“Eureka! Ranch’s unconventional approach has won raves from some of the biggest corporations.”
—CNN

“When Doug meets Disney, creativity ne’er wanes. Our team explodes when he jump-starts our brains!”
—Ellen Guidera, VP, The Walt Disney Company

“Eureka! Ranch . . . has developed more new products (or offshoots of existing ones) than any other organization in America.”
—New York Magazine

“America’s #1 Idea Guru”
—A&E Top 10

“America’s Top New Product Idea Man”
—Inc. magazine

“Eureka! Ranch goes to any length to encourage a fresh perspective . . . clients say it works.”
—Wall Street Journal

“Doug Hall has a method to his madness, a rigorous, quantifiable process for inventing breakthrough ideas for clients. Unlike many creative gurus hustling ideation wares in the corporate marketplace, Doug makes it imperative that his Eureka! Inventing processes are quantified every step of the way.”
—Todd Datz, Features Editor, CIO magazine

“Hall has a habit of thinking big. His credentials are impeccable.”
—Unlimited magazine, Scotland

“[Doug Hall is] an eccentric entrepreneur who just might have what we’ve all been looking for, the happy secret to success.”
—Dateline NBC

“Doug takes all the mystery out of marketing and replaces it with a systematic and logical system. For anyone who takes their marketing role seriously, Doug’s books are a must-read.”
—Kip Knight, VP, eBay
DRIVING EUREKA!

Doug Hall

FOUNDER OF EUREKA! RANCH, INNOVATION ENGINEERING INSTITUTE, AND BRAIN BREW CUSTOM WHISK(E)Y
Other Books by Doug Hall

_**Jump Start Your Brain**_  
A Proven Method for Increasing Creativity up to 500%  
with David Wecker

_**Maverick Mindset**_  
Finding the Courage to Journey from Fear to Freedom  
with David Wecker  
(Paperback Title: _Making the Courage Connection_)  

_**Jump Start Your Business Brain**_  
The Scientific Way to Make More Money

_**Meaningful Marketing**_  
100 Data-Proven Truths and 402 Practical Ideas  
For Selling MORE with LESS Effort  
(Paperback Title: _Jump Start Your Marketing Brain_)  

_**North Pole Tenderfoot**_  
A Rookie’s Adventures and Misadventures  
Walking in Admiral Peary’s Footsteps

_**Jump Start Your Brain 2.0**_  
How Everyone at Every Age  
Can Be Smarter & More Creative
Acknowledgments

This book covers my life’s work and learnings. However, I am not the sole author. To paraphrase Sir Isaac Newton, if there is anything on these pages or in our college courses and tools that is valuable, it’s because I have stood on the shoulders of giants. The following people helped create the Innovation Engineering movement and this book—some in small ways, many in big ways. They are the heart, brains, and soul of Innovation Engineering. It is a challenging thing to make a list like this. I am sure that this list of more than 350 is wrong, but it is a useful start. I am sure that I have missed some important people. I apologize for my mistakes. I will correct this list in a future edition. Thank you to those mentioned and those whom I have missed.


It would be irresponsible of me to not make special mention of a handful of people who have gone above and beyond what is reasonable in their support of me and this movement.

Debbie Hall  My friend, wife, and love of 40-plus years. Her wisdom shapes my thinking and makes me smarter every day.

M. Bradford “Buzz” Hall  My dad. He taught me what Dr. W. Edwards Deming taught him. I will never forget his passion when talking about how leadership needs to focus on fixing the system, not blaming the workers.

Dr. W. Edwards Deming  I never met Dr. Deming in person. I’ve learned about him from having discussions with those who worked with him and from reviewing his writing, videos, and audio recordings. My favorite Dr. Deming quote was his reaction to someone who was complaining that he had changed something in his teaching. His response was simple: “I will never apologize for learning.”

Maggie Nichols  The CEO of the Eureka! Ranch. Maggie was the first person to articulate the vision that we could enable everyone to be able to innovate.
My Mentors on Dr. Deming and System-Driven Leadership  Kevin Cahill, Walter Werner, Bill Conway, Claire Crawford-Mason, Bob Mason, and Barry Bruns. I treasure every meeting, email, and phone conversation with each of them.

Robert Kennedy  Retired president of the University of Maine. Before Innovation was popular, he saw that it was a critical life skill that all students would need to learn.

