Chapter 6

Importance of Lean in Six Sigma Marketing

Superior performance of business reflects through different business dimensions like profitability, customer retention, new offering success in the market etc. Developing and sustaining competitive advantages is the key for superior performance of organization in the market. In the contemporary era when market is flooded with variety of offering, the only thing that brings competitive advantage to the business is intense customer orientation. Traditionally organizations were in the advantageous position due to high customer demand and relatively limited supply of offering. Under such situation developing competitive advantage in the market was merely based on advancing product features and characteristics. Also, due to slender product supply customer loyalty was easy to achieve and hence focus of business was on profit making. Contrary to this, contemporary organizations are facing completely different scenario. Due to myriad of providers in the market the power has shifted to customers. Merely advancing product feature is now not enough to sustain in the market. This is the era when customers are not only looking for nonpareil product feature, but also great service embedded to it (Gummesson, 1994). Customer of recent era are nonnegotiable to any dimension of offering be it product or service. Customer loyalty which was easy to achieve previously now has become gold fish for new generation organizations due to immense market competition.

To sustain in the market, contemporary organizations need to be sophisticated in their approach to understand their customer. We are living in the information intensive era where customers are equipped with all the information about offerings and their availability. Today customers are making smart choices based on comparing different offerings and identifying beneficial deal for them. Organizational attempt to achieve competitive advantage through advancing product feature is out of date. Instead of bombarding customers with offering features, here is the era where focus is shifted to understand customer need. Practicing "outside-in" approach instead of "inside-out" is what required staying competitive in market. Instead of informing customers about offering features, now organizations are focusing on how their offering can contribute to customer's value chain. Hence, understanding what customer value in offering is becoming new dimension to achieve competitive advantage (Slater and Narver, 1994), which is the challenge of SSM.

As mentioned by Almquist et al. (2016), organizations competing on multiple value dimensions are likely to excel in the market. Along with understanding what customer value

in offering, it is equally important for organizations to manage value creation process effectively. Thus, value creation process focus on organizational process aspect (efficiency) and customer aspect of value (effectiveness) (Karlsson, 2006). Lacking on efficiency and effectiveness of value creation process results in offering features that customer don't value or providing something of value in a way that is too costly or time consuming.

Lean and Six Sigma have legacy to improve manufacturing processes. Positive complementariness of Lean and Six Sigma are combined in approach called Lean Six Sigma (LSS). With increased expansion of process improvement methods to service environment, LSS is the strong candidate to propose solution for efficiency and effectiveness issues of value creation process. Major objective of this chapter is to explore candidature of LSS to improve value creation process in SSM.

6.1 Lean approach

Lean and Six Sigma originated in manufacturing. Through their complementary approach towards process improvement, both ultimately place great emphasis on the customer requirements. Lean methodology pays a very first attention to identification of Non-Value-Added activities in the form of *Muda* (waste) from manufacturing functions. Lean culture characterized through attempts to reduce NVA from processes with reference to customer focus. Lean methodology attempts to improve process flow through differentiating Value-Added (VA) and Non-Value-Added (NVA) activities and optimizing VA part. Difference between VA and NVA is based on how they contribute to customer value. As mentioned by Convey (1994):

> *"A VA activity is one which contributes to the customer's perceived value of the product or service. A NVA activity is one which, if eliminated, would not detract from the customer's perceived value of the product or service"*

Lean methodology was first developed by Toyota Motor Corporation during the era of mass production when focus was on production in high quantity, low cost and the processes were not flexible to the changing demand of the customers. The methodology facilitates flexible process that gives customers what they want, when they want it, and guarantees highest

quality product at affordable cost. The methodology was also called Toyota Production System (TPS), which emphasis on reducing seven types of wastes:

1. *Overproduction:* Producing more items or producing it earlier than needed.
2. *Waiting time*: Idle time because of machine failure, lot processing delays and capacity bottleneck.
3. *Unnecessary transport*: Moving material between processes.
4. *Over processing or incorrect processing*: Performing unnecessary process steps.
5. *Excess inventory*: Excess raw material or finished goods that hide process inefficiency.
6. *Unnecessary movement*: Wasted motion during the course of work.
7. *Defects*: Producing defective parts.

