). Retrieved April 11, 2012, from <http://informationr.net/ir/8-1/paper144.html>
- Womack, J.P. & Jones, D.T. (2003). *Lean thinking*. (Rev. ed.) New York: Free Press.



## Appendix A: Deming's Guidance for Implementing of Executive Functions

<b>Exhibit A1. How People Implementing the Executive Functions Realize the Purpose of Effectiveness</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Effectiveness</b>	<p>1. Ownership and management:</p> <ul style="list-style-type: none"> <li>▪ master the meaning of the 14 points;</li> <li>▪ master the system of profound knowledge;</li> <li>▪ internalize the new philosophy, make it their own, act consistently with its dictates, and take pride in it;</li> <li>▪ establish the continuous improvement of products and services as the singular focus of the organization (<i>deliver quality today and improved quality tomorrow continuously and forever</i>);</li> <li>▪ commit to acting from a base of knowledge and using only evidenced-based decision making and problem solving; and</li> <li>▪ eliminate slogans, exhortations, and the setting of numerical targets thereby keeping the focus on learning and the continuous improvement of quality.</li> </ul> <p>2. Educate all contributors about the new direction, why it is necessary, how broadly it will impact the business, and what their role is in implementing it.</p> <p>3. Establish an effective extended value stream composed of member businesses that work together as a team to deliver quality to customers.</p> <ul style="list-style-type: none"> <li>▪ Evaluate prospective value stream members functionally in terms of:               <ul style="list-style-type: none"> <li>▪ how well they contribute to the production and delivery of a finished product that maximally satisfies customer values in use (delivered quality),</li> <li>▪ the degree to which the supplier has adopted the Quality model and is practicing that model within its own business; and</li> <li>▪ the member's capabilities to adjust their activities to serve changing customer needs.</li> </ul> </li> <li>▪ Establish long-term, teamed relationships with each vetted member of the extended value stream.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ownership and executives, managers, and supervisors (EMS) who are open to new knowledge and whose personal values align with the intents of the Quality model.</li> <li>▪ EMS who understand what waste is, how it expresses itself, and how to measure correctly its impact on business effectiveness</li> <li>▪ EMS who understand that inspection is waste and that the correct approach to ensuring quality is to build it into every output and process implemented throughout the organization</li> <li>▪ EMS trained in the meaning of leadership <i>and</i> in the following knowledge and skills.               <ul style="list-style-type: none"> <li>▪ Knowledge of the company and its end-to-end approach to delivering value to its customers</li> <li>▪ Knowledge of the processes for which they are responsible</li> <li>▪ Knowledge of the importance of setting the focus on continuous improvement</li> <li>▪ Knowledge about variation including its inherent presence in all processes, its sources and detection, and its mathematical and graphical representation</li> <li>▪ Understanding of the proper locus of responsibility for addressing common and special cause variation</li> <li>▪ Skill in getting and giving information and ideas</li> <li>▪ Skill in evidenced-based decision making and problem solving</li> <li>▪ Skill in detecting the type of variation observed</li> <li>▪ Skill in uncovering and removing the causes of special cause variation</li> </ul> </li> </ul> <p style="text-align: right;"><i>Continued...</i></p>

**Appendix A: Deming’s Guidance for Implementing of Executive Functions**

**Exhibit A1. How People Implementing the Executive Functions Realize the Purpose of Effectiveness (continued)**

Result Affected	Required Activities	Required Resources
<p><b>Effectiveness (continued)</b></p>	<p>4. Build-in quality to every product and process implemented at its design stage.</p> <ul style="list-style-type: none"> <li>▪ Continually improve understanding of customer needs and uses</li> <li>▪ Translate the customer’s future needs into measurable characteristics</li> <li>▪ Use cross-functional teams to design products and the processes with the features sets that satisfy customers needs and activities.</li> <li>▪ Ensure that, if the state of knowledge dictates a needs for inspection, it is done at the right point with minimum total cost (e.g., by ensuring a stable and capable inspection process and using sampling).</li> <li>▪ Prove designs in the laboratory and in trial production.</li> </ul> <p>5. Map and continuously improve the process (value stream) that implements every function within the business with the intent of advancing the success of the business as a whole.</p> <ul style="list-style-type: none"> <li>▪ Ensure that all value streams work together to maximize the delivery of value to customers.</li> <li>▪ Ensure that the designed capability of each process within each value stream is realized (i.e., make system stable).</li> <li>▪ Zero out the loss function for every process within every value stream by:                             <ul style="list-style-type: none"> <li>▪ eliminating common cause variation and</li> <li>▪ optimizing the alignment of typical performance to the performance that maximally satisfies customer needs.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Skill in eliminating common cause variation and raising the capabilities of systems</li> <li>▪ The disposition to use their learned knowledge and skills</li> <li>■ EMS who:                             <ul style="list-style-type: none"> <li>▪ target their communications to people who are capable of acting on them,</li> <li>▪ can form a useful communication, and</li> <li>▪ can assess whether a communication has been successful.</li> </ul> </li> </ul>

