How to Innovate Fearlessly

The universe is a very complicated place, far more complicated than we can comprehend. We sequence the human genome without a complete understanding of how that makes us human. We map the brain; yet still do not understand why exactly Mahler's Symphonies give us goosebumps. Physicists all over the world are searching for the dark matter and dark energy that, according to current theory, must make up 95.4% of the universe. We can't even find the vast majority of the universe.

In such an intricate world, we can infer that the idea of managing complexity is perhaps a misnomer. No matter the process, it is infinitely complex. As John Muir wrote, "When we try to pick out anything by itself, we find it hitched to everything else in the universe." We need to know how our task fits in with every other process of the universe in order to properly understand it. That can be a very scary thought when we can only account for 4.6% of the universe. However, the brain has its ways of simplifying the world for us, taking shortcuts as a means of managing information overload. Generally, this sort of information is tacit knowledge, that internal information that we carry with us. Sometimes our brains simply ignore data deemed irrelevant.

If everything is infinitely complex then we must assume we can never have every piece of relevant data. Of that imperfect data, everything is going to be filtered through our own biases. As a result, management can't be exclusively a creative art nor can it exclusively be a science.

Science, Art, and Definitions

I am an artist, and I used to be a tuba player. Learning the tuba meant learning the underlying principle behind what makes the tuba work both from an artistic and a scientific perspective. Scientifically, the tuba projects a vibrating column of air out of a conical brass instrument. Artistically, that sound must blend with the orchestra to arouse emotion from the audience. The artistic side cannot work without an understanding of the scientific side, and the scientific side alone is not enough to make music.

Separating science from art isn't like separating an egg. An egg can be divided into two main parts: the yolk and the white. Those two parts are still egg, even when separated. This is the problem we face when we attempt to separate art and science. Every art has science in it, and every science has an aspect of art. Understanding and managing our world must be a combination of the two: they are both egg.

Everyone is innately scientific and artistic. And like a good omelet, the two are blended so well it is difficult to distinguish one half from the other. Some people believe that they are more yolk while others think they are more egg white. This is because one side has not been cultivated as much as the other. Many people doubt their creative abilities simply because it has been allowed to lay dormant for so long. Creativity can be an unknown variable.

Don't Take Measurements Literally

When musicians play a piece of music there are thousands of factors to be taken into consideration, both scientific and artistic. A good musician doesn't necessarily pay explicit attention to all of them. The variables aren't being ignored: the brain is working the way it always has, dealing with multiple inputs subconsciously. The musician's performance becomes a habit; the technique required to play world-class music can be considered tacit knowledge. It would be silly to imagine Renee Fleming thinking about every minutiae of a performance while she is performing at the Metropolitan Opera. The musician is always listening to the blended output and is ready to make changes if something goes awry.

As Miss Fleming has done within an opera orchestra, it is human nature to take an intricate process and simplify it within our endlessly complicated and connected universe. When managing a company or dealing with a problem, there needs to be a process in place to guide our actions. First we need to dive into the building blocks of our organization, or whatever task we are working on. Once the details are understood, we need to hold onto that knowledge and step back. By taking what we know about each tree and applying that to our understanding of the forest we are able to understand that big picture more clearly.

Each individual tree, the minutiae, makes up the data, measurements, which are known to be incomplete. The minutiae can be explored until all of the data is understood as clearly as possible. But by pulling back, it becomes possible to be creative with that data, and see the forest as a whole. I took music theory classes almost every semester of my six years in music school. There I learned the building blocks of music and then went straight into a rehearsal where I would not obsess over the theory. I knew the theory so well that I did not need to be consciously thinking about it when I performed. The third in a major chord needs to be lowered a tiny amount, and I knew how to do that without altering the tone quality of the note. The audience doesn't need to understand this process, there is only a more beautiful sound than if the note was not changed slightly. The adjustment became natural and simple once the structure of sound waves was properly understood.

I was able to see the big picture through learning the building blocks of music with the combination of science and art on a fractal level. Once I saw that bigger picture, I could delve into the details with more accuracy and understanding. This way

nothing was truly new. We take our knowledge of a topic on one level and transfer it to another level or another topic.

There is a virtuous circle within this method that mildly resembles the six-sigma problem solving process, although, it is closer to instructional scaffolding. The biggest difference is that the first step doesn't begin by defining the problem or by measuring anything.