Roger Kilmer and Aimee Dobrzeniecki  Retired from the US Department of Commerce. They were among the very first to see that innovation was not going to be optional for US manufacturing companies.

Jesse Bechtold, Larry Stewart, and Bob Zider  Three pioneers who gave me strength when I needed it.

The Eureka! Ranch and the University of Maine Innovation Engineering Teams  My dad taught me that smart people always hire and/or work with people who are smarter than they are. Innovation Engineering exists because the following people are smarter than I am: James Beaupre, Lydia Carson, Chris Coleman, Scott Dunkle, Bruce Forsee, Joe Girgash, Brad Hall, Debbie Hall, Margaret Henson, Renee Kelly, Corie Roudebusch Spialek, David Lafkas, Jeremy Lancaster, Greg Lemmon, Margo Lukens, Angela McCue, Jesse Moriarity, Maggie Nichols, Hemant Pendse, Maggie Slovonic Pfeifer, and Jake Ward.

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Introduction

System-driven innovation, like the System of Profound Knowledge that my grandfather taught, is a new mindset that you have to commit to. . . . Your market’s going to change, your business is going to change. It gives you such an amazing advantage, because it teaches you how to look at and deal with those changes by thinking differently.

—Kevin Cahill, from the interview in the appendix
Executive Director of the Deming Institute
Grandson of Dr. W. Edwards Deming

The aim of this book is to teach you how to create a Meaningful Difference with your career, team, company, and community. This is accomplished through the Innovation Engineering system for thinking smarter, faster, and more creatively.

The need to think smarter, faster, and more creatively is broadly accepted in today’s fast-changing world. What is not understood is how to do it. Innovation Engineering teaches you and everyone you work with a reliable system for creating fresh ideas and, even more important, how to turn them into reality more successfully. And, as you will learn in chapter 13, when just 10% of your team, company, or community has UNSHAKABLE belief in their ability to innovate a culture of innovation is created.

Innovation Engineering defines innovation in two words: Meaningfully Unique. When a product, service, work system, or job candidate is Meaningfully Unique, customers are willing to invest their time, energy, and money into it.

The never-ending quest for meaningful uniqueness is at the heart of this book, my life, and the Innovation Engineering movement.

Each of our students defines meaningfulness differently. Some find meaning in improving manufacturing, government, or even junior high school teaching systems. Others find meaning from creating smarter methods for rehabilitating prison inmates, caring for nursing home
residents, anchoring North Sea oil rigs, or growing the impact of a non-profit. Some students find meaning in the invention of amazing new food products, medical devices, internet services, financial services, or industrial equipment.

The breadth and depth of application we are observing, from employing the Innovation Engineering mindset and methods, are both amazing and humbling.

**Innovation Engineering**

Innovation Engineering is a new field of academic study and management science. It reimagines how change is led, managed, and delivered. It accelerates the creation and development of more profitable and successful products and services. However, **new products and services are just 10% of the innovation opportunity; 90% of the innovation opportunity lies in systems for working smarter.** These include operational systems, production systems, sales and marketing systems, finance and legal systems, strategic alignment systems, idea decision systems, rapid research systems, and the list goes on and on.

Ideas for growth and efficiency implemented successfully are the outward manifestation of Innovation Engineering. The more meaningful impact lies in the transformation that occurs within each person. When employees and leaders are confident that they can innovate, a chain reaction of positives occurs. They feel good about their jobs, companies, and careers. And, they have hope for the future, as they know they can change and adapt as the world around them changes.

**What makes Innovation Engineering reliable is that it’s grounded in data, backed by academic theory, and validated in real-world practice.** Collectively, it’s the number-one documented innovation system on Earth. More than 35,000+ people have been educated in Innovation Engineering classes, and over $16 billion in growth and system improvement projects are in active development.

**Innovation Engineering Case Study**

One small example of Innovation Engineering effectiveness is Brain Brew Custom Whisk(e)y. It’s a collaboration between my Eureka! Ranch team and Edrington Distillers of Scotland (distillers of the Macallan, Highland Park, and other super luxury spirits).
Using the Innovation Engineering system, we have invented and patented a Time Compression technology that crafts amazing whiskies and bourbons in 40 minutes (not years or decades).