According to Taiichi Ohno, NVA activities accounted for approximately 95% of all costs in non lean manufacturing environment. To reduce proportion of NVA for uninterrupted process flow, lean methodology use process mapping and Value Stream Mapping (VSM). Process mapping from start to end reveals duplicated efforts and useless delays in process as shown in Figure 6.1 (Liker, 2004). Creating SIPOC (Supplier-Input-Process-Output-Customer) diagram is the first stage of generating process transparency. Once boundries of the process are decided by SIPOC diagram, detailed value stream can be generated to observe information and material flow.

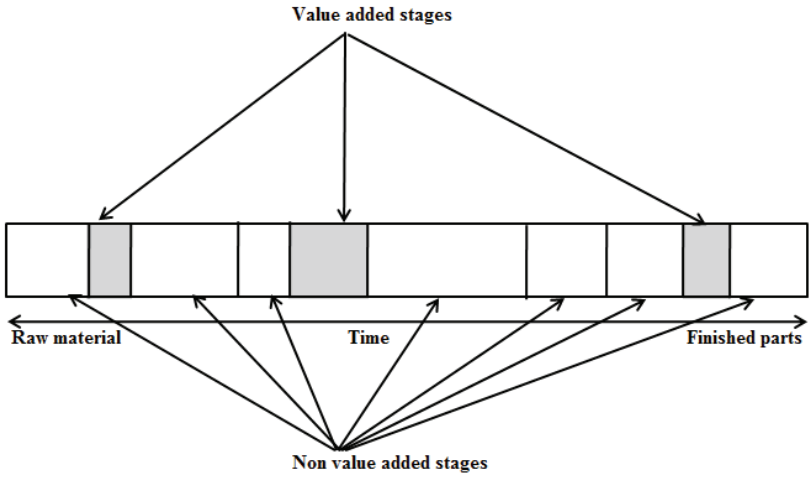

Fig 6.1. *Value added and non value added stages in process flow*

Many authors propose scheme to differentiate between VA and NVA activities (Koskela (2000), Kaplan and Cooper (1998), Womack (2003), George (2002)). However, the Business-Value-Added (BVA) activities are the third kind of value added activity generally unnoticed by the producer. As mentioned by Womack (2003) BVA activities do not directly contribute to the customer value but is required by the process to realize it. These activities are not directly objected to removal from process mapping, but focus is on minimizing their proportion. Identifying difference between VA, BVA and NVA with customer point of view is important part of smooth process flow. George (2002) proposes following sets of question to distinguish between VA, BVA and NVA.

The customer VA questions can be:

- Does the task add a form or feature to the product or service?
- Does the task enable a competitive advantage?
- Would the customer be willing to pay extra or prefer us over the competition if he or she knew we were doing this task?

The BVA questions are:

- Is this task required by law or regulation?
- Does this task reduce the financial risk of the owner?
- Does this task support financial reporting requirements?
- Would the process break down if this task were removed?

The NVA questions are:

- Does the task include any of the following activities: counting, handling, inspecting, transporting, moving, delaying, storing, looping, expediting, and multiple signatures?
- Taking a global view of the supply chain, having made these improvements, to how many factories do we really need to deliver projected volume? Will the faster lead time and lower costs fill up existing facilities?
- With faster lead times, how many distribution centres can be eliminated?

Once VA, BVA and NVA activites are identified unlike aggregated working system, lean methodology works based on single product flow.This results in easy identification of waste from process line, making process more responsive to any change required by the customer. Once the order of the product is placed by the customer, its whole value stream mapping is identified and the whole production process works based on *"pull system*" instead of "*push system*". Which ultimately results in high process speed and low NVA steps in the process. Lean use different tools like Just-in-time, Kanban, 5S, 5Why's etc. Such a lean process is one in which the value-added time in the process is more than 25% of the total lead time of that process (George, 2002). As seen in Figure 6.1, the VA activities contribute a small proportion of process which needs to improve considerably. Muralidharan and Raval (2017) recommend that NVA activities should not overpower the VA activities, or it can lead to complete damages to the product or service.

