

The Man Who Would Transform Management

by Gerald R. Chester, Ph.D.

Ed was born in Sioux City, Iowa, on October 24, 1890. His father was a lawyer and his mother a musician. Ed was a hard worker and loved the outdoors. He enjoyed his father's love of learning and even earned the nickname "professor" because of his penchant for studying.

Though Ed's parents were educated, his father struggled to support the family. In 1906 the family moved to Wyoming seeking a homestead. He fluctuated between farming and working in town, but his efforts never generated much income and the family suffered in poverty most of Ed's formative years. Ed's mother taught music to provide additional support for the family.

The frequent sound of music in the home was infectious and Ed developed a lifelong love of music. He wrote music throughout his life and mastered the piccolo and the drums. Ed's musical compositions included "I Bow My Knees Unto the Father," "Look Thou Upon Me" (words from Psalms 25), and a special rendition of "The Star Spangled Banner." His music reflected the deep spiritual convictions that guided him all his life.

In 1921 Ed graduated from the University of Wyoming with a bachelor's degree in engineering. In 1923, while working on his master's degree at the Colorado School of Mines, he met and married Agnes Belle, a young schoolteacher. Soon the newlyweds became parents of an adopted daughter named Dorothy.

After graduating with his master's degree in mathematics and physics, he was encouraged by a professor to work on his PhD. In 1924 Ed and his family moved to New Haven, Connecticut, to attend Yale University. In 1928 Ed graduated with a PhD in mathematical physics. His first job was at the Fixed Nitrogen Lab of the United States Department of Agriculture. He worked there more than a decade. In 1930 he experienced the death of his wife Agnes Belle. It was a sad period for Ed, but soon the sadness turned to joy again when he met Lola.

In 1932 Ed married Lola, a colleague at the lab. During the next fifty years, Lola was not only Ed's wife, but also his career partner. She was a colleague, researcher, and the editor of his writings. She also bore Ed two daughters—Diana in 1934 and Linda in 1942.

When working on his PhD, Ed used the summer breaks to work at Western Electric's Hawthorne plant in Chicago—a forty-six-thousand-person sweatshop (mostly women) that made telephones. It was here Ed was exposed to the work of two men who would influence his life: Dr. Walter Shewhart, who became Ed's mentor; and Elton Mayo, an Australian psychologist, sociologist, and organization theorist.

Mayo lectured at the University of Queensland from 1919 to 1923 before moving to the University of Pennsylvania, but he spent most of his career at Harvard Business School (1926–1947) where he was a professor of industrial research.

Ed was influenced by the management philosophy espoused by Mayo. Among the salient points of Mayo's beliefs that influenced Ed the most were the following.

- Individual workers cannot be treated in isolation but must be seen as members of a group.
- Monetary incentives and good working conditions are less important to the individual than the need to belong to a group.
- Informal or unofficial groups formed at work have a strong influence on the behavior of those workers in a group.
- Managers must be aware of these social needs and cater to them to ensure that employees collaborate with the officials of the organization rather than work against it.

Mayo's appreciation for the social needs of people and the importance of people to organizations would help shape Ed's management philosophy in the years to come.

The most influential professional relationship for Ed, however, was with Dr. Walter Shewhart, a statistician at Bell Labs in New York who had earned a PhD from the University of California in Berkeley in 1917. Dr. Shewhart was assigned to improve quality control at the Western Electric Plant in Chicago. During the course of this work, Dr. Shewhart discovered that the enemy of product uniformity was process variation. To produce uniformity meant the variations that occurred throughout the manufacturing process had to be brought under control. Hence the term "process control."

Since the manufacturing process consisted of many steps, each step had to be studied individually and all the steps as a group or system. To understand the impact of variation, control limits needed to be applied and monitored to assure consistent quality control.

Dr. Shewhart discovered that there are two types of variation—common causes and special causes. Common causes are variations that are part of life and are knowable and controllable. Special causes were anomalies or surprises that are largely unexpected and uncontrollable. The key to improving uniformity of quality in a product is to control the common causes and eliminate the special causes. Hence improvements in process control were focused on first eliminating the special causes, and then containing and reducing the common causes.