Don't Define

Definitions can be very complicated; Henry Adams accurately and ironically stated that 'words are slippery.' Boiling a word such as 'manager' to a single definition doesn't do the term justice. It would be almost impossible to translate that term to all of the 6,700 languages spoken all over the world and account for societal norms.

As soon as we create finite terms for anything, we have already eliminated possible solutions. Language is restrictive. Therefore, we can begin to solve a problem by saying 'something is not quite right.' The difficult component is knowing that there is a problem and having the desire to delve into the unknown before it is reflected on the balance sheet.

Step Back

Among musicians, it's common knowledge that the part of the brain involved in properly listening is the same part involved with playing music. This makes accurately listening to every element of a performance as it happens impossible. The same thing happens as we attempt to fix a problem when we are intertwined in the process. Musicians will record themselves playing a passage and listen to it at a later time for the minutia.

Of course this isn't always possible at the office, but there is another way to achieve the same result. Put the ego away and simply ask someone who isn't as buried in the process. Musicians do this all the time; asking others for their points of view can be a valuable exercise that can expose us to different perspectives.

Mistakes Are Not Good, Just a Good First Step

In the music world there is no such thing as 'correct.' The laws of physics need to be obeyed, but there are human limitations to the process. A perfect performance doesn't exist. Neither does a perfect organization or a perfect process. Since there is no end point, the process of striving for perfection will always be unsuccessful. This raises an interesting point that when compounded reinforces the fact that mistakes are not good, but a good first step.

Musicians know that they are wrong often. In fact, the whole point of a rehearsal is to determine who is most wrong and to fix those errors. It can be very scary. I still remember the fear of being the lone tuba in an orchestra for the first time. I was

incredibly vulnerable and exposed. I realized quickly that it's okay to make mistakes; it's okay to be vulnerable. The vulnerability comes from offering everything I had to give as a musician. The ego falls to the wayside and I was giving it all for the benefit of the group.

An individual musician only looks good when the ensemble looks good. It can be scary to allow such vulnerability, as it is impossible to know what will come from it. However, as the ego is put aside an individual can accomplish much more than when he or she is concerned with protecting one's own image.

Vulnerability Versus Risk

This wrongness means that there usually isn't a right way of doing things. Therefore, the possibilities are endless. Every process is open to change, and almost every process should be changed as time and culture progress. Thomas Jefferson asserted that laws should expire every generation to keep Government current. Picasso famously stated that one first needs to learn the rules in order to break them. The breaking and changing of the rules is what is often abandoned in the business world. Breaking the rules is often neglected out of fear of the unknown associated with risk.

This idea of inherent wrongness and vulnerability is very different from risk taking. A risk is only a risk if it exposes an organization to more danger than normal; it's relative. Whereas being vulnerable implies that the ego, or self, is the only entity at stake. A risk is not a risk if we are able to make adjustments and be versatile, or when we are intimately familiar with a similar process. Therefore it's possible to keep that vulnerability and unavoidable wrongness present in our lives while never taking a risk.

Musicians spend all of their practice time getting to know their limits and stretching them. When it's time for a performance or audition, a good musician will never give more than 95%. As one's limits are approached in any vocation, control is lost. Once that control is gone, it becomes impossible to recover from a mistake quickly enough to save a performance, or a company. One's actions can then be qualified as a risk. It is very important to spend that 'practice time' understanding our own limitations within our environment to properly understand when we are taking a risk when we are placed in a new environment.

When Steve Jobs pushed the iPhone out, he was not taking a risk. He understood his environment and properly understood what he could do with his team. Forging into unknown - or relatively complex - territory doesn't need to be risky if we are willing to take the time and do the research necessary to understand what one is capable of within one's environment. It's the process of transferring known abilities to concepts that can be the difference between jumping blindly into a blue ocean or wading in the old red ocean or blending the two and creating a safe, yet lucrative 'purple' ocean.

Live for the Fight: Others and Ourselves

Musicians know that they will die having never successfully performed a perfect concert, yet there is always satisfaction through the process. The satisfaction doesn't come from being perfect or even being the best. The satisfaction comes from solving relevant puzzles and working one step, one day at a time towards something we believe in.