6.2 Lean Six Sigma (LSS) approach

Lean Six Sigma approach promotes integration between Lean and Six Sigma. George (2002) first proposed integration between Lean and Six Sigma based on following aspects:

- Lean cannot bring the process under statistical control and cannot provide the tools and organizational guidelines that establish a data based foundation for sustained improvement in customer- critical target.
- Six Sigma alone cannot dramatically improve process speed to reduce lead time or reduce invested capital.

However author identified factors that differentiate Lean and Six Sigma approach as shown in Table 6.1. These factors also provide ground for strong integration between Lean and Six Sigma based on following facts:

- Focus of Six Sigma is on variation reduction, which makes it more suitable to improve standardized part of process while focus of Lean is on waste reduction, which makes it more suitable to improve transactional including marketing part of process.

- Since variation reduction can be realized based on numeric information, Six Sigma emphasis upon quantification. Many process steps hinder uninterrupted process flow. Hence, Lean realize improvement in the process flow through simplifying process steps.
- Focus on variation reduction and emphasis upon quantification in Six Sigma propose rich environment for causal model to work. Understanding bottle neck of process flow in Lean can be improved through identifying root causes behind that.
- Exploring causal relationship in Six Sigma required sophisticated statistical tools like regression analysis, factor analysis, cluster analysis etc. Root cause analysis in Lean can be done through simple tools like Fish bone diagram, Pareto analysis, 5Why's etc.
- Uniform output is the by product of variation reduction in Six Sigma and reduced cycle time is the by product of improved process flow in Lean.
- Expected end result of Six Sigma approach is uniform output of standardized procedures and expected result of Lean approach is acceleration in process flow hence reduced cycle time.

Table 6.1. *Differentiating factors of Lean and Six Sigma*

Factor	Lean	Six Sigma
Theory	Waste reduction	Variation reduction
Major philosophy	Based on simplification	Based on quantification
Change examination	Through root cause analysis	Through causal model
Tools	Easy to understand graphical tools to examine process flow and delays at different stage	Statistical tools to examine variation underlying conversion steps
Effect	Reduced cycle time	Uniform output

6.3. Lean in Six Sigma Marketing value creation process

Importance of customer value is well discussed in marketing literature (Gro¨nroos (20044), Almquist et al. (2016), Woodruff (1997)). Managing value delivery process is as important as understanding what customer value in offering. A winning strategy for value delivery process

consists of a set of actions that leads to competitive advantage. Effectiveness and efficiency are the desirable characteristics of value delivery process. Effectiveness of value creation process is characterised through how accurately it fulfils customer requirements. Hence, effectiveness addresses customer perspective of value creation process. Efficiency of value creation process is characterised through how competently it delivers value and is aimed at cost and cycle time optimization. Efficiency addresses producer's perspective of value creation. Hence, a set of actions that leads to competitive advantage should contribute to effective and efficient performance.

LSS is the approach that can contribute to effectiveness and efficiency of value delivery in marketing process. As shown in Figure 6.2 value delivery process consists of conversion and flow part of activities in sequential manner. Before reaching to ultimate customer value delivery, there are intermediate conversion steps that contribute to ultimate customer value proposition. Keeping these conversion stages align with ultimate value delivery is important. Not only that majority of the time conversion stages follow standardized and repetitive structure with clearly defined start and end point. Due to these favourable characteristics of Six Sigma environment, conversion stages of value delivery process can very well be managed by Lean or LSS approach. Hence, Six Sigma contributes significantly to manage effectiveness of value delivery process. Between conversion stages there is flow of information and material which doesn't follow standardized structure. Non standardized nature of flow leads to complicated and delayed process steps, and they generally results into high cost and extended process time. Lean can improve flow component by simplifying process stages and reducing any type of waste from process line. Lean can improve efficiency of the process by increasing proportion of VA activities of flow component. Hence, Lean can contribute in improving velocity of flow components and thereby reducing process cost and cycle time.

