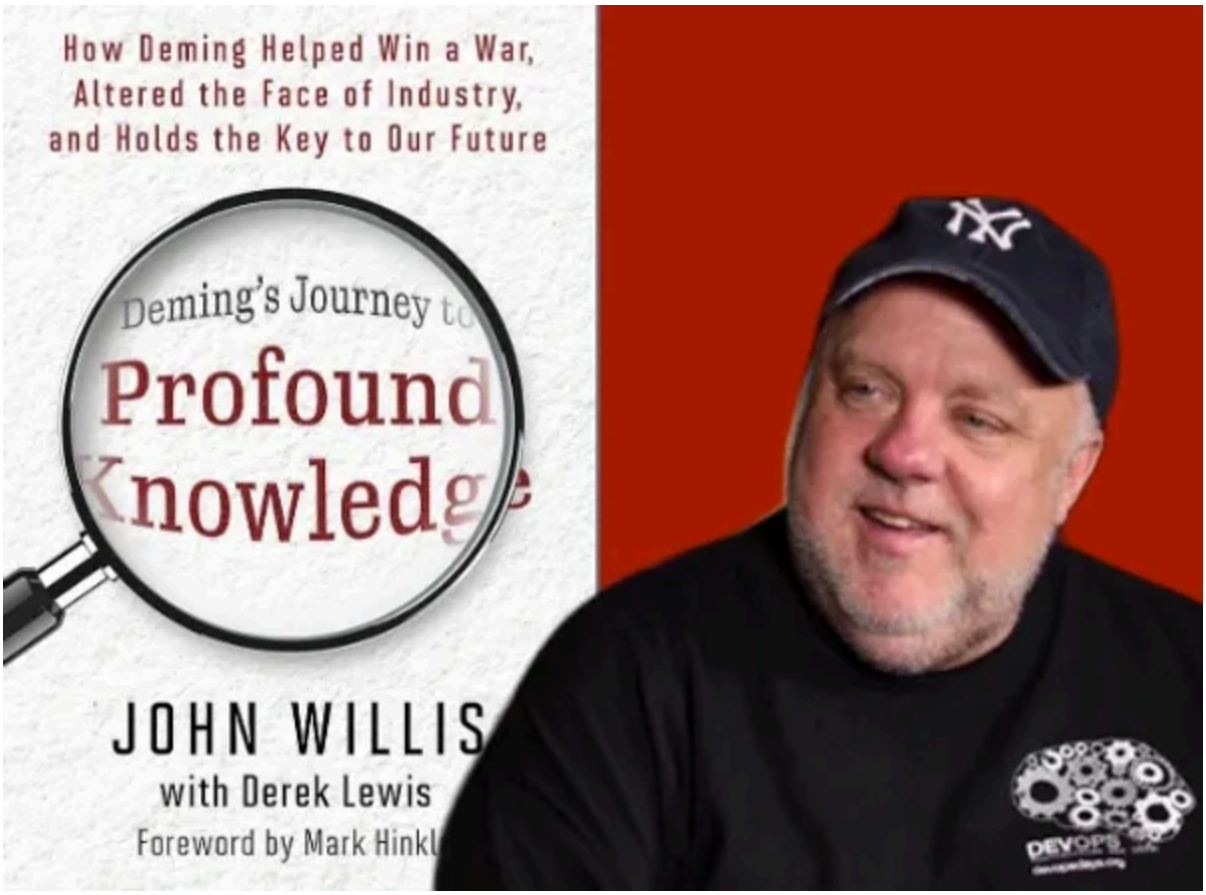
BOOK NOTES: Deming's Journey to Profound Knowledge



Announcement

Starting March 21, 2025, every Friday from 1 PM to 2 PM Eastern for nine weeks. Find out more at www.leanbook.club.

Book:
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“John Willis has looked deep into Dr. Deming's history and teachings and profoundly explains his profound knowledge. Read this book and you will understand like never before the wisdom and sound advice of Dr. Deming.” —Jeffrey K. Liker, author of *The Toyota Way*

“A thoroughly entertaining and educational look at Deming, a man whose insights are fundamental to modern software development. This book includes delightful stories of those around Deming who influenced his work and helped create the foundation for agile and DevOps.” —Jim Whitehurst, Senior Advisor at IBM

From the birth of modern industry to winning WWII to Japan's Economic Miracle, W. Edwards Deming helped shape some of the most profound moments in modern history. Deming, an American engineer and statistician, is widely recognized for his contributions to the field of quality management. But his teachings go beyond quality management; they influence not only how we work today, but also how we can continue to succeed in the future.

Part business history, part biography, part journey into deep business sense, bestselling author John Willis captures the full picture of Deming's life and influence. Most importantly, Willis reveals the experiences that led to Deming's greatest discovery: the System of Profound Knowledge, a collection of fundamental truths that show how any system or process can be transformed into something greater.

From the real-life Rosie the Riveter to a hacker writing US cybersecurity law, Deming's ingenuity and system of thinking changed how we think in the modern world. This book shows how we can take that influence and continue to apply it our own future.

“Deming's Journey to Profound Knowledge is a must-read for any student of Lean, Agile, quality, the Toyota Production System, and continuous improvement—or any leader who seeks to create a culture of excellence in their organization.”

When: Starting March 21, 2025, every Friday from 1 PM to 2 PM Eastern for nine weeks. Find out more at www.leanbook.club.

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Next Steps: Sign up, order your book*, and read the first week’s assignments on

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Agenda

1. Week 1, 3/28/25, Chapters 1-3

2. Week 2, 3/28/25, Chapters 4-5
3. Week 3, 4/4/25, Chapters 6-8
4. Week 4, 4/11/25, Chapters 9-10
5. Week 5, 4/18/25, *Bye Week No Book Club*
6. Week 6, 5/2/25, Chapters 11-13
7. Week 7, 5/9/25, Chapters 14-15
8. Week 8, 5/16/25, Chapters 16-17
9. Week 9, 5/23/25, Chapters 18-19, Author Q&A TBA

Sign-up:
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Author's Website: https://www.linkedin.com/in/johnwillisatlanta/

Author: I've had an extensive career in IT management spanning over 45 years, with a body of work that includes "Deming's Journey to Profound Knowledge" and "The DevOps Handbook." My current research interests lie in DevOps, DevSecOps, IT risk, modern governance, and audit compliance. Over the years, I've sold companies to Docker and Dell, and I was a founding member of Opscode (now Chef).