The technology enables such richness of flavor with easy drinking smoothness that our products win 2 to 1 and 3 to 1 in head-to-head taste tests versus luxury scotches and bourbons. Two of our bourbons won top honors—double gold medals—at the North American Bourbon and Whiskey Competition, and one was a unanimous choice Double Gold at the San Francisco World Spirits Competition.

Even more exciting, the new technology enables the creation of custom whiskey. As we say, “The world doesn’t need another whiskey, but everyone needs their own whiskey.” Time Compression technology makes it possible for everyone to create their own unique mash bill and then apply a blend of Old World, New World, and craft aging styles for a one-of-a-kind original taste. To learn more, visit brainbrewwhiskey.com.

We understand that traditionalists may see Brain Brew Custom Whisk(e)y as being disrespectful to “the way it’s always been done.” However, the target audience for our innovations consists of forward-thinking craft spirits enthusiasts who are more interested in taste than tradition. Brain Brew is the ultimate demonstration of the Innovation Engineering mindset—traveling from invention and through development to test market in 10 months and winning top honors in international whiskey competitions in 18 months. Our marketing slogan is a variation of the famous
Apple commercial: “Some call us the crazy ones . . .” It articulates our courage and commitment to our mission.

Some call us the crazy ones . . . and we’re OK with that.

**Pedigree**

Innovation Engineering was developed through experiences, ideas, and advice from innovation leaders at corporations such as Toyota Manufacturing, Trek, Procter & Gamble, The Macallan, The Walt Disney Company, American Express, Schlumberger, AT&T, Nike, Nestle, Humana, Kimberly-Clark, GOJO Industries, Cintas, Daimler, HoneyBaked Ham, Dunnhumby, and thousands of other companies that are less well known.

The development of Innovation Engineering also includes experiences, ideas, and advice from leaders of nonprofits such as March of Dimes; National Wildlife Federation; Alliance for Strong Families and Communities; College Board; Student Conservation Association; Earth Share; CoreChange; and INPEACE; the governments of the USA, Canada, Ireland, Scotland, and South Korea; and dozens of colleges and universities.

The impact on nonprofit organizations was confirmed by research by a team from Stanford University. They studied various innovation methods across a range of nonprofits. They found that most “innovation methods” don’t actually result in innovative solutions. Most simply result in “innovation as usual.” However, Innovation Engineering was found to be unique. The researchers concluded that it resulted in true breakout innovations. This validates that system-driven innovation is not just for commercial companies. Nonprofits that measure results based on delivery of their mission can also realize dramatic gains from it.

**The Importance of Engaging Everyone in Innovation**

When employees are enabled to innovate, they are more engaged. Gallup reported that only 31% of employees feel engaged; 69% feel nonengaged. This breaks down to 38% of management and 29% of Millennials. Both of these numbers are horribly low. Millennial disengagement is particularly concerning when you look at demographic trends.

Innovation Engineering provides a system that enables all employees (Baby Boomers, Gen Xers, and Millennials) to think, create, AND take
action on their ideas. When you enable employees to use their brains and imaginations, a cultural transformation occurs. In just six months, our tracking studies find measurable improvements on factors such as “the courage to take action,” “optimism,” “quality of work,” and the organization being “a great place to work.” Basically, work is fun again!

How Innovation Engineering Engages Everyone

Virtually every existing innovation/creativity program preaches the importance of embracing a childlike, extroverted, creative spirit. This works for the 15% of the population who have a right-brain creative thinking style.
However, it doesn’t work for the 85% of the work population with a logical left-brain thinking style.

Asking left-brain logical thinkers to let loose makes them uncomfortable. It often causes them to disengage or, even worse, become active resisters. And, without the 85% who are logical, there is virtually no chance that a Meaningfully Unique innovation will become reality. That’s because left-brainers are critical to accomplish the engineering, finance, production, and operational work that is required to make meaningful change happen.

Innovation Engineering methods and tools are designed to engage both left- and right-brain thinkers. Projects are focused with clear and motivating strategic missions that speak to both project vision and boundaries. Idea-sparking stimuli feature both right-brain trends/insights and left-brain technologies/patents. Decisions are grounded in data as opposed to corporate politics. Math and writing are both used to enable deeper thinking about ideas. Feasibility challenges are openly confronted not ignored. Key issues are tagged as “Death Threats” and resolved through disciplined and documented Fail FAST, Fail CHEAP cycles of learning.

