NEWS

Lean Enterprise Division

Chair's Message

Greetings,

This year is the first strong step forward toward our vision for the Lean Enterprise Division (LED) in 2020. I am very excited with the possibilities and want to share this wonderful journey with you and your colleagues. So please read this newsletter and consider how we can help you grow professionally, how we can help your organization become more successful, and how you might contribute and share your experiences and knowledge with others.

Where LED Has Been

The LED has grown from its beginnings as a group of ASQ members interested in advancing manufacturing to the third largest division in ASQ, with almost 6,000 members in more than 40 countries around the world. Whereas we once were narrowly focused on primarily manufacturing, today we are actively reaching out to those applying lean in other sectors such as healthcare and government.

We have established a liaison with the ASQ Healthcare Division and have established a healthcare track at the 2013 Lean and Six Sigma Conference. The Lean and Six Sigma Conference, which we jointly sponsor with the Six Sigma Forum and the Healthcare Division, has grown to more than 600 attendees.

In addition, LED chose to join the lean certification program with the Association for Manufacturing Excellence (AME), the Society for Manufacturing Engineers (SME) and the Shingo Prize—developing relationships with those organizations through joint participation in conferences.

Where LED Is Heading

ASQ is going global and so is LED. We will continue to reach across organizational sectors to broaden the application of lean. We will continue to strengthen our relationship with AME, SME, and Shingo. However, we will leverage the resources of ASQ and other organizations to deliver professional offerings such as conferences, training, certification, and publications to an expanding, global membership.

We will expand our relationships to other organizational sectors by establishing liaisons with other ASQ divisions such as the Government Division and the Education Division, and encouraging tracks for each in the Lean and Six Sigma Conference. In addition, where opportunities occur, we will work directly to support ASQ sections working with local government entities (municipal and state) and educational institutions (school districts, colleges, and universities) in the application of lean.

We will establish LED liaisons in Africa, Asia, Australia, Europe, Latin America, and South America. This will coordinate with the delivery of publications, training, and certification in multiple languages— Chinese, French, German, Japanese, Korean, and Spanish. ASQ LED will hold joint conferences with the premier quality and lean organizations in those locales with speakers traveling both from the U.S. to those locations and from those locations to the U.S.

As a result, the membership of LED will grow dramatically and will require a different governance structure with a larger, more diverse leadership team with representatives from around the world. This leadership team will take advantage of technology to collaborate

Lean Enterprise Division
ASQ The Global Voice of Quality™

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and work together but will come together for at least one face-to-face meeting per year at one of the regional locations. Committees and sub-committees will be filled with members from around the world as well, drawing from diverse sectors where lean is being applied including education, government, healthcare, and manufacturing among others.

Let us know what you think about this vision by submitting comments on our LinkedIn group (http://www.linkedin.com/groups?gid=1806599&trk=myg_ugrp_ovr) or sending me an email with your thoughts. I hope to see you at our booth in the exhibit hall at the 2013 ASQ World Conference on Quality and Improvement in Indianapolis, IN, May 6 – 8. Stop by and get one of our fabulous T-shirts, take in one of several presentations by our leadership team, and in the evening drop by our hospitality suite to network and mingle.

All the best to you and yours,

Frank Murdock
Chair
ASQ Lean Enterprise Division

Note From the Editor

Welcome to the latest issue of ASQ's *Lean Enterprise Division News*. My name is Lance Coleman and I have been a division member for a little more than two years. Some of you may know me as the Publications Subcommittee chair. In that capacity, for the past year, I helped recruit authors, review submittals to the newsletter, and occasionally contributed articles myself. This quarter, just this once, leadership has decided to let "the inmates run the asylum" and so, I am pleased to serve on this issue as your guest editor.

Featured in this issue is a recap of another successful Lean and Six Sigma Conference, including an interview with one of our keynotes, Dr. Jeffrey Liker, as well as a sneak peak at what the division has in store for this year's ASQ World Conference on Quality and Improvement in Indianapolis, IN. Also this month, after a brief hiatus, the newsletter is pleased to once again include articles, case studies, and book reviews.

In the near future, you should receive our annual survey in the mail, sent to all division members to find out what you like about the services we provide and how we can better add value to your membership. When you receive this email, please take the time to fill out the survey and return it to us. The LED leadership, as well as the leadership here at the newsletter, want your feedback so that we can continue improving both our operations and our services provided, while continuing to bring greater value to our membership from year to year. Let us be a resource for you as you grow in your chosen profession. Also, don't feel that you have to wait until the annual survey to provide feedback. If there is some way that we can improve or if you want to give us a pat on the back for something we did that you especially liked, drop me a line anytime at the email below.

Become involved with either the newsletter or some other aspect of the Lean Enterprise Division. We are always looking to identify new and future leaders—and make new friends. If you should see me or any of the division leadership at our booth at the WCQI or on the road somewhere, please stop by, say hello, and introduce yourself.

Until the next time …

Kind regards,

Lance B. Coleman, Sr.
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T[3] Tools, Techniques, and Templates: Voice of the Customer

by Frank Murdock, chair, ASQ Lean Enterprise Division

T[3] is a regular feature of the LED newsletter dedicated to introducing some of the common tools, techniques, and templates used to help organizations on their lean journey. The voice of the customer is a key building block of lean and the subject of this issue's T[3] column. This article is taken from Section 4.2.1.6. of *The Lean Handbook, A Guide to the Bronze Certification Body of Knowledge* published by Quality Press in 2012 (asq.org/quality-press/display-item/?item=H1403).

