Lean Six Sigma and Innovation

By Dr Uwe H Kaufmann and Hector Ramos

Over the last decade, companies and organisations in nearly every industry all over the world have introduced *Lean Six Sigma* to increase customer satisfaction and to deliver impressive results. An outstanding example is General Electric, the company who has made Six Sigma as popular as it is today.

Another term that has drawn tremendous attention in the business world is *Innovation*. On the one hand, Lean Six Sigma works towards very low variation in processes with high efficiency. Innovation, on the other hand, seeks to find undiscovered, uncertain territory. Such efforts are rather inefficient. Innovation requires risk-taking, making mistakes and learning from failures.

Can a corporate culture be developed on both key thinking patterns in order to get the best out of Lean Six Sigma Efficiency and Innovative Solutions?

What is Six Sigma?

Six Sigma is "Completely Satisfying Customer Needs Profitably". (General Electric, 1995).

Six Sigma is a highly disciplined process that helps all kind of companies focus on developing and delivering near-perfect products and services.

Why "Sigma"? The word is a statistical term that measures how far a given process deviates from perfection. The central idea behind Six Sigma is that if you can measure how many "defects" you have in a process, you can systematically figure out how to eliminate them and get as close to "zero defects" as possible. *Lean* is a methodology focussing on the elimination of waste in any kind of process. Lean Six Sigma is aiming towards flawless processes producing nothing but quality with minimal resources.

There are three key elements of quality: customer, process and employee.

Customers should be the centre of each company: they define quality. They expect performance, reliability, competitive prices, on-time delivery, service, clear and correct transaction processing and more. In every attribute that influences customer perception, we know that just being good is not enough. Delighting our customers is a necessity. Because if we don't do it, someone else will! (General Electric at www.ge.com).

Advantages of the well-known Lean Six Sigma approach are not so much the tools. Nearly all Lean Six Sigma tools have been around for decades. The advantages of Lean Six Sigma are in having the most talented people in the company - led by the leadership team - working on business-relevant projects whilst getting a very comprehensive training on a structured approach supported by extensive coaching to apply powerful tools.

What is Innovation?

Innovation means "Change That Creates a New Dimension of Performance." Peter Drucker (Hesselbein, 2002).

Michael Hammer contrasts Innovation with improvement and suggests that there are times when you simply want to improve existing processes and then there are other times when you want to innovate and completely change the way you do business. In other words, Hammer is using Innovation as a synonym for re-engineering. (HBR 04/2004)

O'Reilly and Tushman review numerous examples of Innovation and end up proposing the continuum in Figure 2. (HBR 04/2004). The three categories that O'Reilly and Tushman use to map the various examples of Innovation they studied suggest that there are three general approaches to Innovation. Obviously there are all kinds of situations that lie between Incremental Innovations and Discontinuous Innovations.

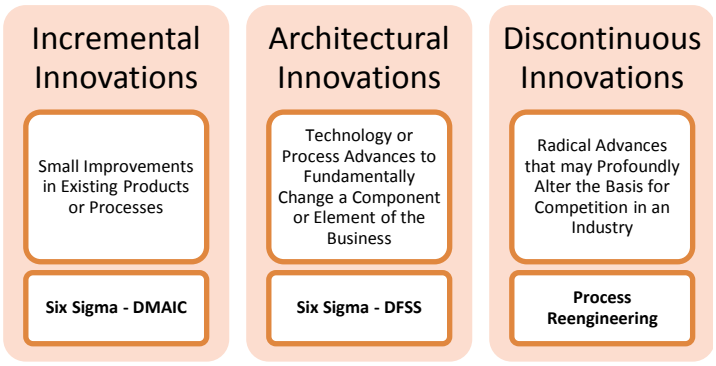

Figure 2: The O'Reilly-Tushman Innovation Continuum

This model offers a quite broad definition of Innovation. Even Process Improvement following the Lean Six Sigma DMAIC approach is called Innovation. So, does Innovation need Inventions? Analysing technical Innovations, Genrich Altshuller, a Russian patent examiner, found that more than three quarters of all patents are based on Modifications and Improvement without any major Invention involved. Only 5% of all patents are based on a paradigm shift, only 1% is about a new discovery. I.e. innovation is indeed much more than new Inventions.

The modern understanding of Innovation is quite flexible; it encompasses Innovations in all parts of the value chain of any company such as Finance, Process, Offering and Delivery.

DELL has revolutionised the *Business Model* in order to improve the cash flow and reduce the risk: they collect the money from you even before they start making your computer. And, they may not have the best products, but they have a very efficient and *Customer Friendly Service* to fix problems as soon as they occur.