The result is an unleashing of a culture of whole-brain thinking. The 15% who have a right-brain thinking style have new hope with Innovation Engineering, as there is a system for turning their ideas into reality. The 85% who are left brain are more engaged because for the first time, for many, they see an innovation system with structure, clarity, and discipline.

**Quick Backstory on System Thinking**

Innovation Engineering applies the system thinking of Dr. W. Edwards Deming to innovation, strategy, and the way we work together. For those who don’t know of Dr. Deming, here’s a quick overview.

After World War II, the Japanese economy and manufacturing base were in shambles. The country had a negative net worth. To rebuild it, American General Douglas MacArthur supported a program to educate business leaders in smarter ways of working. In 1950, Dr. W. Edwards Deming, a statistician from Powell, Wyoming, conducted a series of seminars in Japan. His mission was to teach system thinking to Japanese business leaders. He showed them how to approach manufacturing as a system of interconnected parts—instead of as a series of silos—to increase quality while also reducing costs.
The leaders of Japanese companies embraced the message. Japanese industry was so thankful for Dr. Deming’s contribution to the rebirth of their economy that they named their national quality award the Deming Prize. The Japanese emperor awarded him the Second Order of the Sacred Treasure in recognition of his contributions to Japan. Shoichiro Toyoda, the first president of the Toyota Motor Corporation, described Dr. Deming’s impact on Toyota this way:

Every day I think of what he meant to us. Deming is the core of our management.

—Shoichiro Toyoda, first president, Toyota Motor Corporation

I believe that the key to Dr. Deming’s success was that he blended logical, rational discipline with emotional, soul-inspiring hope. He used his statistical science to enable the human spirit. At many of his four-day seminars he would start by saying: “Why are we here? We are here to come alive, to have fun, to have joy in work.”

In the early 1980s, as Dr. Deming predicted would occur, the Western world faced the invasion of higher-quality products from Japanese manufacturers at better prices. It was called the Japanese miracle. In just 30 years they had risen from the ashes of war to challenge the world.

Dr. Deming’s role in the Japanese transformation was “discovered” in the USA with the airing of an NBC White Paper documentary by Clare Crawford-Mason titled “If Japan Can, Why Can’t We?”

The television special featured Dr. Deming and the story of Nashua Corporation, where the CEO, Bill Conway, had hired Dr. Deming to help him transform his company. The TV special discussed Nashua’s success with applying Dr. Deming’s mindset to the company’s carbonless paper division. It was a story I knew well, as my father, M. Bradford “Buzz” Hall, had helped lead that project as director of central engineering.

The TV special made Dr. Deming, at the age of 80, the management rock star of the 1980s. He led up to 40 (four-day) Deming Seminars a year, well into his nineties. His teaching of system thinking ignited the greatest change in how companies are managed in 100 years or more.

More on the history of Dr. Deming’s work can be found in the back of this book, along with an interview with Kevin Cahill, president and executive director of the W. Edwards Deming Institute and grandson of
Dr. W. Edwards Deming. Additional information, including a link to the original NBC documentary, can be found at the Deming Institute website: deming.org.

The Factory Represents Just 3% of the Opportunity

Derivatives of Dr. Deming’s teachings are classically packaged today under names such as Total Quality, 6 Sigma, Lean, and the Toyota Production System. Each has had, and continues to have, a transformational impact on factories.

However, the factory was and is but a small part of Dr. Deming’s vision. In his book *The New Economics*, Dr. Deming wrote that *the factory represented just 3% of the opportunity for company improvement from applying system thinking:* “The shop floor is only a small part of the total. Anyone could be 100% successful with the 3% and find himself out of business.” He felt that 97% of the opportunity for improvement from applying system thinking lay in applying it to innovation, strategy, and the way we work together.

Just as Dr. Deming taught leaders how to transform manufacturing quality from a random act to a reliable science, Innovation Engineering teaches how to transform innovation from a random act to a reliable science.

*To survive, companies need a durable competitive advantage. No technology, plant, product, or market will ever be that. The only durable competitive advantage is your people and their ideas.*

Yes, Innovation Engineering takes its founding principles from Deming, and I am sure Deming would have loved it. I am also quite confident that Juran, Crosby, and Taguchi would approve. The key issue to me is that Innovation Engineering creates a repeatable process that leads to a durable competitive advantage.

—Walter Werner, Deming Master

What Held Back the Application of System Thinking to Innovation?