What Is the Voice of the Customer?

The voice of the customer (VoC) is the ongoing, regular measurement of the needs and expectations of those who purchase your products or services. The VoC differs from the in-process measurements found in lean such as cycle time, yield, and overall equipment effectiveness (OEE), which are sometimes called voice of the process (VoP) as illustrated in the diagram below[1]:
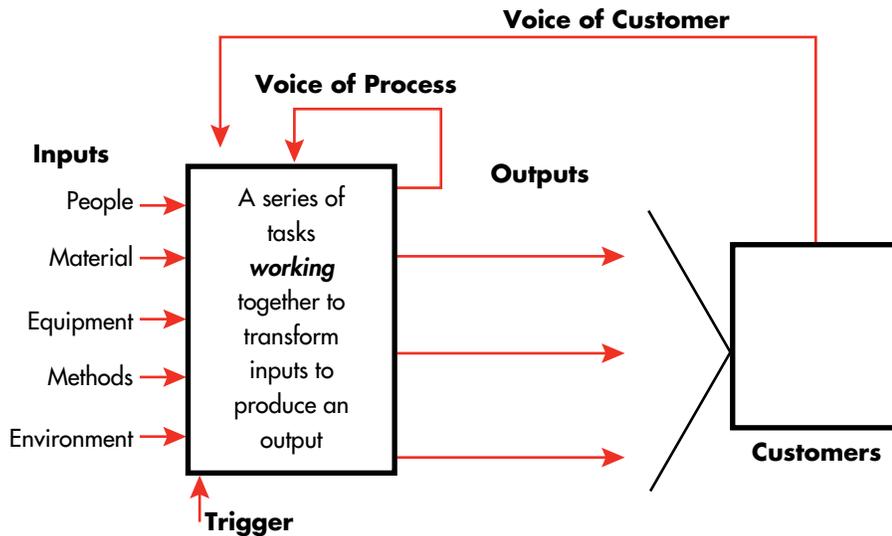
In the diagram, the process is indicated by the box on the left with inputs and with outputs that go to customers. In principle there are two feedback loops at work—the voice of the process and the voice of the customer. The VoP measurements are used to control the process and ensure that the outputs satisfy the requirements of the customers. The VoC identifies and measures those customer requirements. Both measurement systems should be ongoing with a regular frequency. However, the VoC cannot effectively be used for control for several reasons:

- It is too slow
- It takes too long to collect
- It typically is expensive
- It is too difficult to interpret for those working in the process because measurements are stated in customer terms and not in the terms of the producers

The VoC is translated into key process indicators (KPIs), which then are used as part of the VoP and used to control the process by determining if the products, as they are produced, meet customer requirements in terms of quality (first-time-right or yield), delivery (cycle times), and value (cost measures such as full-time equivalent [FTE]).

Why Is the Voice of the Customer Important, Particularly in the Application of Lean?

Lean is about getting rid of waste. Waste is anything that does not add value—particularly anything for which the customer is unwilling to pay. Therefore the customer defines the

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1 "The Process Diagram, A Key Tool for Process Thinking," Frank Murdock, 2008 Lean Six Sigma Conference.

T³: Voice of the Customer

value in our lean value stream, and the VoC is the means by which we collect the data, which tells us what is of value to customers and what is not of value to them. In this sense then, the voice of the customer is foundational to all lean improvement efforts.

How to Measure the Voice of the Customer?

Just like all lean improvement efforts, we need to go to *gemba*, go to the source. This time the source is not where the work is being done within the process or value stream but where the customer is using our products or services. Too many times the only source of voice of the customer information is the orders the customers place and their complaints or warranty costs when they are not satisfied with the products or services we provide them. In both cases it is too late.

In the case of orders, our production systems are already in place and there is very little we can do to re-create the way we produce the products or deliver the services. And of course with complaints or warranty costs, the damage has already been done. Dr. Deming used to say that a complaining customer tells at least eight others about what happened to them, whereas a satisfied, loyal customer tells only three others about his or her great experience.

So, although order databases and complaint and warranty systems are a necessary part of the VoC, they do little to help drive prevention and, in particular, do little to define what is valuable and what is not.

The first step is understanding who your customers are. This is typically done by performing an *80/20 analysis* regarding the products and services you provide and who is purchasing them. Typically 80 percent of your products and services are purchased and used by 20 percent of your customers. Also, not all of your customers have the same needs and expectations. *Customer segmentation* classifies customers into groupings based on similar requirements. This is done together with the *80/20 analysis* and the selection of the key value streams. Then data is collected on the needs and expectations of each customer segment and the segmentation is refined using the P-D-S-A cycle below:

Voice of the Customer Plan-Do-Study-Act
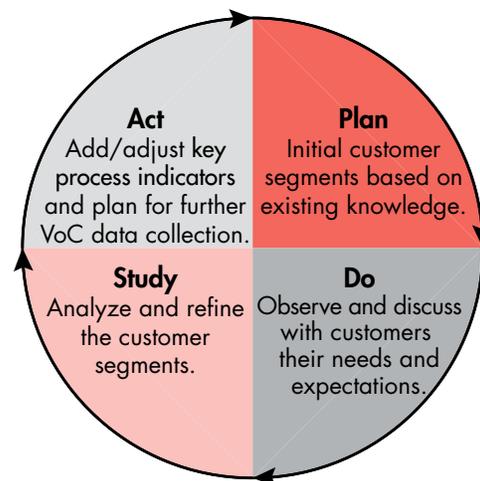
Once the customers of a given value stream have been identified, we discuss why they are using your products or services, what their needs and expectations are, why they have those needs, and what their objectives or goals are with respect to using your products or services. It is critical that we understand why, because as producers we have the technology, the means, and the knowledge to satisfy those goals or objectives in many different ways—ways customers will probably not be aware. This then sets the stage for innovative new products or services, particularly for needs

