The Invisible Element

A Practical Guide for the Human Dynamics of Innovation

By Robert B. Rosenfeld & Gary J. Wilhelmi

with Andrew Harrison
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SUSTAINED INNOVATION

QUANTIFIABLE GAIN

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INVISIBLE RULES OF ENGAGEMENT

ORGANIZATION ‘DNA’

- Leverage Differences
- Co-Location
- Passion / Pain
- Problems to Ideas
- Innovation Systems

Elements of Destruction are Present at Creation

Soft Values Drive the Organization

Trust is Foundational
“We all know innovation is the lifeblood of business, yet most writing on this important subject is devoted to process. In The Invisible Element, Rosenfeld and Wilhelmi look beyond process to tap the critical human elements essential to creating a culture that fosters and sustains innovation.”

Don Hall Jr., President and CEO, Hallmark Cards, Inc.

“Many business publications and thought leaders exalt the importance of innovation. Despite the good intentions of organizations, many organizations find it difficult to implement a concrete and comprehensive set of activities to support their desire to innovate. In this book, Rosenfeld and Wilhelmi present a practical guide to help leaders close the gap between their desire to innovate and their ability to drive innovation into their organization. If you want to ‘unshackle your innovators,’ this is a must-read book!”

David Altman, Ph.D., Executive Vice President of Research, Innovation and Product Development, Center for Creative Leadership

“From a lifetime of personal innovation experience and keen observations of behaviors within organizations, Bob Rosenfeld and Gary Wilhelmi have created a set of models to assess both individual and organizational innovation conditions. Captured in The Invisible Element: A Practical Guide for the Human Dynamics of Innovation are timeless principles and practical methods to guide the establishment of productive innovation systems. Honed through interactions with innovation leaders throughout the world, these models, principles, and methods are invaluable to innovation leaders as they take innovation to the next level.”

Michael Vahey, Innovation Champion, SAS Office of Innovation, Raytheon
“Innovation has been the holy grail of technology-driven companies, where hit and miss has been more the norm than the exception. Yet, in this book, Rosenfeld and Wilhelmi give the reader an inner view of the necessary albeit hidden human chemistry of innovation. They masterfully combine three critical dimensions to creating innovation: in-depth leanings of textbook, actionable steps of a how-to guidebook and the priceless wealth of over 40 years of hands-on experience. I highly recommend this book to any executive who wants to take innovation from fuzzy trial-and-errors to success by design.”

Dr. Francois Nader, President and Chief Executive Officer, NPS Pharmaceuticals

“Change agents take notice! You need to put Bob Rosenfeld and Gary Wilhelmi’s new book, The Invisible Element: A Practical Guide for the Human Dynamics of Innovation, on your ‘must read’ list. As anyone who has tried to affect change in an organization will tell you, it’s one thing to know something; it’s quite another thing to apply it. Those who’ve tried to make a difference in an organization know from experience that application is everything. Stated another way, it’s what you do with what you know that makes a difference. The Invisible Element is the practical guide you’ve been waiting for -- it will help you apply all the innovation principles that are nicely summarized here.”

Mary Margaret Evans, Vice President for Government Relations & Strategy, Insitu

“I found this book to be much more than a how-to book on the human aspects of innovation, it is an insightful guidebook on optimizing the human power element of any organization. A must read for anyone who believes in the value of an empowered and engaged workforce. I highly recommend it to anyone in serious pursuit of sustained innovation in their business.”

Dennis Duke, Director of Advanced Programs, Rolls-Royce Naval Marine Inc.

“The Invisible Element: A Practical Guide for the Human Dynamics of Innovation is an essential read for anyone trying to establish or lead an effort to drive innovation throughout an organization. Sustained innovation requires both a good process and the right culture. Much has been written about process, but no one has addressed the human side of innovation as thoroughly and insightfully as this book.”

Gary Einhaus, Retired General Manager, CTO and New Business Development Director at Eastman Kodak
“Rosenfeld and Wilhelmi crystallize new aspects of human innovation in this latest book.”

Pierre Legualt, President and CEO, Prosidion Ltd.

“Innovation in an organization often creates an alpha and omega relationship between innovators and their bosses. Desired but often misunderstood and rejected, the dynamics of this complex and often contentious interaction has baffled and eluded all involved for many years. Using 40 years of experience, Bob and Gary create practical approaches to unlock this paradox, reduce the friction of change, and clearly illustrate what actually happens as new ideas are broached, developed and implemented. This ‘how to’ manual is a must read for innovators and leadership teams wishing to maximize the return on their innovative investment!”

Peter Engstrom, Co Founder and Board President of At Home Chesapeake and former Vice President for Federal Knowledge Business, Science Applications International Corporation (SAIC)

“The Invisible Element is a persuasive, practical and insightful book dedicated to helping firms, institutions, and individuals unleash their hidden creativity. Teamwork is only as good as the team itself, and the specific and innovative techniques in this wide-ranging book will be essential to helping leaders build the right team for the right job. In the process, they will also come to understand one of the keys to The Invisible Element: that the constants of human behavior transcend cultures and unite civilizations.”

Charles King, Professor of International Affairs and Government at Georgetown University

“Bob and Gary have provided a unique business guide to innovation. This is not a recipe, which presumes consistent results from standard ingredients, but rather a detailed discussion of the key human characteristics that need to be gently nudged and nurtured in order to create an environment in which innovation can flourish. Too often books of this type focus on one or two pieces of the puzzle. From the Innovation House, through the various frameworks, tools, and assessments, to the epilogue, the authors effectively use models, diagrams, analogies and examples to explain the breadth of the human aspects (the hidden elements) of the innovation challenge. For individuals and organizations willing to make the necessary investment, the authors’ recommendations payoff could be significant.”

Allison F. Dolan, Privacy Specialist, MIT and former Innovation Facilitator at Eastman Kodak
“Bringing creative ideas to life requires not only brilliant thoughts, but considered, insightful, and principled actions. You need trust; you need principles; you need some analytical tools and facts on hand; and you need a profound respect—and, ideally, affection—for the diversity of human beings. In *The Invisible Element: A Practical Guide for the Human Dynamics of Innovation*, Robert Rosenfeld and Gary Wilhelmi demonstrate their deep understanding of the social dynamics behind the realization of great ideas. Their work draws on decades of practical experience and reveals how to transform organizations into more productive, more innovative, and more humane places.”

*Margaret Paxson, PhD, Senior Associate, Kennan Institute, Woodrow Wilson International Center for Scholars and Visiting Scholar, Institute for European, Russian, and Eurasian Studies, Elliott School of International Affairs, George Washington University*

“The Invisible Element: A Practical Guide for the Human Dynamics of Innovation is an inescapable part of our individual, community and institutional lives. Being part of positive sustainable change or innovation is an immense challenge in our chaotic and complex societies. If you want greater coherence and cohesion in the innovations that you are a part of, then *The Invisible Element* is an excellent road map for navigating your journey. Whether you are involved in incremental, expansionary or revolutionary innovation, this detailed and thoughtful book is a must-have operating manual. Along with Rosenfeld’s previous book, *Making the Invisible Visible: The Human Principles for Sustaining Innovation*, we are using *The Invisible Element* to realize our vision of ‘advancing prosperity by fostering sustainable cultures of innovation.’”

*Johann S. Wong, CFA, serial entrepreneur and founder, London Innovation Centre and InnovationPi*
Acknowledgements

There is no way that we could ever acknowledge all of the individuals who helped shape this book. It is truly an integration of all of the interactions we have had with different colleagues/innovators throughout our careers. It is through these interactions that we have been able to shape our thoughts and insights into the world of innovation. To all of you, we sincerely thank you and hope that each of you can see a little of yourselves in this book.

We want to thank our colleagues at Idea Connection Systems, Inc. for the many hours of idea sharing and shaping as well as valuable suggestions and critique of the material in this book. In particular we want to thank Larry VanEtten for putting up with our “Pingging” and keeping us somewhat grounded. Without his insights and support, we would have never completed construction of our Innovation House™.

To Andrew Harrison, the writer of this book, it has been our pleasure to watch your evolution in the field of innovation. At our introductory lunch, it was apparent you were a social innovator and truly understood the value of people. But as our relationship grew, you moved well beyond “just our writer.” You have fully grasped the concepts in this book and added a flavor that brings our work a more understood way of application. By working with us and at Idea Connection Systems over the past three years, we are pleased to call you a peer in the human dynamics of innovation.

The friendship and support of the Center for Creative Leadership was an invaluable catalyst in pulling this book together. In particular, Barbara Demarest and David Horth’s support and assistance in developing the “Making the Invisible Visible” short course provided the impetus for us to put all of the pieces together in what we hope is a coherent model.