In 1938 Ed's attention was drawn to a paper Dr. Shewhart had written in 1934, published in the "Review of Modern Physics." The paper dealt with the measurement error in science. Ed

realized that Dr. Shewhart's process control work had application in both business and science. This deepened their relationship; Ed and Dr. Shewhart became collaborators.

In 1940 Ed joined the United States Census Bureau to take charge of statistical sampling for the census. The accuracy of sampling was intensely debated. In the end, sampling was adopted and used for the first time by the census bureau. Ed played a key role in the application of Dr. Shewhart's statistical process control. Functions such as card punching and other data management processes were submitted to scientific scrutiny for the first time. By his own admission, Ed did many new and interesting things during this season.

Ed taught the Shewhart methods of statistical quality control (SQC) to engineers, managers, and production personnel involved in the war effort. Perhaps it was during this time that Ed experienced a change in his heart. Up until this time, his passion had been mathematics and science. But now his interest expanded to include business and manufacturing. This wartime experience enabled him to see more clearly the value of SQC to improve quality in all types of processes.

In 1946 Ed left the census bureau to start his own consulting practice. That same year, the American Society for Quality Control was formed; Ed was a charter member.

In 1947 Ed started his consulting practice. Though he was not formally trained in business, he became a management consultant specializing in SQC. In addition he joined the faculty of New York University as a professor in the graduate school of business where he taught sampling and quality control.

During the next two years, the State Department sent him to Greece to observe elections; he also visited India and Japan and was asked to help plan the 1951 Japanese census.

While Ed was still working as a consultant to the State Department, post-World War II America went into high gear producing consumer products. The altruism (the country's interest trumped profit) of World War II gave way to greed for profit. Quality became secondary to quantity. The SQC techniques Ed taught were regarded as time-consuming and unnecessary.

Compounding the problem, the popular theory of management at the time was advocated by Frederick Winslow Taylor in the early part of the twentieth century. Taylor postulated that human performance could be managed through standards and rules. This led to time and motion studies and quotas. Since many managers had military experience, this top-down rule-oriented approach to management was attractive. Taylor's approach had a level of success with uneducated immigrant workers, but it proved to be slow and cumbersome for most. And for Ed, it was inconsistent with the people-centric philosophy of Elton Mayo.

By 1949 Ed's nascent consulting practice was at a crisis point. Corporate America was paying no attention to the SQC methods that had benefited the companies supporting the war effort. And the management philosophy toward workers was atrocious. Ed was frustrated and

convinced that subordinating quality to quantity was foolish short-term thinking. But no one seemed to be listening. His efforts to promote SQC were largely disregarded.

The painful rejection birthed a new idea. Ed realized that he was focused on the wrong people. While it is important that operational people are committed to SQC, he realized that his real target market should be senior management. Operational people would not submit to the discipline of SQC without senior management support. Ed concluded that the adoption of SQC would require a new theory of management. This was a turning point in Ed's life and would shape the remainder of Ed's career.

While he formulated a new value proposition for his consulting practice, he continued to help the Supreme Command for the Allied Powers (SCAP) prepare for the 1951 Japanese census. This necessitated that he spend considerable time in Japan.

Ed was the consummate learner. He sought to become Japanese as much as was possible. He studied the language, traveled the country, and fellowshiped with the people. Though the Japanese had been the aggressors against the United States in World War II, he felt compassion for the people in post-war Japan who suffered greatly.

Food was in short supply. Many buildings had been destroyed and countless homeless were suffering from exposure to the cold and rain. People were dying from malnutrition, exposure to the elements, and lack of medical care. Japan was dependent on imported food; but there were few manufactured products to export and bring in funds to buy the food. What little they did export was poorly made; hence, the appellation "Made in Japan" meant poor quality.

Ed's heart was deeply touched by the plight of the Japanese people. Their suffering was significant and their options few. The American community in Japan, however, including Ed, did not suffer. There were plenty of warm facilities, food, and medical care. Ed took advantage of his PX privileges. He bought food, including cake and ice cream, and hosted guests (mostly statisticians he was working with) in his hotel room. The guests enjoyed the luxury of full stomachs.

Ed's compassion for the Japanese endeared him to them. They reciprocated his gestures of kindness. He enjoyed their hospitality, traditions, and humor. A bond of mutual trust and affection developed between the Japanese and Ed.

At the same time and unbeknownst to Ed, there was a newly formed organization called the Union of Japanese Scientists and Engineers (JUSE). The purpose of JUSE was to explore ways to help rebuild the country.