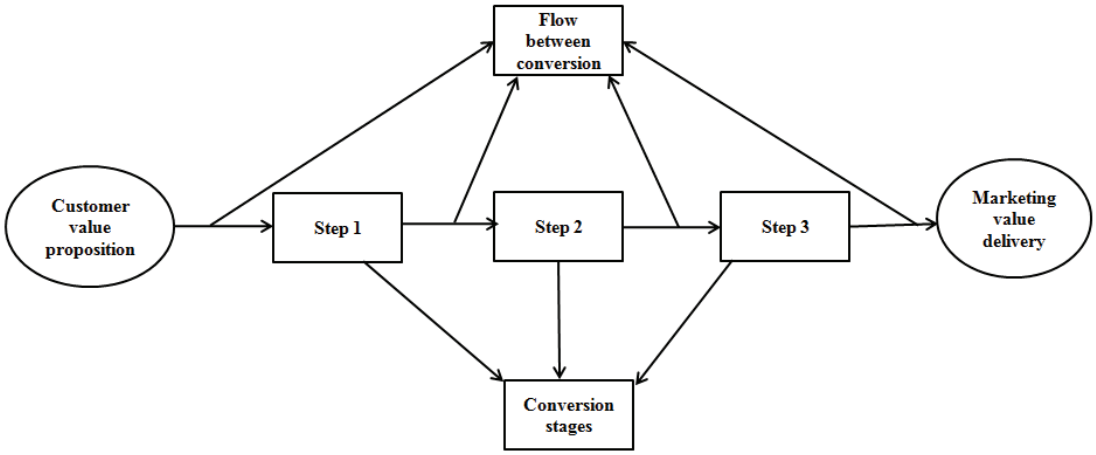

Fig 6.2. *Value delivery process with conversion and flow component*

6.4. Lean approach to optimize seven wastes of Six Sigma Marketing

As discussed in Section 6.1, goal of Lean efforts is to minimize seven different types of wastes. Due to its inception in production, these seven wastes and their optimization has always been discussed with reference to systematic manufacturing environment. However, such wastes are very much evident in marketing as well. Optimizing different marketing functions with reference to these wastes can results into effective and efficient customer value management through marketing.

The seven wastes of marketing can be articulated as follows:

1. *Overproduction:* Excess of supply compare to demand of product in market is called overproduction with reference to production. Function of SSM is to maintain customer value chain by striking the balance between customer integration and distance. Supplying the relevant information to the customers as and when needed by customers is the sign of healthy marketing function. Bombarding customers with the information about offerings that is not relevant to them or they are not interested into is called overproduction with reference to SSM. For example, many companies try to reach wider market through direct sales call. Since, the information provided is not relevant or not required by customers at that point of time – such scenario result in to underutilized marketing efforts. Even with reference to digital marketing, popping ads of offering on different web pages that customers visit can very well be considered as overproduction as shown in Figure 6.3.

As shown in Figure 6.3, if you search for some product in amazon or any other site, their advertisements will popup while exploring other web pages. This dimension signifies overproduction of SSM efforts.

2. *Waiting time*: Idle time between process stages due to machine failure or capacity bottle neck is called waiting time with reference to production. Effective marketing communication should inspire customers to take informed decision. With reference to SSM, any delays that occur due to inefficient marketing operation that resist customers to take informed decision is called waiting time. Delays to respond over customer inquiry calls, message or e-mail is considered as waiting time with reference to SSM. This slow reaction to qualified leads by marketing function may cost loss of customer to the company.