I also founded Gulf Breeze Software, an award-winning IBM business partner known for its expertise in deploying Tivoli technology for enterprises. I've authored six IBM Redbooks on enterprise systems management, and I was the founder and chief architect at Chain Bridge Systems. All in all, I've authored over 11 books and launched more than 10 startups.

Notes:

1. Week 1, 3/28/25, Chapters 1-3
    a. Introduction: What Ed Said
        i. “If Japan Can … Why Can’t We?”
        ii. Whereas the rest of the industrialized nations of the world lay in ruins after World War II, the US was left virtually untouched. As the only game in town, US industry reigned supreme.
        iii. “Golden Age* of Capitalism.” From 1948 to about 1970,
        iv. Edwards Deming first went to Japan in 1950 to teach industrial productivity through statistical analysis. He was so successful that Japan’s annual award for productivity is called “the Deming Prize.”
        v. It’s no stretch to say that the Allies won because of the quality produced by Rosie the Riveter. Rosie out-manufactured her male predecessors. And she did this using something called statistical process control (SPC).
        vi. Deming’s System of Profound Knowledge
        vii. These four elements of Profound Knowledge are: 1. A Theory of Knowledge: How do we know what we believe we know? 2. A Theory of Variation: How do we analyze and understand what we know? 3. A Theory of Psychology: How do we account for human behavior? 4. An Appreciation of Systems/ Systems Thinking: Are we seeing the bigger picture?
    b. PART I: FOUNDATIONS OF PROFOUND KNOWLEDGE
    c. Chapter 1: Humble Origins & Non-Determinism
        i. The opposite of analytic thinking is systems thinking (a.k.a. appreciation of a system): the ability to see how one thing is part of a larger, connected system.
        ii. The WHO focused only on the immediate problem and failed to consider how one “solution” might trigger a chain reaction. They failed to see the whole system. This is exactly what I meant earlier about Profound Knowledge: profound change requires Profound Knowledge, and one of the tenets of Profound Knowledge is systems thinking, an ability to see the situation in its greater context.

iii. Analytical thinkers say, “Mission accomplished. Now, let’s go home.” Systems thinkers say, “What were the results? Now, let’s make it even better.”
iv. Non-determinism played a crucial role in shaping Deming’s worldview and began to lay the foundations for his System of Profound Knowledge. For one, it taught him that long-established and long-held beliefs weren’t necessarily true; the entire structure of the physical world was being rethought and reexamined.
v. the underpinnings of our very existence are random. That idea of randomness would be born out through his fascination with statistics, which in turn would inform his understanding of variation (the second element in the System of Profound Knowledge).
vi. look beyond black-and-white cause and effect. It forced him to look at problems as multifaceted, complex systems, where changing one factor might have far-reaching, and unintended, consequences. This was the beginnings of his understanding of the fourth element of Profound Knowledge: Systems Thinking.

d. Chapter 2 The Jungle in Paradise
i. The workers are handicapped by the system, and the system belongs to the management.—Dr. W. Edwards Deming, Out of the Crisis
ii. The workers of Hawthorne understood the significance of the work that came out of their factory—and they were a part of it.
iii. Though he wouldn’t fully appreciate it until after he left, the factory was a testing ground for his Theory of Knowledge
iv. Hawthorne was the seedbed for Deming’s understanding of Profound Knowledge.
v. where Ford treated people like cogs in a machine, Taylor approached workers as if they were machines themselves—machines that could be optimized for maximum efficiency, given the right physical and psychological conditions.
vi. His social experiment measured the change in workers’ output at different levels of lighting. He found that any change in lighting increased employee productivity. However, he later discovered that the rise in output came from workers knowing they were being closely watched, not from how much light they had available. This discovery was dubbed the Hawthorne Effect, the act of subjects changing their behavior in response to being observed.
vii. To be blunt, this perspective is based on the idea that workers don’t want to work. That given the opportunity, they will shirk as much as possible and be as lazy as they can. There’s an assumption of underlying antagonism between “them” (the workers) and “us” (the managers).
viii. “Piecework is man’s lowest degradation.”
ix. Chapter 3: The Birth of Quality Control & Standardization

e. Chapter 3 The Birth of Quality Control & Standardization
    i. Our system of make-and-inspect, which if applied to making toast would be expressed: “You burn, I’ll scrape.”—Dr. W. Edwards Deming,
    ii. The quality of anything humans made, by and large, depended on the skill of the craftsman who made it. Everything built, crafted, or made was unique.
    iii. by and large the quality of anything humankind made depended on the skill of the craftsman who made it.
    iv. However, with the ten guns he had, he demonstrated to Congress that the parts from any one musket could be switched out with another. If the gun broke, the Army wouldn’t have to buy a whole new gun—just a replacement part. The legislators quickly mandated that all such equipment be standardized.
    v. American System was a profound evolution in industrial development.
    vi. Standardization: That’s what changed the world. That’s what spurred the Machine Age and everything that came after. Factories standardized their products and processes. Manufacturing quality had evolved from one craftsman’s skill to an era of standardization.
    vii. From his background in non-determinism, Ed understood that randomness and variation are simply facts of life … even in standardized manufacturing processes. He must have mulled for hours on how to find the solution to process deviations and defects inherent to the operations of Hawthorne.