Examples of Voice of the Customer in Lean Applications

Sector	Value Stream Area	Customer	Customer Segments	VoC Measurement	Method	Frequency
Manufacturing	Car assembly	Car owner	Region, income, gender, age, fleet	Interior noise	Drive clinics	Quarterly
Healthcare	Clinical services	Patient	Location, income, gender, age, type of insurance	Satisfaction	Interview	Weekly
Service	Restaurants	Paying guest	Location, income, gender, age, avocations	Facial expressions, body language	Observations by host	Daily
Government	Airport transportation security	Traveler	Gender, age, impairments, class of travel	Personal security and comfort	Interview	Weekly
Education	Elementary schooling	Parents or guardians	Income, age, marriage status, education level, country of origin	Satisfaction and involvement	Individual conferences with teacher	Quarterly

that remain unspoken but are articulated through customer behaviors. The classic Canon personal copier was developed after observing office workers staying after work to use the company copier.

References

Creating a Customer-Centered Culture: Leadership in Quality, Innovation, and Speed, Robin Lawton, Quality Press, Milwaukee, WI, 1993.

"How to Conduct Customer Surveys," Institute for Citizen-Centred Service, Government of Ontario, Toronto, Canada, 2004.

Out of the Crisis, W. Edwards Deming, MIT Center for Advanced Engineering Study, Cambridge, MA, 1982.

The 2013 Lean and Six Sigma Conference—Another Incredible Experience

by David Behling, LED Programs Chair

Almost 500 lean and Six Sigma professionals had a wonderful time learning from more than 50 sessions, four leading keynote speakers, and networking with peers at the 2013 Lean and Six Sigma Conference in Phoenix, AZ, March 4 – 5.

The conference got off to a "wow" start with Dr. Jeffrey Liker's opening keynote. He reminded us what lean really means and how important lean leadership is. (Read an interview with Dr. Liker in this issue.) The energetic Jim Bowie, our evening keynote, stretched our minds with how lean and the philosophy of the samurai are similar. He emphasized how lean practitioners are truly the modern-day samurai warriors and made to seek battle. I cannot wait to read his book on this subject later this year. Look in our next newsletter for an interview with Bowie.

On day two, Stacy Aaron demonstrated the complexity of change and the steps that one must take to ensure that your organization, leadership, and team are ready for change. She left us with an excellent tool—a change readiness audit form. Robert Woods closed the conference by explaining how he and his team have been able to change and transform some of the agencies within the Arizona state government. It was truly an inspirational talk, as everyone could relate to the complexity and bureaucracy of the government.

It is impossible to mention all or even most of the incredible sessions that I attended, heard about, and learned from. I would like to mention two sessions that really spoke to me. The first one was "Value Stream Mapping for Service and Office," by Mike Osterling. It was truly eye opening to gain a better understanding of how VSM can just as easily be applied to the nonmanufacturing parts of the world. The second was a workshop called "Mind and Voice of the Customer," by Robin Lawton. His ability to translate how to discover the mind and voice of the customer into such easy-to-follow steps was amazing.

The conference continues to grow and become more of a global and national conference every year. We had attendees from nine countries outside the United States and from 47 of our 50 states. We also began a new relationship with the Healthcare Division at ASQ. For the first time, we specifically added multiple sessions dealing with the healthcare industry. We expect this relationship to continue to grow in the coming years.

We were pleased to have a lot of enthusiastic traffic at our booth throughout the conference. We offered a free conference registration to Forrest Breyfogle III as part of our annual newsletter author drawing. We also held an on-site drawing for the *Lean Handbook* (provided by Quality Press) and the *Lean Memory Jogger* (provided by Goal/QPC). Ofelia Burns, a lean consultant from Chandler, AZ, won the *Lean Handbook* and Mike Osterling, a lean transformation facilitator from La Mesa, CA, won the *Lean Memory Jogger*.

Next year's conference will be held February 24 – 25 in Phoenix, AZ. I hope that you will be able to join us and the 500-plus other lean, Six Sigma, and healthcare professionals who will be attending.

About the Author

David Behling is the program chair of the Lean Enterprise Division. He has worked extensively in the lean, improvement, and quality fields helping transform companies by creating a lean culture and building lean leadership. He is currently the director of process improvement at Goodwill Industries of Southeastern Wisconsin in Milwaukee, WI.

Learning From the Experience of … Dr. Jeffrey Liker

by David Behling, LED Programs Chair

Dr. Jeffrey Liker

This is the first edition of the "Learning From the Experience of … " column in which I will be bringing you interviews with some of the top lean, improvement, and leadership individuals who are at the forefront of our field. The format for this column will be simple question and answer with the goal of keeping several of the questions the same for all interviewees.