Applying system thinking to innovation struggled because of a lack of data. In a factory, it’s easy to gather data from production equipment.
Innovation is more difficult because it involves “human systems,” which are classically unstable and unmeasured.

To paraphrase Dr. Deming: Much of what matters about innovation has been immeasurable, unknown, and unknowable. The good news is that, today, innovations and the impact of various innovation methods are measurable.

For more than 30 years, client projects at the Eureka! Ranch have served as a “laboratory” for innovation measurement experiments. PhDs and statisticians have run experiments and analyzed data from thousands of real innovation projects. To develop a significant database from idea to creation to eventual marketplace success took a lot of time and patience. Fortunately, the corporations mentioned previously—and others—were willing to participate in experiments and data collection requests over many years.

Statistical analysis of the database enabled us to identify what separates successful from unsuccessful innovations. The analysis also identified principles and methods for helping everyone think smarter, faster, and more creatively.

Thanks to the support of organizations large and small, we have the world’s first and only complete database from idea creation, week by week through development, and all the way to market. It is this quantitative database that makes it possible to apply system thinking to innovation.

The Mission of the Innovation Engineering Movement

The Innovation Engineering movement is a global community of innovation pioneers dedicated to system-driven innovation. Our mission is . . .

To change the world through systems that enable innovation by everyone, everywhere, every day, resulting in increased speed (up to 6x) and decreased risk (up to 80%).

Systems that Enable Innovation by everyone, everywhere, every day is the core of our mission. It’s also the right thing to do.

William Hopper, coauthor of The Puritan Gift, explained to me that enabling employees was the key to the Japanese Miracle: “In 1961 when Sumitomo Electric Industries won the Deming Prize, they did it in a totally different way. Before their victory
the winner’s quality efforts were driven by experts. Sumitomo enabled all of the workers to be a part of the process of quality.”

The Deming prize committee in 1961 wrote of the win by Sumitomo:

One of the most important differences between Sumitomo Electric and other companies which have been awarded the Deming Prize is that in Sumitomo people from the top down to foremen worked together. This was an important difference from what happened in previous winning companies and may have contributed much to success.

A newspaper story in Japan on Sumitomo’s success told how they enabled frontline employees:

Foremen were trained to prepare control charts and became fully able to use them themselves. They then changed working methods so that younger workers could make products at a high yield. Before this quality-control method was introduced, only some highly trained technicians, with special skill and experience, could make products at a high yield. Afterwards, foremen were able to change the production method so that high yield was attained.

Sumitomo spent several million yen to introduce the new quality-control procedures, but the profit from them was in the hundreds of millions. The experience of Sumitomo is that if all employees cooperate to improve the method of manufacturing the product, a very high standard can be achieved.

—shared by Kenneth Hopper

As Japanese companies enabled frontline employees, industry gains from Deming’s teachings grew exponentially. Kenneth Hopper created the graph of productivity gains (shown on the following page) for an article he wrote in 1979. Note the dramatic growth in Japan starting in 1961 with the win of the Deming Prize by Sumitomo.

Innovation Engineering is dedicated to the same kind of shift—from innovation being the job of a small group of “gurus” to enabling innovation by everyone, everywhere, every day. The result is a transformation in innovation results.
**Increased Innovation Speed:** Increased Speed is important if we are to take advantage of the opportunities created by today’s digital and global economy. The good news is that order-of-magnitude increases in speed are possible. Digital tools and modern work systems make it possible to create, validate, manufacture, and make real new products, services, and internal ways of working faster than ever before.

**Decreased Innovation Risk:** Decreased Risk is important, given the epidemic of innovation failure that exists around the world. Research finds that just 5% to 15% of innovations are successful at large companies. Most business leaders would...
have greater odds of success if they went to a Las Vegas casino and gambled their innovation investment on one big bet. A slot machine would give them 32% odds of winning, blackjack 45%, and roulette 47%.

It’s easy to realize increased speed by accelerating projects without regards to risks. Similarly, it’s easy to reduce risk by slowing down all innovations and subjecting them to never-ending analysis.

What’s needed is the combination of Increased Speed and Decreased Risk. This can only be accomplished by changing the system of how we think, lead, and work.

**Why Call It Innovation Engineering?**

The name Innovation Engineering precisely defines our purpose and mindset.