2. Week 2, 4/4/25, Chapters 4-5
    a. Chapter 4: The Root of All Evil
        i. Misunderstanding variation is the root of all evil.—Botchagalupe
        ii. One of the linchpins of Deming’s System of Profound Knowledge is understanding uncertainty; that is, applying statistics to variation (which in this case would be the differences between how many bricks each person counted). This allows us to quantify certainty versus uncertainty.
        iii. Put another way, statistics is about how confident you feel when dealing with uncertainty.
        iv. operationalism. It is based on the idea that we can know the meaning of something only if we have a way of measuring it.
        v. Gauss’s method would later become the basis for global positioning systems, or GPS.)
        vi. Shewhart’s method was a paradigm shift. It was the first example of anti-Taylorism, where using math and statistics enabled management to see defects as results of the process instead of the workers.

vii. Shewhart turned this into a cycle, what Ed would later call the Shewhart Cycle: Figure out what you want, make it, inspect it, figure out what caused the defects, go fix it, and then go through the whole cycle again, using feedback from your mistakes to continuously improve production quality.
viii. Even after Deming tweaked the Shewhart cycle, he still referred to it throughout his life as the Shewhart wheel. Despite this, his students in Japan called it the Deming cycle. Today, you might recognize it as the "plan, do, check, act" method, or simply the PDCA cycle.
ix. Deming came to rename check as study. To his way of thinking, check was too much like the go/ no-go inspection process of checking manufactured products. He believed the better term was study, which implied approaching the results with a scientific curiosity to investigate and understand why things turned out the way they did.
x. Shewhart classified defects as being caused by one of two things. The first was chance, what Deming would later call common cause. These were variations that could be predicted and should be planned for. The second was assignable, or what Deming would call special cause,§ causes that couldn't be predicted and shouldn't be planned for.
xi. The real value of Statistical Process Control is that it allows you to observe variation and look at random versus non-random patterns. A random pattern represents a stable process, a.k.a. a process "under control." A non-random pattern is a useful predictor of potential defects, signaling an amount of uncertainty in the process. And here is the root of all evil: misidentifying variation.
xii. According to Shewhart's Statistical Process Control, managers shouldn't waste their time trying to fix every single problem. Instead, they should identify which ones can be predicted and fix them. Identify the ones that will likely never happen again and don't make knee-jerk decisions. As a result, managers can spend their time on things they can control and waste very little of their time on things they can't.

b. Chapter 5: Pragmatist
i. Le Grand K. Sounds like the stage name of a French rap artist.
ii. two types of knowledge: a priori, meaning before the fact, and a posteriori, meaning after the fact.
iii. In the Enlightenment's way of thinking, you could know something without needing evidence to prove it. Descartes wrote, "I think; therefore, I am." He knew something without needing any kind of outside validation or evidence—a priori knowledge. Another example would be knowing that one plus one equals two. Philosophers don't need to run an experiment to know the answer is two; they just do.
iv. A posteriori knowledge is when you know something because, and only because, you have the evidence to prove it.

v. Jazz may be America's one truly original musical art form.
vi. 1. How much more money would we make with an extra 9? 2. Does adding that extra 9 cost more than we would make?
vii. C. I. Lewis's two types of knowledge: a priori (drawing your conclusions beforehand) and a posteriori (drawing conclusions after the fact).
viii. Walter Shewhart used the philosophy of pragmatism to completely rethink manufacturing. Most know the result of this today as the PDSA cycle (plan, do, study, act), what Ed called the Shewhart cycle. It has become the template to improve virtually every type of system or process:
ix. 1. First, gather evidence to create a hypothesis: What needs to change? 2. Second, make the change. 3. Third, review what happened: Is the process better or worse? Why? 4. Last, decide where to go from here: Revert to before? Iterate further?
x. Think about the shift in mentality. Before PDSA, the managers at Hawthorne Works would look at the huge pile of scrap at the end of the day and say, "It is what it is. Sure wish we could find better workers."
xi. With PDSA, managers had a formal tool to help them track bad quality, make a change, and see if it improved product quality.

c.

3. Week 3, 4/11/25, Chapters 6-8
    a. PART II: APPLICATIONS OF PROFOUND KNOWLEDGE
    b. Chapter 6: Dr. Deming Goes to Washington
        i. They believed statistical sampling was the way forward. Done right, a small sample group could act as stand-ins for everybody.
        ii. Shewhart gave us a way to continually improve a process. • Deming gave us a way to continually improve a system. • Shewhart showed us how to optimize an existing process. • Deming showed us how to rethink the process altogether. • Shewhart used statistics to improve manufacturing. • Deming used statistics to improve everything.
        iii. And it worked, saving the Bureau $ 263,000 annually—roughly $ 5 million today. More importantly, it made the census counts more accurate, leading to a more representative and fairer democracy in the US.
        iv. With the successful introduction of statistical analysis into the US Census system, Deming took the first dramatic step toward generalizing Shewhart's methods beyond manufacturing to all systems thinking.
    c. Chapter 7 Rosie & World War II
        i. We won because we smothered the enemy in an

avalanche of production, the like of which he had never seen, nor dreamed possible.—US Lieutenant General William S. Knudsen Director of Production, US Under Secretary of War

ii. But how did any US worker manage to quickly adapt to converted factories and new technologies while doubling, tripling, or quadrupling production and simultaneously increasing production quality? The answer lies with Deming and is largely considered the reason the Allies won the war.

iii. Factories all over the country converted from making everyday items to producing war supplies. The Lionel Toy Train company switched over to manufacturing maritime supplies such as compasses. Alcoa, a storied aluminum company, built airplanes. Ford Motor Company created B-24 Liberator bombers. Even the Mattatuck Manufacturing Company making something as mundane as upholstery nails converted to manufacturing rifle cartridge clips.

iv. After the war, Soviet leader Joseph Stalin would raise a toast: “Without American production the United Nations could never have won the war.” 8

v. Mass production won the war. But not by using the production processes of the past. No, US industry vastly scaled production while simultaneously improving quality through statistical process control and statistical sampling.

vi. But according to the American general who oversaw the domestic war production effort, the Allies didn’t win because of D-day or the atom bomb. The Axis powers didn’t lose because of a misstep or overreaching. Victory came because the US outproduced the rest of the world. As noted previously, by the end of the war, the US had supplied two-thirds of the Allies’ military needs. The quantity—and, perhaps more importantly, the quality—of American manufactured goods had risen dramatically.

