Improving Customer Satisfaction with Lean Six Sigma

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In today's economic environment many companies are turning to Lean Six Sigma for the first time. Others are reinvigorating their current Lean Six Sigma programs. With its focus on bottom line financial benefit through sustainable productivity and efficiency improvements obtained by minimizing process waste and variation, Lean Six Sigma is the perfect tool for reducing your operating costs as the market retreats. While this is an obvious necessity, now is a good time to remember that the ultimate goal of Lean Six Sigma is not simply reducing operating costs but rather increasing customer satisfaction through sustainable ***breakthrough*** performance improvements. When the pie shrinks, you don't just want to increase the number of cherries in your slice, you also want a bigger slice of the pie. Lean Six Sigma can be a principal tool to increasing market share, revenue and earnings.

> *"Lean Six Sigma can be a principal tool to increasing market share, revenue and earnings."*

Linking Customer Satisfaction to Meeting the Customers' Needs

Customer satisfaction is achieved by giving the customers what they want – meeting their needs. When addressing customer satisfaction with Lean Six Sigma, the ***Kano model*** of customer satisfaction can be helpful. Developed by Professor Noriaki Kano in the 1980's, this model places customer needs into three categories: basic, performance, and excitement.

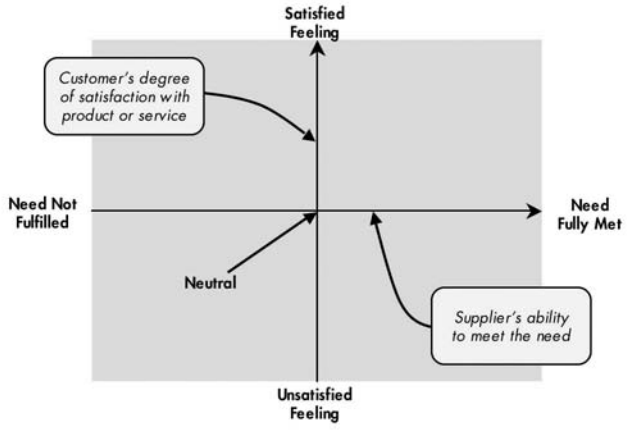
Needs are graphically plotted with the X-axis representing the provider's ability to meet the need and the Y-axis representing the customer's degree of satisfaction, as shown in Figure A. Starting with this model of the customer's needs can focus Lean Six Sigma efforts on those needs that will significantly impact the customer's satisfaction. Significantly increasing customer satisfaction will lead to increased sales and market share.

Basic needs are those that are *expected* by the customer to be fulfilled by the product or service provider. As shown in Figure B, meeting a customer's basic needs has a neutral impact on satisfaction. Failure to meet basic needs, however, has a significant negative impact on satisfaction.

Here is an example to which we can all relate; windshield wipers are expected to be included in the price of a new automobile. Having the salesman tell you that windshield wipers are optional on a particular model will promptly lead you to question his real desire to sell the car. Examples of basic customer needs in the industrial gas business include DOT shipping compliance, failure to leak, correct labeling, and on-time delivery. The ability to meet these needs is taken as a given by the customer and required for companies to stay in business.

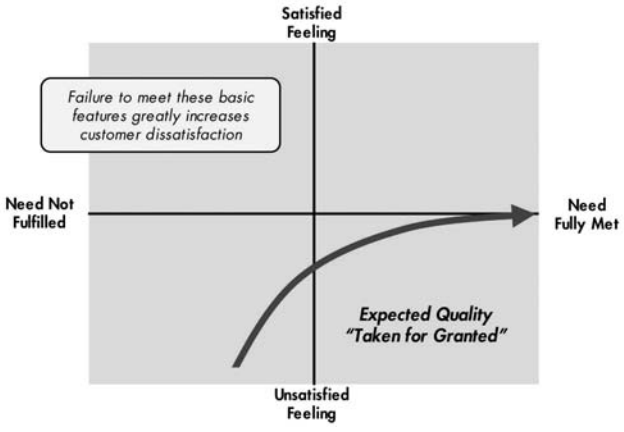
Failures to meet a customer's basic needs are, therefore, to be avoided because of the immediate and significant impact of these failures on customer satisfaction. Thus, Lean Six Sigma efforts are frequently focused on fixing these failures. There is usually abun-

Figure A. **Kano's "3-Dimensions of Customer Satisfaction"**



Noriaki Kano, **Guide to TQM in Service Industries,** Asian Productivity Organization, 1996

Figure B. **Basic Needs**



dant historical data available since failures to meet basic needs are typically documented through quality and corrective action systems. Assigned Lean Six Sigma teams can quickly begin finding root causes, implementing process improvements to correct the root causes, and putting controls in place to ensure that the improvements are maintained and the failures eliminated or significantly reduced.