We are especially grateful to our friends and colleagues who read early drafts of the book and provided valuable insights and suggestions that helped shape the final manuscript.
We’d like to thank our editor, Martha Whalen. Your efforts helped focus our thoughts. To our proofreaders Margaret Tash, Sarah Williams and Marco De-Moor Bey, thank you for your attention to detail. To our cover designer, David Royka, we appreciate your vision. To our book layout designer, Kim Wood, thank you for your flexibility. To our book production specialist, Matthew Bernius, thanks for your expertise.

Finally, to our wives, Debbie and Leeann; without your encouragement, endless hours of editing and your “constructive” critiques, this book would never have been finished. We are eternally grateful and to you, we dedicate this book.
Robert Rosenfeld

Robert “Bob” Rosenfeld is the Founder and CEO of Idea Connection Systems, Inc. (www.innovating.com). For over 40 years, he has been a leader and practitioner in the human dynamics that make innovation happen inside organizations. Along with co-authoring this book, Bob is the author of Making the Invisible Visible: The Human Principles for Sustaining Innovation (2006).

Bob created the first Office of Innovation ever to be successfully implemented in Corporate America in 1978 at Eastman Kodak. In 1985, he co-founded the Association for Managers of Innovation (AMI).

After working with many diverse people and organizations, in 2001, Bob and his ICS team developed Mosaic Partnerships™—an innovative process for breaking down barriers between races that has been implemented in cities around the United States and organizations around the world.

Because of Bob’s innovation experience, in May 2006, he was named the Center for Creative Leadership’s (CCL) first “Innovator in Residence” and in 2008, he was awarded Innovator in Residence Emeritus status.

In 2008, he and his ICS team created the ISPI® (Innovation Strengths Preference Indicator®), an innovation tool used to highlight how people prefer to innovate as well as how they prefer to innovate with others. The ISPI® is used to make the invisible elements of innovation visible to individuals, teams, departments and organizations.

Bob’s efforts in the human dynamics of innovation continue to impact organizations around the globe with clients in the U.S., India, Brazil, Singapore, South Africa, Canada and Europe.

Bob and his wife Debbie have been married for over 30 years. They have seven children, five of whom are adopted, and six grandchildren who live in Rochester, New York. The diversity of their family is a true reflection of the world today and inspires Bob to continue to understand humankind and find ways to cope with the struggles facing modern society.
Gary Wilhelmi

Gary Wilhelmi has consistently been recognized by his peers as an agent of change. As an innovation leader, he has focused on the critical role that people play in the innovation process. He recognized early in his career that “organizations don’t innovate…people do”. As a result, he has developed pioneering approaches and unique tools that allow employers and their employees to understand the role that they play in driving successful innovation.

As an electrical engineer, his experience includes innovative work in such areas as high tech laser and optical systems, first generation fiber optics communication systems, biotechnology, consumer products resulting in hundreds of millions of dollars in sales, sensory research, packaging materials, and more. He has successfully implemented innovation breakthroughs using both internal teams as well as virtual R&D organizations.

Over his 35 years of experience he has worked for McDonnell Aircraft Company, ITT Electro-Optics Products Division, and PepsiCo. Currently he is Vice President of Idea Connection Systems (www.innovating.com) where he is working with various governmental agencies and Fortune 100 companies. This broad range of experience has provided Gary with a unique insight into what is required to create and sustain innovation. It has led to the development of several proprietary tools focusing on the human dynamics critical to the innovation process including the ability to assess an organization’s culture, level of trust, invisible decision making processes, level of motivation, and ability to deal with “wicked” problems.

Gary and his wife, Leeann, have four children and live in the Dallas/Fort Worth area.
Andrew Harrison

Andrew Harrison is the writer of *The Invisible Element: A Practical Guide for the Human Dynamics of Innovation*. The experience of writing this book alongside two industry experts allowed him a rare and exciting opportunity to explore what it takes to spark and sustain innovation within organizations and working groups. The book process also saw Andrew become part of Idea Connection Systems (www.innovating.com) and evolve into the role of Innovation Ambassador.

Andrew’s unique background as a social innovator, author and researcher of human motivation began in 2004 when he exchanged his master’s degree and high paying sales job for a year on the road—traveling the United States interviewing people from varied walks of life about how they came to discover passion from their work; a passion which inevitably spilled over into the remaining aspects of their lives (www.iamontheroad.com).

His study of human motivation now spans many industries and fields. Andrew’s debut book entitled, *Love Your 8,400 Hours at Work: Stories on the Road from People with Purpose and Passion* (Dotted Lines Press, 2010), chronicles the inspiring journeys of a select number of people who have mastered one of the core ingredients to maintaining a happy life—loving what you do (www.84000hours.com).

An understudy to Bob Rosenfeld since 2008, Andrew has been an instrumental part of the team responsible for developing the Innovation Strengths Preference Indicator® (ISPI®). He is certified in the ISPI® for delivering feedback to individuals and groups, in analyzing and forming teams, as well as conducting organizational ISPI® analyses.

Andrew designs and delivers keynote presentations and leads workshops on the human principles that create a culture of innovation. He also instructs and inspires people on how to marry purpose and passion into their work. Andrew has a passion for teaching the tools of the innovation and career trades; a byproduct from his days as a former adjunct college professor.

Andrew’s work has been featured in the Miami Herald, Charlotte Observer, Rochester Democrat and Chronicle, as well as on local ABC, CBS, Fox, and Time Warner TV news programs, NPR radio, and a number of business journals and national magazine publications. He is currently based in Rochester, NY and is both purposeful and passionate about writing, traveling, meeting new people, speaking to groups, cooking and eating, playing golf and watching sports.
We believe that everybody has the potential to be innovative. Some are more adept at innovation towards the evolutionary (or Six Sigma) end of the innovation continuum while others may be more suited for the revolutionary (or breakthrough) end, or somewhere in between. The real question is not whether a person is innovative. The question is how to unlock the innovation potential in all of us.

Through our almost 20 years of working together, we have seen organizations that brought out this innovative spirit in their employees. We have also seen too many that held their innovators “hostage.” They were prevented from turning their potential into a reality by largely invisible characteristics imbedded in the organization. Human dynamics rather than the business or technological aspects drive most of these. For example, when trust within the organization declines, there is a corresponding increase in risk aversion. This is a result of the innovators no longer feeling that their managers will support them if they are not successful. They start making decisions based on their internal fear of failure filter. The net result is that the company’s innovation shifts significantly to the lower risk, evolutionary end of the continuum.

In *Making the Invisible Visible: The Human Principles for Sustaining Innovation* (Rosenfeld, 2006), eight fundamental principles were defined which are foundational for understanding these invisible hurdles. The book provided great understanding, but not the full practical application. Applying them was up to the innovation leader.

In this book, we are moving beyond theory and are providing a practical guide for how to put these principles into action. In the first part of the book, we expand on the human principles and provide tools to better understand them. While it is not required that you have read the first book to be able to understand this book, we encourage you to do so at some point to get a more in-depth exposure to the principles themselves.
The second part of the book is about the application of the principles within your organization to create a sustainable culture of innovation, one that “unshackles your innovators.”

When we first talked about the need for this book and whether or not we wanted to write it, several conflicting thoughts emerged. The biggest reason for not writing it was that we would be giving the world a significant portion of our intellectual property. Yet, when we weighed that against our deep-rooted desire to help current and future innovation leaders create the world of tomorrow, the answer was obvious. We wrote this book to help with the evolution of innovation, of work, and of how organizations work with people.

If reading this book changes or reinforces your beliefs and values relative to being an innovation leader, then we have more than accomplished our goal. If you read it and at least think about what we are saying, then we are still moving innovation in the right direction. If you read it and disagree, we want to hear from you.

Today's world has been created through innovation. So will tomorrow’s. What role do you want to play in shaping that future? Don’t allow your innovation to be shackled. Set it free. After all:

**Organizations Don’t Innovate, People Do™**
Globally, the need for innovation has never been stronger. In 2009, United States President Barack Obama introduced the “Strategy for American Innovation.” In India, their government dedicated 2010 - 2020 as the “Decade of Innovation.” In addition, if you were to poll leaders of organizations around the globe, most would list innovation as a top priority. Yet, if you were to ask those same leaders how they were going to make innovation happen, they would not be able to explain how to do it.

The need for innovation is clear; yet understanding how to do it is not. The reason we wrote this book is to help the world understand how to make innovation happen inside an organization.

To start, we need to understand the world we live in today and the implications of that world on the future of innovation. In this book, you will learn more about the eight fundamental human principles for sustaining innovation and how they can be applied to today’s world. We will describe the principles and make them more visible and then assist you, the innovation leader, in using them to help navigate ideas into innovations.

