One Nanosecond from Obscurity: Extinction or Creative Fulfillment of an Idea

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Every discovery is one nanosecond from either extinction or creative fulfillment. Understanding how to maximize the potential for success should be the desire of every strategic leader. Ideas find their substance in associations made from acquired bits of information that are tested for validity through a rumination process. Brain activity adjusts to detect and sort out errors, resolve conflict, and re-orient attention. Strategic leaders look for ways to manipulate environments that are the most fertile for the discovery process. Besides being committed to new ways of learning and barrier removal, successful creative leaders are counterintuitive thinkers, who look at the same things as others and see new things. Strategic leaders look for ways to insert themselves in the creative process to maximize the potential for success.

"Discovery consists in seeing what everyone else has seen and thinking what no one else has thought."[1] It is in these words that Hungarian biochemist and 1937 Nobel Laureate, Albert Szent-Gyorgi raises one of life's great mysteries. Have you ever wondered why some ideas come to fruition and others do not? If two people look at the same problem, how is it possible that one will frame the issue as everyone else has and the other will discover something that has never before been seen? Both of these individuals, just nanoseconds before the moment of discovery, had much in common, yet something within their brains resulted in two totally different ends. This paper focuses upon that moment in time in which "something" special happens (*kairos*) framed between the commonplace and the moment of creative fulfillment. Understanding an idea's singularity,[2] that unique event with profound implications that reflects change so rapid and so profound that it represents a rupture in the fabric of human history, is a tool that every global leader must have in order to keep pace in an ever-changing world. The status quo is often the preferred action, for it eschews change and the struggle for acceptance of a new way of doing or thinking. [3] Creative fulfillment, on the other hand, is the most important human resource of all. For without it, there would be no progress, and mankind would forever repeat the same patterns.[4]

By understanding the conditions around which an idea ends in creative fulfillment, leaders can manipulate environments such that they foster, rather than impede, discovery. To some, the fulfillment of creativity is a random act that has no tangible reason for existence; while others believe that creativity is a willful act that is controlled through a series of natural laws.[5] Understanding how to manipulate these natural laws to one's advantage will not guarantee success at every turn, however, it will provide one with the proper environment in which creativity can be nurtured.

In order to more fully comprehend the nature of creativity, we must first understand the infinite possibilities that await discovery; that ideas, like life, have certain inherent characteristics that define them. We must understand that discovery is a process; that physical changes occur in the mind, which result in either extinction or fulfillment of an idea. All of which lead to an understanding that environments can be manipulated to the benefit of success.

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Nothing New Under the Sun

It has been said that in the middle of the 19th century, the administrator of the U.S. Patent Office, Oscar Burke believed that the Office should close. He said, "Everything that could have been invented has been patented."[6] Of course looking back, we all know the naïveté of Mr. Burke's thinking for, as it relates to discovery, no period of time has experienced more change and innovation then the period from the middle 1800s to the present; what technologies have wrought is nothing short of miraculous. Yet it is still difficult to comprehend, at least on a human level, that there are still new creations awaiting mankind's discovery. Edward Lorenz's 1961 discovery of chaotic systems in weather forecasting underscores how there are an infinite number of possibilities resulting from small variations of the initial condition of nonlinear dynamic systems which may produce large variations in the long term behavior of the system.[7] Coining the term, *Butterfly Effect*, Lorenz demonstrated that the mere flapping of a butterfly's wings in Brazil may lead to a tornado in Texas. A small variation in when, or at what frequency, the butterfly flaps, results in different ends. So too, it can be said of ideas: There are an infinite number of possibilities given the same initial conditions.

To the adherent of evolutionary theory, given enough time through natural selection, mutations in genetic components result in an infinite variety of species that are stronger than the previous generation. On the other hand, to those who believe that God created man in His image with infinite variety, can it not be said that mankind was given the same ability to create infinite possibilities? Taking both worldviews into consideration, can we, therefore, claim that there is an immutable law that everything is possible given enough time, energy, and money? If so, everything under the sun *is* open to creativity.

Conception of an Idea

Just as in the formation of human life, certain basic requirements are necessary in the formation of an idea. In human life formation, genetic material from both parents must be present. The genetic material of ideas consists of random coded bits of information that are diverse and may or may not be related to the matter at hand. In the right environment, one which has been chemically prepared to nurture growth, the combined genetic material begins to replicate into a totally new organism with a unique genetic makeup. As is discussed further in this paper, once the coded bits of information gather to form an idea, a totally new association is made. It forms, in a sense, a totally new and unique discovery that is related to the original bits of information, but distinctly new in itself.

