Framework for Technology Innovation

(Praveen Gupta, President, Quality Technology Company)

Introduction

Getting new ideas for new entrepreneurial ventures is not limited to a few geniuses. Actually, any of us can pursue that path if we understand how to get those ideas. Of course one can not become a noble prize laureate or Bill Gates immediately. With all the effort, luck counts. Behind every success, there are 100's not so successful businesses. However, success does not diminish the creativity aspect of the idea. For every 10,000 ideas there come a one 'GEM.' But we must continually introspect ourselves, apply our knowledge and experience to generate new ideas in the context of current and future trends.

Ideas can be either in a totally new area, untouched by anyone, or a dramatic change to take 800 pound gorilla. Either type of idea will require a break from the current, i.e., results in innovation. Innovation is creativity applied to generate value. In either case, the individual who is trying to innovate, must possess the following skills:

1. Time management
2. Process thinking
3. Statistical thinking
4. Innovative thinking

Time management is required to manage ourselves productively. ***Process thinking allows us to understand our surroundings according to the*** Shewhart's plan, do, check and act (PDCA) cycle. ***Statistical thinking*** enables us to interpret information around us in terms of common, or innovation. The statistical thinking allows one to make a decision based on the understanding of its causes based on the nature of change. ***Innovative thinking*** has been used predominately by a selected few who consider themselves the 'technology' guys. However, in order to be innovative, one must understand the process of innovation to be a serial innovator. No one is a perfect innovator, and all of us are somewhat innovators. We all could become better innovators.

Innovation

Clayton M. Christensen and Michael R. Raynor, in their book *The Innovator's Solution*, have emphasized sustained-innovation for achieving corporate business growth. According to them, a successful era of superior performance in the life of a corporation occurs due to some innovative disruption. Statistically speaking, the breakthrough innovation can be related to at least 47.5% change in current performance level. However, the challenge is a lack of an established framework for innovation that can be institutionalized through education and practice.

To develop innovative thinking, one must challenge the obvious. In order to solve a problem, one must be able to think of creating a problem in many different ways, or how many ways the problem manifests. Each way of creating a problem isolates that way from solving the problem, and therefore, gets closer to the ideality. Some of the common steps to innovative thinking consist of the following behaviors:

Visualizing the problem in different ways, or from different angles
Representing your thoughts in visuals

Thinking fast and frequently
Trying different combinations
Investigating the opposite side
Thinking beyond the known
Looking for disconnects
Looking for ignorance
Thinking in teams, build on others' ideas

Generating New Ideas

One of the ways to expand universe of ideas is to absorb ideas behind the successful products, processes, or success stories. To be creative, one should not think big, or to infinity. Actually, one can be creative in thinking about creativity. By understanding the first thought behind a success story through reverse engineering, one can adopt the following strategies to generate new ideas:

- Look around for ideas continually
- Never criticize, wonder a lot
- Imagine the farthest, including uncharted territories
- Roam around the world, all in the mind
- Visualize situations, do thought experiments
- Handle multiple variables and tasks
- Prioritize opportunities

Framework for Innovative Thinking

With availability of various innovative methodologies, tools, and practices, a framework for innovative thinking is yet to be developed. Extensive research and experience with the innovative thinking, the author has developed a model, called the Gupta's Einsteinian Theory of Innovation (GETI). GETI is based on the famous Einstein's equation $E = mc^2$, where, the "E" represents energy, the "m" represents mass and the "c" represents the speed of light, which is 186,000 miles per second.

Innovation is a transformation of one set of ideas into a value-added solution or a set of ideas, in other words, quickly processing one set of ideas to create new ideas or thoughts. Therefore, speed at which one can process these thoughts becomes an important factor in accelerating innovation, or creating innovation on demand. Applying Einstein's equation to the process of innovation, one can equate "E" to the energy (value) associated with innovation, "m" to the physical effort or resources allocated to innovation, and "c" to the speed of thought which can be faster than the speed of light. For example, try to mentally visit a place that you had already visited, and see how long it takes you to get there, infinitely small. Restating the Einstein's equation with proper substitutions, the following relationship can be obtained:

$$Innovation\ Value = Resources * (Speed\ of\ Thought)^2$$

Where the speed of thought can be described by the following relationship:

$$Speed\ of\ Thought \equiv Function(Knowledge, Play, Imagination)$$

The units of the Innovation Value can be represented in terms of resources and ideas over the unit of time, which can be equated to a new unit, Einstein (E) with the maximum

value of '1.' Thus, the innovation value can be increased with more resources, or faster generation and processing of ideas. It appears that the innovation value can be accelerated with better utilization of intellectual resources, than merely allocating more physical resources to innovation.

We can measure knowledge, quantify combinatorial play, but will have difficulty in measuring imagination due to the complexity of mental processes. Therefore, imagination is transformed in quantifiable terms as, "***Pure imagination is a random extrapolation***." Thus imagination becomes an attribute, the extrapolation, that is measurable.

Based on the GETI framework, one must practice the following steps to accelerate breakthrough solutions through innovative thinking.

Steps for Technology Innovation:
Following are recommended steps to nurture an innovative mind:

1. Make innovation the purpose of ones life and identify your personal talents for creativity.
2. Research a topic individually, and gain deeper understanding of the subject. Do not immediately solve the problem without proper research and knowledge.
3. Identify the potential variables affecting the problem. Make the list as long as possible. Expand the list through various tools of innovative thinking, such as mind mapping or TRIZ.
4. Test 'what if' scenarios to isolate unlikely combinations of variables, and identify likely combinations of variables.
5. Establish direction of innovation. Investigate likely combinations that could create solutions in the direction of desired innovation.
6. Extrapolate the dimensions of interest and validate potential outcomes.
7. Expand the box of thinking to explore potential innovative solutions for generating significant change.
8. Continue to explore and formulate alternative solutions, and select a best solution.
9. Enjoy many interests and activities and be playful.

Just play and have fun!

Acknowledgements:
The author would like to thank Arvin Srivastava, Shan Shanmugham, and Avanti Gupta for their suggestions to improve the article.

Praveen Gupta is the President of Quality Technology Company (QTC), an Illinois based consulting and training company in corporate performance improvement, and innovation. Praveen has authored several books, including his bestseller **Six Sigma Business Scorecard**, which has been well received worldwide as evidenced through its translation effort in Japan, Korea and Latin America, and adaptation by software vendors in the U.S. He can be reached at praveen@qtcom.com.