Fig 6.3. *Popping ads signifying overproduction in SSM*

3. *Unnecessary transport*: Non value added movement of material between process is called unnecessary transport in production. Though, this waste is based on physical movement of material in production environment, it can very well be visualized in transactional environment as well. Once individual falls into the fringe of marketing efforts of the organization, maintaining their persona is another important part of effective marketing management. Buyer's persona is the portrayal of ideal customer of the offering. Creating buyer's persona helps marketers to understand what

customer value in their offering and how this message should be conveyed. Marketing communication should be such that it can offer solution to the untapped desire of customer's need. Based on understanding of customer's perception and solution proposed by offerings, marketers can make their communication at most effective and hence minimizing possibility to get it void. Viz., when marketing managers are well informed about their offering's value and how it can get fit into customer's value chain, they can make their communication more effective, which customers can not overlook. This minimize unnecessary dialog between firm and customer which is analogous to unnecessary transport of production environment.

4. *Over processing or incorrect processing*: Instituting any changes in the product that is not valued by customer is called over processing or incorrect processing. Creating buyer's persona helps marketers to put their feet in buyer's shoe and make them understand how their offering can meet customer's need. It also helps marketers to better identify possible improvement horizon in offerings. This exercise avoids unnecessary hasty changes in offerings which can be seen analogous to over processing or incorrect processing of production environment.
5. *Excess inventory*: Excess lot of material on site can very well hide process inefficiency of production process. Similar situation happens in marketing function. Excess of information regarding offerings puts marketers in the dilemma regarding what to communicate with customers and how to communicate with them. *"Communicate to the core"* is the message to control excess nausea of product or service information. That is communicating with customers based on their desired value in offering instead of what company want to perpetuate is the Lean way to optimize SSM efforts.
6. *Unnecessary movement*: Wasted motion during work schedule is called unnecessary movement in production setting. Communicating through the channel which is not effective is analogous to unnecessary movement of production. Like unnecessary movement in production this unnecessary investment in ineffective communication channel leads to underutilized marketing efforts and hence contributing to waste that can cost significantly to the organization.
7. *Defects*: producing parts that doesn't meet customer requirement is called defects in production setting. With reference to marketing, leaving your prospective customer on the mercy of market at any stage of customer purchase funnel is called defects. Incorrect, incomplete and unattended invoices and information are also defects in a

marketing process. This all happens due to improper communications and lack lustre approach of people working at the ground floor. Conscious communication efforts are required at awareness-consideration-conversion stages of customer purchase funnel. Failure to design this integrated marketing message is considered as defects with reference to SSM.

With an appropriate *Gemba* approach many of the above wastes can be reduced to a minimum level. Thus, implementing Lean in SSM helps to minimize wastes and NVA activities from the marketing process very effectively and efficiently. Scientific outlook of Lean in SSM is discussed by Muralidharan and Raval (2017a).

6.5. Environmental sustainability through Lean in Six Sigma Marketing

Improving business processes through LSS or any other approach is not the only goal of modern organizations. Changing environmental conditions of our planet has made organizations to think about how they can contribute to pollution prevention and environmental opportunities. Dominating concept in current process improvement literature is contribution of LSS to environment sustainability (Muralidharan (2015), Chugani et al., (2017)).

According to Muralidharan (2015), *Green Six Sigma* (GSS) can be defined as "*the qualitative and quantitative assessment of the direct and eventual environmental effects of all processes and products of an organization. The activities involve the systematic usage of infrastructure and manpower; optimum use of technology and accountability of sustainable business practices*".

Some of specific qualitative assessments that need special attention are:

- Source of information regarding raw materials and machinery
- Strength of the company in terms of its size, manpower, machinery and methods
- Major breakthrough achievements in the past and present
- Availability of the complete information on innovations carried out by the company

- Availability of environment friendly and sustainable developments carried out by the company
- Waste disposal schemes employed
- Sources of energy conservation and fuel consumption
- Methods of reducing noise pollution
- Environmental performance measurement
- Process control and quality control measures practiced in the company
- Tax paid and company liabilities specific to environmental issues
- Reactive rather and proactive maintenance activities

Apart from the above qualitative information, there are many expected and unexpected environmental effects taking place in an organization, which can be measured in some quantitative scale. Some of them are:

- number of collaborations between companies and governments
- number of major accidents, catastrophes that have taken place
- number of projects conducted on healthy business practices and sustainable business practices
- number of bugs reported in computer programs and software
- number of training programs held for educating the employees
- amount and of level of green house gas emissions
- amount of Carbon released by the company
- amount of waste produced and disposed in a day

Lean was not initially aimed to address environmental opportunities, but waste eliminating nature of Lean makes it suitable to contribute to it. Persistent attempt of Lean to reduce waste makes it potential approach to drive sustainability efforts. Lean approach is highly focused upon reducing seven types of wastes as discussed above. These wastes can be seen through environment perspective to join the bandwagon of Green movement. As explained in (EPA, 2009):

- *Overproduction*: Over production of units lead to high consummation of raw material and energy. Also hazardous material results in to extra emissions, disposal and extended exposure of hazardous material to workers.
- *Waiting time*: Wastage of energy during waiting period like power failure, voltage fluctuation, lightning, cooling or heating. Potential damage of units or raw material during such a long waiting time causes wastages of energy, cost and time.
- *Unnecessary movement/transport:* Energy requirements during unnecessary movement of goods and manpower are many often unnoticed and can be a cause for delays and depression. Special packaging is required to make goods transferable in such situations. The unnecessary movement and delay of transportation can also cause Green House Gas (GHG) emission and Carbon management a serious issue for pollution increase and can result in permanent shut down of the company.
- *Over processing or incorrect processing*: More consumption of raw material and parts is as good as repeating the process again and again, and can lead to accumulation of wastes in terms of knowledge and machinery causing a serious threat for environment.
- *Excess inventory:* Excess inventory required additional place for storage and hence extra energy consumption for storage place. Excess inventory also results into damaged parts due to long term storage. This results into more material and energy to replace damaged parts. Close monitoring of abundance and scarcity is the best way of removing these wastes.
- *Defects*: They are wastage of raw material and energy to produce defective part. Space and energy requirements to store defective units and to recycle or dispose defectives are a major concern these days. By promoting green methods of evaluations like: reuse, reduce, and recycle policy, we can manage defects for a better environment.

Hence, Lean approach which focuses upon waste reduction can refocus its efforts based on sustainability considering the above aspects. Such approach is very well known as “Green Lean” or “Clean Lean” in literature. Six Sigma as a process improvement approach focus on defect reduction and hence optimum use of resources. This leads to lower production cost and high profitability. Revere and Black (2003) define Six Sigma DMAIC plan considering

energy conservation at its core. According to them, the following aspect of sustainability can be integrated in the DMAIC approach:

- Define: Energy management team should be formed to keep sustainability project align over different phases like measure, analyze, improve and control. Proper budget should be allotted to run energy management programme successfully.
- Measure: To examine the energy consumption of organization and to explore improvement opportunities, energy audit should be done.
- Analyze: Data collected through audit can be analysed to understand current energy consumption status, to understand budget allocation and to examine energy saving opportunities.
- Improve: Based information analyzed, energy saving goals can be decided to improve upon current energy consumption.
- Control: Once improvement is realized – sustainability of project implementation is achieved through control phase.

Hence, Six Sigma tool as a process improvement approach can contributes significantly to energy conservation and safe environment. This facet of Six Sigma is reported as "Green Sigma" or "Green Six Sigma" in literature (see also Muralidharan (2013), and Muralidharan and Ramanathan (2013)).

As discussed above since Lean and Six Sigma contribute to "Green" practices, and therefore, have positive impact on environment. Though not much literature is available on "Green Lean Six Sigma", few authors address this topic through case studies. Zamri et al. (2013) discuss application Green Lean Six Sigma (GLSS) in Malaysian Automotive industry. Author examined relationship between GLSS and financial performance of the organization. However, more studies are required to understand full potentiality of GLSS. The driving force of GSS or GLSS can be anything like: improving public relations, improving customer relations, improving investor relations, improving corporate relations, reduce logistic costs, satisfy customer requirements, understand competitors and government compliance etc. An organization, therefore, must encourage manufacturing of green products and involve green methods while designing their product. The best business practice like SSM or Green Six Sigma will then become an integral part of such an organization.