Americans from Bell Labs who worked with SCAP became aware of JUSE and thought the introduction of SQC techniques would help the Japanese rebuild quicker. Since the genesis of SQC was Shewhart's work at Bell Labs, the Bell workers sent books to Japan, including Shewhart's book.

The JUSE members were immediately drawn to SQC. Some of the JUSE members knew Ed and knew that Shewhart had mentored Ed, so they invited him to come to Japan and teach them. Ed gladly accepted and was so thrilled to find a client that he declined compensation.

On June 19, 1950, Ed gave the first in a series of lectures to an audience of five hundred. His lectures became so popular that the venues were packed and many were turned away.

Though the enthusiasm for SQC was invigorating, Ed knew that the Japanese interest would not endure without senior management buy-in. Hence, with the help of some of the JUSE members, a meeting was set up for July 13, 1950. Twenty-one senior executives of Japan's leading industrial companies attended. As Ed spoke to the presidents he outlined not only SQC but also his management theory.

Among senior executives, conventional wisdom focused on products, but Ed challenged their thinking. He posited that the customer should be the focus. Hearing and responding to the customer is essential to building world-class products. Furthermore, customers demand great value—desired features at affordable prices. And the only way to consistently produce excellent products is using SQC techniques.

By the end of the summer of 1950, Ed had introduced SQC and his theory of management to most of the major company presidents in Japan. Though some were reluctant, most embraced Ed's theories. JUSE became the training arm for SQC and Ed's management theory in Japan. JUSE trained thousands of engineers and managers during the next decade.

Ed discovered a critically important truth. Transformation of an organization starts with transformation of management. Transformed managers can then set a context in which the organization's workers can also experience transformation.

When Ed challenged the Japanese senior managers, he told them that if they would embrace his philosophy, their products would be world-class within five years. In hindsight it is clear that Ed was wrong. It didn't happen in five years, it happened in four years. Recognition of this reality was slow for many, however, particularly for those in the United States.

From 1950 to 1980, Japanese quality continually increased because of Dr. W. Edwards Deming's work. During this time the United States was unaware of the developing economic prowess of Japan and the impact it would have on US companies. Like the frog in the pan of water that is slowly being heated up to the point that the frog dies, the United States was unaware of the economic heat coming from Japan. Slowly Japan became a leading electronics and automobile provider. Japanese products increasingly took market share away from American companies.

In 1980 NBC aired a program titled "If Japan Can, Why Can't We?" This documentary focused on SQC and Dr. Deming's management methods. Dr. Deming's phone rang nonstop the next day. Struggling companies sought help. The greed-based focus of quantity over quality was failing American companies and they were ready for transformation. Though Dr. Deming was

eighty years old, he was about to enter the prime of his life. And he was in the enviable position of being able to cherry-pick the companies he would serve.

Dr. Deming had learned the importance of preconditions. Before meeting with a potential client, he required the company president to request a meeting. This policy was rooted in his understanding of the importance of senior management buy-in. His management philosophy required transformation that started at the top.

The Deming-prescribed transformation was not top-down management as in the military, but it began with the adoption of Dr. Deming's philosophy of senior management. Then senior management had to set the context and commission the transformation throughout the company. As the people in the company were transformed, the company was transformed. Then transformed companies could produce high quality products using SQC techniques.

As important as SQC was to Dr. Deming, even more important was his management philosophy. This philosophy is expressed in Dr. Deming's "System of Profound Knowledge."¹ Following are the system's four key elements.

- Appreciation of a System
- Theory of Variation
- Theory of Knowledge
- Psychology

Appreciation of a system is about interdependence and purpose. Dr. Deming defined a *system* as "a set of interdependent components that work together to accomplish a purpose." To him, an organization was a system. The purpose of an organization must be clearly known if the system is to function well. He believed strongly in long-term thinking and planning as tools to define and refine the purpose of an organization.

The *theory of variation* is based on the reality that variation is systemic in the universe. To keep a system under control requires management of variation in the processes of the system. Dr. Deming noted two categories of variation—common causes and special causes. Common causes stem from routine events and do not cause processes to deviate from their limits. Special causes are spurious events that cause processes to exceed their limits. The key to quality and productivity is to eliminate the special causes and to minimize the common causes.