Performance needs, the second category of customer needs, are those where the ability to meet the need has a proportional impact on customer satisfaction. For performance needs, as shown in Figure C, more (or less) is better.

Going back to the windshield wiper example, one performance need is price; the lower the price, the greater the satisfaction with the windshield wiper. Conversely, as the price increases, so does the dissatisfaction. Performance needs are the customer's needs on which companies generally compete. Within the industrial gas business, companies typically compete on performance needs such as price, lead times, purity, etc.

> *"Improving the ability to meet performance needs is also a frequent Lean Six Sigma project. The desired outcome is easily measured: lower cost, shortened lead times, or increased purity."*

Improving the ability to meet performance needs is also a frequent Lean Six Sigma project. The desired outcome is easily measured: lower cost, shortened lead times, or increased purity. Improvement targets for specific needs must be set and Lean Six Sigma teams must be tasked with hitting the targets. These targets are generally set by halving the difference between where the company currently is and what they think is possible. The teams start studying the current processes used to meet these needs, identifying and eliminating the non value-added work and waste from the processes, designing and implementing streamlined, waste-free processes, and, once again, putting controls in place to sustain the newly achieved improved performance.

There are problems with competing on performance needs alone, however. First, improvements in the ability to meet performance needs produce generally only mild increases in customer satisfaction. Very significant improvements in performance are needed to drive large changes in customer satisfaction. For example, shortening the lead time for a product from five days to three days will probably not have a very large impact on overall satisfaction. The second problem is that incremental improvements in performance can be, and will be, very quickly matched by competitors, thus eliminating any competitive advantage a company might have had. This leads to new targets and new Lean Six Sigma projects. So on it goes.

Breakthrough, game-changing improvements in the ability to meet the customer's needs are required to achieve significant improvements in customer satisfaction. Breakthrough improvements to products or services will minimize competition, significantly increase sales and market share, and – if the improvement excites the customer enough – allow the provider to name the price! Generally, breakthrough improvements, especially if derived from patented or protected processes or methods, take longer for the competition to copy. Thus, the market lead associated with breakthrough improvements tends to be longer lasting.

This leads us to the third category of customer needs, called ***excitement needs.*** Personally, I prefer the term ***latent needs*** for this category since these are needs that the customer does not know a given provider can meet or, in many cases, the customer is not even aware of the need.

I also like the term Tom Peters uses for this category of needs: ***WOW!*** Failure to meet a latent requirement has no impact on a customer's satisfaction since he is not aware of the need in the first place, to say nothing of anyone's inability to fill it. But, as shown in Figure D, successfully identifying and fulfilling a latent need has a very large impact on customer satisfaction.

Relative to the automotive example, an excitement feature could be a windshield wiper blade that never wears out or one that automatically turns on when it rains. Think about the TiVo, the iPod, or the Boeing 707 Jetliner – all filling latent needs. Latent needs that are currently going unfilled in the industrial gas business include……HA! Did you really think I was going to share that information with *you!?* We all need to find these potential market discriminators ourselves.

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Figure C. **Performance Needs**