What Is Innovation?
At this point, it makes sense to clearly define what we mean by innovation. Unfortunately, innovation is one of those words that has come to mean different things to different people. One area of confusion is the belief that innovation and creativity are synonymous. We see these two activities as complementary but very distinct. The following are definitions of creativity and innovation that we will use throughout this book:

- Creativity is the generation of new and/or novel ideas.
- Innovation is a creative act or solution that results in a quantifiable gain.
Many organizations do a good job of focusing on creativity and the tools necessary to produce creative thought. Yet, the key to success is to understand how to take people’s creative ideas and turn them into a quantifiable gain.

A quantifiable gain is determined by the currency of the realm or, in other words, “what matters.” A quantifiable gain is a measure that defines the value of exchange between individuals or companies in the marketplace. The currency of the realm might be return on investment (ROI) for one company, the number of new products for another, or the number of publications or students for a university, and so forth.

Many times, organizations get stuck on their own concepts of innovation. They associate innovation only with new ideas that are revolutionary or breakthrough (e.g., the iPod®). Yet, there is much more to innovation than popular innovations publicized in magazines.

A breakthrough idea or product is just one end of the innovation continuum. Tweaking a process may also be considered innovation. Innovation is any change, be it large or small, which leads to a quantifiable gain. We look at the end goals of innovation on a continuum, ranging from Revolutionary (e.g., breakthrough) to Evolutionary (e.g., Kaizen Teian, Six Sigma) (Figure I.1, see next page).

When we talk about product development or new product life cycles, we will look at the continuum from revolutionary to evolutionary. In contrast, when we talk about human or organizational characteristics, we generally reverse the continuum. The reason for doing so is simply to mirror the way most people think about innovation in the different contexts. We will refer to the innovation continuum throughout the book.

Revolutionary ideas redefine problems, break boundaries, and create new paradigms – they provide completely new and sometimes disruptive ideas. The first flight and the personal computer are examples of revolutionary ideas.

Expansionary ideas tackle challenges. They answer the question, “How can we do things differently?” An example here is a product line extension (e.g., different flavor, color, or shape) that uses the same technology and pulls in new customers or expands the market.

Evolutionary ideas seek solutions by using existing concepts. They answer, “How can we do things better?” These ideas are very process-driven, such as Lean Six Sigma, which uses the “Define, Measure, Analyze, Improve, and Control” (or DMAIC) methodology.
Innovation is tied into all activities of an organization, including leadership, operations, sales, marketing, and research and development (R&D), among others. In all of these activities, there is the need to innovate somewhere along the innovation continuum.

Operations may focus more on Lean Six Sigma programs, which align more often with the evolutionary end. In contrast, R&D may align better with expansionary or revolutionary innovation. The key is that for any organization to sustain growth, innovation is required somewhere along this continuum – and it generally translates into activities across all three categories. The dilemma facing innovation leaders in today’s world is how to make such innovation happen. Their organizations need to shift focus in order to expand their innovation portfolio, but how? What are their innovation objectives? How do they identify where to focus their innovation efforts? And finally, how do they create an environment conducive to innovation and how can they assist employees?
Business and Innovation – Past, Present and Future

Drafts of this book were all written using computers – not a surprise in today’s world. One of the devices that is used constantly is one that we have grown to take for granted: the mouse. This device has been instrumental in making the human interface with computers significantly easier and opened up the frontier of personal computers.

We will now show our age: For some of us, early in our careers, computers were the size of buildings and we interfaced with them primarily through punch cards. We would walk to the computer center with stacks of these cards, wait in line to feed them into the reader (or oftentimes, the card eater), hope we hadn’t mistyped a card (or worse, mixed up the order of the cards), and then wait to see if the program ran correctly. The advent of the modern age of computing has changed all of that. The introduction of the graphical user interface (a symbolic world with little pictures of folders and other icons on our desktops) and the use of the mouse to allow the user to easily navigate through these icons has changed computing forever.

The mouse took almost 20 years to go through its initial development. It started from what Douglas Engelbart invented in the 1960s at the Stanford Research Institute and was later refined by the engineers and scientists at the Xerox Palo Alto Research Center (PARC) in the 1970s. In 1979, Steve Jobs saw the mouse at PARC and, based upon what he saw, a decision was made to bring it into Apple and create a version that could be a commercial success.

The problem for Jobs and Apple was that in 1979, the mouse itself cost about $400, and it required an additional interface module at a cost of $300. Jobs wanted a mouse that could be manufactured for $10 to $35, but it was far from obvious that it could be done. Jobs went to Hovey-Kelly, a small start-up design company (that later became known as IDEO) to redesign the mouse. Starting with a Ban Roll-On ball and some Teflon dishes, they were able to overcome myriad technical issues, and, as we know, the rest is history. While the story of the design effort at Hovey-Kelly is interesting in itself, the main focus of thinking about the evolution of the mouse in this book is more about the “why” rather than the “how” or “what.”

The real question is why it took almost 20 years to go from the invention of the mouse in the 1960s to having the version that Jobs saw in 1979 to having 25 prototypes of the “modern” mouse by the end of 1980. There were brilliant scientists and engineers working on it from the beginning. The value of the interface was obvious to the people involved. So what made the difference?
We believe a major part of the answer is that Jobs wanted to build Apple rather than create a new computer. He wanted to grow Apple and have a distinct, competitive advantage over other computer manufacturers.

Think of the countless examples of companies not wanting to take risks to grow. Instead, they were more focused on maintaining their current markets, improving productivity, and extending current product lines, i.e., basically focusing on evolutionary and some expansionary innovation. Why is it that Kodak invented the digital camera but was a late entry into the world of digital photography? Why did the Swiss not capitalize on digital watches? Why did it take 3M years to introduce Post-it® Notes? And so on.

For sustained growth, you need to create a dynamically balanced innovation portfolio and focus efforts to meet the ongoing growth needs of your organization. To successfully do this, you need to also understand the world around you.

While the understanding of today’s world will date this part of the book, the methodology of looking at and understanding the implications of current events, both political and commercial, can be utilized at any point in time. So, how do we view the landscape of the current world and what are the implications for innovation?

We have seen that innovation has been cyclical throughout generations, shifting from revolutionary to evolutionary and back again. The current cycle appears to have its beginnings in the early 1990s, with a number of large organizations going through significant reorganizations, downsizings, and reduction in forces (RIFs). Organizations reduced staff predominantly to improve overall bottom-line performance. These reductions have had a profound effect on organizations, impacting their ability to keep up with innovation demands and, in particular, on revolutionary innovation.

First of all, these RIFs tended to shatter the psychological contract between the employee and the company. Any idea of an implied employment contract was eliminated. People felt far less secure in their jobs. Along with this shift came an erosion of trust between employees and the organization. Individual decisions shifted to include a major component of “looking out for myself.” Many innovation decisions are now based on an individual’s fear of failure assessment because employees no longer feel that the innovation leaders or the organization will support them if the innovation is unsuccessful. This has forced the innovation portfolio to shift significantly towards the lower risk, evolutionary end.
Another unintended (and far less visible) consequence of the RIFs was that a disproportionate number of strong pioneers (out-of-the-box thinkers and doers) were included in staff reductions. Pioneers tend to be viewed by organizations as undisciplined, disruptive, and unconventional – basically as “nice to have” but not required. Consequently, in difficult times this group is viewed as the least critical element for immediate success. Eliminating these people has resulted in organizations no longer having the ability to generate the paradigm-pioneering ideas required for breakthrough innovation.

The final, unintended consequence from the RIFs that we want to mention impacts the innovation leaders of today. Many current leaders were trained and developed their innovation leadership skills during the 1990s. They have become very adept at leading Lean Six Sigma or line extension innovations. However, few of them have ever had the opportunity to lead the complicated process of a revolutionary or breakthrough innovation. They have never had to grow something new.

All of these combined circumstances help explain why so many organizations are currently struggling with the need for more revolutionary innovation to re-energize their top and bottom lines.

Through the focus on productivity over the past 20 years, organizations have lost sight of the need to balance their portfolios for both short- and long-term growth. As the short-term growth engine slows down, companies are trying to understand why they no longer have the pipeline of new ideas to fuel their continued growth. They are now trying to instantaneously jump-start the breakthrough innovation engine. Unfortunately, most breakthrough innovation does not occur that way. Large organizations are now trying to look for innovations and technologies that they can bring inside to accelerate the restarting of the innovation engine.

