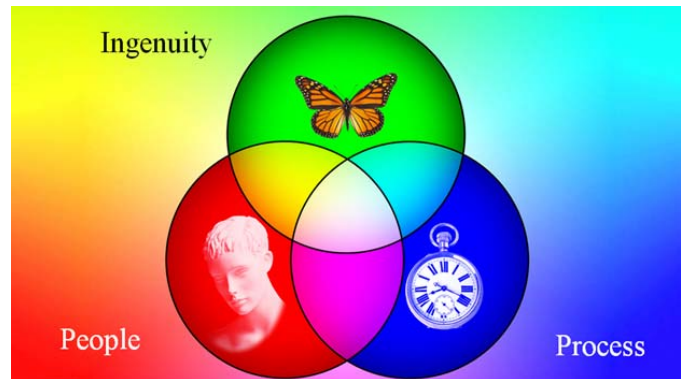
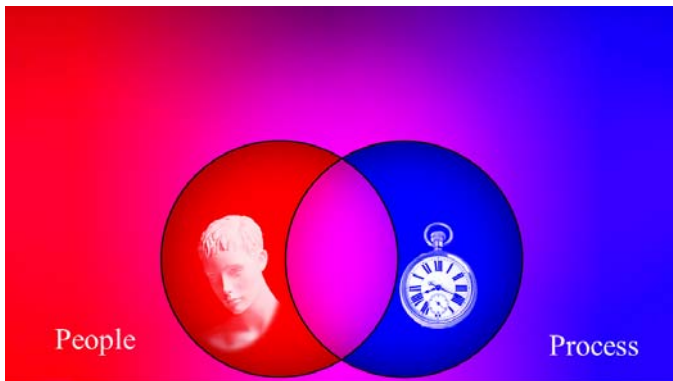


Harnessing the Power of Human Ingenuity

Steven Wille & Dr. James Rairdon



To lead a great organization you need strength in two critical areas: *people* and *process*. Great people doing great things. That was the conventional wisdom in the 20th century, but many excellent companies from that era did not make into the 21st century. Today, we need more. We need innovation and human ingenuity. Things are changing fast and if we don't keep up our companies, and our careers, are likely to falter and fade quickly. Back in the mid-nineteen hundreds, companies lasted an average of 61 years on the Standard & Poor 500 list, which was longer than a normal career. Today, the average is 18 years. How can you survive and thrive?

We are not proposing that the old management leadership formulas should be discarded. We are saying you need all three, *people*, *process*, and *human ingenuity*. It is like the three colors in your television coming together to make white light. It simply cannot be done with just two colors. The three color LED lights in your television are red, blue and green. We will use these three colors to represent the three critical skills for management leaders, with red representing people, blue representing process, and green representing human ingenuity. All three are needed in appropriate quantities to create the full picture.

Let's start with human ingenuity, the green in our model. You notice there's a butterfly in the graphic, representing the *butterfly effect*. Small changes in starting conditions can result in big changes in outcome. Because of the butterfly effect we will never be able predict the outcome from a complex system. The but-

terfly effect came from Edward Lorenz, who is known as the father of chaos theory. He wrote a paper in 1972, *Predictability, does the flap of a butterfly's wing in Brazil set off a tornado in Texas?* There is an interesting story behind this. In 1961, he and a group of meteorologists were using computers to predict the weather. Digital computers were relatively new in 1961 and they did not have graphical monitors with pictures back then. They had printouts with numbers on paper that represented quantifiable data, such as temperature, humidity, wind speed, and other variables.

One day Lorenz wanted to extend a forecast, so he keyed in the printed numbers from the first run, ran the model, and was surprised by the results. For the first few days, the weather was similar to the first run, but 30 days out, it was completely different. At first he thought that there must be a vacuum tube broken in his computer. Then he realized the printout was rounded to three decimal points, but the computer memory was rounded to six decimal points. A difference in temperature of less than one-one thousands of a degree in his model changed the outcome dramatically 30 days out. Right then, he knew we would never predict the weather 30 days out. Here we are 50 years later, and we still can't. He was right. He spent the rest of his life looking at non-linear equations and at problems that can't be solved in a traditional linear way, but exhibit predictable patterns and possibilities. Today, chaos science, also known as complexity theory, is recognized as the way the natural world works. So many variables come together at one time it is absurd to attribute any natural

event to a single factor. It is the interaction of variables that delivers the outcome.