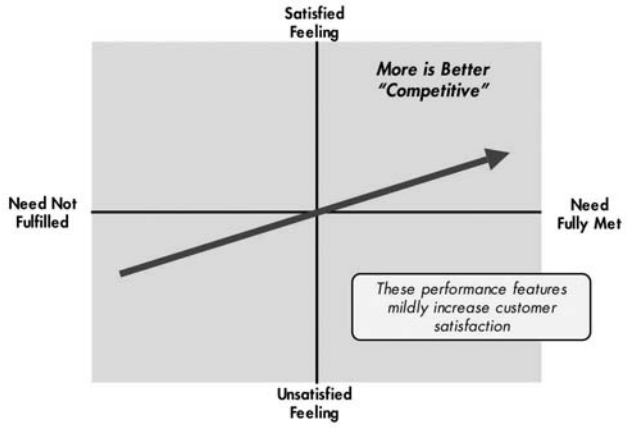
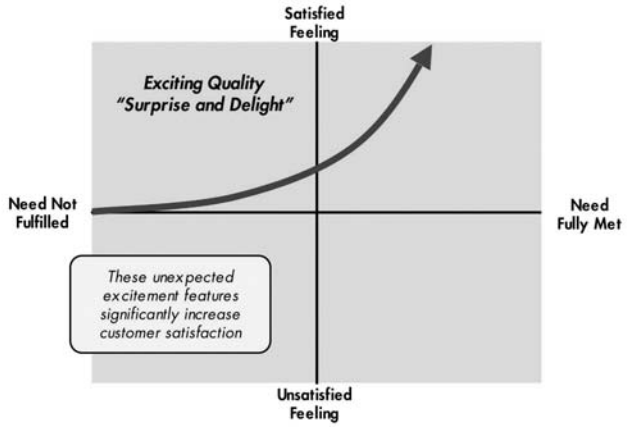


Figure D. **Excitement Needs**



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Achieving Breakthrough Performance Improvements

Obviously then, companies need to be constantly searching, identifying, and fulfilling needs that excite the customer. There are two ways to achieve customer excitement, either through a significant improvement in the ability to meet a known, stated customer need ***(breakthrough performance improvements)*** or through the identification and fulfillment of an unknown, unstated customer need ***(latent performance improvements).***

Lean Six Sigma can provide methods and tools that will facilitate achieving sustainable customer-exciting performance in fulfilling existing and unstated needs. The first type of needs, existing needs, is the best place to start.

Companies need a detailed understanding of what the customer expects from their product or service. Answers to the following questions are required before starting to make improvements:

- What are the customer's stated needs? What does the customer really expect the product or service to deliver? Are we interpreting the stated needs in a way that meets the customer's real intent?
- How well do we currently fulfill these needs? Equally important, how well do our competitors fulfill these needs? Where do we lead the market in performance and where do we trail?
- What improvements in meeting these needs are reasonable?

> ***"Only once the customer's needs are thoroughly understood can a company set improvement targets."***

One Lean Six Sigma tool that can help answer the first question is ***Quality Function Deployment*** (QFD), commonly called the House of Quality. Developed by the Japanese in the 1960's for complex engineering construction work, QFD is now extensively used in the U.S. for new product development. This tool is used to translate the customer's needs into product or service requirements (using the language of the business) and then identify the links between these requirements and the features or methods by which a company intends to meet these needs. With QFD, holes in understanding the customer's needs quickly become apparent, as do any conflicting needs. QFD can be used to quickly and fully address quality issues with a customer and to identify any differences in interpretation of, or subtle conflicts in, the stated needs.

Only once the customer's needs are thoroughly understood can a company set improvement targets. Of course large improvements can achieve significant improvements in customer satisfaction. But how much of a breakthrough improvement will excite the customer?

Equally important is identifying what is really achievable. Can the target be achieved within the current processes? Can it be achieved within current state-of-the-art? Can it be achieved within the financial limitations of the company? Setting improvement targets that are not achievable, either physically, financially, or politically, will doom Lean Six Sigma projects to failure in terms of performance, schedule, or budget.

Again, Lean Six Sigma provides tools that can help address these questions and set reasonable, achievable improvement tar-

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Figure E. **Quality /Cost Profile**