Also during this period, companies shifted a significant amount of their manufacturing and some of their development efforts offshore. A somewhat invisible consequence of this is that the innovation leaders in these countries are getting firsthand experience in developing and growing organizations with the ability for successful breakthrough innovation. These managers are developing the technical, business, and human understanding required to start competing globally with innovation breakthroughs. If you are in the United States, what are the implications of this consequence for your organization?

The final two elements that are shaping the innovation landscape of the world today are terrorism and the economic crisis of 2008. We won’t go into detail on either one of these elements. However, we want to point out that
both are obviously having a significant, visible impact. Just as important, and somewhat less visible, is the impact they are having on trust around the world. We are becoming less trusting of those who are different from us. People have become less trusting of the leadership of financial institutions. Overall, trust in political leaders is at an all-time low. The bottom line is that the innovation leader in today’s world is faced with a combination of consequences from the:

- Erosion of trust within organizations and around the world
- Reduction or elimination of the pioneers within larger organizations
- Focus on evolutionary/expansionary innovation, to the detriment of continued development of breakthrough innovations

The impact of each of these consequences has directly affected innovators. Therefore, it is more critical than ever before that the innovation leader takes into consideration the eight human principles in designing and implementing the innovation organization for the future.

**Now Is the Time**

This is a great time to be an innovator. The world is now seeing the need for innovation in how to conduct business, utilize technology, and deal with people.

The recent emphasis on innovation may be attributed to many factors, but the main reason is that organizations now need to grow in highly competitive markets. They no longer compete with businesses down the street; rather, they compete all across the globe.

We have heard from many innovation leaders who say their organization talks about innovation but does not allow it to happen: “We’ve been pretty successful with our current processes. We’re growing at X% per year, we only have 15% of the market, and we are still growing. We’ve done this by being fairly autocratic and ensuring everyone is working on exactly what we want them working on. Why would we want to change? At some point, yes, but we’re a long way from being at that point.”

We tell them, “If you are interested only in quarterly results as opposed to sustaining that growth for a long period, we agree – you don’t need to change. But at what point in the future would you like to go out of business? How many minicomputer manufacturers are still thriving today? What happened to the big TV sets that used vacuum tubes?” The examples go on and on.
If you simply compare the Fortune 100 lists from 1968 to 2007, there are only 10 companies from the top 50 that showed up on both lists. This means that 40 companies doing great in 1968 were replaced on the 2007 Fortune list. What happened? Why did 80% of the list change over this timeframe?

The Fortune 100 list changes because innovation evolves over time. Based on our combined 80 years in the field, for organizations to succeed in today’s world, they must grow both the top and bottom lines concurrently. More than ever, it has become much more complicated to get the job done on both sides. Our message is clear and simple: If organizations don’t innovate, they’re not going to be around. Your organization can do one of two things – **Innovate or die.**

**People Make Innovation Happen**
If you Google the term, “innovation books,” the list is massive. Many of these books talk about the business aspects of innovation. Books such as Christensen and Raynor’s *The Innovator’s Solution* or Kim and Mauborgne’s *Blue Ocean Strategy* help answer the question of how to identify where to focus innovation efforts. They primarily focus on the business aspects. However,

**Organizations Don’t Innovate, People Do™**
If managers don’t understand the people side of innovation, they can have the latest advancements in technology and appropriate business processes, but they will still be left wondering why they cannot generate innovative ideas and translate them into business successes.

Therefore, this book is intended to offer guidance on the human element as it pertains to innovation. It will walk you through the human dynamics required for innovation to take place. This book will not tell you where to look for innovation; rather, it will tell you what it’s going to take for your organization to be innovative. This book will not tell you where to innovate; instead, this book will tell you how to innovate.

Robert Rosenfeld’s book, titled *Making the Invisible Visible: The Human Principles for Sustaining Innovation*, provides a solid philosophical understanding of how to make innovation work. Our book expands on that foundation with a primary focus on how to transform understanding into action within an organization. It goes into greater detail on the eight underlying human principles of innovation and, more importantly, describes how to put these principles into practice. This book is not about theory;
rather, it is about how to put theory into practice to create a sustainable culture of innovation.

We will explain how to sustain innovation by implementing an approach that can be replicated. We go beyond the foundational principles and give you tips and tools for generating innovation in both the short and long term. The model that we will use throughout the book is based on information conveyed in the Innovation House™ (Figure I.2).

As indicated via this model, we will explore innovation in numerous ways. To begin with, we will briefly discuss the principles defined by Rosenfeld, which form the bottom of the Innovation House. These include:

- Three principles of an Innovative Environment:
  1. Trust Is Foundational
  2. Elements of Destruction Are Present at Creation
  3. Soft Values Drive the Organization

---

**Figure I.2**

*The Innovation House™.* This house is a schematic that represents how key human principles (depicted in the lower portion of the house) can be applied to create a culture conducive to sustaining innovation.
Five principles for the Essence of Innovation (or the five “pillars”)

1. Leveraging Differences
2. Co-Locate For Effective Exchange
3. **Passion** is the Fuel and **Pain** is the Hidden Ingredient
4. Innovation Starts When Problems Are Converted Into Ideas
5. Innovation Needs a System

We will also explain how these principles are integrated to create the time-dependent applications depicted at the top of the house. These include: Organization DNA, Invisible Rules of Engagement, Innovation Process, and Quantifiable Gain. By moving from the principles through the application portions of the Innovation House, we also move from the invisible to the more visible aspects of innovation.

In this book, we will show you how all of the individual elements of the house link to each other to form a whole, how they work synergistically, and why leaving one out can be deadly. We will also help you understand the implications of defining each of the elements in relation to your organization’s goals and objectives.

To apply the Innovation House at a very high level, follow these two strategies:

1. If you are creating a new organization, culture, or team, start from the base of the house and work your way up.
2. If you are doing long-range planning, conducting an end-of-year review, or initiating a major innovation strategy, start at the top of the house and work your way down. If you are not getting the quantifiable gain you are hoping for at the top of the house, chances are there is an issue with the bottom of the house.

Appendix I provides a glossary of terms to help you understand and apply the principles in this book.

It is now time to start building your organization’s Innovation House.
SUSTAINED INNOVATION

INNOVATION PROCESSES

INVISIBLE RULES OF ENGAGEMENT

ORGANIZATION ‘DNA’

QUANTIFIABLE GAIN

Elements of Destruction are Present at Creation

Soft Values Drive the Organization

Trust is Foundational
Part One

The Eight Human Principles
SUSTAINED INNOVATION

QUANTIFIABLE GAIN

INNOVATION PROCESSES

INVISIBLE RULES OF ENGAGEMENT

ORGANIZATION ‘DNA’

Leverage Differences
Co-Location
Passion / Pain
Problems to Ideas
Innovation Systems

Elements of Destruction are Present at Creation

Soft Values Drive the Organization

Trust is Foundational
In the 1920s, it took 17 days to paint a Buick and 34 days to paint a Cadillac. At that time, Charles “Boss” Kettering was made a Vice President of United Motor Company (which later became known as General Motors, or GM).\textsuperscript{1,2,3} At a division manager’s meeting, Kettering explained the problem. He pointed out that GM could put together a car in minutes but that it took anywhere from 17 to 34 days to paint it. If GM was going to produce thousands of cars a day, then storage was going to become a major issue.

Kettering called a meeting of some of GM’s paint suppliers, paint chemists, and internal paint experts. After explaining the problem, he asked for ideas about what could be done. Following considerable discussion, somebody asked Kettering how long he thought it should take. To this he replied, “One hour should be about right.” The group responded that his timeframe was unrealistic, since the paint would not have time to dry. Kettering asked if anything could be done to make the paint dry faster. The group responded, “Not a thing in the world.”

One day in New York, Kettering saw a wooden tray in a jewelry shop with a lacquer on it that he did not recognize. He bought the tray, tracked down the manufacturer and, eventually, learned the source of the lacquer. He went and talked to the man who was making the lacquer in his backyard and asked to buy a quart. The man replied that he had never made that much before and then asked Kettering, “What are you going to do with it?”

Kettering answered, “Paint a car door.” The man said that Kettering wouldn’t be able to do so because the lacquer would dry almost immediately. He said, “If you put the lacquer in one of your spray guns, it would dry and blow away as dust before it reached the door.” So Kettering asked, “Can’t you do anything to slow down the process?” The man replied, “Not a thing in the world.”
Here was the dilemma: Kettering had one lacquer that dried too fast and another that dried too slow. So he continued to work with both lacquers and, with the help of DuPont and others, they eventually created a new kind of lacquer called Pyroxylin. It dried in an hour.

Developing the technical solution, however, was only part of actually reducing the time to paint a car from 17 to 34 days down to one hour. Getting the technical solution tried and proven within GM (and ultimately accepted by one or more of the division managers) proved to be a significant challenge for Kettering. When he asked if the primer coat could be altered to allow the new lacquer to adhere to the car, Kettering received a somewhat typical bureaucratic response: “No sir – we have adopted it [our current primer], and it is our standard.”