Porch of Maidens, Erechtheion, built between 421 and 406 BC
Greek temple on the north side of the Acropolis of Athens

To see human ingenuity emerge from complexity, we are going to look at history. Consider ancient Athens, the birthplace of what we know as western thought, including democracy, philosophy, and the scientific method. Where did this human ingenuity come from in this small city on the Mediterranean two thousand five hundred years ago? When we think of Athens we often picture the temples on the acropolis, but that is not where the human ingenuity emerged. It emerged from the city. The Acropolis, with its temples, is on the hill. The people were in the city. Here is a recent picture of Athens, the very same streets where Socrates, Plato, Aristotle and so many other great thinkers roamed. There was an unusual quantity of highly intelligent people along with political and economic condition where they could think, debate, write, and do cool things. They changed the world.



City of Athens 21st Century

At many times and places in history human ingenuity emerged to change the world. Consider William Shakespeare. Some people say he couldn't have written the works of Shakespeare. It was too good. There must

have been more to the story. He lived in Elizabethan London when poetry and plays were valued. There were no copyright laws, so writers could borrow from one another. Every iteration got better. It was because Shakespeare lived in London in the Elizabethan age that he could interact with other great writers. From this place and time emerged some of the greatest literature in the English language.

There is a modern day ancient Athens and Elizabethan London where ideas are emerging at an incredible rate. Consider the Silicon Valley in California. Because it is a concentrated area with smart people packed together, unintentional collaboration leads to new ideas. New products emerge. Marissa Mayer, a long time Google employee was hired by Yahoo to be CEO and bring more of the Google culture to Yahoo. One of the first things she did was announce the end of telecommuting so that people would be together. She recognized that people may be more productive when working alone, but she was willing to give up productivity to get more collaboration.

The Gallup Business Journal reported that according to their studies when employees spend no time working remotely, 28% were engaged in their work and 20% were disengaged. Gallup found that by spending 20% of their time working remotely, employee engagement went up to 35% and disengagement down to 12%. Above 20% working remotely, the engagement and disengagement trended backwards. This suggests there is a human need to work alone and a human need to interact in the same space. In other words, doing both is better than one to the exclusion of the other. Going back to the red, blue, green model, one color to the exclusion of the others throws the picture off color. We need the green of collaboration that lets human ingenuity emerge, and we need the blue of routine work that is best done working alone.

This leads us to the blue in our model, represented by a watch. The watch maker makes the watch, sells it, and never visits the customer again. This is possible because of the quality craftsmanship that goes into building a machine that operates in a controlled and predictable way. Extending the watchmaker model to the business world, we need organizations that operate in controlled and predictable ways. Repeatable process-

es and best practices are key to achieving this.

At one time, *made in Japan* inferred low quality products that would fall apart quickly. Today, *made in Japan* infers high quality. What changed? Much of the credit for the transformation goes to W. Edwards Deming who emphasized statistical process controls. In the late 20th century when American companies were falling behind in quality, Deming returned to America and helped create a quality awakening. Today, American companies compete globally with quality products.

The great American productivity that emerged in the early 20th century can be traced to the work of



Frederick Taylor

Frederick Taylor who is recognized as the father of scientific management. Prior to this time labor was cheap and not much attention was paid to worker productivity. Who cared about immigrants, serfs, peasants, or slaves, as long as the work got done? Taylor quantified the value of labor. He walked around with a stop-

watch to see how long any task might take, and then he looked for a faster way to do that task. He also engineered the tools to aid productivity. For example, he optimized the size and shape of a shovel, making it appropriate for the material to be shoveled. A worker should go home tired but not exhausted. Peter Drucker, another great management thinker of the 20th century said of Taylor, "On Taylor's scientific management rest, above all, the tremendous surge of affluence in the last 75 years which has lifted the working masses in the developed countries well above any level recorded before even for the well-to-do." Scientific management changed the world.

One of the greatest scientific management experiments of all time, was at the Western Electric Hawthorne plant, just south of Chicago. In the 1920s, there were 40,000 people working in this plant where telephone equipment was made. The telephone was to the early 20th century what the internet is to the 21st century. In today's dollars, the annual output of this factory was 3.7 billion dollars' worth of goods. It was a great place to test scientific management because a small



Western Electric Hawthorne Works, in Cicero, Illinois

gain in productivity would lead to a large gain in profit. That thinking led to the illumination experiments. Before starting the experiment, productivity was measured to create a baseline at a specific level of light. At the time, factories were lit by natural light coming in through windows. The question at hand was the potential value of increasing the illumination through electric lighting. Illumination was doubled and productivity went up. It was doubled again and productivity increased. To be a valid experiment there had to be a negative test. The lights were dimmed. Productivity remained high. They had to bring the lighting down to 0.06 foot candles, the level of moon light, before productivity went below baseline. This experimenting ran for two and a half years.