**Innovation** is about ideas that matter. Creativity is the creation of the new and novel. Innovation is about ideas that make a difference. The difference can be new products/services, how we do our work, or even how we ignite social change in our communities.

**Engineering** is about applied science. Many books and classes preach the virtues of innovation. Innovation Engineering is different—it details the big-picture leadership principles plus practical and proven “how to” methods for increasing innovation speed and decreasing risk.

We teach theory to provide a background understanding. However, our education programs are primarily focused on how to innovate. We sweat the details. We work and rework each element of innovation until it is reduced to a reliable and reproducible process that can be documented in writing in an operational manual. We tell students to start their innovation efforts by doing exactly what we teach. When they develop confidence in their capability, they then have a responsibility to help the Innovation Engineering community discover and validate even more effective ways to innovate.

**An Academic/Industrial Partnership**

Early on we decided to create Innovation Engineering in partnership with the University of Maine. They lead the Innovation Engineering movement on college campuses around the world.
Today, Innovation Engineering is recognized as a new field of academic study. It’s offered as an undergraduate minor, a graduate certificate, and as an off-campus executive education program. A PhD program is also in development.

On college and university campuses we educate students on how Innovation Engineering will enable them to take advantage of the tremendous opportunities in the new economy. We explain how it will help them: 1) get a job, 2) get promoted, and/or 3) turn their ideas into reality faster and with less risk.

The Innovation Engineering courses enable the personal passion of students. A student graduating with a degree in history or English or business, with a minor in Innovation Engineering, or the graduate certificate, has the skills and confidence to apply, activate, and make a meaningful difference leveraging what they learned in their major field of study.

Studying Innovation Engineering on or off campus does not make you an “engineer,” as that is a title reserved for those who have passed the requirements set up by engineering trade associations for certification as a professional engineer. However, it does teach key elements of the engineering mindset: curiosity, discipline, experimentation, problem solving, and how to use writing and math to think deeper about challenges you face.

**Systems That ENABLE instead of Control**

The word *system*, especially in connection with innovation, creates a vision of being controlled, constrained, and restricted. That is NOT the purpose of Innovation Engineering systems. We design and develop systems that ENABLE innovation by everyone.

The difference between systems that “enable” versus “control” is one of intent. In both cases the goal is the same—reliable delivery of desired results. As Graeme Crombie, an Innovation Engineering Black Belt (the highest Innovation Engineering certification) and an early supporter in Scotland, says:

*When the system is designed to Enable then it allows employees to take ownership for desired results, thereby delivering a higher degree of certainty that desired results will be delivered.*

*The old form of Control requires that leaders and managers use micromanagement, direct supervision, and overexerted influence on events that really they should be leaving to the worker.*
Empowerment gives people authority to change. However, this will have no impact if people don’t know where to innovate, why to innovate, or how to innovate. Enabling is about providing the training, tools, and leadership coaching to make innovation practical, possible, and easy.

Dr. Deming famously declared, “I should estimate that in my experience most troubles and most possibilities for improvement add up to the proportions something like this: 94% belongs to the system (responsibility of management), 6% special causes (responsibility of employees).”

**Common Cause Error = Systemic errors of the system**
- 94% of problems
- Management is responsible for making the improvement of the system a priority.

**Special Cause = Random or fleeting events**
- 6% of problems
- These are primarily the responsibility of employees.
- Note: Employees are also responsible for helping management improve the system.

The simple way to state the Deming quote is the way my dad always said it to me: “94% of problems are caused by the system—6% by the workers.” Throughout this book, this is the version of the quote that we will use, as it is more directly relevant when applying system thinking to innovation.

Dr. Deming was a tireless advocate for enabling workers to have pride in their work. As he wrote:

*A bad system will beat a good person every time. . . . A basic principle presumed here is that no one should be blamed or penalized for performance that he cannot govern. Violation of this principle can only lead to frustration and dissatisfaction with the job, and lower production.*

—Dr. W. Edwards Deming

Improvement of a system involves reducing common cause variation. However, you can’t improve a system that doesn’t exist. And frankly, **more than 99% of companies have no system for innovation**. Now if you
reject the idea that you don’t have a system for innovation, you are in good company. Every week, when business leaders tell me they already have a system for innovation, I ask to see it. A moment of confusion then occurs. I follow up by asking to see the operations manual for it, the training program curriculum for teaching new employees and new managers. Confusion is now replaced with bewilderment. I then explain that if you can’t write it down, you don’t have a system. This also means that you can’t blame employees for not following the company system for thinking smarter and more creatively when you don’t have a system.