vii. The Allies won the war because of Rosie, and Rosie succeeded in no small part thanks to Deming’s course in manufacturing statistical process control.¶ Importantly for Ed’s journey to Profound Knowledge, the Stanford classes demonstrated once again that the theory of variation and the theory of knowledge could work in virtually any

industry with the same results: increased quality, decreased waste, and an ever-improving system.

d. Chapter 8 CLASSIFIED
    i. It is not enough to do your best; you must know what to do, and then do your best.—Dr. W. Edwards Deming
    ii. “Systems thinking is a way of making sense of the complexity of the world by looking at it in terms of wholes and relationships rather than by splitting it down into its parts. It has been used as a way of exploring and developing effective action in complex contexts.”
    iii. bounded rationality,
    iv. We’re not computers that can run every possible scenario in a matter of milliseconds. Humans can process only so much information at a time. When we get in a car wreck, our reactions are more instinctual than rational. After the fact, we can look back and say, “Why didn’t I just pull the steering wheel to the left? I would have missed the other car completely!”
    v. Ed’s classified work at Aberdeen revolved around using, developing, and teaching sampling techniques to test war munitions.
    vi. They recognized that variation was inevitable and, thus, sampled a fraction of each manufacturer’s output. Then they focused their quality efforts on those whose bombs or bullets fell outside of acceptable control limits.
    vii. Japan’s engineers had understood long before its military the vast American superiority in engineering and manufacturing, and above all in mass production.
    viii. On multiple fronts, Ed—armed with his budding discovery of the tenets of Profound Knowledge—played no small part in the main reason the Allies won World War II.

4. Week 4, 4/18/25, Chapters 9-10
    a. PART III: INTERNATIONAL IMPLICATIONS OF PROFOUND KNOWLEDGE
    b. Chapter 9: Samurai Statistics
        i. Some 80% of all factory and production sites had been decimated from bombing runs; manufacturing was a tenth of what it’d been before the war.
        ii. Shewhart introduced control charts (a visual depiction of statistical process control) at Bell Labs in 1924.

iii. Here's the irony. The US used statistics to win the war, even as Japan threw statistics out the window. Afterward, Japan used statistics to win the economic war, even as the US threw statistics out the window.
iv. "You don't know a control chart?" they shouted. "How do you plan to manage quality?" 15
v. Few people understand the reality of life in a war-torn country. Few people want to understand it. Not Ed—he wanted to see it. Wanting to experience Japan firsthand, he defied GHQ's standing orders that Allied personnel were to remain inside the green zone.
vi. never accepted any money from the Japanese. He donated to the people of Japan all the fees from his lectures—and he would make over two dozen visits over the next thirty years—as well as the not-insubstantial royalties of his translated books.

c. Chapter 10 JUSE & the Gentle Giant
    d. Shewhart had a Japanese mirror image, it would have to be Ken'ichi Koyanagi. You could always find the man at the fringes of great stories and initiatives happening around Japan. But for all his influence, you could never find him at the center of anything … including his own life.
    e. Perhaps more importantly, Ed knew that unless it included top management, the classes were unlikely to succeed.
    f. He would later note that, to his knowledge, he was the only man as part of an occupied force who'd ever been voluntarily invited to return to the conquered country by the conquered.
    g. They were wonderful students, but on the first day of the lectures a horrible thought came to me, "Nothing will happen in Japan; it'll be a farce unless I talk to top management." By that time I had some idea of what top management must do. There are many duties to be performed that only the top people can do: consumer research, for example; work with vendors, just for example. I knew that I must reach top management. Otherwise it would just be another flop as it was in the states.
    h. I immediately talked to American friends who knew the right Japanese and before long, I was talking to Mr. Icharo†† [sic] Ishikawa.… I had 3 sessions with Mr. Ishikawa; and at the end of the third session, he understood what I needed to do. He sent telegrams to … top level men to come to the Industry Club the next Tuesday at 5 o'clock to hear Dr. Deming. 24
    i. Deming's one-hour presentation was less a lecture than an impassioned plea. He believed they could rebuild. Indeed, according to him, "I was, in 1950, the only man in Japan who believed that." 26 He said that if they would do what he told them, they would be an economic force again in five years.
    j. Mount Hakone. One attendee would later say, "Here was this tall, strange American telling us that we would be an important force in five years if we

did what he said. We really didn't believe him, but in order not to lose face, we did what we were told and it worked."

k. By year five, the country had an enviable economic growth rate of 9%–10% per year. By the 1960s, Japan's growth rate climbed even higher during the fabled Japanese economic miracle. By 1968, the country was the second-largest economy in the world—bigger than the UK, Italy, France, and the USSR. It would hold this distinction until 2010, when China edged it out.
l. Years later, Ed would come to be called "the Prophet." He had seen what no one else could see. This was perhaps one of his greatest contributions to the people of Occupied Japan: he inspired hope, if not confidence.
m. beautiful sentiment from The Reckoning: Arriving at a difficult time for the Japanese, Deming never condescended to them. He looked at them, and, unlike so many of his fellow citizens, he saw not their poverty but their purpose. At a moment when Americans were powerful and rich and the Japanese weak and vulnerable, he, unlike many Americans, never made them feel inferior. On the contrary, he genuinely reassured them. If this brilliant American expert believed in them, they could begin to believe in themselves. 29
n. JUSE established the Deming Prize.
o. Demingism was not only taking root—it was working. Deming's reputation as an oracle was secured. From then on the quality-control movement had its own dynamic. The top people came to Deming with a desire to learn that bordered on obsession. Watching them, listening to their intense, often awkward quotations, Deming knew that he was taking on an odd kind of permanence, that every single thing he said was being not so much memorized as codified. 32
p. To honor his invaluable and kind efforts on behalf of the nation of Japan, in 1960 Deming received from the Prime Minister on behalf of Emperor Hirohito himself the Second Order Medal of the Sacred Treasure, the highest honor a foreigner can receive.

q. Because of Ed's persuasiveness, he was able to get in front of 80% of the nation's industrial capital. There, he convinced the CEOs that, to succeed, quality had to be a way of thinking embraced by everyone in the organization—starting at the top. Look at the CEO of the cable manufacturer who cornered Deming at that reception. When's the last time you heard of a CEO being involved in the statistics of production? That's a testament to the influence Deming had.
r. Toyota's presidents and chairmen would remark, "There is not a day I don't think about what Dr. Deming meant to us. Deming is the core of our management."