Overcoming bureaucratic opposition required taking significant risk, driven by passion and commitment to making GM successful. At one point, Kettering went so far as to get one of the general managers to give his paint manager a six-week vacation to go fishing. During that time, they were able to prove that the alternative primer successfully helped the new DuPont Pyroxylin paint to stick. Prior to a lunch meeting, Kettering asked one of the paint suppliers what color he would like to have his car painted. While at lunch, without telling the supplier, Kettering had the car repainted that color. Upon leaving the meeting, the supplier said that somebody had stolen his car. To this, Kettering replied, “That’s your car. That’s the color you selected, isn’t it?”

In the end, Kettering was successful in getting all of the division managers to accept the new paint and primer. He reduced the time to paint a car to one hour – his goal in the first place. His comment on the success was, “We don’t have the perfect paint yet. But reducing the time it takes to paint a car from 17 days to one hour is a good first step.”

Charles Kettering was one of the legendary innovators of the early twentieth century. He was responsible for innovations ranging from selective ringing for the telephone industry to the electric cash register and the electric car starter. He helped create what became the Memorial Sloan-Kettering Cancer Center. And on January 1, 1998, the former General Motors Institute changed its name to Kettering University, to honor Kettering as a founder.
A few quotes from Kettering provide a glimpse into how he viewed innovation:

“An inventor fails 999 times, and if he succeeds once, he’s in. He treats his failures simply as practice shots.”

“If you have always done it that way, it is probably wrong.”

“We often say that the biggest job we have is to teach a newly hired employee to fail intelligently, to experiment over and over again and to keep trying and failing until he learns what works.”

The question to ask yourself is, if Charles Kettering came into our organization as a young engineer from Ohio State University, would he be encouraged to develop into one of our greatest innovators, or would our organization attempt to squelch his innovative nature just because it’s “not the way we do things”?

The Human Element
How many times have you heard about an organization or company being innovative, or about an organization that is not as innovative as it used to be? Since Organizations Don’t Innovate, People Do™, what people are really saying is, “Our organization’s culture sponsors innovation,” or “Our organization used to have an innovative culture.” An organization’s culture can unlock the innovative potential of its people or keep it suppressed via an attitude of, “That is not how we do things here.” Upon reflection, what kind of culture does your organization have?

To diagnose issues that may be associated with a less than optimal level of innovation, it is imperative to understand that innovation does not occur in a vacuum. Innovation occurs in the real world with all of its complications, problems, and setbacks. Human beings, much like innovation, thrive best in nurturing environments. Innovation cannot be forced, but it can be fostered. Organizations cannot mandate innovation. They can only provide the environment, resources, and focus that will allow it to flourish.

Creating and sustaining innovation is very complex because of the human element. Until now, we did not have a universally accepted set of core principles that emphasized the importance of the human element. Nor did we have a common language for innovators to use. As such, innovation leaders would strive toward reaching similar goals, but up until now they
were unable to learn from each other’s experiences through use of standard terminology. Herein, we provide such principles and language.

There are three interconnected dimensions of a successful innovation organization: business, technical, and human. We call this the “Innovation DNA” (Figure 1.1).

All ideas have both business and technological dimensions. The business dimension is made up of typical factors associated with bringing ideas to fruition: development costs, venture capital, promotion, market acceptance, production costs, break-even points, etc. In contrast, the technological dimension encompasses methods used in the development of an idea into a final product. The business and technological dimensions vary between different organizations. However, the human dimension does not vary – in fact, it is the life force that can bind business and technology dimensions together to make the whole system work. But when the human dimension breaks down, the system implodes on itself or splinters and breaks apart.

You can take advantage of technology and have great business systems, but if you don’t have a successful human dimension, your organization will never reach peak innovation potential. Human dynamics provide a positive, but invisible, life force. They consist of the principles, values, methods/actions, and behaviors that help organizations generate positive results.
Principles, Methods and Actions, Values and Behaviors

We define a “principle” as a fundamental truth used as the basis for:

- Understanding a natural or scientific phenomenon
- Reasoning or action
  - Conducting our personal lives

Specifically, a principle is a fundamental truth that:

- Offers insight into why and how people try to solve specific problems or make decisions
- Provides a solid foundation upon which to build new ideas and innovations
- Is universally applicable to a broad spectrum of problems
- Allows for enhancement and modification of ideas, as well as increased understanding

Examples of principles include:

- Gravity – Law of Nature
- Family is foundational – Law of Society
- Innovation requires people – Law of Innovation

The world of innovation is continuously changing. As such, it requires that we understand and embrace fundamental principles in order to design and implement the systems and/or processes needed to support innovation. And without this understanding, we will not gain the knowledge we need to continuously update and improve these systems or processes so that we can generate the desired results.

Principles are tools we rely on and use knowing that they are timeless. They may evolve over time, but they represent generally accepted fundamental truths and understandings of the world as it exists.

As with all tools, only those principles that we actively employ will impact results. In order for principles to be translated into results, we need methods and actions through which to apply them. Principles are timeless, whereas methods and actions are situational. Methods answer the question, “What should we do?” And actions answer the question, “How should we do it?”
Here are two examples that will help paint the picture:

- **Example 1**: Say you want to pick up a pallet of merchandise. The fundamental principle involved here is that lifting the pallet requires overcoming gravity. Some of the methods and actions include using an overhead hoist, a forklift, or lever and fulcrum.

- **Example 2**: With innovation, you often strive to reduce time required for the innovation process. The key principle here is that innovation does not occur without motivating people to use appropriate methods and take appropriate actions. Some of the methods and actions you might use include making innovation a strategic priority, establishing an appropriate reward and recognition system, creating a culture of innovation within your organization, and so forth.

In the examples provided above, it is important to note that the same results could be achieved for some time without ever truly understanding the key principles involved. However, principle-based development illuminates the knowledge required to modify methods and actions over time. This allows organizations to repeatedly generate (and replicate) desired results. It sustains innovation.

Think about the Wright Brothers and the development of aviation following their first flight. If the principle of air flowing over the wing, generating lift, was not identified, could others have duplicated and advanced the initial designs of the Wright Brothers as quickly? Only by understanding the underlying principles can we modify what works today to meet needs in the future without relying strictly on luck.

Consider that principles are tools, whereas methods and actions define what and how the tools should be implemented. Regardless, a fundamental concept is still missing: the source of energy (or motivation) for implementing methods and actions. Values are the impetus for generating results. Values provide the source of energy (or fuel) for turning a principle into action.

Said another way, there exists a tremendous number of principles in the universe that are widely accepted but most of which we do not really care about. We will only expend time and energy to apply those principles that we truly value. For example, if you are not trying to lift a pallet of merchandise, how much time would you actually spend thinking about the weight of the pallet (gravity)? And if you’re not into aeronautics, how much energy would
you put into studying aerodynamics and, specifically, the lift associated with airflow over a wing?

Simply put: If you don’t value something, you won’t value its principles. If you don’t value the positive human dynamics that make innovation happen, and if you don’t value the people inside your organization, then it doesn’t matter if there is a poster on your company’s wall that states, “People are our most important asset.” **Principles and values drive actions, not posters.**

One way to determine what is valued by your organization is to examine key behaviors. What are your senior leaders interested in, where do they spend their time, and what questions do they ask? Answers to these questions provide a window into what is valued. Many years ago, Frito-Lay had a serious accident in one of the labs. Rocco Papalia⁶ (Senior Vice President of R&D) and the rest of his leadership team agreed that the accident was unacceptable and that, going forward, the whole organization would be committed to creating and sustaining a safe place to work. Indeed, they put their words into actions and told employees that their safety was to be valued. From then on, every senior staff meeting started with a safety update. Every accident (whether or not it resulted in lost time) was reviewed, and action plans were implemented to ensure that the causes of the accident were eliminated. Engineers, scientists, and technicians completed safety training programs, and employees were not allowed to operate equipment without implementing the required safety practices. Attention to safety became an important part of annual performance reviews. Home safety was even addressed. The net result was a virtual elimination of accidents. And even better: Employees understood that senior management valued their safety.

What does your organization value? Where are leaders spending their time and energy? Do they value people as a crucial element in the innovation process? The model in Figure 1.2 (next page) provides a way to identify the principles driving your organization via an examination of observable behaviors and business performance. In addition, the model allows the innovation leader to work forward from fundamental principles, to design the methods and actions necessary to encourage appropriate behaviors, and (consequently) to achieve the desired results.