I had the pleasure of spending time with the opening keynote speaker, Dr. Jeffrey Liker, at our recent Lean and Six Sigma Conference. Dr. Liker is a professor of industrial and operations engineering at the University of Michigan and president of Liker Lean Advisors. He is author of the international best seller, *The Toyota Way: 14 Management Principles From the World's Greatest Manufacturer*, and has co-authored other books about Toyota including his most recent book, *The Toyota Way to Lean Leadership: Achieving and Sustaining Excellence Through Leadership Development*. His articles and books have won 11 Shingo Prizes for Operational Excellence.

What does lean mean to you?

Lean is the shortening of time between the customer order and the product build/shipment by eliminating sources of waste. One must get to the roots. Lean should be creatively innovating to a future state, and **not** just taking things away.

What is the biggest misconception about lean within society?

Many people still see lean as being all about cost cutting and improving efficiency. They miss the philosophy; this points to leadership issues. Leadership does not have a vision of what they want to achieve.

… within the lean community?

Many lean professionals speak of and see lean as being a methodology and "technical" toolkit.

What is the biggest opportunity for lean in today's world?

It is helping people and organizations creatively learn in order to obtain a desired future.

How can that be accomplished?

All issues need to be solved by having people come together to agree on a course of action.

How does lean leadership differ from leadership?

Lean leadership is extremely different from the Western view of leadership. In the Western world, leadership is connected to being charismatic, a decision maker, and getting people to "walk through walls." Lean leadership sets a vision and leads people to be motivated to do what needs to be done. The "how to do this" is missing from current leadership books. A lean leader teaches you how to think and then follow the vision and mission, **not** just "walk through a wall."

Innovation is becoming a bigger theme today and companies are talking about how to incorporate innovation into their lean programs. What do you think about this?

This idea does not make sense. The foundation of the Toyota Way/lean comes from one of the greatest inventors, Sakichi Toyoda. Breakthrough innovation generally occurs in small steps and sometimes a big one. Lean is innovating your way to better solutions, which are tested and proven through the PDCA cycle. The entire Toyota Way is about developing new routines and challenging everyone to think. It could be called the Toyota Thinking System.

Dr. Liker ended his keynote presentation with the following quote:

> *"There are many things one doesn't understand and, therefore, we tell them why don't you just go ahead and take action; try to do something. You realize how little you know and you face your own failures and redo it again, and at the second trial you realize another mistake or another thing you didn't like so you can redo it once again. So by constant improvement, or the improvement based upon action, one can rise to the higher level of practice and knowledge."*
>
> –**Fujio Cho**, former Toyota chairman

I would like to again thank Dr. Liker for his time in providing me the opportunity to conduct this interview.

About the Author

David Behling is the programs chair of the Lean Enterprise Division. He has worked extensively in the lean, improvement, and quality fields helping transform companies by creating a lean culture and building lean leadership. He is currently the director of process improvement at Goodwill Industries of Southeastern Wisconsin in Milwaukee, WI.

Lean and Total Employee Involvement—A Case Study

by Ramesh Rajagopal

As a result of 20 years of experience with business excellence, I have identified three key elements for the success of a business excellence initiative in any organization:

- Leadership – Commitment and constancy of purpose
- Culture – To make continual improvement a habit
- Total employee involvement (TEI)

All three elements are linked and interdependent. The first element (leadership) drives the other two key elements. The second and third elements could realistically be merged, but I am keeping them separate for purposes of clarity.

Organizations that are just starting the business excellence journey often get confused about where to start: TQM, 5S, lean, Six Sigma, or TPM? All of these are tools that need to be driven by people. So, in my opinion, the first and foremost thing in the business excellence journey is to identify a strategy for total employee involvement. When my company started its journey in Bangalore we asked whether we should start with lean or Six Sigma. After much discussion, we decided to go with lean because of the following reasons:

- Lean is relatively easy to understand compared with Six Sigma.
- Lean is a better tool to quickly address low-hanging fruit.

Overall, lean involves more employees in the process when compared with Six Sigma because lean is less dependent on the use of statistics than Six Sigma. Therefore, we thought it would be easier to start with lean.

Lean is implemented differently in every organization. Lean can be deployed as a problem-solving tool or it can be deployed as a culture-building tool through which problems are solved. We decided to take the later approach.

We started our journey with 7S (based on the traditional 5S + safety + spirit). (Refer to the sidebar of this article for a description of the 7S process.)

As a first step of total employee involvement, we formed a 7S committee represented by employees from all levels. 7S workshops were conducted using a rapid improvement approach. For two days all the employees focused only on 1S, 2S, and 3S. During this workshop managers joined operators and cleaned machines, toilets, the scrapyard, etc.

To make 7S part of our culture, we introduced the following four initiatives:

- Morning pledge – starts two minutes before working hours and all employees hold their hands together to take the following pledge:
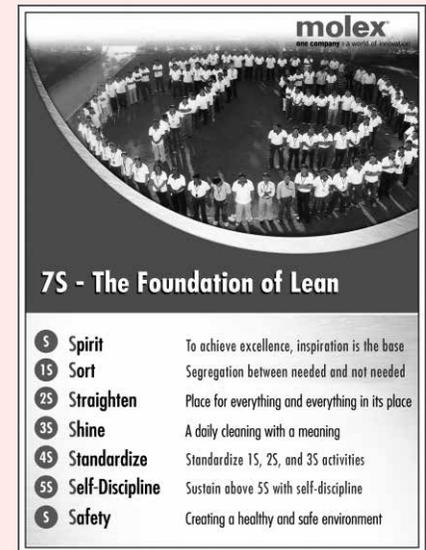

Alone I am strong, **together we are STRONGER.** My goal is to delight customers through continual improvements, innovation, and team spirit. We will work as a family with mutual trust, respect, and self-discipline.