Product: Cadillac CTS

Market: Sport Luxury Car

Key Customer Criteria	Relative Importance		Weighted Performance Ratings						Weighted Ratings**			Gap (QL - You)
	Criteria Weight	Share of Importance*	Cadillac CTS	BMW 3 Series	Mercedes E Class	Infinity G35	Lexus IS	Acura TL	You	Market Share Leader	Quality Criteria Leader	
Styling	8	0.145	8	5	7	8	7	6	1.164	0.727	1.164	0.000
Prestige	6	0.109	4	9	8	6	6	5	0.436	0.982	0.982	0.545
Acceleration	7	0.127	9	8	7	8	9	7	1.145	1.018	1.145	0.000
Top Speed	6	0.109	8	6	7	6	9	6	0.873	0.655	0.982	0.109
Handling	7	0.127	6	9	7	6	8	8	0.764	1.145	1.145	0.382
Reliability	4	0.073	5	7	7	8	9	9	0.364	0.509	0.655	0.291
ABS/Traction Control	5	0.091	5	5	5	5	5	5	0.455	0.455	0.455	0.000
Power/Heated/Cooled Seats	3	0.055	9	6	6	6	6	3	0.491	0.327	0.491	0.000
Ease of Purchase	5	0.091	8	7	7	9	7	8	0.727	0.636	0.818	0.091
Ease of Maintenance	4	0.073	6	9	5	7	8	9	0.436	0.655	0.655	0.218
		0.000							0.000	0.000	0.000	0.000
		0.000							0.000	0.000	0.000	0.000
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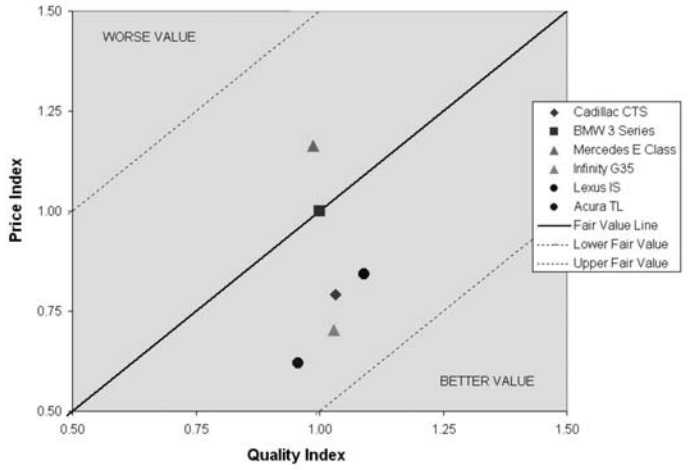
		0.000							0.000	0.000	0.000	0.000
		0.000							0.000	0.000	0.000	0.000
Totals	55	100%	68	71	66	69	74	66	6.8545	7.1091	8.4909	1.6364
				Market Share Leader								

* Criteria Weight / Total Criteria Weights
** Share of Importance x Performance Rating

Competitive Position	Cadillac CTS	BMW 3 Series	Mercedes E Class	Infinity G35	Lexus IS	Acura TL	
Market Share (Must total 100)	10	24	15	22	17	12	100
Price Relative to You ***	100	115	145	95	120	85	
Direct Cost Relative to You ****	100	120	125	90	80	85	
Performance Relative to You	100	104	97	101	109	97	

Market Weights for Quality and Cost	
Quality	75
Cost	25
Total	100

Figure F. **Value Map**



gets that are significantly large enough to impact customer satisfaction. To determine appropriate targets for breakthrough performance improvements a company must understand 1) how the competition currently performs (inside) and 2) what is "best in class" performance (outside) for comparable needs. Commonly called ***benchmarking,*** both inside and outside comparisons are useful in establishing the minimum improvement required and the maximum improvement possible.

The Lean Six Sigma tools most useful in assessing your competition's ability to meet the customer's needs (inside benchmarking) are the ***Quality/Cost Profile*** and the ***Value Map.*** Shown in Figures E and F, these tools provide both a head-to-head comparison for each customer need and an overall value assessment for each competitor. With this information, a company can identify those needs where they lag behind the competition — needs that require they at least match the best competitor to eliminate a potential negative market discriminator. More importantly, however, this information can be used to identify those needs where a company leads the competition. To achieve breakthrough performance the Lean Six Sigma teams must be applied to further increase the market lead so that a company can leverage these needs as positive market discriminators.

To determine potential "best in class" performance relative to specific customer needs requires that the Lean Six Sigma teams break down each specific need or group of needs into generalized, abstract needs. For example, specified lead time requirements to multiple locations can be abstracted to distribution needs. Once abstracted into general terms, a company can identify the leaders in distribution methods and technology; Federal Express and Walmart quickly come to mind. Now the teams can study the distribution systems of the "best in class" and identify methods and technologies that can be applied to their specific industry and processes. After potential breakthrough performance improvements have been identified, it simply becomes a matter of "running the numbers" to verify that the potential increases in sales and market share are worth the investments required to implement the new methods or technology.

"Experience shows that the most useful pieces of information relative to identifying a customer's latent needs can come from the most unlikely of sources."