As indicated in Figure 1.2, key stakeholders⁷ drive the current set of principles and values within an organization. In turn, their principles and values drive the organization’s response. Because key stakeholders have control and influence over the organization, the way they think and behave impacts employees’ behavior in lower levels of the organization.
To make innovation happen, the key stakeholders must first identify and understand the principles and values in this book and then implement them. This will drive the overall methods and actions within their organizations. As part of this, the stakeholders’ behaviors must be consistent with what they say are the company’s values for the organization to believe them.

Here is a summary of the **Principles to Results Model (PRM)**:

- Principles are fundamental truths.
- What you value determines which principles you and/or your organization will utilize.
- Methods and actions dictate how the principles are applied.
- Behaviors leading to results are the visible outcomes from the methods and actions.

If you create an organization without knowing the principles upon which you are building a foundation, you will have no idea where your organization is headed or how it will get there. Therefore, to be sustainable, your Innovation House must be constructed on identified and valued principles. You must also understand the different focuses of innovation within your organization, i.e., Where does your organization require revolutionary innovation?
Expansionary? Evolutionary? By examining current and future innovation portfolios, the desired innovation focus should become apparent. This will help you articulate the long-term vision required to construct your Innovation House.

**Innovation Portfolio**

An innovation leader must have a clear understanding of both the type of innovation required and how to generate it. Having a well-planned business strategy without the human or organizational systems to execute it will produce “hit and miss” results. It will also be unclear as to what worked or didn’t work and why. In the same way, having an ideal organizational system without a clear innovation focus is like driving a car blindfolded; you will be expending energy but not arriving at the desired destination, with potentially disastrous results.

Part of the learning that must occur should be geared toward understanding the desired innovation portfolio and the level of effort needed to move along the innovation continuum. What percent of your organization’s innovation effort should be directed toward revolutionary, expansionary, and evolutionary innovation? There must be a clear understanding of the innovation portfolio and the level of effort devoted to business as usual, new products for existing customers, existing products for new customers, and new ventures as addressed in Figure 1.3 (see next page). The purpose of this book is not to go into what this portfolio should look like for your particular organization. Instead, we only want to emphasize that developing this portfolio for your organization must be done in conjunction with understanding and applying the human principles for innovation.

As we begin to use the innovation portfolio, it is important to understand each of the quadrants and how they relate to the *Innovation Continuum*.

- **Quadrant I is called business as usual.** It is primarily associated with those slight modifications or improvements to the product to improve quality, reduce cost, or meet an existing market need (e.g., a different flavor). Innovation in this quadrant represents the evolutionary end of the continuum.

- **Quadrant II is called platforms.** The focus of activity in this quadrant is to expand the company’s market through application of its existing technology. This might include moving into a different geography or market segment. An
example might be taking a product that has been successful in one country and moving it into a different one. Innovation in this quadrant falls within the expansionary portion of the continuum.

- **Quadrant III is called solutions focused.** The primary focus is to provide products to meet a current customer or market need. As an example, consider the development of a new system to allow unmanned aircraft vehicles (UAV) to operate in a civilian airspace for an existing customer. Innovation in this quadrant is in the expansionary portion of the continuum.

- **Quadrant IV is called venture.** Activities in this quadrant are focused on developing new products for new markets.

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**Figure 1.3**

One approach for looking at the distribution of innovation effort. Upon completion of this analysis, an innovation leader can begin to build the required innovation culture and apply the human principles for sustained innovation.

<table>
<thead>
<tr>
<th>PRODUCTS/TECHNOLOGIES</th>
<th>SOLUTIONS FOCUSED</th>
<th>VENTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>Current IE* _____% Desired _____%</td>
<td>Current IE* _____% Desired _____%</td>
</tr>
<tr>
<td>Existing</td>
<td>BAU**</td>
<td>Platforms</td>
</tr>
<tr>
<td>Current IE* _____%</td>
<td>Desired _____%</td>
<td>Current IE* _____% Desired _____%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MARKETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
</tr>
</tbody>
</table>

*% Innovation Effort
**Business as Usual
Developing the personal computer for general use in the home and inventions such as cell phones, GPS systems in cars, and the Internet are good examples. Innovation in this quadrant is toward the revolutionary end of the continuum.

By understanding your organization’s current and desired portfolios and the types of innovation required, you will be able to define the types of innovation systems you’ll need, the people (skill sets) you’ll need, and the overall culture you’ll need to foster in order to succeed.

**Summary**

Every idea has both a business and technological dimension, but it is the human dimension that translates an idea into a valuable innovation. There are eight human principles for sustaining innovation, which comprise the lower portion of the Innovation House (see page xx).

The impact of key stakeholders on your organization cannot be overestimated, as their principles and values will impact their behaviors and, subsequently, determine how innovation will be viewed, encouraged, acted upon, and so forth. Employees will attempt to mimic behaviors of these key stakeholders – which will ultimately impact business performance. Therefore, it is critical to understand how principles and values are adopted by your organization and, consequently, how they influence the methods and actions that can drive results. This is the way key behaviors are adopted and, in turn, how they become part of the culture.

In the remainder of Part One, we will examine each of the eight human principles for sustaining innovation and address how to apply them.

At the beginning of this chapter, we said innovation cannot be forced, but it can be fostered. This brings us to our first human principle: For innovation to be fostered, there must be trust.
Thank you for reading this preview of The Invisible Element: A Practical Guide for the Human Dynamics of Innovation by Robert B. Rosenfeld and Gary J. Wilhelmi with Andrew Harrison. We hope you have found it useful!

If you are interested in purchasing a full copy of the book, you can do so at http://www.innovating.com/innovation-resources/products and http://amzn.to/Hj770o.

If you would like to learn more about Rosenfeld, Wilhelmi and/or Harrison, you can visit http://www.innovating.com/about-us/our-team/united-states.

If you would like to get in touch with Rosenfeld, Wilhelmi and/or Harrison, please email aharrison@innovating.com.

Idea Connection Systems is a global innovation consulting firm founded in 1988 that focuses on the human dynamics that make innovation happen inside organizations. We are also the creators of the psychological tool ISPI™ - Innovation Strengths Preference Indicator®. You can learn more about Idea Creation Systems by visiting our website at www.innovating.com.
SUSTAINED INNOVATION

Innovation Systems
Problems to Ideas
Passion / Pain
Co-Location
Leverage Differences

INVISIBLE RULES OF ENGAGEMENT

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Appendix I

Glossary

(Note not all of these terms are used in this book. We have included several terms used elsewhere in looking at innovation to help you have a common understanding of them.)

A

Actions
Answer the question, “How should we do it?”

Advocate
A proponent of an idea or proposal.

Affect
Scientific term used to describe a subject’s externally displayed mood.

“Air Cover”
Protecting a team from undesirable impact from the larger organization. Ensuring that they have the resources and freedom necessary to successfully attack a wicked problem.

Amotivation
Limited or no intent to act – going through the motions.

Autonomy
Feeling of volition or being in control to act.

B

Bi-association
The connection of the thoughts or elements from different planes or domains to produce novel thought.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Hole Effect</td>
<td>Unintentional practice of reducing the submission of ideas by non-response.</td>
</tr>
<tr>
<td>Bootleg Work</td>
<td>Work done on projects outside the area of a person’s normal billable or chargeable responsibilities.</td>
</tr>
<tr>
<td>Bottom Up</td>
<td>For innovation, this means ideas that come from people whose assigned area of work is different from the nature of the idea they are presenting.</td>
</tr>
<tr>
<td>Builders</td>
<td>Seek solutions based on existing concepts to do things better.</td>
</tr>
<tr>
<td>Buy-in</td>
<td>Acceptance of or commitment to an idea.</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td></td>
</tr>
<tr>
<td>Camaraderie</td>
<td>Being eager to work with others and hearing what they have to say.</td>
</tr>
<tr>
<td>Challenge Board</td>
<td>A panel designed to examine an idea or solution to make sure that all angles have been addressed.</td>
</tr>
<tr>
<td>Champion</td>
<td>A person (sometimes a group) that is devoted to a concept and pursues it relentlessly against all odds – an individual who is willing to become a proponent of an idea at an early stage.</td>
</tr>
<tr>
<td>Change Partners™</td>
<td>Trusted influencers within the organization who can help influence others to help implement a desired organizational change.</td>
</tr>
<tr>
<td>Coaching</td>
<td>The leadership skill that enables others to develop the ability to solve their own problems and make their own decisions, thereby helping them grow in confidence, ability, self-esteem and overall value to the organization.</td>
</tr>
<tr>
<td>Cognitive Diversity</td>
<td>Differences in how people perceive or act upon their environment; differences in styles people use to acquire and apply knowledge.</td>
</tr>
</tbody>
</table>
**Commission**

Usually involves a conscious decision to withhold or provide incomplete information.