- Daily 10-minute 7S time so that every employee can focus on maintaining the 7S standards in their area
- Monthly half-day 7S time to complete major projects
- Once a quarter TEI day to recognize the good work

Initially we faced resistance from some sections because the above initiatives affected delivery to customers (we shut down the plant while performing the initial 7S), but later many of them realized that this is a "sharpening the axe" exercise that will help in the long term.

Journey With 7S

Based on the Traditional 5S + Safety + Spirit

7S - The Foundation of Lean

S	Spirit	To achieve excellence, inspiration is the base
1S	Sort	Segregation between needed and not needed
2S	Straighten	Place for everything and everything in its place
3S	Shine	A daily cleaning with a meaning
4S	Standardize	Standardize 1S, 2S, and 3S activities
5S	Self-Discipline	Sustain above 5S with self-discipline
S	Safety	Creating a healthy and safe environment

Meet Us Now on Twitter @asqled

Some of the goals that the ASQ Lean Enterprise Division is aiming to achieve using Twitter:

1. Announce and recognize winners of lean contests at conferences, best lean writers, speakers at lean conferences, and certified lean professionals.
2. Announcements and reminders for conferences, training, and call for white paper submissions.
3. Announcements for case studies and articles.
4. Announcements for lean jobs and career advancement opportunities.
5. Get direct feedback from our members and those who are interested in what we do.

Twitter is a small attempt by the Lean Enterprise Division to make ourselves available for our members, help whenever possible, and to show that the Lean Enterprise Division is built and run by real people who believe in quality and lean, and who care about our members. So come follow us on Twitter and get immediate access to rich content from quality professionals and lean practitioners around the world. We can be followed on Twitter at @asqled. We look forward to meeting you.

For the next step we performed some lean pilot projects using separate small teams. Pilot projects included work cell layouts, kanban, stationary supermarket, quick changeover, etc. Our stationary supermarket was a great success because it improved trust between our employees and also demonstrated the power of a two-bin system. Our stationary costs were reduced by 25 percent after this exercise!

We also introduced a very unique lean certification to certify 100 percent of our employees. The course, named "lean vidhyarthi"—Sanskrit for "student of lean"— was designed to include basics of lean, teamwork, and 5S, and was offered to all of the company's employees within a six-month period. Participation in lean increased during this period as everyone became convinced of the power of lean. During the same timeframe, we also started an employee suggestion system. Once we achieved a reasonable level of maturity, we switched our reward system and started rewarding implemented kaizens.

To measure the effectiveness of total employee involvement (TEI), we introduced a metric called the TEI index:

> TEI index = total number of employees who participated in improvement activities/total number of employees in the organization.

This index is published department-wide on a monthly basis, and functional department heads are expected to do root cause analysis if their TEI index is too low.

We are now in the fourth year of this journey and have seen many benefits—both tangible and intangible. The greatest benefit we got from this journey is utilizing human potential. Unutilized human potential (the 8th Waste) was addressed through total employee involvement. We also experienced a significant change in the company's culture, made possible by great leadership.

So what are the three key elements for the success of your business excellence journey? Leadership, culture, and total employee involvement. Remember, the first one drives the other two!

(The author thanks Scott Smith for his editorial assistance.)

About the Author

Ramesh Rajagopal is a graduate in engineering, has an MBA, and has more than 21 years of experience in implementation of Six Sigma, total quality management, quality assurance, total productive maintenance, lean management, quality and environment management systems, supplier development, training, organization development, and change management. He is a Certified Six Sigma Master Black Belt, TPM facilitator and ISO QMS Lead Auditor. Rajagopal is also a Senior member of ASQ and serves on the ASQ Lean Enterprise Division Publications Subcommittee.

Swimming in the Value Stream
Conducting A More Robust Quality Audit Using Value Stream Mapping (VSM)

by Lance B. Coleman, Sr.
LED Publications Subcommittee Chair, CSSGB, CQA, CBA

I attended my first ASQ Lean and Six Sigma (LSS) Conference two years ago in Phoenix, AZ. Being relatively new to LSS, I wasn't sure how much of what I might learn would be directly applicable to my then, day-to-day duties as a quality auditor. However, since the conference was local I was curious enough to pay my own way, and am certainly glad that I did.

I have always used flowcharts and process maps when preparing for audits, however, in preparing for my first audit of 2011, I decided to incorporate value stream mapping (VSM) into my analytical toolbox. When conducting a quality audit, it is customary of course to:

(1) match documents and procedures to regulations/standards,

(2) match employee actions to internal documents/procedures, and

(3) verify appropriate training, operating controls, environmental controls, and record keeping, as a minimum.

Additionally, an auditor might look to identify best practices as well as opportunities for improvement.

Incorporating VSM into an audit adds another level of analysis. Which actions are value added and which are not? Are value-added actions optimized while nonvalue-added actions minimized? How efficient are the feeder value streams that flow into the primary value stream that is being audited? Where are the potential bottlenecks in the value stream flow? What are the feedback loops in place to monitor and evaluate the effectiveness of the system under review? How close are we to matching product cycle time to takt time? As I was preparing for this audit of our purchasing department, I found myself thrilled at the prospect of the additional lines of investigation that VSM had opened up for me. VSM, particularly when incorporated seamlessly in the internal quality audit program, grants a level of analytical detail that is needed when the goal is system level improvement.