Epistemology, the *theory of knowledge*, is essential because knowledge is requisite to achieve quality control. Knowledge enables predictability, a key ingredient for controlling processes. To gain knowledge requires theory. Theory provides a basis for understanding data. Data are the results of observing and measuring processes and systems. Only when the data can be interpreted by theory can knowledge be gained and efficacious corrections made. The essence of Dr. Deming's theory of knowledge was the scientific method. The scientific method has four components: the theory, test of the theory, analysis of the data, and correction to (or validation of) the theory. Dr. Deming expressed this by the Shewhart PDCA (plan, do, check, and act) cycle.

Dr. Deming believed that there are right answers and that proper application of the PDCA cycle would lead to those right answers.

Everything that an organization accomplishes requires people. Understanding people (*psychology*) is therefore a key ingredient in successfully managing an organization. There are three major factors of people management. First, people are not fungible. Second, the best way to motive people is intrinsically not extrinsically. And third, people must be managed.

Dr. Deming's System of Profound Knowledge is rife with biblical thinking although it is not clear that he understood that reality. Note, for example, the following:

Axioms and Corollaries from Deming's System of Profound Knowledge	Reference
1. Epistemology is not relative; hence, there are correct answers.	John 14:6
2. Organizations have a purpose.	James 4:13–17
3. Organizations must function with a view to the future (multi-generational).	Ephesians 1:11
4. Quality is the key to excellence and efficiency.	Colossians 3:17, 23
5. Variation is systemic in the universe due to the fall of man.	Romans 8:19–22
6. An organization is a system of interdependent components working to accomplish a goal.	Titus 2:9–10
7. People are not fungible.	Ephesians 2:10
8. The problems in any organization always begin with the leaders.	Proverbs 29:12
9. Transformation begins with the leaders.	1 Corinthians 11:1

In addition to the System of Profound Knowledge, Dr. Deming noted seven deadly diseases² that impede the quality and productivity of organizations. These diseases can be divided into two general categories as noted below.

Generational transfer and enduring purpose

1. Lack of constancy of purpose to promote business continuity
2. Focus on the short-term (the opposite of constancy of purpose)
3. Evaluation of performance that supports short-term over long-term results

Money issues

4. Management job hopping
5. Running a company based on visible figures (defining success in terms of dollars)
6. Excessive medical costs
7. Excessive liability costs

Dr. Deming's System of Profound Knowledge also led to the development of the Fourteen Points—management philosophy, values, principles, and practices that enable organizations to effectively utilize SQC.

The chart below compares the Fourteen Points to the Beyond Babel Model presented in my book *Beyond Babel*.

Fourteen Points	Beyond Babel Model
Point 1: Create constancy of purpose towards improvement of product and service.	Strategic Planning
Point 2: Adopt the new philosophy.	Biblical Worldview
Point 3: Cease reliance on mass inspection to achieve quality.	Executional Excellence
Point 4: End the practice of awarding business on the basis of price tag.	Executional Excellence
Point 5: Improve constantly and forever the system of production and service.	Executional Excellence
Point 6: Institute training on the job.	Biblical Worldview
Point 7: Institute leadership.	Equally Yoked Leaders
Point 8: Drive out fear.	Biblical Worldview
Point 9: Break down barriers between departments.	Executional Excellence
Point 10: Eliminate slogans, exhortations, and targets for the work force.	Biblical Worldview
Point 11: Eliminate numerical quotas.	Executional Excellence
Point 12: Remove barriers to pride of workmanship.	Executional Excellence
Point 13: Institute a vigorous program of education and self-improvement.	Biblical Worldview
Point 14: Put everybody in the company to work to accomplish the transformation.	Biblical Worldview

If you are familiar with the Beyond Babel Model, you will note that none of the Fourteen Points directly addresses the Customer Validation phase. Clearly, Dr. Deming valued feedback from customers. It was a key element of the Shewhart Cycle (plan, do, check, act). The “check” step included customer feedback when appropriate. It appears that Dr. Deming developed the Fourteen Points in response to his efforts to get senior management to embrace SQC and it was not necessarily intended to be a complete list.

The last decade of Dr. Deming's life was truly his magnum opus—the culmination of a lifetime of study and learning. His theory about how to efficiently produce quality products finally had its full expression. Even though the barrier to becoming a Deming client was high, his client list expanded dramatically.