## Appendix A: Deming’s Guidance for Implementing of Executive Functions

<b>Exhibit A2. How People Implementing the Executive Functions Realize the Purpose of Sufficiency</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Sufficiency</b>	<ol style="list-style-type: none"> <li>1. Ownership and management satisfy Required Activity 1 with regard to ensuring effectiveness (page 103).</li> <li>2. Ownership and management establish the organization’s commitment to quality as “unshakable” in the eyes of all stakeholders. They:               <ul style="list-style-type: none"> <li>▪ resolve that no employee will lose his or her job as a result of the employee’s contributions to improving quality and productivity,</li> <li>▪ ensure that managers act as leaders not judges and work as colleagues with the people they supervise, counseling them on a day-to-day basis, enabling their success, and learning from them and with them, and</li> <li>▪ drive out fear so that everyone may work effectively for the company.</li> </ul> </li> <li>3. Eradicate all other barriers to quality improvement including replacing performance management systems that undermine pride of workmanship, compromise people’s intrinsic striving to learn and grow, distract management from its role as leaders, impede teamwork, or otherwise compromise the aims and method of the Quality model.</li> <li>4. Implement:               <ul style="list-style-type: none"> <li>▪ more careful selection of people in the first place,</li> <li>▪ better training and education after selection,</li> <li>▪ pay based on the performance of the system within which people work (e.g., as in gainsharing),</li> <li>▪ performance assisting interviews —“three or four hours at least once a year”—not to criticize but to provide help to each worker in his or her efforts to improve personal performance, and</li> </ul> </li> </ol>	<ul style="list-style-type: none"> <li>▪ Ownership and executives, managers, and supervisors (EMS) who are open to new knowledge and whose personal values align with the intents of the Quality model.</li> <li>▪ EMS trained in the meaning of leadership <i>and</i> in the following knowledge and skills.               <ul style="list-style-type: none"> <li>▪ Knowledge of the company and its end-to-end approach to delivering value to its customers</li> <li>▪ Knowledge of the processes for which they are responsible</li> <li>▪ Knowledge of the importance of setting the focus on continuous improvement</li> <li>▪ Knowledge about variation including its inherent presence in all processes, its sources and detection, and its mathematical and graphical representation</li> <li>▪ Knowledge of people’s intrinsic desire to achieve valued outcomes and grow in capability</li> <li>▪ Knowledge of the significance of their intrinsic striving for achieving quality</li> <li>▪ Understanding of the proper locus of responsibility for addressing common and special cause variation</li> <li>▪ Skill in detecting the type of variation observed</li> <li>▪ Skill in uncovering and removing the causes of special cause variation</li> <li>▪ Skill in enabling people to experience success and achievement (<i>pride of workmanship</i>) including how to detect and remove barriers to pride of workmanship</li> <li>▪ Skill in eliminating common cause variation and raising the capabilities of systems</li> </ul> </li> </ul>

*Continued...*

**Appendix A: Deming’s Guidance for Implementing of Executive Functions**

<b>Exhibit A2. How People Implementing the Executive Functions Realize the Purpose of Sufficiency (continued)</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Sufficiency (continued)</b>	<ul style="list-style-type: none"> <li>▪ use data to understand and improve systems and people’s performance and not to rate or rank people.</li> <li>5. Make training on the job effective.                             <ul style="list-style-type: none"> <li>▪ Train management and front-line workers in the knowledge and skills needed to succeed in their roles (see list on pages 25–27).</li> <li>▪ Use all modalities in training to ensure that it responds to people’s different learning styles.</li> <li>▪ Modify the work settings so that managers and front-line workers can successfully apply what they learn in training.</li> </ul> </li> <li>6. Build-in personal success for every individual by:                             <ul style="list-style-type: none"> <li>▪ selecting people based on their skills,</li> <li>▪ “creating for everybody interest and challenge, and the joy of work” (Deming, 2000, page 125),</li> <li>▪ training them in the performance of their jobs,</li> <li>▪ supporting them in stabilizing their individual performance at a level that matches the capabilities of the system within which they work,</li> <li>▪ sustaining their efforts to grow in capabilities by moving them to new jobs when their achievement in their current job asymptotes (Deming, 1982a, page 249), and</li> <li>▪ encouraging people to study, advance their learning in new areas, and “continue their education in colleges and university for people who are so inclined” (Deming, 2000, page 126).</li> </ul> </li> <li>7. Build-in workplace success for every worker by:                             <ul style="list-style-type: none"> <li>▪ detecting and eliminating system-caused performance problems or limitations in results produced, and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Skill in detecting systems or actions that deny people pride of workmanship and undermine their intrinsic striving to learn and grow in capability</li> <li>▪ The disposition to use their learned knowledge and skills</li> <li>▪ EMS who:                             <ul style="list-style-type: none"> <li>▪ recognize the corrosive effects of fear on continuous improvement;</li> <li>▪ have confidence in their ability to learn, grow, and sustain their contribution in the face of any problems or challenges to status quo that new ideas present; and</li> <li>▪ are skilled in:                                     <ul style="list-style-type: none"> <li>▪ getting and giving information and ideas,</li> <li>▪ evidenced-based decision making and problem solving, and</li> <li>▪ recognizing people’s feelings, understanding their causes, and avoiding actions that inadvertently provoke fear or otherwise thwart their contribution and success.</li> </ul> </li> </ul> </li> <li>▪ EMS who:                             <ul style="list-style-type: none"> <li>▪ target their communications to people who are capable of acting on them,</li> <li>▪ can form a useful communication, and</li> <li>▪ can assess whether a communication has been successful.</li> </ul> </li> </ul>