The Hawthorne plant was still operating in 1975 when the director of corporate planning for AT&T, Henry Boettinger, said, "The experimenters at the Hawthorne plant did not discover what they set out to find and the researchers had sense enough to recognize what they had found." A whole new world opened up because of this experiment. That takes us to the red part of our model, the people side. A factory is more than a building with equipment, processes and procedures. Human beings do the work. Human systems are complex and it is difficult to isolate one factor, such as lighting, and say it will lead to higher productivity.

For next six years the human factor was studied. A relay assembly test room was set up so the output from a team could be accurately measured. Working conditions were modified in many ways, such as work hours, breaks, and earning more pay for more work output. In addition to this, over 20,000 workers were interviewed personally in open ended sessions conducted by trained interviewers who were focused on how people really felt about their jobs.

According to the testers, as summarized by Elton Mayo and Fritz Roethlisberger, many human factors

come together, but one thing that stood out. The supervisor's method was the single most important variable. That launched the whole business of management training with a focus on the human relations side of management, in addition to the process side of management. The Hawthorne phenomena is much bigger than a single interpretation of what caused the increase in productivity. It is the complex interaction of many factors coming together.

This pivotal experiment was nearly a hundred years ago. Is it relevant to the 21st century? In 1994, *Discover Magazine* reported an odd occurrence. Some teams in a call center were more productive than other teams, even though all teams were essentially the same in human skills and experience with the same working conditions. An outside experimenter focusing on human interaction observed that the teams that took their breaks together were fifteen to twenty percent more productive than teams that took staggered breaks.

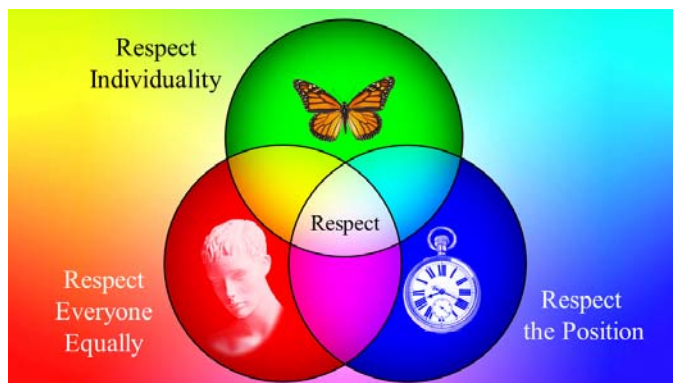
A retired engineer from Hewlett Packard told us that back in the 1960s, when HP was the great innovative company, every mid-morning a coffee cart would roll in with free donuts and coffee. Engineers quit working to stand in line for donuts and coffee. How many companies roll in a cart with free donuts and coffee 10:30 every morning so that they can get some better collaboration? It may seem like a waste of time, but fifteen to twenty percent more productivity is not something to be ignored.

It would be fair to say that management practice in the 20th century evolved to encompass both people and process. It also would be fair to say that the massive corporate productivity and quality gains of the 20th century were related to these enlightened management practices. Since then the world has changed and 20th century solutions may not be sufficient for 21st century problems. We live in a Wiki world. Wiki is Hawaiian for quick. Rod Collins, author of *Wiki Management*, says, "Nobody is smarter and everybody and nobody is faster than everybody." People around the globe are working simultaneously on new opportunities. The old hierarchy and bureaucracy from the 20th century cannot keep up. It is dead. The authors of this paper agree with Collins when examining corporations under the green light in our model, but we maintain the hierarchy

is alive and well under the blue light of process control and quality operations. In other words, we are proponents of red, blue, and green light making white light, and that is the place to be in the 21st century.

Three Proposals

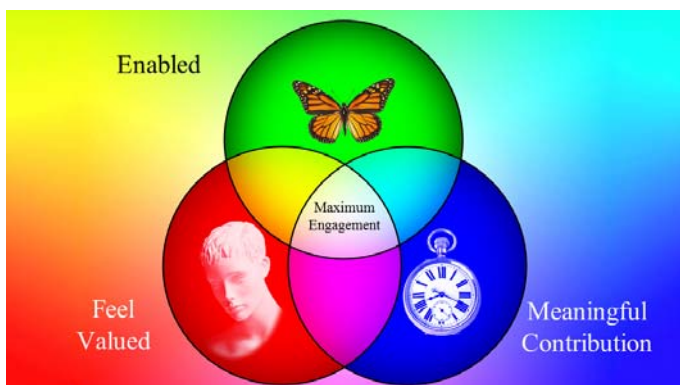
The historical support for this three color model for management leadership is interesting, but it does not tell us what to do in the future. Therefore, we offer three color proposals. You won't find these in any book. We made them up, but they're based on the idea that all three dimensions are useful, and one to the exclusion of the others is a mistake. The purpose of our proposal is to get you into three color thinking in every interaction. We will look at three situations and offer three different ways of seeing these situations.