Discovery is a Process

Discovery is a process that begins with the recognition of some pattern that either exists or does not where one is expected. The pattern may be found in the acquisition of data or in an observation found in some abstract concept.[8] The human mind is not only capable of recognizing patterns but it seeks them out and attempts to form them even when none exists.[9] It is important to stress at this juncture that the human mind is capable of identifying even quite abstract patterns that might not fully contain visual representations. [10]

After the mind recognizes a pattern, it attempts to query that pattern against known pieces of information, often in a random fashion. It is in this rumination period that elaboration takes place;[11] where the mind sorts out faulty connections and rapidly moves on until it finds connections that "make sense." It is at the point at which a positive connection is made between

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two seemingly random pieces of information that the "*aha moment*" (or the moment of singularity) occurs. What complicates this process during this period of rumination is that often a new vocabulary or form of measurement must be developed in order to describe the pattern. [12]

Following the moment of singularity, the mind begins to test the connection through a process of continued elaboration, rearrangement, or analysis before it yields a testable prediction.[13] This is the moment of creative fulfillment; the point in which the idea or discovery is to be tested in the real world. Contrary to common conceptions, discovery does not happen *ex nihlo* (out of nothingness), rather it is the result of millions of queries made much in the same fashion as one would test a piece when solving a jigsaw puzzle or the early phone operators plugging wires together in order to make connections.

Physical Brain Processes

Significant changes in brain activity have been observed throughout the discovery process. During the pattern recognition and rumination phases, low-frequency *delta* and *gamma* brain wave activity drops.[14] Since delta waves are characteristic of memory processes, and gamma waves of coordinated mental activity, this reduction in output suggests that during these phases there is a purposeful escape from conventional thought patterns that allow for querying in a seemingly random pattern. If delta and gamma brain activity remains high, it appears that querying is almost impossible, for in their presence *internal retrieval processes* are interrupted.

At the end of the rumination phase and just prior to the moment of singularity, there is a spike in *theta* brain activity coming from the anterior cingulated,[15] which is located in the frontal lobe and is believed to be involved in error detection, conflict resolution, and the reorientation of attention.[16] This reinforces the idea that insight requires directing the brain away from dead ends that characterize mental impasses[17] and suggests the formation of new associations between previously unconnected concepts.

At the moment of singularity, increased brain activity has been discovered in the temporal lobe (most likely in the hippocampus) and is therefore involved in memory formation as well.[18] Research has also discovered that activity in the amygdale, also located in the temporal lobe, may be involved in discriminating between important and unimportant items to be stored in memory.[19] Damage in this portion of the brain severely limits the brain's ability to decide whether a discovery is worthy of being stored.

Manipulating Positive Environments

Experimental observations suggest that how a person is thinking before a creative act may determine whether a new concept will be formed or cease to exist. If true, is it therefore possible to manipulate environments in which creative fulfillment has a better than average chance of occurring, given that brain function is normal? Although research is ongoing, nothing currently suggests the creation of some "Pollyanna Creative Chamber" in which a leader can send his followers for an hour to solve the world's problems is possible. Yet there may be some simple techniques that might nurture the soil of positive possibilities.

With the discovery of the relaxation response in the 1960s (the relationship between relaxation and metabolic bodily changes),[20] the field of biofeedback research has increased greatly. Although biofeedback relaxation techniques are designed to primarily reduce anxiety and its associated physiological morbidities, evidence demonstrates that these biofeedback relaxation techniques are able to manipulate brain wave activity in the areas of the brain involved in

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discovery.[21] Reducing both delta and gamma waves through use of these techniques will aid in reducing too focused thinking and allow for freer association activity. Similarly, increasing theta wave production could promote more moments of creative fulfillment.