**Communal Culture**

An organization characterized as having both high sociability and solidarity.

**Communication Content**

- **Physicality (Level 1)**
  
  Physical description of an item (color, taste, shape, etc.).

- **Analytical (Level 2)**
  
  Analytical analysis of a physical item (economics, production capacity, market/sales potential, etc.).

- **Evolutionary (Level 3)**
  
  Potential enhancements without changing basic form (size, color, shape, etc.).

- **Innovative (Level 4)**
  
  Slight changes to basic form (SUV vs. sedan).

- **Revolutionary (Level 5)**
  
  Significant changes to basic form (plane vs. car).

**Competency**

Fundamental characteristic causally related to sufficient or superior performance in a job or role.

**Conation (Conative)**

Aspect of mental processes or behavior directed toward action or change and including impulse, desire, volition, and striving.

**Contentiousness**

Inability to allow for creative disagreement or active engagement without being possessive of ideas, taking (or making) the disagreement personal, or being disagreeable.

**Continuous Improvement**

Process for incremental improvements that lead to cost savings or increased quality.

**Core Cluster**

Small number of people who take on the responsibility for direction and stewardship of an organization. They perform as a ‘real team’ whose
members are committed to the common purpose and goals of the organization – they will hold each other accountable.

**Covenant**
Relationship between two or more people in which each accepts definable (written or oral) responsibility for the mental, emotional, physical, spiritual, and financial well-being of one another.

**Creativity**
Generation of novel ideas or new way of thinking.

**Creativity Partner™**
Individual who has a high level of both Head and Heart trust used to develop or refine an idea in its early stages; trusted confidant.

**Culture**
Attitudes, norms, values, and beliefs that exist within an organization.

**Culture Shock**
Feeling an individual gets when they enter a strange culture where all of their familiar cues are removed.

**Currency of the Realm**
Value of an item expressed in the language and behaviors meaningful to those concerned.

**D**

**Data**
Raw observations without interpretation.

**Destructive Communications**
Communication to respond (“below the line”) which is based on a win-lose or protectionary mentality and is a major obstacle for innovation to occur.

**Discord**
Negative attitudes within an organization which can tear apart the fabric of its culture.

**Discounting**
Belittling the contributions of others or putting down their ideas.

**Discrete Solutions**
Solutions that focus on novel or different approaches versus those that are slight improvements.
**Disruptive (Disruption)**  Upsetting the status quo either internal to an organization, external (marketplace), or both.

**Diversity**  Differences that occur in any population – both visible and invisible.

**Domain Expert**  Person recognized within an organization as being an expert in a particular field.

**Dominating Attitude (Dominance)**  Feeling that people you supervise “work for you” or “under you” vs. feeling that you are responsible for them.

**E**

**Emotional Intelligence**  Ability to be aware of our emotions, manages the negative ones, and harnesses the positive ones to build passion and energy for individual and team goals.

**Enhancement**  Process whereby an innovation advocate works with the idea originator to refine, develop and describe ideas so the ideas will receive serious attention when presented internally.

**Entrepreneur**  Individual who takes on the risk of creating a business to commercialize an idea – their own or somebody else's.

**Erroneous Data**  Input considered unreliable and discarded.

**Errors of Commission**  Are a result of specific actions taken with the intent to mislead (or cover up something).

**Errors of Omission**  Come from not taking action, but not taking action was not premeditated to mislead anybody.

**Evolutionary Innovation**  Seeks solutions based on existing concepts to do things better (e.g., Six Sigma).

**Expansionary Innovation**  Challenges the problem to do things differently (e.g., line extensions).
<table>
<thead>
<tr>
<th><strong>Explicit Knowledge</strong></th>
<th>Knowledge that is written down in reports, papers, patent disclosures, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extrinsic Motivation</strong></td>
<td>Motivation that comes from outside an individual such as money, recognition, or grades.</td>
</tr>
<tr>
<td><strong>Figures of Merit</strong></td>
<td>Define a priori when the outcome is “good enough.”</td>
</tr>
<tr>
<td><strong>Filter (Communication)</strong></td>
<td>To restrict the use or sharing of information based on internal trust / motivation.</td>
</tr>
<tr>
<td><strong>Fragmented Culture</strong></td>
<td>Organization characterized by low sociability and low solidarity.</td>
</tr>
<tr>
<td><strong>Gap Analysis</strong></td>
<td>Technique for determining the steps or actions required to move from a current state to a desired future state.</td>
</tr>
<tr>
<td><strong>Gate (Stage)</strong></td>
<td>Passage from one stage to another in the development process.</td>
</tr>
<tr>
<td><strong>Generative Communications</strong></td>
<td>“Above the line” communications to learn/understand which facilitates open communications and innovation to occur.</td>
</tr>
<tr>
<td><strong>Genetic Elements of Destruction</strong></td>
<td>Elements date back more than 10 years or to the beginning of the company. They are ingrained in everything and are the most difficult to overcome.</td>
</tr>
<tr>
<td><strong>GPS</strong></td>
<td>Global Positioning System for navigation.</td>
</tr>
<tr>
<td><strong>Hard Objectives</strong></td>
<td>Tangible objectives (e.g., percent profitability, share).</td>
</tr>
</tbody>
</table>
“Head Case” An individual whose passion is not aligned with the core principles and values of the organization. Their passion is strictly to further their own personal agendas.

Head Trust (Intellectual Trust) Trust of the intellectual capabilities / inputs of another individual or organization.

Heart Trust (Emotional Trust) Trust of another person or organization that they have your best interests at heart – are not predisposed to injure you in some way.

Humility Understanding your place in the scheme of things and being able to use your talents and abilities, without self-aggrandizement, for the benefit of the whole.

Idea Mental concept or image.

Ideator Person who generates many ideas, but may have little interest in developing them.

Incremental solutions Solutions focusing on slight changes to the existing system or process versus a significant change.

Indiscriminate Criticism Criticism of the organization, its policies and fellow employees, which undermines trust, threatens organizational viability, and discourages innovation.

Individual Cluster Specific executional team (e.g., Wicked Leaders & Wicked Practitioners).

Information Interpretation of data to create understanding.

Innovation Advocate Person who assists originators in taking ideas through the agonizing, organizational maze. This includes helping originators:
  • Refine and develop ideas to get most
favorable hearings.

- Locating resources that can be used to help.
- Coaching and encouraging originators and other team members as idea advances.
- Helping originator understand the overall process and accepting the results (positive and negative).
- Encouraging submission of more ideas.

*Innovation Continuum*  Spectrum of innovation from evolutionary (doing things better) to revolutionary (creating a new paradigm).

*Innovation Diversity*  Leveraging of diversity (visible and invisible) within an organization to stimulate innovation.

*Innovation Leaders*  Leaders who support and drive innovation.

*Innovation Systems*  People-based infrastructures within an organization that facilitate innovation.

*Innovator*  Person who generates creative ideas and transforms them into a quantifiable gain.

*Internal Consultant*  People, generally within the organization, who have expertise in the area of the originator’s idea.

*Internal Venturing*  Process for launching new businesses that do not fit within the company’s current line of business.

*Intrapreneur*  An entrepreneur who stays within a larger organization.

*Intrinsic Motivation*  Refers to motivation that comes from within an individual rather than from external sources.

*Inventor*  Person who discovers a phenomenon or dreams up an idea and then proceeds to transform it into a tangible product. Ideas may or may not be patented.
J

K

Kaizen Teian  A Japanese philosophy focused on continuous improvement.

Key Stake holders  Those individuals who can directly affect or are accountable for establishing the direction for the organization. They are generally the key decision makers.

Knowledge  Information in context that creates action; enables making a decision / creating a solution / etc.

Knowledge Nugget  Single bit of knowledge usually contained within a knowledge transfer system.

Knowledge Worker  An individual valued for their ability to interpret information within a specific area

L

Lean Six Sigma  A continuous improvement program, which uses the DMAIC (Define, Measure, Analyze, Improve, and Control) process.

M

Marathoner  Somebody who can stay motivated to work on a new project through to its conclusion.

Maslow’s Hierarchy  NEED TO:*
- Helping others - Connect beyond ego \(\rightarrow\) help others realize their potential
- Self-Fulfillment - Realize one’s own potential
- Aesthetic - Create Symmetry / Order
- Knowledge - Understand / Explore
- Self Esteem - Achieve / Gain Approval
• **Belonging** - Affiliate with other / Acceptance
• **Safety** - Remove Danger
• **Physiological** - Meet basic physical needs: Hunger/Thirst/Bodily Comforts


**Methods**

Answer the question, “What should we do?”