Show Respect

Under the blue light, showing respect is to respect the position. The chair represents the authority of the person sitting in the chair. What do you do when a person of authority tells you to do something? You do it, unless it's illegal or unethical. If you cannot get this right you will not last long in the organization. Under the red light it is a whole different picture. This is where you respect the person, not the position. The red and blue are in direct opposition. Do I respect the person or the position? The answer is both. This was learned in the 20th century. Most organizational people have figured out how to do both. In the 21st century equality and position are still important, but a third dimension has emerged. The green light has a libertarian tint to it. We respect the individual and we do not treat everyone the same. We do not say, "If we do it for you,

we have to do it for everyone.” Instead, we look at individual opportunities. That is the only way to allow human ingenuity to emerge. What if you had Aristotle working for you, and Aristotle did not feel like doing it your way? Would you say, "If we do it for you, Aristotle, we have to do it for everybody." There are many Aristotles working at your place right now. We have a highly educated workforce. Many workers do not mind trying new ideas that may or may not work. Are you shutting them down with simplistic rules that apply to everybody? We have no trouble giving the people in the hierarchy special privilege. Is it unreasonable to give special privilege to the highly ingenious people?



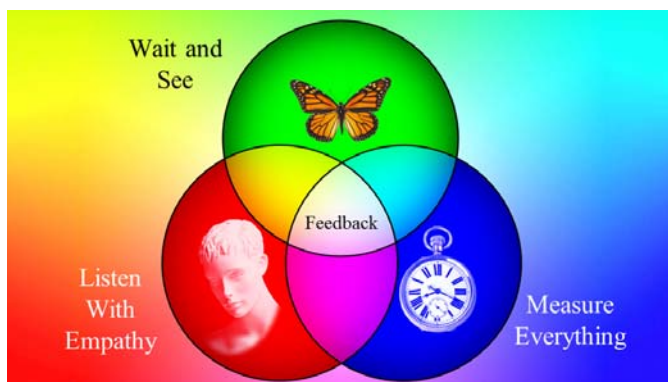
Get Feedback

Under the blue light, numbers are the key to quality and process improvement. A feedback system with objective measurements tells you where you are out of compliance and gives an opportunity for corrective action. Measurements work in sports, too. When you keep score you focus on things that affect the score. In general, you get what you measure.

Under the red light, feedback is not measurable. It is about how people feel. The response is not corrective action, but rather, empathy. Only through a non-directive, non-judgmental, empathetic response do you get people to open up and tell you what they really think. This kind of feedback is just as valuable as the numbers, but it is different and serves a different purpose. You need both, all the time.

The type of feedback you get under the green light can be a challenge for management leaders because the feedback is slower. You wait and see. How long does it take to solve a difficult problem? No one knows because it has not yet been solved. There are no simple

answers for complex problems. Admitting you do not know everything is a mark of maturity. Eventually you might know, and based on that longer term feedback you can make appropriate decisions, but anything quicker can be misguided.



Get Engaged

Employee engagement is a hot topic. We want people to be all they can be. That is good for the person and good for the organization. Disengagement serves no one. Our third proposal is about maximizing employee engagement.

Under the blue light it is all about being a part of something bigger and making a meaningful contribution to the mission of the organization. We set goals and tie them to meaningful organizational goals. We also delegate meaningful work to people as they progress in their careers. The reward for a job well done is more work and more responsibility.

Under the red light it is about feelings. Even if a person is making a meaningful contribution, if there is no indication that the work is valued, why bother? Pay for performance without an equal dose of genuine gratitude is the fast path to disengagement. Human beings can be so complicated and demanding.

Even with a meaningful contribution and feeling of value, there is a limit on what a person can do. The green light symbolizes the multitude of other things required for a person to be enabled to be fully engaged. Enablement includes skills training and general support, plus the freedom to act. It also includes room for failure and trying again.

These three proposals are intended as a general guide for thinking in three dimensions and seeing things under a different light. We all have our personal filters

and selective color-blindness. Only by taking the time to remove the filters and see the situation differently can we manage and lead when the world keeps changing at a rapid pace.

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Frederick Taylor

http://en.wikipedia.org/wiki/Frederick_Winslow_Taylor

Hawthorne:

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