5. Week 5, 5/2/25, Chapters 11-13
    a. Chapter 11: The Butterfly Effect
        i. Over O'Neill's thirteen years as chief exec, Alcoa quintupled its net income and added $ 27 billion to its market cap … all while becoming one of the safest industrial companies in the world. How'd he do it? In The Power of Habit, Charles Duhigg wrote, he did it "by attacking one habit and then watching the changes ripple through the organization." 1
        ii. Don't Compete to Win At Aberdeen, Ed saw firsthand what it was for an entire nation's industrial infrastructure to set aside competition and market share to focus on a single, unified national effort.
        iii. Deming gave Japan a fundamentally different view on how to practice capitalism. Instead of companies competing with each other to get a bigger slice of the pie, they should cooperate together to grow the size of the pie instead.
    b. Chapter 12: Made in Japan
        i. There is not a day I don't think about what Dr. Deming meant to us. Deming is the core of our management.—Shoichiro Toyoda, former president and chair of Toyota, and grandson of Sakichi Toyoda
        ii. One of the lesser understood discussions around Deming's impact in Japan is that he learned at least as much—if not more—from the Japanese as he taught them. He came to Japan with a full understanding of the Theories of Knowledge and Variation and a deep appreciation for systems thinking. But it would be there in Japan that he culminated his final piece of Profound Knowledge, one that he'd begun thinking about at Hawthorne Works: a Theory of Human Psychology.
        iii. At some point, thieves broke into one of Sakichi's factories and stole the plans for a loom. Sakichi's son said, "The thieves may be able to follow the design plans and produce a loom. But we are modifying and improving our looms every day.… They do not have the expertise gained from the failures it took to produce the original.… We need only continue as always, making our improvements." 2
        iv. As mentioned, there was another element of culture that readily dovetailed with what Ed taught, not just at Toyota but in the greater Japanese culture: acting as a collective, unlike the typical American approach of rugged individualism. When someone mopped the floors in a Toyota factory, they weren't just cleaning. They were making the cars that their family, friends, and neighbors would drive. They were rebuilding their country for their fellow citizens and their children. There was some serious purpose pushing the top end of that mop stick.
        v. While president at General Motors, Alfred Sloan purportedly said, "We aren't in the business of making cars. We're in the business of making money." On the other side of the Pacific, a rising star at Toyota Motors

would come to say, “We don’t make great cars. We make great people who make cars.”

vi. Piggly Wiggly was the tipping point where Ohno went all-in on his fledgling just-in-time practices.

vii. Toyota couldn’t afford those luxuries. In fact, during the postwar years, they couldn’t afford much of anything. They had to find ways to turn Toyota into a lean, mean, automaking machine with little margin for error.‡ Kiichirō, Eiji, and Ohno made three important decisions—three concepts that have become staples of successful manufacturing for over fifty years now: 1. Streamline their manufacturing process to wring out every ounce of waste they possibly could (a.k.a. just-in-time manufacturing). 2. Institute statistical process control, not only at Toyota but in their huge network of suppliers. 3. Produce in small lots (instead of massive batches like Ford and GM).

viii. Toyota Way: • Kaizen: continuous improvement (predating Shewhart but perhaps inspired by Sakichi reading Henry Ford’s book). • Jidoka: the machine stops when there’s a problem. • Andon cord: any worker can stop the assembly line when there’s a problem. • Go to gemba:** the supervisor immediately goes to the source of the problem. • Just-in-time and kanban: replacing push systems with pull, “made-to-order,” systems.

ix. Toyota being the poster child of Japanese thinking. The company was, as Steven Spear calls it, a community of scientists. 12 In general, Japan embraced a culture of failure and—as Ed had been preaching for years—placed blame squarely on the shoulders of managers and the manufacturing process instead of the worker. Moreover, he found a culture of intrinsically motivated employees, something he’d vaguely glimpsed at Hawthorne Works.

x. The America of the fifties and sixties … scorned Deming and his teaching and [had] in effect driven him abroad to find his students. America in those years was rich and unchallenged.… The theory of management then asserting itself in American business was a new one: Managers should no longer be of the plant. They should come from the managerial class, as it arrived from the best colleges and business schools.… Their experience should not be practical.… Practical experience was, if anything, a handicap. 17

xi. The US had no use for its native son. American companies didn’t need people with technical degrees to advise managers and executives. Manufacturing was no longer about quality but quantity. Deming used to tell the story about the engineer who worked for Western Electric during the war. The soldier returned in the mid-fifties to find the sister company of Walter Shewhart’s organization didn’t use control charts anymore. 18 That’s how low a priority quality had become.

xii. He would go on to use this as a metaphor for systems thinking: if singers can't hit the notes, don't blame the singers—rewrite the song. In other words, don't blame the workers for a poorly managed system. Just fix the system.

c. Chapter 13 Rising Sun, Falling Eagle

i. You know how the Japanese can make things this way and we can't? They kaizen 'em. A process of deliberate, patient, continual refinements. Each year the products get a little better, a little smaller, a little cheaper. Americans don't think that way. Americans are always looking for the quantum leap, the big advance forward. Americans try to hit a home run—to knock it out of the park—and then sit back. The Japanese just hit singles all day long, and they never sit back. So with something like this, you're looking at an expression of philosophy as much as anything.—Michael Crichton, Rising Sun

ii. Knowing that the Japanese love baseball, he invites them to play a "friendly" game with a simple wager: Keaton: "We just play for beer." Japanese manager: "So do we!" Keaton: "And afterwards, we piss for distance." Japanese manager: "For us, it's accuracy." 4

iii. The effectiveness of lean manufacturing became so prevalent that even reluctant companies were forced to adopt it.

iv. While US companies read about Toyota's "just-in-time" system, they rarely embraced the "respect-for-human" side of the equation. They focused on the process but forgot the people.

v. What GM lacked was a systemic understanding of Profound Knowledge. GM, like other American companies, had copied the methods but not the motives. Companies needed more than smarter manufacturing: They needed smarter management.

vi. That's how America rediscovered Ed. A neighbor. "If Japan Can … Why Can't We?" aired June 24, 1980, to fourteen million people.