Why Should You Care?

Innovation Engineering will help you increase innovation speed and decrease risk. However, that’s NOT the most important benefit of Innovation Engineering. According to Sheldon Scott, CEO of the Whitney Blake Company, the most important benefit is to “Make Work Fun Again!”—a close variation to Dr. Deming’s promise at the start of seminars, stated earlier: “Why are we here? We are here to come alive, to have fun, to have joy in work.”

By “fun” we don’t mean frivolous play. We’re talking about the joy that comes from doing something that makes a difference in the world. Said another way: In the irreverent manner of members of the Innovation Engineering movement on and off campus . . .

The fundamental aim of Innovation Engineering is to enable people to do COOL SH*T THAT MATTERS.

The simple fact is—when you spend your time and energy on projects, products, or services that matter to YOU, your ORGANIZATION, and to CUSTOMERS, then you experience a chain reaction of Pride of Work, increased sales, and profitability.

Pride of Work was a very important concept for Dr. Deming. He was once asked how he would summarize his overall message in a few words.

*I’m not sure, but it would have something to do with variation.*

Later he added, *I said earlier that my message had to do with variation. I’ve given it some more thought, and I would say it has to do with Pride of Work.*

—Dr. W. Edwards Deming
Whatever Happened to Pride of Work?

In my opinion, one of the greatest benefits of the internet is that it has enabled the “craft” movement, from distilleries to breweries to farm-to-table restaurants to Meaningfully Unique tools and toys. When you visit a new city, it’s commonplace to search for real craft experiences.

What separates craft companies from mass-market companies is Pride of Work. Leading a team of young people, crafting Innovation Engineering courses and tools, and starting our Brain Brew craft distillery has provided me with a first-person understanding of the new way of business. At its core, it’s about doing meaningful work. We aren’t just doing our job. We are creating whiskey, classes, and internet tools that we are deeply proud of. We sweat details that our competitors ignore.

Steve Jobs’ success with Apple and Pixar was due in large part to his commitment to maintaining a craft mindset despite being one of the largest companies in the world. His biographer, Walter Isaacson, told CBS News that Jobs learned this from his adoptive father, Paul Jobs: “Once they were building a fence. And he said, ‘You got to make the back of the fence that nobody will see just as good-looking as the front of the fence. Even though nobody will see it, you will know, and that will show that you’re dedicated to making something perfect.’ ”

I believe that the source of the wide range of positive and negative feelings toward Steve Jobs is this craftsmanship mindset. To those who get craftsmanship, fanatical passion is part of the process. To those who are practical and prudent, it’s craziness.

Pride of Work is enabled when you are working on Cool Sh*t That Matters!

Some folks talk about innovation being constrained by the worker’s fear of failure, laziness, or short-term targets driven by greed. The cause for this runs deeper. We have lost the joy of work for work’s sake. It takes very little additional effort to do something right than it does just to do it. Don’t make excuses, because ultimately the only person that will know if it’s great work or not is you.

—Ken Grier, creative director
The Macallan Scotch whisky distillery
Never-Ending Innovation on Innovation

We practice what we preach—never-ending continuous innovation of our training and tools.

We don’t claim to know all the answers. We regularly upgrade our best practices with: 1) ideas from users, 2) academic research discoveries, and 3) licensed content from commercial experts.

We are very disciplined in what we add to the Innovation Engineering curriculum and tools. Our upgrade process involves a small team of volunteers adapting and applying the new approach to their work. Their focus is an “engineering” mindset of finding the 20% who give 80% of the benefit. They are relentless in simplifying and streamlining new systems and methods. When innovation system improvements or tools are validated as reliable, they are incorporated into our best practices.

We aggressively embrace new methods, systems, and tools. As I write these words, members of the Innovation Engineering movement are gathered at the Eureka! Ranch to innovate on our project management system. They are using stimulus from experiences, academic research, and other systems to ignite ideas for how we can further accelerate development projects.

We believe that learning how to innovate smarter and faster is not a competition. We encourage our students, both on and off campus, to experience every innovation class and tool they can find. We have designed our innovation systems to make them work well with others. Within our community we have many organizations that have painlessly integrated Innovation Engineering with 6 Sigma, Lean, Lean Start Up, Design Thinking, Business Model Programs, and Phase Gate systems. We believe in collaboration. As Ben Franklin said, “We must all hang together or most assuredly we will all hang separately.”