Despite the many additional avenues of investigation that VSM presents, I am able to incorporate them seamlessly within my previously developed audit plan without falling prey to the pitfall of many an auditor—scope creep. I am grateful to the ASQ Lean Enterprise Division for acquainting me with this powerful tool, which I have used on multiple occasions since that first audit.

For comments or questions, email lance at lance@fullmoonconsulting.net.

About the Author

Lance Coleman is a quality engineer and lean leader at The Tech Group, where he serves as site kaizen, CAPA, and customer complaint coordinator, while also managing the internal quality audit program. Coleman has a degree in electrical engineering technology from the Southern Polytechnical University in Marietta, GA, and is an ASQ Senior member as well as CSSGB, CQA, and CBA. Coleman currently serves as the ASQ Lean Enterprise Division Publications Subcommittee chair.

Lean Government

Terra Vanzant-Stern, Ph.D.

Lean government implies a new attitude that examines complex bureaucratic systems with the intent of simplifying procedures and reducing waste. Several government agencies have discovered that the lean approach has enabled them to make complicated processes function better, faster, and more cost-effectively.

The U.S. Environmental Protection Agency (EPA) is a strong advocate of lean government. The EPA recently published several successful case studies. The International City/County Management Association (ICMA) supports a program to assist local government organizations with implementing lean. ASQ advocates the adoption of lean and/or Six Sigma within the U.S. federal government. Several U.S. political figures have endorsed lean initiatives.

During the 81st General Assembly in the State of Iowa, legislation was passed that authorized the Department of Management to create the Office of Lean Enterprise. In the January 2012 Colorado State Address, Governor John Hickenlooper said almost every department had initiated a lean program in order to identify waste/inefficiencies and create savings. Colorado House Bill 11-1212 was passed to integrate lean government principles. This bill promotes incorporating lean practices, as well as training state employees, to be lean experts within the State of Colorado.

Clearly, in the United States, the practice of lean government is becoming more and more popular. Examples of government agencies with active lean departments include but are not limited to:

- U.S. Department of Defense
- U.S. Army
- U.S. Department of Agriculture
- U.S. Department of Housing and Urban Development
- U.S. Nuclear Regulatory Commission

Lean government practices are moving abroad. The Sweden Migration Board is widely regarded as one of the most prominent public authorities to have adopted the lean model. In 2009, Singapore Housing and Development Board teams used lean tools to provide award-winning customer service.

Using lean tools, government entities can expect to:

- Eliminate or dramatically reduce backlogs
- Reduce lead times
- Decrease the complexity of processes
- Improve the consistency of reviews or inspections
- Benefit from better staffing allocation

The challenge with implementing lean government is that most government departments are organized around functions rather than processes. In many cases necessary resources are not located in the same building. Cross-training programs are generally not supported. Changing or modifying this dynamic alone drastically reduces waiting time, redundancy, and/or rework, but the concept is not always met with enthusiasm.

Lean government supports the idea of creating work cells. A work cell is formed by placing all the necessary resources in one area. Work cells permit cross-training opportunities and reduce both rework and redundancy. Work cells can better manage the first-in-first-out (FIFO) process, generally increasing citizen satisfaction. Work cells are designed to improve process flow, eliminate waste, and promote standardization.

A basic premise of lean thinking is to study the value of the work people do and directly connect it to the quality of service provided for the citizen. These activities may cause stress among employees who have not been enlightened by the merits of lean. Employees may fear job loss or loss of control of their daily activities.

The following activities should be observed with a high level of sensitivity:

- Core processes
- Current systems managing these processes
- People involved in these processes
- Innovation possibilities

In the initial process, value stream mapping (VSM) can be extremely useful for governmental agencies. VSM refers to the activity of developing a visual representation of how a particular process, product, or service flows through the system.

VSM also identifies timeframes, handoffs, and resources involved throughout the process. VSM, similar to flowcharting, has a set of symbols that represent various processes, materials, and information. However, unlike flowcharting, VSM symbols are not standardized, and there are several variations. New VSM symbols may be created, when necessary, or verbiage may be placed inside a rectangular box to provide explanation regarding that step. Once the map is created it is easier to identify areas of overt as well as hidden waste. Bottlenecks, redundancy, and rework are also more apparent.

In the beginning, another useful tool is kaizen events, also known as rapid improvement events. The idea behind kaizen events is to identify process improvements that can be implemented immediately. Kaizen events are designed to yield quick results. The ancillary benefit is this often increases employee buy-in and morale.

Kaizen events typically bring together a cross-functional team for three to five days to study a specific process. It is important that the members of this team have the ability to make decisions for their group since commitments are made during this session.

Kaizen events are conducted by a facilitator who walks the group through a model for process improvement. Often this model is plan-do-check-act (PDCA). Depending on the nature of the project, the define-measure-analyze-improve-control (DMAIC) model may be used. Proprietary models, such as select-clarify-organize-run-evaluate (SCORE™) may also be used to conduct the session. Additionally, there is the more traditional and simplified kaizen approach that promotes:

- Assessment
- Planning
- Implementation
- Evaluation

In the assessment phase, the major goal is to determine the critical-to-quality (CTQ) factors. After a consensus is reached on the CTQ factors the next step is to develop metrics. In the planning phase, the process improvement intervention is discussed. In the implementation phase, the process improvement is implemented and monitored. Finally, the evaluation phase measures the results based on the metrics developed during the assessment phase.