Achieving Latent Performance Improvements

Identifying and fulfilling latent performance improvements is difficult, but also much more rewarding. The only way to identify these unknown customer needs, so that they can be fulfilled, is to understand the customer. A company must intimately know how the customer procures, handles, uses, and disposes of their product or service. When they understand their product or service in the customer's environment they identify opportunities for improvement that can also improve how the customer uses the product or service.

Two tools are extremely useful in understanding the customer's environment with respect to the product or service. One is a general marketing tool and the other is the most important Lean Six Sigma tool. The general marketing tool is a simple system for collecting information regarding the customer. It is important that all information is collected, no matter how the information enters the company. Experience shows that the most useful pieces of information relative to identifying a customer's latent needs can come from the most unlikely of sources. Companies touch customers in many ways: sales staff, delivery personnel, quality engineers, accounting, on-site servicing, and many others. Each of these organizations sees a different aspect of the customer's environment. Latent needs can be found when all of these different "images" are brought together and combined through methods like affinity diagramming or Ishikawa analysis.

The second way in which the customer's potential latent needs can be identified is through the use of ***value stream mapping*** and ***process mapping.*** Value stream mapping is a high level look at the internal life cycle of the product or service from receipt of the customer's order to delivery of the product or service. The value stream map includes information flow (both inside the company and outside to the suppliers), material flow, in-process inventory, and processing time information. With a value stream map of the current process a company can visualize a future-state map that eliminates or minimizes waste: waiting, inventory, defects, transportation, motion, over production, and non value-added processing. This future-state map presents an idea of an optimized system that minimizes production costs while "wowing" the customer.

A second approach is to use process mapping, which is a detailed step-by-step construction of how the product or service is procured, produced, delivered, used, and discarded. Process mapping can be used to identify activities that are non value-added, wasteful, or prone to mistake in the current process. A company must particularly look for opportunities where small changes in what they do internally have a major simplifying effect on the customer's work. They also need to look for opportunities where sub-optimization of a particular step in the process has impacted the overall effectiveness of the system. Construction of the customer's portion of the process map is best done with the customer's participation, which in many cases may not be practical. In these cases, a company can again fall back on the "images" obtained through the myriad of contacts the company has with the customer. This information can be used to construct the customer's portion of the process map.

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I have found that with a process map of the entire product or service, production, delivery and use opportunities for latent performance improvements become apparent. In an example from a previous employer, a detailed process map for a particular hazardous product showed us that our customer was required to stock our product in a remote location to his facility. In his assembly process the customer subsequently removed our product from the remote storage, transported it to an assembly area, and assembled it to another hazardous product that was stored at a separate remote location. This necessitated two trips (transportation waste) to two different locations (inventory waste). We recommended that, for a very nominal fee, the customer have the second hazardous product directly shipped to our facility and that we would assemble it to our product and ship the assembly to the customer. Once assembled together the two products could be stored at a single location. This simplified our customer's assembly process and greatly increased his satisfaction with our company. (At a later date we convinced the customer that we could produce the second hazardous product and effectively doubled our revenue with this single customer.)

"Continual improvement in fulfilling the customer's performance needs is also important to ensure competitiveness."

Summarizing

Lean Six Sigma has been demonstrated time and time again to be the premier tool for improving internal productivity and efficiency. It has also been very successfully used to improve customer satisfaction by addressing failures to meet a customer's basic needs. Failure to meet the customer's basic needs is detrimental to the reputation of a company and will eventually force it out of business, if not quickly and fully corrected. Continual improvement in fulfilling the customer's performance needs is also important to ensure competitiveness. In difficult economic times such as we are currently experiencing, we need to refocus Lean Six Sigma efforts so that we are also addressing the customer's performance and latent needs. This will lead to significant growth in sales and market share.

Unfortunately, there is a fly in the ointment: over time what were once the customer's latent needs become his basic needs. Automatic transmissions, car radios, air conditioning, and CD players were all once latent needs in the automotive industry. Now they are basic needs that must be fulfilled in order to compete.

In today's world, the slide from latent need to basic need is ever accelerating. Only through the application of focused, disciplined, data-driven methods like Lean Six Sigma will companies be able to perform with the speed and accuracy required to stay ahead of the competition and the customers. ■