It doesn't take 10,000 hours to become a master. It might take 10,000 hours to become so familiar with a process that it can be called second nature and part of our tacit knowledge. Legendary Cellist Pablo Casals continued to practice throughout his life. At 93 years old he was asked why he continued to practice three hours a day. His response: 'I'm beginning to notice some improvement.' There is no end to our errors therefore there is no end to exploration and improvement. The musician that hits 10,000 hours of practice time and then stops is soon unemployed.

Now we can hopefully align our perspective with our goals. The ideal is to accept that in our endlessly complicated world, we will always be making mistakes. We must find pleasure in determining when a mistake is made, solving that problem quickly and learning from that mistake so it never happens again. As we realize and accept that something we once thought true is actually wrong, innovation stops being a buzzword and starts becoming part of everyday life.

The knowledge that we are always making mistakes should bring us to doubt our tacit knowledge, especially in a world that is relentlessly changing. Musicians are constantly trying new methods, because there is no such thing as good enough. This could mean using a different warm up every few months, experimenting on new musical phrasings, or doing scientific research to determine the best way to physically play the instrument. The brain wants us to be lazy and tacit knowledge is the result of supposed efficiencies in the brain.

We can transfer the doubting of tacit knowledge to the business world quite easily. All we have to do is ask the question "why" about everything and to keep probing deeper. We should not take anything for granted. Research in Motion might still be a player in the tech world if management had been aware of the broad trends taking place across the world, specifically in Palo Alto. There must be comfort in transition periods as every moment is a transition period. This is looking at the details even of things that we think we understand and then pull back to look at the big picture. Going in and pulling back should allow one to see the situation in a novel way, as long as the mind is open to change.

Simplicity is the Result of Understanding the Complexity

The performing musician tacitly understands everything that is happening from a scientific perspective. Music is simply sound, and to offer the best sound possible, the technique needs to be there. This means studying, not only from people who know how to do it, but it also means studying science in case a former teacher missed something. This doesn't mean being cynical; it means accepting that everyone is human and even the masters made mistakes.

This process involves inspecting every aspect of life to see where efficiencies can be made. I started running, working out, and eating a healthy diet once I realized that the things I did when I wasn't playing the tuba affected my tuba playing. This is a life concept: everything connects. When studying 20th century Russian music, one has to fully understand the culture of 20th century Russia. This doesn't mean simply studying 20th century Russian culture, but that would be a good starting point. There is a seemingly endless amount of history that is applicable. Understanding that everything in life connects will allow us to draw lessons from any source. We can be learning about anything by spending a day at the pool and paying attention to the social dynamic, or how the water moves and finding the connections to whatever we are working on. This is the ultimate efficiency.

Embrace the Complexity of Connections to Create Simplicity

If a one hundred person orchestra were polled on which section is most important, answers would skew towards the answering member's section. The real answer is that no one is most important. They all communicate together, listening and compromising constantly. No section - or literally anything - exists in a bubble; if one section were absent, then the music would be missing something. Again it is fractal; the individual musicians are one level of complexity, the sections are another, and by the time we pull out to listen to the orchestra as a whole, we are now dealing with simplicity. One hundred individual sounds compound to create one sound.

What this means is that there is no specific art or science that will give all the answers; everything is related therefore everything is relevant. The concept of real world applications is bred from ignorance and a lack of imagination to see the connections that already exist. Music is a wonderful example as it is a form of communication that cannot be defined by language. Musicians always need to find new ways to communicate a message more strongly through the music. And there is no end.

The concept of a jack-of-all-trades has been shunned in our world of specialization, but if an individual is actually a master of one trade, he or she is already a jack-of-all-trades just from a basic ability to make connections. As a tuba player I was also able to play the trombone adequately well just by transferring the knowledge I learned on the tuba. We need to be searching for new knowledge, new experiences, and new emotions to better our mastered trade. Through this search, our brain will make connections as long as we know that the world is endlessly complicated and any task can be broken down to fundamental, transitive pieces.

As a result, the more one learns about anything and everything, the more connections one can make between two seemingly different concepts. Our fear of the unknown is suppressed as we make these connections. This creates efficiencies

and innovation that breed success. There are patterns in everything just waiting to be discovered. So we keep reading, listening, and learning with an open mind.