The success of any rapid improvement event depends on:

- Teamwork
- Personal discipline
- Employee morale

In addition to rapid improvement events, another way to kick off a lean government

program is by initiating a workplace organizational model such as 5S. Similar to a VSM, the 5S model offers visual validation. Comparable to a kaizen event, 5S can be completed in a relatively short period of time.

The 5S model uses a list of five Japanese words that when translated to English start with the letter "s"—sort, set in order, shine, standardize, and sustain. The 5S model is also used to organize physical space in such diverse areas as healthcare, warehouses, and retail.

A new term—used more and more often in government services—is lean IT. Although lean principles are well established and have broad applicability, the move to IT is still emerging. Lean IT will increase in use as more governments go online to deliver better services. Although many governments have already made the move to electronic files, the method used to manage these files often mimics manual systems. This makes retrieval of critical data difficult and cumbersome. Lean IT for government will allow these services to be more user-friendly and easier to audit.

In government services, the most challenging task is managing work-in-progress (WIP). There is a common belief that work received cannot be completed within a short timeframe. This is often true because governmental systems are set up to collect data but often lack the discipline to act quickly on the data collected. One value of lean is that used properly, daily processes and activities are immediately identified in the value stream. Knowing how many permits are issued in a particular period or being able to calculate what is a need for tomorrow is the first step in process improvement.

Easy information-gathering tools are used that do not require a vast amount of training or instruction to be effective. Lean uses ordinary metrics to calculate results. When WIP is increased, productivity and quality generally decrease. The immediate goal becomes reducing WIP.

Most lean government projects share the same goals:

- Increase citizen satisfaction
- Optimize the value delivered to the public
- Involve employees in the continual improvement effort
- Develop consistent metrics that are clear and concise

Types of governmental projects that have benefited from implementing lean and/or Six Sigma include improving:

- Documentation management
- File archiving
- Inventory management
- Payment process
- Permit process
- Security clearance

Lean government starts with a vision. In the United States, the lean government leadership vision is usually to provide an efficient environment where citizens are satisfied and employees are happy. Internationally, the happiness factor is often not regarded as an element, and citizen satisfaction is second to governmental control.

One common factor with international lean government, however, is the commitment necessary for upper management to motivate the workforce. Another common factor is that this cannot be achieved without some sort of map of the ongoing process. Nevertheless, in many cultures attaining a map or verbal validation of the current process is nearly impossible.

Lean government can benefit from methodology and tools normally associated with Six Sigma. For example, lean government favors the PDCA model for problem solving. Many problems in government are far too complex to benefit from this model.

Some governmental issues may need a more robust model such as the DMAIC model or a design-for-Six-Sigma (DFSS) model used in Six Sigma and Lean Six Sigma programs. Six Sigma and Lean Six Sigma tools that effectively analyze root cause or performance capability may also be beneficial.

Lean government, like Lean Six Sigma, takes full advantage of other business management tools including balanced scorecard, strengths-weaknesses-opportunities-threats (SWOT) analysis, and benchmarking theory.

The purpose of lean government is to contribute to overall citizen satisfaction. This is accomplished by optimizing value and by delivering services faster. Lean government involves employees in the problem-solving process and uses performance metrics to measure success.

Colorado House Bill 11-1212 provides a solid explanation of lean principles, which may be applied to any public sector entity. It states:

> "Lean government principles means a continuous and rapid process improvement of state government by eliminating a department's nonvalue-added processes and resources, providing feedback on process improvements that have the purpose of increasing a department's efficiency and effectiveness, and measuring the outcomes of such improvements."

Internationally, as well as domestically, awareness of the government infrastructure is necessary before attempting to initiate a process improvement. The hierarchy, hiring policy, and labor responsibilities need to be considered as well. Paying attention to diversity and remembering lean principles will ensure lean government success.

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About the Author

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Performance Metric—Can "One Percent" Rule?

Janet Bautista Smith, ASQ CSSBB, CQE, CQM, CQA

How many times have you heard this response from one of your business partners, *"99 percent on-time delivery is an excellent performance resulting from our optimum process capability."*
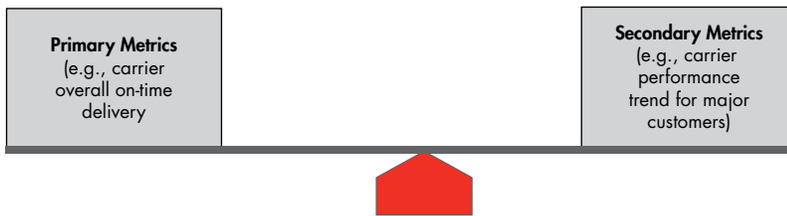
At first glance, this statement seems logical and impressive, especially with a consistent overall 99 percent performance. With the limelight projected on the 99 percent success, the remaining **one percent** is overshadowed and kept in oblivion until a more in-depth data mining reveals the components of this *hidden, critical one percent*. In the case study depicted in Diagram 1, the one percent failure's breakdown shows concentration on two major revenue contributors. The carrier may have dismissed the importance of the one percent failure, as the criticality of its impact on the balanced scorecard is not readily visible.