**Mercenary Culture**

Organization characterized as having low sociability and high solidarity.

**Motivation**

Reason for an individual to act, to share or take in thoughts.

**Motive**

What really drives an organization.

**Networked Culture**

Organizational culture characterized as having high sociability and low solidarity.

**Nonlinear System**

System whose behavior is not simply the sum of its parts or their multiples – they are often difficult (or impossible) to model, and their behavior with respect to a given variable (for example, time) is extremely difficult to predict.

**Office of Innovation**

Office created by Robert Rosenfeld in 1979 for Eastman Kodak to handle new ideas.

**Office of Innovation Process**

Manner in which the Office of Innovation handles ideas. There are five stages:
• Idea Generation
• Idea Screening
• Group Review
• Seeking Sponsorship
• Sponsorship

**Omissions** Not providing complete information due to ignorance or lack of information.

**Open-mindedness** Respect for employee’s opinions and encouraging them to bring issues/concerns/ideas forward.

**Originator** Someone who comes up with an idea to be developed.

**Originator-Assisted** Process which helps to transform their ideas into business opportunities.

**P**

**Pain** Suffering seen as a punishment or penalty.

**Paradigm** Set of rules that defines boundaries and describes what to do to be successful within those boundaries.

**Paradigm Builder** Someone who solves problems by working within existing structures / paradigms.

**Paradigm Creators™** Individuals who have the right combination of passion and skills to make a significant change.

**Paradigm Pioneer** Someone who solves problems by pushing the limits of existing structures/paradigms or creating new ones.

**Partner** Person associated with others in some activity of common interest whose identity is entwined with the activity.

**Passion** In psychology and common use, emotion is the language of a person’s mental state of being; strong, enthusiastic devotion to a cause, ideal, or goal and tireless diligence in its furtherance.

**Passive Advocacy** Unwillingness to allow others to know what you think or feel.
Patience and Long-Suffering
Grace under stress. There are things out of your control that cannot be rushed; there are time frames out of your control.

Personal Sensitivity
Degree of filtering (sharing or withholding) of thoughts based on level of potential exposure.

Physio-Culture
Differences that are readily apparent through observation and interaction (e.g., gender, race, culture, etc).

Pingging™
Thought/communication process usually found in strong pioneers in which they follow a non-linear process, often going off on tangents when working to solve a problem.

Pioneers
Redefine the problem definition to break boundaries and create new paradigms.

Planned Ideation
Is directed from the top down. It is part of normal management strategies. Many of these ideas are in response to specific problems or challenges.

Poingging™
Thought/communication process found in the majority of the population in which people will generally follow a linear, incremental process with moderate tangents to expand their solution set in working to solve a problem – the middle ground between strong Pinggers and Ponggers.

Pongging™
Thought/communication process usually found in strong builders in which they follow a linear, incremental process when working to solve a problem.

Pride
Holding on to your idea so tightly that different perspectives cannot be seen or considered.

Principle
A fundamental truth used as the basis for understanding a natural or scientific phenomenon, reasoning or action, or conducting our personal lives
Problem
An issue or anything that challenges you.

Purity of Motive
Working in the best interest of the organization without a hidden agenda.

Q
Quantifiable Gain
Measurable benefit to the organization in terms of the currency of the realm.

R
Receiver
One listening to (reading) the thoughts verbalized (written) by another.

Relatedness/Belonging
Identifying with and feeling of belonging to the organization.

Relationship Spectrum
Continuum describing the depth of a relationship from a loose arrangement on one end to a covenant on the other.

Revolutionary Innovation
Redefines the problem definition to break boundaries and create new paradigms (e.g., Wright Brothers’ first flight).

S
Service
Meeting the needs of others.

Sifting
Process which separates the idea with potential from those which have reached the limit of their development.

Six Sigma
A continuous improvement program to improve the capability and reduce defects in a process using a methodology known as DMAIC (define, measure, analyze, improve, control).
**Sociability (Organizational)**
The level of friendliness – or how well employees get along with each other.

**Soft Objectives**
Objectives related to how people feel as a result of implementing a process (e.g., measured in terms of attitude, job satisfaction, etc.).

**Solidarity (Organizational)**
The level of alignment on common tasks, mutual interests, and shared goals within the organization.

**Spirit**
1. Compilation of wisdom creating the essential principle(s) influencing the thoughts and actions of an individual.
2. The life force within an organization.

**Sponsor**
People having both the power and ability to allocate funds and/or resources to projects.

**Sprinter**
Somebody who becomes totally immersed in a new activity for a short period of time, then wants to move on to something different.

**Steward**
Person who takes on the good of the company as a whole and for its employees – willing to devote significant time and energy to help others and the company to grow.

**Strategic Transfer**
Transfer of technology or knowledge from one point to another for the purpose of leveraging capabilities.

**Stubbornness**
Being unreasonably obstinate, always insisting on your own way, being unable to admit the value of other viewpoints.

**Sustained Innovation**
Continuous flow of new products, processes, and services that ensure an organization’s competitive edge.

**Synergy**
Effect that is greater than the simple sum of the parts.
Tame Problems

- Relatively well-defined and stable problem statement.
- Definitive stopping point.
- Objectively evaluated solutions as right or wrong.
- Similar to other problems and solution approaches.
- Solutions can be tried and abandoned or adopted.

Targeted Innovation

Process for developing solutions to meet a specific need.

Transient Elements of Destruction

Elements that are recent and are usually associated with specific individuals. They are far less engrained into the organization than the genetic ones and are easier to overcome.

Transmitter (Communications)

One sharing internal thoughts (verbal or written) with another.

Trust

Degree that one believes/entrusts another with sensitive thoughts to be used. Confidence in the integrity, ability, character, and truth of a person or organization, including both head and heart trust.

Unplanned Ideation

Ideas generated without the influence of a formal process. Often they are bottom up driven.

Values

Values are the impetus for generating results. Values provide the source of energy (or fuel) for turning a principle into action.
**Vetting of Knowledge Nuggets**

To make sure the nuggets have been reviewed to ensure accuracy and applicability.

**W**

“We be’s”

Attitude of people who feel all they have to do is make it look like they are supporting an activity, knowing that it will go away before they really have to do anything or change. The mindset of “we be here before you and we be here after you.”

**Wicked Advocate**

The person(s) charged with the accountability to represent the wicked team to the outside organization for the purpose of insuring that results of the team’s efforts will be accepted and embraced by the rest of the organization or company.

**Wicked Manager/Wicked Leader**

The person(s) charged with the accountability to lead or direct all or part of an organization, often a business, through the deployment of resources (human, financial, material, intellectual or intangible).

**Wicked Practitioner**

The person(s) associated with an organization tasked with working on a wicked problem.

**Wicked Problems**

- No definite problem formulation.
- No stopping rules.
- Solution evaluation better or worse vs. right or wrong.
- Each problem is unique.
- Problem is symptom for other wicked problems.

**Wicked Sponsor**

The person(s) who has ultimate authority over the project and provides project funding, vision and scope. They approve major deliverables and also champion the project within their organization.
**Wisdom**  
Compilation of knowledge to gain greater insights / discern relationships

**X**

**Y**

*Yin/Yang Innovation Balance*  
Organizations need a balance of innovation along the entire innovation spectrum.

**Z**

*Zero-Sum Game*  
The sum of activities remains constant. For everything added, something needs to be subtracted. For everything subtracted, something needs to be added.
Appendix II

**Bibliography**

A

*All About the Human Genome Project (HGP)*. Retrieved 2009, from National Human Genome Research Institute: http://www.genome.gov/10001772


B


**C**


**D**


_E_


_F_


_G_


Personal communications: Thomas McGafee, PhD.

Personal communications: Jerry Belle, President, Aventis NA.

Personal communications: Col. Peter Engstrom, Ret.

Personal communications: Rocco Papalia, Sr. Vice President, Frito-Lay, Inc.


Q


R


S

SAIC (Science Applications International Corporation): http://www.saic.com/


The Apache Software Foundation: http://www.apache.org/

The Linux Foundation: http://linux.com/index.php


Appendix III

Endnotes

Introduction


6. 7" by 3½" card with 80 columns and 12 punch locations per column. The cards were used for inputting computer programs and data.


11. The ™ notation is only used the first few times a word or phrase is used. After that it is not used in order to make the text easier to read.


**Part 1 (Chapters 1 — 10)**

**Chapter 1**


15. Transcript of personal copy of Kettering’s speech.


18. Personal communications: Rocco Papalia, Sr. Vice President, Frito-Lay, Inc.

19. Key stakeholders are defined as those individuals who can directly affect or are accountable for establishing the direction of the organization. They are generally the key decision makers.