Besides biofeedback techniques, leaders must identify ways in which they can integrate new thinking in their followers. Although important, the physical space may not be as critical to the concept of discovery as is the psycho-social environment. Lack of rigidity,[22] empowerment,[23] trust,[24] and tolerance of failure, [25] are just a few of the characteristics that can be found in creative organizations. However, to provide for a more open psycho-social environment that fosters discovery, leaders need to promote and demonstrate different thinking skills such as those that (a) are able to identify the mind's strengths and weaknesses, (b) understand how cognitive processes operate, or (c) identify how to obtain reliable information and how to test new ideas formed from that learning.[26]

Two ways to foster this type of thinking are to become an incessant inquisitor and one who thrives on removing mental barriers. Asking "Why?" about everything, forces others to substantiate or validate existing actions or methods of operation. Likewise, asking, "Is this the best way to . . . ?" keeps the leader and his or her surrounding environment primed for discovery. Refusing to tolerate any barriers that the mind or external forces place in the way of discovery removes any habitat of refuge or safety that would limit discovery. Followers who see constant demonstrations of this new way of thinking in their leaders and their local environments find that they, too, can take part in using their skills and abilities to create new ideas that can have a positive effect on the world around them.

Counterintuitive Thinking

Returning to Szent-Gyorgi,[27] one cannot find discovery in thinking the same way that everyone else has. If leaders want to assure that their organizations thrive in the arena of idea creation, they must eschew that which is commonplace and promote counterintuitive thinking. Take, for example, the hiring practices of most organizational leaders; they want experts who have vast experience or training in a particular job classification. Their pool of viable candidates usually contains MBAs with a minimum of 5 to 7 years of experience in a specific field: marketing, finance, or manufacturing. Although some of these candidates might come with expert qualifications, they may know too much about their field of expertise. As one climbs the educational level, he or she is taught that it is essential to become an expert. These people come with mental constructs that were created with a network of facts, assumptions, and models that are virtually impossible to overcome.[28] In fact, as one becomes more of an expert, these constructs solidify and lay down mental pathways that are more difficult to break; thus making it more difficult to entertain radical ideas or new alternatives. Herein lies the danger: Experts tend to become more rigid, thus limiting the number of associations possible in rumination phases of discovery. The counterintuitive way of thinking with respect to expertise is to hire people who know how to ask questions, who have a broad knowledge about a lot of things, and who are not afraid to let others know that they do not know everything. Finding candidates that fit these qualifications may be difficult, but finding them might make the difference between success and failure.

Intuition tells us that to succeed in business in the global marketplace one has no time for frivolity or an excursion into irrational thought. Nothing could be further from the truth. Looking at problems rationally might establish parameters surrounding a problem that has its best solution

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found outside the established compound. Irrational thought may appear to some to lack academic rigor, but the true discoverer is not so much smart as he or she is clever. [29]

Another counterintuitive method is to hang with pessimists and nay-sayers. Most people do their best to avoid these people. After all, who wants to constantly be faced with a litany of reasons why something cannot be done. On the contrary, as long as the pessimist is not the final decision-maker in an organization, nay-sayers help to direct thinking. They might see barriers to the process that require new associations, or they may help to lay out the minefield pocked with future market objections during the implementation phase of discovery.

Some get the image of discoverers as loners; people sequestered in labs in deserted locations. Although somewhat true, few can deny that creativity breeds creativity. Intuition might lead to thinking that in order to become a sculptor one must hang out with other sculptors or the formation of a new chemical discovery by hanging with other chemists. The process of discovery is not necessarily fueled by like-minded or like-talented people, rather by the process of creativity itself. Discovery and creation breed more of the same.

While most organizational leaders spend their lives trying to avoid crisis and conflict, counterintuitive thinkers create crises where none exists. Creating crisis breaks the harmful constraints that bind organizations from moving forward.[30] This process is similar to when forest firefighters set small blazes to act as firebreaks to keep the situation under control. In organizations, crisis will come at some point, so it is much better to have some control rather than none in how that conflict affects outcomes.

Finally, most leaders have a fairly descent handle on their business operations in near future terms (3-5 year timeframe), however, counterintuitive thinkers spend their time focused on the immediate and far future (20-100 years). These *futurists* are constantly scanning trends to identify pitfalls and opportunities hiding just around the corner. If a leader is thinking in the here and now without concern for trends that might have a negative effect upon his or her industry in the future, they are missing the most fertile field for creativity: self-determination.

Conclusion

Creativity and discovery is a process that requires understanding and thoughtful analysis, for failing to fully comprehend its intricacies leaves one disadvantaged. Could it be that many ideas never find creative fulfillment because they have not received the proper nutrients in the right environment? All along the discovery process are points in which the competent strategic leader can insert him or herself to mold environmental conditions that favor success. Creative fulfillment can no longer be seen as something left to chance or to the whims of uncertainty.

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