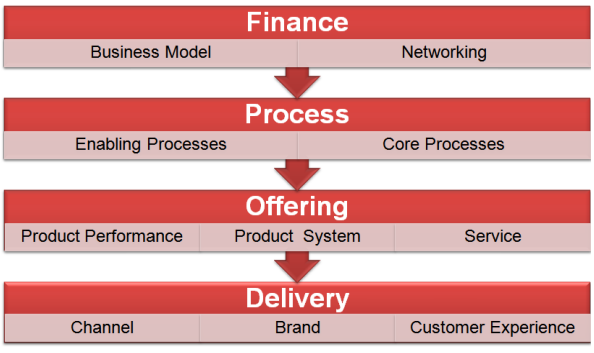

Figure 3: Doblin about Types of Innovation

A flight on Singapore Airlines nearly makes you forget that you are flying, with the most attentive, respectful, and pampering *Pre-flight, In-flight and Post-Services* you can imagine.

Microsoft has done an outstanding job in bundling a variety of office products into their Microsoft Office suite *Product System* enabling their customers to focus on what they want to do and not what tool they need to use.

Many of the innovations described above have nothing to do with any invention. However, they are focusing on a new way of adding value to customer and business.

How can Innovation and Lean Six Sigma Add Value Together?

Jeff Immelt at the helm of GE was asked whether it is a big leap from a Lean Six Sigma culture focused on productivity and quality to an Innovation culture: “I look at Six Sigma as a foundation on which you can build more Innovation.”

While “Innovation” i.e. creative ideas is most sought after during the improve phase of each Lean Six Sigma project, some Innovation tools can add value even in the early stage of many Lean Six Sigma initiatives.

Strategy Innovation

Lean Six Sigma projects almost never question the company’s strategy. Innovation should start at the boardroom, when the senior management decides about the focus for the next couple of years. An important requirement for successful innovation is the capability of every organisation to scan the environment. Some Innovation tools can help to do this.

Delighting Customers

At the beginning of many Lean Six Sigma projects, Voice of the Customer is an important tool to be used to make sure we understand customer requirements. These requirements are usually structured using the so called Kano diagram. Lean Six Sigma practitioners know about the “white space” in the Delighters box of this diagram. It is easy to talk about the “Musts” and “Satisfiers”, however the Delighters don’t come to mind easily. This is an indication that we will not be able to delight our customers with outstanding products or services: with innovations. We rather focus on meeting requirements we know already about or – even worse – customers have told us already. The truth is: Our competitors will do the same. Innovation tools can help to “think out-of-the-box”.

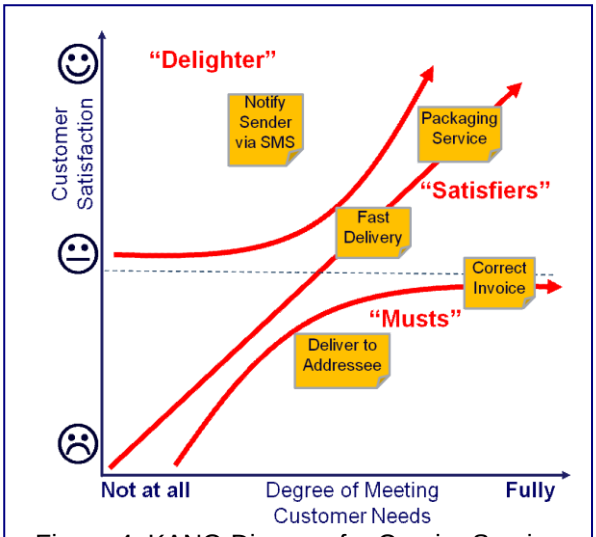

Figure 4: KANO Diagram for Courier Service

“Out-of-the-Box Solutions”

Often in the ‘Improve’ Phase, Lean Six Sigma teams get stuck with coming out with ideas that will adequately & effectively address the problems and build sustainable improvement. The challenge is rather mental than a question of tools: They have spent days or weeks on collecting data around the problem, analysing potential root causes and verifying their findings. They are 100% involved in every single detail of the process they are working on. Now, that they are requested to “think out-of-the-box” they cannot easily change the mood and

switch to be “creative” and “innovative”. Apart from enriching the team with colleagues who have not been part of the earlier stage of the project, some more help is needed in order to get more than the usual “we have improved our process” solutions. These teams need to be coaxed into delivering many wild, crazy and unknown ideas to come up with something innovative. Generating an innovation and creativity structure following the Buffalo Framework for Creative Problem Solving (CPS by Buffalo University) has been proven very useful.

Does Innovation Need Lean Six Sigma

There are many Innovation toolboxes around. Most of them are based upon a series of steps starting with clarifying the problem, generating ideas, refining and selecting ideas to compose solutions and implementing these solutions.

The strength of Lean Six Sigma is in its rigorous, process and data-driven as well as consistent approach to solving problems. Innovation toolboxes are lacking some of these strengths. Given that many Innovations are a result of weeks of hard-work combined with moments of insightful creativity it follows that Innovation and Lean Six Sigma can definitely complement and leverage on each other rather than being competing initiatives.

Finally, Lean Six Sigma and Innovation both add value to the business. Whereas the “original Lean Six Sigma” rather focuses on efficiency and cost reduction, the traditional understanding of Product Innovation helps to grow the business. Nowadays, these definitions have been reversed: Lean Six Sigma is also used to grow sales and innovation techniques help to make processes more efficient, too.