His clients included well-known companies such as Ford, Honeywell, AT&T, and Campbell Soup. He also served less-well-known companies, such as, Malden Mills, Janbridge, Inc., and

Microcircuit Engineering. Dr. Deming was persuaded that every industry and company could benefit from his theories. Hence, he worked tirelessly to teach, train, and coach every client.

After the NBC program in 1980, his four-day seminars expanded from tens to thousands in attendance per session.³ He continued as an adjunct professor and served his consulting clients.

At an age when most people retire, he was in his prime. It is interesting to note that both Dr. Deming and another famous management theorist, Dr. Peter Drucker, never retired. Both men worked until they died in their nineties (Deming at 93 and Drucker at 95). Our last years can and should be our best years—the years when we have acquired true riches, the skill to live well in God's universe (wisdom).

Dr. Deming died before the Six Sigma era. Six Sigma is a tactical approach to SQC.⁴ While Dr. Deming's approach included SQC, his approach went beyond to embrace a theory of management that was required to support SQC.

Dr. Deming's penchant for quality was pragmatic. He knew that quality would lead to more efficiency and productivity. When the focus of an organization was on productivity, this led to poor quality. Poor quality led to inefficiency, increased reworking, and low productivity, which meant that more work had to be expended for each unit of useful production. He famously said that he wanted to train people to "work smarter not harder," a phrase I heard my own father utter, which tells me he was listening to Dr. Deming.

As with all great men, Dr. Deming lived with an enduring purpose. He felt called to and devoted his life to the transformation of western management.⁵ Western management was jaundiced by a lack of clear purpose, short-term thinking focused on money, and the misunderstanding and misuse of people. His concern about the diseases of western management was so great that at the 1985 presentation of the Deming Award in Japan, he warned the Japanese to guard against adopting flawed western management practices.⁶ He saw Japanese companies, who had built high quality enterprises based on his theories, entering into business relationships with American companies infected with bad management practices. He cautioned the Japanese companies about being unequally yoked (in regard to management theory) with American companies. He believed that such relations would undermine the Japanese devotion to sound management theory.

Dr. Deming died at age ninety-three. He was eulogized as a model for the rest of us. At his funeral the following statement was made: "His religion was a very strong part of the fabric of his life. He composed hymns, sang in the choir, said his prayers, and followed the Golden Rule as best a man could."⁷

Others noted, "Perhaps it was this underlying belief and faith in God that accounts for all the other remarkable traits of this man: his honesty, respect for others, readiness to help others, love of family, and desire to change the world for the better."⁸

And someone else noted Dr. Deming's belief "that business has a social responsibility to survive, to grow, and to provide jobs."⁹

For all the good that Dr. Deming did, he was a work in process. Notwithstanding his profound theories, his understanding of a biblical worldview of work was incomplete and still growing when he died.

No one will ever fully master a biblical theory of management and business. For each person called to the business world, the challenge is to continuously grow in the understanding of God's universe and the application of that understanding to management and business. Business is a tool of dominion; hence to obey the Creation Mandate (Genesis 1:26–28), we must continuously improve our skill and ability to manage organizations and produce excellent products.

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1. *The New Economics* by W. Edwards Deming, MIT Press, Second Edition, 1994, 92ff.
 2. *Out of the Crisis* by W. Edwards Deming, MIT Press, 2000, 97ff.
 3. *The Deming Management Method* by Mary Walton, Berkeley Publishing Group, 1986, 246.
 4. "Deming Management Philosophy and So-Called Six Sigma Quality" by David Wayne, <http://www.q-skills.com/Deming6sigma.htm>.
 5. "W. Edwards Deming: The Story of a Truly Remarkable Person" by Robert B. Austenfeld, Jr., May 10, 2001, <http://www.iqfnet.org/Ff4203.pdf>, August 24, 2009, 90.
 6. *The Deming Management Method* by Mary Walton, Berkeley Publishing Group, 1986, 246.
 7. "W. Edwards Deming: The Story of a Truly Remarkable Person" by Robert B. Austenfeld, Jr., May 10, 2001, <http://www.iqfnet.org/Ff4203.pdf>, August 24, 2009, 90.
 8. Ibid.
 9. Ibid.