Never-ending, continuous innovation on Innovation Engineering systems means that, while this book details the state of the art at this time, I anticipate that this book will be regularly updated with the latest learning. In the short term, you can keep up with new learnings by signing up to receive our blog. You can find it by going to innovationengineering.org/news.

The Organization of this Book

This book provides a beginning understanding of the six college courses that make up the Innovation Engineering curriculum. It begins with a
discussion of the Innovation Problem and Solution. It then details how Innovation Engineering came to be born, developed, and validated. Chapters 3 through 8 outline systems for how to Create, Communicate, and Commercialize innovations. Chapters 9 through 12 review principles for how you can upgrade your internal innovation systems to be faster and more effective. They include a collection of four subsystems that are critical for enabling innovation: Alignment, Collaboration Cafe, Merwyn Rapid Research, and Patent ROI.

The book closes with a chapter on how to create an innovation culture within your team, company, or community.

How Could They Know?

As you embark on this journey, you will quickly see the world in a new way. Problems will be seen as opportunities to 19. A mindset of “If it’s not broke, don’t fix it” will be replaced with a never-ending passion for discovering ideas, methods, and tools for working smarter.

As your mindset changes, you are likely to find that your new thinking conflicts with others. You will become frustrated that they don’t embrace and celebrate your new courage and confidence to use innovation to work in smarter ways.

A fundamental belief within the Innovation Engineering community is that people are fundamentally good. We believe that the naysayers you interact with are not against change or Innovation Engineering. They just don’t understand it. They can’t imagine that innovation could be a reliable science instead of a random gamble. It was the same with Dr. Deming’s efforts in the 1980s. When asked if executives were doing enough to apply his teaching, his response would be loud and on the verge of belligerent:

-Managers don’t know about it. How could they know? How could they know there was anything to learn? How could they? How could they? How could they know there was any other way to manage?

Quite simply, most adults think that ideas are magical and only randomly reveal themselves to so-called special people. How could they know that everyone can add value and make a difference if they are simply taught how to think quicker, faster, and more creatively.
How could they, or you, know? Until recently there were no courses available in system-driven innovation. The good news is that now you can learn how to use system thinking to enable yourself and your organization to innovate faster and with less risk. Not only can you learn it—you can master it.

However, before we get started, I want you to pause and reflect.

**What Did You Learn?**

If you attended an Innovation Engineering class on campus or off, or were working with some Innovation Engineering Pioneers on a project, you would hear this question often.

The question is designed to cause you to stop, think, confront, and explore what you’ve experienced from a “bigger picture” system perspective.

The best way to explore what you have learned, what confirms as well as what contradicts your preexisting thinking, is through conversation with your coworkers, family, or friends. Speaking what you learned out loud makes a difference. Research finds that when we speak our thoughts in a full voice so that our ears hear the idea, a different part of the brain becomes engaged, resulting in new levels of understanding.
The second best way is to have a conversation with yourself in writing. Write what you’ve learned in a journal, a notebook, or on your computer. The written word also has a way of bringing out truths that we aren’t at first fully conscious of.

Each chapter ends with a section called **What Did You Learn?** You are free to utilize this prompt or to ignore it. Research finds that those who do—who consciously reflect—will realize a much greater return on their investment in reading this book.

Rock & Roll!
Doug Hall
Springbrook, Prince Edward Island, Canada
Cincinnati, Ohio, USA

**You Have Two Choices to Make**

1. **If you fully “buy in” to the need for Innovation Engineering**, skip ahead to Chapter 3 and get started. If you have some reservations, the next two chapters are for you.

   Chapter 1 outlines the innovation problem and why innovation is no longer optional.
   Chapter 2 outlines the Innovation Engineering solution, history, and pedigree.
   I’ve included these two chapters because it’s only with a total commitment to the new mindset of system-driven innovation that you will realize the potential of Innovation Engineering.

2. **If you are someone who values the PEDIGREE behind what you are being taught, flip to the back of the book and read the Backstory chapter on Dr. Deming.** It lays out the foundation that system-driven innovation is based on. If this is not important to you—simply go ahead to Chapter 1 or 3 as detailed above.