Impact of critical *"hidden'"* metrics such as this one percent case study can be exposed using the different quality programs such as, but not limited to, the audit function. One strategy is the implementation of the *lean-based auditing beyond compliance* wherein hidden factors are uncovered through these initiatives:

- Recognition of process signs
- Identification of measurement methods to reveal the hidden factors
- Implementation and sustenance of improvement efforts
- Installation of process controls, such as secondary metrics to balance the desired output (see Diagram 2)

Diagram 2 – Metrics

Primary and Secondary Metrics to Counter Balance Desired Output

| Primary Metrics (e.g., carrier overall on-time delivery) | Secondary Metrics (e.g., carrier performance trend for major customers) |

Through the dynamic execution of the quality elements, such as optimization of the audit result as input to the management review process, define-measure-analyze-improve-control (DMAIC) cycle serves as a detector in uncovering hidden factors hindering growth and customer satisfaction. The complexity of detecting hidden factors depends on the detection mechanism in place. Some hidden factors are barely hidden and easy to spot; some are complex, and visible signs may be misleading—like the underground network of weeds suffocating the improvement initiatives.

Discovery of the hidden factor will facilitate evaluation of root causes and action plans. In this case study, the critical one percent may be further analyzed using tools such as supplier-input-process-output-customer (SIPOC) to determine the critical elements possibly causing the late deliveries. There are many paths in data mining the root causes; one way is to create a simple flowchart of the process such as Diagram 3.
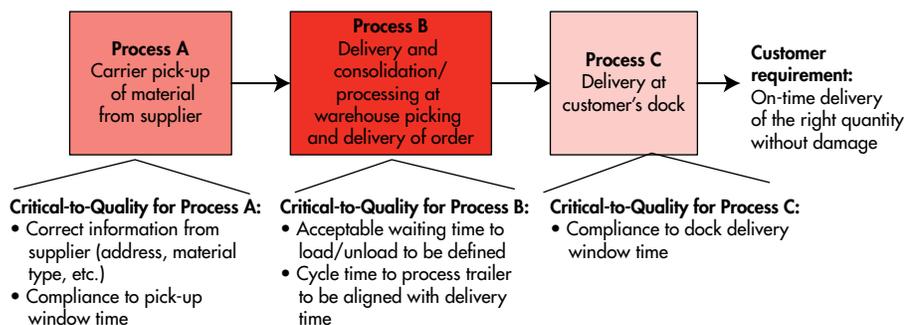
Diagram 3 – Uncovering the Critical One Percent

Process A Carrier pick-up of material from supplier

Process B Delivery and consolidation/processing at warehouse picking and delivery of order

Process C Delivery at customer's dock

Customer requirement: On-time delivery of the right quantity without damage

Critical-to-Quality for Process A:
- Correct information from supplier (address, material type, etc.)
- Compliance to pick-up window time

Critical-to-Quality for Process B:
- Acceptable waiting time to load/unload to be defined
- Cycle time to process trailer to be aligned with delivery time

Critical-to-Quality for Process C:
- Compliance to dock delivery window time

Diagram 1 – One Percent Failure Impacts Major Customers

Carrier On-time Delivery – Elements' Breakdown
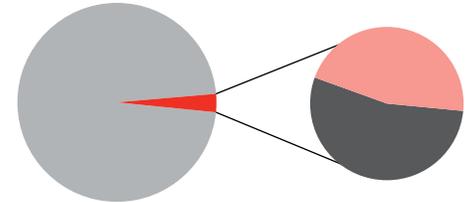
- 🟥 **Failure, One Percent**
- ⬛ Breakdown of one percent failure: 60% major customer A
- 🟥 Breakdown of one percent failure: 40% major customer B

The critical to quality (CTQ) for each process should lead to meeting the expected result, preferably a measurable deliverable as shown in Diagram 3. One method of identifying the CTQs for each process is by *thinking backwards*. Using the end result (i.e., customer requirement of on-time delivery of the correct high-quality product that they expect) as the focus will facilitate identifying the appropriate CTQ for each process that will ultimately lead to the satisfaction of that end result. Each CTQ, as shown in Diagram 3 can be the early warning sign of possible issue that will impact the final process. This breakdown is one of the simplest tools in uncovering root causes or roadblocks to prevent the case of the hidden critical one percent.

Reference

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About the Author

Janet Bautista Smith is the director of quality and continuous improvement for ProTrans, International. She has a BS degree in chemical engineering from University of Santo Tomas, Philippines and is an ASQ CSSBB, CQE, CQM, and CQA. She is an active member of the ASQ community, and a published author whose work includes *Auditing Beyond Compliance*, published by ASQ Quality Press in 2012.

UPCOMING WEBINARS

Date	Time	Name	Topic
May 16	Noon	Chris Lindstrom	TWI – How to Make Standards Stick
June 11	11:00 a.m.	James Peterson	Restarting Your Transformation
July TBD		Terra Vanzant-Stern	Leadership by Default
August 15	10:00 a.m.	Drew Locher	TBD

COME SEE US AT WCQI!

Several members of the ASQ Lean Enterprise Division are presenting at this year's World Conference on Quality and Improvement, and LED will have a booth in the exhibit hall. Stop by our booth at the conference to say hello, get information on upcoming division happenings and directions to our hospitality suite that we will be hosting at the Marriott hotel. We will also have a drawing to receive either a free *Lean Handbook* or set of *Lean Memory Joggers* for anyone who stops by and leaves their business card.

NEXT ISSUE

Our next issue is the Certification and Back to School issue. It will feature certification news, a review of the *Lean Bronze Certification Handbook* by Chris Hays, as well as an article on the pros and cons of certification by Jeff Fuchs. There will also be articles and case studies on other topics of interest to lean practitioners.

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