6. Week 6, 5/2/25, Chapters 14-15

a. Chapter 14 Demingmania

i. Deming said that Nashua was the first American company to fully listen to the rest of his teachings. This was thirty years after he'd begun working with Japanese industry.

ii. While Nashua had also practiced quality by inspection at one time, Deming led the company to abandon that system. 4

iii. In these lectures, he taught not only practical statistics but six core management principles: 1. Work closely with a few suppliers. 2. Work closely with the custokers' trust. 6. Continuously imprmer. 3. Tear down

the walls within the company. 4. Eliminate inspection. 5. Earn worove operations.

iv. When Ed stood before those top managers at Ford in 1981, he made a Mount Hakone–like prophecy: If Ford would do what he said, in five years they would lead the market. In 1986, Ford was the most profitable carmaker in America—a title it hadn't held for over sixty years.

v. A strong component of Deming's approach to management is called MBM, or management by means, the counter to management by objectives (MBO) and management by results. The key difference between MBMs and MBOs is Deming would ask by what means did you achieve your goal? If you don't know how you achieved your objective, how do you know if you can do it again? But when you understand the means, you can consistently achieve and even supersede your objectives. It's the difference between giving a person fish and feeding them for a day and teaching them to fish and feeding them for life.

vi. 14 Points for Management as presented on the Deming Institute website:

1. 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. 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. 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. 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. 5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. 6. Institute training on the job.
7. 7. Institute leadership. 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. 8. Drive out fear, so that everyone may work effectively for the company.
9. 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.

10. 10. Eliminate slogans, exhortations, and targets for the workforce 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 workforce.
11. 11. Eliminate work standards (quotas) on the factory floor. Substitute leadership. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.
12. 12. 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. 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.
13. 13. Institute a vigorous program of education and self-improvement.
14. 14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

vii. Seven years later, DARPA (the military's Defense Advanced Research Projects Agency) would create the DARPA Grand Challenge, a fully autonomous race with a cash prize to the winner. In its first year, 2004, held in the Mojave Desert, the best vehicle traveled a total 7.32 miles out of the 150-mile roadway. No winner was declared. Yet the true race was on: the creation of self-driving vehicles. A month before the Mojave mishap, two men founded Tesla Motors in Palo Alto. A year later, Elon Musk, flush with cash from his stake of the sale of his PayPal shares, became the largest shareholder. Three years later, in 2008, Musk would force out the two founders to become CEO. The same year, Tesla's first car, the Roadster, began to roll off the factory line. Six months later, the government loaned Tesla $ 465 million, part of the US government's $ 8 billion Advanced Technology Vehicles Manufacturing Loan Program. In April of 2010, Toyota was forced to close the NUMMI factory after GM reneged on their joint-venture partnership. The next month, Tesla bought it. By October, the site was producing the Tesla Model S. In 2014, Musk announced Tesla Autopilot, its advanced driver-assistance system.

viii. The Prophet Honored in His Own Country Deming's homeland finally began to take note of what he had to say. He would eventually receive more than a dozen honorary degrees from universities, including his alma maters Yale and the University of Wyoming. In 1987, President Ronald Reagan awarded him the National Medal of Technology; Deming had to decline attending the event because he'd already committed to a previous

client engagement. That is, Ed thought the work was more important than the accolade.

b. Chapter 15 Dr. Quinn, Medicine Woman
    i. Thus began a three-year friendship/ apprenticeship that saw Doris traveling with Deming all over the United States, at his side not only during his four-day seminars§ but also in consulting for individual companies. Moreover, he became a part of her extended family, like a favorite uncle.
    ii. He was always kind to the workers. He was harder on the supervisors and harder still on the managers. But when it came to senior leadership, he let them have it. The Master had no qualms about letting them know what their failures were and how their thinking was fundamentally flawed.
    iii. Doris once asked him, “Aren’t they going to be upset with you?” In his deep, gravelly voice, he answered, “They don’t pay me to sugarcoat the truth.”
    iv. “You know? I shouldn’t have been so hard on her. It’s not her fault that she didn’t know how to interpret special-cause and common-cause variation. That’s a failure on the part of upper management for not providing the proper training.”
    v. If you were going to fly with him for five hours, you’d better have five hours’ worth of questions. As Doris says of Deming, the greatest achievers are often insatiable learners.
    vi. Dr. Quinn joined the faculty of Vanderbilt University Medical School, teaching quality improvement. After fifteen years there, she accepted the position of director of process improvement and quality education for MD Anderson Cancer Center, the largest cancer center in the world.
    vii. Most likely, it was Doris’s New Guinea story with the magic men that sparked this unique friendship, as it was a real-life example of the theory of psychology Deming was finalizing in 1989.