What Does it Take to Drive Innovation

Jeff Immelt: “I don't think every manager can do both, Six Sigma and Innovation, but I don't need every manager to do both. … We want to make it O.K. to take risks and do things that aren't just going to produce results this quarter.”

Innovation needs a breeding ground – as Lean Six Sigma does. For instance, when GE introduced Six Sigma, everyone in GE had some major initiatives like Workout or “Looking outside GE” or “Change Acceleration Process” in his backpack. So, no one was surprised to see the next initiative coming. And although not everyone liked it, the organisation was prepared. What does it take to introduce innovation and make it successful?

The Readiness to Innovate depends on basically three factors:

- Individual Creativity
- Support by Work Environment
- System Openness

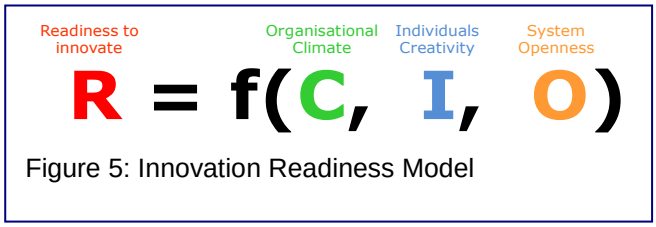

Figure 5: Innovation Readiness Model

Individual Creativity of your staff can be assessed by various instruments and can be enriched by training and coaching interventions and personal experience. Normally, each company consists of a variety of people who exhibit different creative thinking preferences. These are either Adapters, Adopters, Inventors or Innovators. Leaders need to identify and leverage on a variety of creative thinking strengths to optimise the effectiveness of Innovation interventions.

Equally important is the environment for creativity provided by the Leadership Team. Such environment is a kind soft thing which is hard to manage but can create powerful opportunity

for individual creativity to take place. This Environment consists of Management Practices, Leadership Style, Supervisory Encouragement, Teamwork Culture and Group Dynamics.

Art Fry, a 3M scientist and many others fiddled with the idea for the Post-It note for several years before it went into production in 1980. The Post-It note was the result of a failed attempt to create stronger glue. The failure was then reframed into an innovation. The costs involved were not easily justified at the beginning of the "project". The 3M management has always been open and supportive for "creative" researchers testing new ideas. They encourage employees to spend up to 15% of their time on independent research projects.

All innovative potential in each company needs a direction. This direction comes from scanning the periphery, understanding signals from Customers, Competitors, Value Networks, Suppliers etc. And this needs to be done from an innovative perspective. Companies like Ebay and Goggle know that very well and involve different parties in their innovative processes.

Conclusion

Whilst Innovation focuses on delivering value-based initiatives (products, services, business models…) to the business and to its customers, Innovation needs well-structured and reliable processes to deliver its full potential.

Innovation is not only about new products or services; it can enhance all parts of the value chain of any business. The more types of Innovation a business is able to use, the higher its competitive advantage will be.

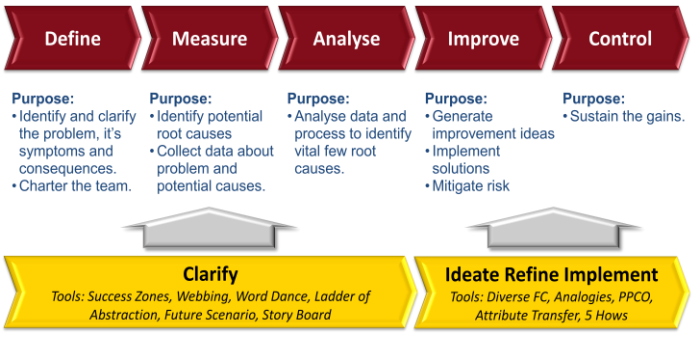

Figure 6: Six Sigma Enriched by CPS Tools

Innovation and Lean Six Sigma are different methodologies with different philosophies, focusing on different objectives delivering different results and requiring different management styles.
However, they can be synergised to optimise business performance. This requires a sound understanding of their formulas for success.

About the Author

Dr Uwe H. Kaufmann is the Singapore-based Managing Director of Centre for Organisational Effectiveness Pte Ltd, a business advisory company focusing on the Asian Market. He has extensive experience in implementing process and organisation improvements for various industries. He specialises in Lean Six Sigma and Innovation as well as Strategy Implementation. He received his Six Sigma Master Black Belt qualification with GE Capital. Uwe is a German national and can be reached at Uwe.Kaufmann@COE-Partners.com.

Hector Ramos is a Managing Consultant of Centre for Organisational Effectiveness Pte Ltd based in Singapore. He holds a Master of Science degree in Creative Studies and Change Leadership by the University of New York, USA. Hector offers training in creative thinking to enable groups to discover and leverage on their innovative potential and abilities. Hector can be contacted at Hector.Ramos@COE-Partners.com