*Continued ...*

## Appendix A: Deming's Guidance for Implementing of Executive Functions

<b>Exhibit A2. How People Implementing the Executive Functions Realize the Purpose of Sufficiency (continued)</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b><i>Sufficiency</i> (continued)</b>	<ul style="list-style-type: none"> <li>▪ acting to improve the system by eliminating waste and elevating its capabilities.</li> <li>8. Establish effective communication across the enterprise.                             <ul style="list-style-type: none"> <li>▪ Eliminate communications that exhort or demand behavior the recipient of the communication is not capable of performing.</li> <li>▪ Evaluate a communication by its effects, not its intent.</li> </ul> </li> </ul>	

**Appendix A: Deming’s Guidance for Implementing of Executive Functions**

<b>Exhibit A3. How People Implementing the Executive Functions Realize the Purpose of Synergy</b>		
<b>Result Affected</b>	<b>Required Activities</b>	<b>Required Resources</b>
<b>Synergy</b>	<ol style="list-style-type: none"> <li>1. Ownership and management satisfy Required Activity 1 with regard to ensuring effectiveness (page 103).</li> <li>2. Drive out fear so that everyone may work effectively for the company (Point 8).</li> <li>3. Remove barriers to collaboration between all activities within the business.</li> <li>4. Ensure that everyone understands that achieving the common goal requires teamwork across all contributors.</li> <li>5. Ensure that people have the knowledge and skills needed to work as a team with each other.</li> <li>6. Ensure that forums are established wherein people can relate with each other within and across functions to share information and ideas, solve problems, and otherwise stimulate and support each other in the pursuit of their common aim.</li> <li>7. Establish effective communication across the enterprise.               <ul style="list-style-type: none"> <li>▪ Eliminate communications that exhort or demand behavior the recipient of the communication is not capable of performing.</li> <li>▪ Evaluate a communication by its effects, not its intent.</li> </ul> </li> </ol>	<ul style="list-style-type: none"> <li>▪ Executives, managers, and supervisors (EMS) who:               <ul style="list-style-type: none"> <li>▪ are skilled in building, leading, and participating in teams,</li> <li>▪ can detect internal systems or features of systems that undermine teamwork, and</li> <li>▪ act to eliminate them.</li> </ul> </li> <li>▪ EMS who:               <ul style="list-style-type: none"> <li>▪ recognize the corrosive effects of fear on continuous improvement;</li> <li>▪ have confidence in their ability to learn, grow, and sustain their contribution in the face of any problems or challenges to status quo that new ideas present; and</li> <li>▪ are skilled in:                   <ul style="list-style-type: none"> <li>▪ getting and giving information and ideas,</li> <li>▪ evidenced-based decision making and problem solving, and</li> <li>▪ recognizing people’s feelings, understanding their causes, and avoid actions that inadvertently provoke fear or otherwise thwart their contribution and success.</li> </ul> </li> </ul> </li> <li>▪ EMS who:               <ul style="list-style-type: none"> <li>▪ target their communications to people who are capable of acting on them,</li> <li>▪ can form a useful communication, and</li> <li>▪ can assess whether a communication has been successful.</li> </ul> </li> </ul>



# Vital Enterprises

---

8105 Luling Lane

Austin, TX 78729

Fax: 512.219.9495

[WWW.VITALENTUSA.COM](http://WWW.VITALENTUSA.COM)