7. Week 7, 5/16/25, Chapters 16-17

a. Part IV The Next Generation of Profound Knowledge
b. Chapter 16 The Digital Cambrian Explosion
    i. the Age of Information, starting in 1971. This revolution had its turning point in 2000—a transition I call the digital Cambrian explosion.
    ii. Ford’s genius was bringing together the innovations of interchangeable parts, Adam Smith’s division of labor (from The Wealth of Nations), and his invention of the assembly line.
    iii. Wilke’s secret to success? A culture of operational excellence—built on lean manufacturing, statistical process control, the theory of constraints, and purpose-built software.‡

iv. The fourth and final piece of Wilke's culture of operational excellence (purpose-built software) suspiciously aligns perfectly with Deming's first admonition in his 14 Points for Management: constancy of purpose toward improvement of product and service.
v. In Frankenstein, Mary Shelley wrote, "Nothing is so painful to the human mind as a great and sudden change."
vi. Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate. Something interesting is happening.
vii. This is a minuscule example of how a new type of combinatorial innovation has changed the world today—just one of hundreds, perhaps thousands of examples of how Ed's contributions to Amazon and the greater digital Cambrian explosion have shaped the world.
viii. The Development of Agile and Lean Software Development
ix. To his great surprise, from this three-day meeting emerged the groundbreaking Agile Manifesto. You would be hard-pressed to measure the economic and social significance of these talks and the ensuing document. The twelve principles outlined in the Manifesto, however, are primary drivers of the digital Cambrian explosion. They resulted in agile software development, and agile is what gave us Amazon and all the other companies built on Amazon's cloud-computing platform.
x. To hit the highlights: as part of the agile development process, teams work in short iterations to release software incrementally and iteratively so that the release process can be streamlined and the software can be released automatically.
xi. envelope game.‡‡ There are two teams, and each team has three people. The first person on the team folds a piece of paper, the second one stuffs it in the envelope, and the third one seals the envelope. One team has to work in batches of ten at a time. That is, the first person has to fold all ten pieces of paper before handing all ten over to the stuffer. The second person has to put all ten pieces into their respective envelopes before turning them over to the sealer. The last person seals all ten envelopes. This represents the old approach to software development, where huge pieces of software were slowly passed from team to team, each doing their part, much the same way factory assembly lines worked under Fordism. This is sometimes described as a "waterfall process."
xii. The second team does the same thing, with one difference: instead of preparing the envelopes in batches, they used a method from the Toyota Way, called single-piece flow. As soon as the first person folds their first paper, they immediately hand it off to the next person and begin folding

the second piece. The stuffer immediately stuffs the envelope and hands it off to the third person. While the envelope sealer is completing their task, the stuffer has already received their second piece of paper, and the paper folder is working on their third.

xiii. all ten pieces of paper and be in the middle of stuffing the envelopes; all of that work would have been wasted and all ten pieces of paper would be scrapped. The agile team, on the other hand, would have used only a portion of the first kind of paper (so the remainder wouldn't have to be thrown away). They could more quickly adapt to the new situation with less rework and less waste. The agile team would also make more money more quickly. Say they got a dollar for every envelope they delivered. The batch team would have to wait until all the envelopes in the first batch were sealed before mailing them and making $ 10. The agile team, on the other hand, would make $ 1 within moments. They would make $ 10 while the first team was still stuffing envelopes and would go on to make $ 20 by the time the first team delivered their initial batch of ten.§§

xiv. (The key difference between Mary's lean software development and agile was that lean development focused on waste, whereas agile focused on delivery.) For those of us in the software development industry, lean methodology was like throwing gasoline on a growing fire. Again, Mary was an intellectual descendant of Deming.

xv. DevOps added two significant components: collaboration between developers and operations and explicit examples of how to automate both agile and lean principles.

xvi. "Think of it this way: DevOps is a lighthouse bringing all of us ops and sys-admins‡‡‡ lost at sea back home." I think that did the trick.

xvii. They called it The Phoenix Project. (He included DevOps in the subtitle, I might proudly add.)

xviii. The DevOps Handbook.

c. Chapter 17 What Would Deming Do?

i. PA common disease that afflicts management and government administration the world over is the impression that "Our problems are different." They are different, to be sure, but the principles that will help to improve quality of product and of service are universal in nature.—Dr. W. Edwards Deming, Out of the Crisis

ii. In Deming's masterwork, The New Economics, published in 1993, the Master simplified his 14 Points for Management into the four elements of the System of Profound Knowledge: 1. The Theory of Knowledge: a theory for knowing how you know something 2. The Theory of Variation: a theory of how to measure what you know. 3. The Theory of Psychology: a

theory of how to understand human behavior 4. Appreciation of Systems and Systems Thinking: an understanding of interconnectedness

iii. To profoundly change a system, whether that be how you manufacture a product or how we educate students, requires know-how outside of that system.

iv. When trying to transform people, organizations, and even governments, the System of Profound Knowledge is very much the same: you have to expertly balance multiple elements in order to see a perfect picture through the lens. In the case of Deming's system, there are four. Without all four, the route to profound change or transformation isn't clear.

v. The first element, the theory of knowledge, essentially asks, "How do you know what you know?" Whereas people often react to problems with knee-jerk reactions and helter-skelter decisions, Deming saw that every action should be grounded in tangible evidence, i.e., the philosophy of pragmatism.

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vii. Third, Deming was a student of human behavior and psychology. In fact, Doris Quinn told me that in the four-day seminars she assisted him with, perhaps only 20% was devoted to variation and statistical process control.

viii. The fourth element is the knowledge of systems thinking. Few people intuitively think in terms of a system; Deming was one of them. Deming would refer to this as an appreciation of a system. To him, seeing the world as a network of interconnected systems was as natural as gravity: regardless of your perspective or understanding, it was a fact of life. The world working in systems wasn't a theory for him; it simply was.

ix. Most people can see only the problem in front of them. The Master, on the other hand, could "see" the factors, elements, and variables that contributed to it. He saw how everything worked together, how the factors of a problem came into existence several steps ago. For Deming, the method was more important than the outcome, like how Sakichi Toyoda prioritized improving his machines over simply building as many as possible, or how Paul O'Neill prioritized safety, which naturally resulted in higher-quality operations. Get the process right and you'll naturally get the

right results. Put another way: don't optimize the components of a process—optimize the process itself.

x. Before you can make something better, you have to understand it. Deming said you can't understand something completely unless you're looking through the lens of all four elements.
xi. If this seems a bit shady, read Flash Boys: A Wall Street Revolt by Michael Lewis.
xii. Deming told managers that only 6% of problems were due to human error; 94% of problems were due to system error. And since the system is the responsibility of management, he meant that 94% of problems are caused by bad management.
xiii. A Theory for Knowledge
xiv. Without learning, an organization dies. A tool for learning is the PDSA loop, and it's an essential part of testing software code these days.
xv. A Theory of Variation
xvi. A Theory of Psychology

8. Week 9, 5/16/25, Chapters 18-19, Author Q&A TBA

a. Chapter 18 Deming's Dark Legacy

i. The illiterate of the future will not be the person who cannot read. It will be the person who does not know how to learn. —Alvin Toffler
ii. How could Deming's System of Profound Knowledge have the company avoid this? Well, first, you'd use the Theory of Knowledge: you think you're safe because you protect the perimeter, but how do you know that? Then, you'd use the Theory of Variation: How are you analyzing and measuring this? You'd use the Theory of Psychology to change the habits of the organization to better understand the importance of security concerns, e.g., letting someone into the building without checking their ID. Last but not least, there's the need to have a systems approach to understand the purpose and importance of security in your organization.
iii. We call them white hat hackers. This comes from old Westerns, where the bad guys always wore black hats while the gun-slinging good guy wore a white cowboy hat.
iv. Josh Corman started a grassroots organization named I am the Cavalry. His message is that we can't wait for the cavalry to save us, be that the government or others; we have to save ourselves.
v. Under the Emergency Medical Treatment and Labor Act, hospitals aren't supposed to discharge patients with life-threatening conditions. In practice, over a quarter of hospitals are in violation of the act, according to a research study spanning 2005–2014.

vi. Three, a study revealed that 85% of hospitals lack even a single qualified cybersecurity
vii. While it sounds like science fiction, the dark web is quite real. Everyone is familiar with the “surface web,” the publicly accessible websites we see every day. Most people have interacted with the “deep web.” This is simply the parts of the internet accessible only with logins and passwords, like your email or bank account. There is a third, hidden layer, where the really nasty stuff happens, called the dark web, often accessed via The Onion Router (usually referred to as simply “Tor”).
viii. A software bill of materials is the digital version: software vendors must document where they obtained the code in their software, be it open source, proprietary, or commercially available. This is straight out of supply-chain management and the Toyota Way.
ix. At some point, you have to hand it to him: Deming’s teachings are eternal and universal.

b. Chapter 19 Out of the Cyber Crisis
   i. #1: Mission Focused “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.”
      1. Shannon Lietz, the person who coined DevSecOps. She says security needs to be designed into an organization’s systems—not something that gets bolted on after the fact.
      2. it’s leadership’s responsibility to educate the entire organization about the roles and responsibilities related to cybersecurity. Annual staff trainings aren’t nearly enough.
      3. few truly have a purpose. Fewer still have a shared purpose across the organization.*
      4. The mission of any organization should be to responsibly provide its products and services to others.
   ii. #2: Adapt or Die “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.”
      1. If he were here today, he’d shout at organizational leaders, “Wake up! The way you’ve approached IT for the last four decades still doesn’t work! The problems are too complex; simple solutions won’t work. You have to embrace a new way of thinking about security and safety.”
   iii. #3: Stop Inspecting Quality “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.”
      1. Inspecting a product once it’s built doesn’t improve its quality. Inspection merely discovers a lack of quality. Quality isn’t something to be added at the end but to be designed into the

product from the get-go. Deming said quality isn't so much about improving the product as it is about improving the process.

iv. #4: The Fallacy of the Lowest Bidder "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."

v. #5: Never Stop Improving "Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs."

vi. #6: Train for a Systems Thinking Mindset "Institute training on the job."

1. 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, reward for the top, punishment for the bottom. Management by objectives, quotas, incentive pay, business plans, put together separately, division by division, cause further loss, unknown and unknowable.
2. When people are being trained, they need to understand what the job involves and why it's done in the first place. Then, they need to continually learn through practical experience, experimenting with new methods and ideas, studying results, and striving to be as perfect as pragmatically possible.

vii. #7: Don't Manage—Lead "Institute leadership. 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."

1. Deming often gave his take on the old adage: "In God we trust. All others must bring data."

viii. #8: No Fear "Drive out fear, so that everyone may work effectively for the company."

1. blameless post-mortem. Instead of assigning a problem or vulnerability to a certain person, blame would be placed on the system.
2. This is exactly what Deming meant when he told managers to "drive out fear so that everyone may work effectively for the company."
3. Aristotle, came from the Greek philosopher's famous quote, "The whole is greater than the sum of its parts."

ix. #9: No Silos "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."

1. Goldratt talked about the mistake of isolated improvements—what he called local optima—that sacrificed what was best for the system as a whole. Another term for this is the inefficiency paradox, where optimizing the individual components of a system results in a suboptimal system.

x. #10: No Slogans "Eliminate slogans, exhortations, and targets for the workforce 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 workforce."

1. Simple slogans won't solve our problems. Never have. Never will.

xi. #11: Quality, Not Quotas "Eliminate work standards (quotas) on the factory floor. Substitute leadership. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership."

1. When organizations care more about numbers than quality, they incur enormous costs.

xii. #12: No Barriers to Pride "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. 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."

1. The New Economics, Deming wrote, "The aim of anybody, under the merit system, is to please the boss. The result is destruction of morale. Quality suffers."
2. He admonished managers to remove the barriers that robbed people of pride in their work. Deming believed—and study after study supports his belief—that, in general, people want to do good work. They want to be proud of what they do and what they have accomplished. Company practices, processes, and culture get in the way of that, demoralizing them.

xiii. #13: A Self-Learning Organization"Institute a vigorous program of education and self-improvement."

1. Andrew Clay Shafer says, "You are either a learning organization or you are losing to one that is."

xiv. #14: Transformation Is for Everyone "Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job."

1. In business, the word transformation gets bandied about a lot, but Deming selected this word with care. It means a thorough or dramatic change.
2. Deming already did his part. As he would say at the end of each lecture, “You have heard the words; you must find the way. It will never be perfect. Perfection is not for this world; it is for some other world. I hope what you have heard here today will haunt you the rest of your life. Then I have done my best.”9