

QUALITY TOOLBOX

Framing Your Lean-to-Green Effort

There is much talk about “lean”¹ these days within the environmental, health, and safety (EHS) professional world.

The United States Environmental Protection Agency (EPA) has a Web portal dedicated to lean (<http://www.epa.gov/lean/>). An EPA voluntary program, the Green Suppliers Network, offers subsidized lean consulting assistance to companies that are interested in learning more about its “lean and clean” approach (<http://www.epa.gov/greensuppliers/>).

The Society of Manufacturing Engineers has created a lean-to-green initiative for its membership (<http://www.sme.org/leantogreen>). Many companies are actively promoting their own lean-to-green programs.

Why all the hoopla? Can these environmentally aware initiatives help overcome the issues that have plagued lean in the past? Most importantly, what can lean-to-green do for your company?

This “Quality Toolbox” column offers a few ideas on making lean-to-green work. But first, let’s review some background, which can help put these issues into context.

Déjà Lean?

Many readers may think “been there, done that” when they hear about the new emphasis on

Creating value and delivering continual improvement

lean. Perhaps your organization was one of the many that started a lean program with great enthusiasm a few years back—only to have it go stale.

We know that a significant number of lean programs fail to thrive in today’s ever-changing manufacturing environment. Once lean becomes “just another program,” top management attention often shifts to other initiatives, and lean suffers.

Environmental Managers and Lean

Some EHS managers may also be less than enthusiastic about lean—in large part because of bad experiences in the past.

Lean offers organizations a toolbox full of methods that can be used to eliminate waste from business processes. Lean practitioners traditionally have focused on what they refer to as the “Eight Deadly Wastes”: defects, overproduction, waiting, not utilizing people’s creativity, transport, inventory, motion, and excessive processing.

But what about environmental wastes? Often, they are simply neglected by lean practitioners, who may view environmental issues as not be-

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longing in their domain. What's worse, environmental professionals historically have not been involved in their organizations' lean programs.

This omission has led to cross-boundary problems. By refusing to pay attention to environmental wastes, discharges, and emissions, lean programs can inadvertently create more of them. All too often, environmental managers only learn about these new wastes after the fact.

Fortunately, lean-to-green initiatives are now seeking to change this situation. And EHS professionals are starting to get more involved in lean efforts.

Making Lean Work

The problems that companies encounter may lead you to wonder if there is something intrinsically wrong with lean. Is there something wrong

about its approach to defining "waste"?

Not at all! The problems arise not because of lean itself, but because of the way lean is implemented.

Lean is a powerful force for process improvement. It works best—and generates the most value—when it is linked to programs that create a demand for continual improvement.

Commonly Used Drivers of Continual Improvement

Fortunately, most organizations already have such programs, or could benefit from adopting them. The management system standards that many companies have implemented in recent years, such as ISO 9001 (quality), ISO 14001 (environmental management), and OHSAS 18001, (occupational health and safety) require an organizational commitment to continual improvement. Business excellence frameworks (such as

that used in the Baldrige National Quality Program and similar programs in 75 other countries) create a similar demand.

Management System Standards

Organizations use a variety of management systems for functional areas such as quality, environment, and occupational health and safety. The systems help companies "mainstream" their management of these areas and ensure that they are aligned with the business's overall objectives and goals.

Companies that adopt widely used management system standards such as ISO 9001, ISO 14001, and OHSAS 18001 must commit to achieving compliance with legal requirements and using a prevention-based approach to management. More importantly, they must commit to continual improvement.

These management system standards do not prescribe specific methods for generating improvement. That's where lean comes in. Lean can serve as a practical method for achieving continual improvement.

Business Excellence Frameworks

Business excellence frameworks include sets of guiding principles and performance criteria. Organizations can compare the framework principles to their own core values and use the criteria to improve their performance in key areas.

The performance criteria are written like "best practices." The more you do within each criterion, the closer you are likely to get to what would be considered a best practice.

It is possible to score the organization's current status using a technique referred to as ADRI (approach, deployment, results, and improvement). This scoring can be done by program managers or by independent third-party assessors. Continual improvement is measured by increases in ADRI scores made over time.

Integrating Your Business Management System

Management systems and business excellence frameworks are often operated as separate and distinct silos. So how can they work together to help an organization or facility promote an effective lean-to-green effort?

Ideally, an organization should integrate all these various programs into one overall “business management system.”² A comprehensive system can save money and foster greater collaboration among departments. Even if your organization has not yet fully integrated its system, however, you can still benefit greatly from using lean to drive continual improvement.

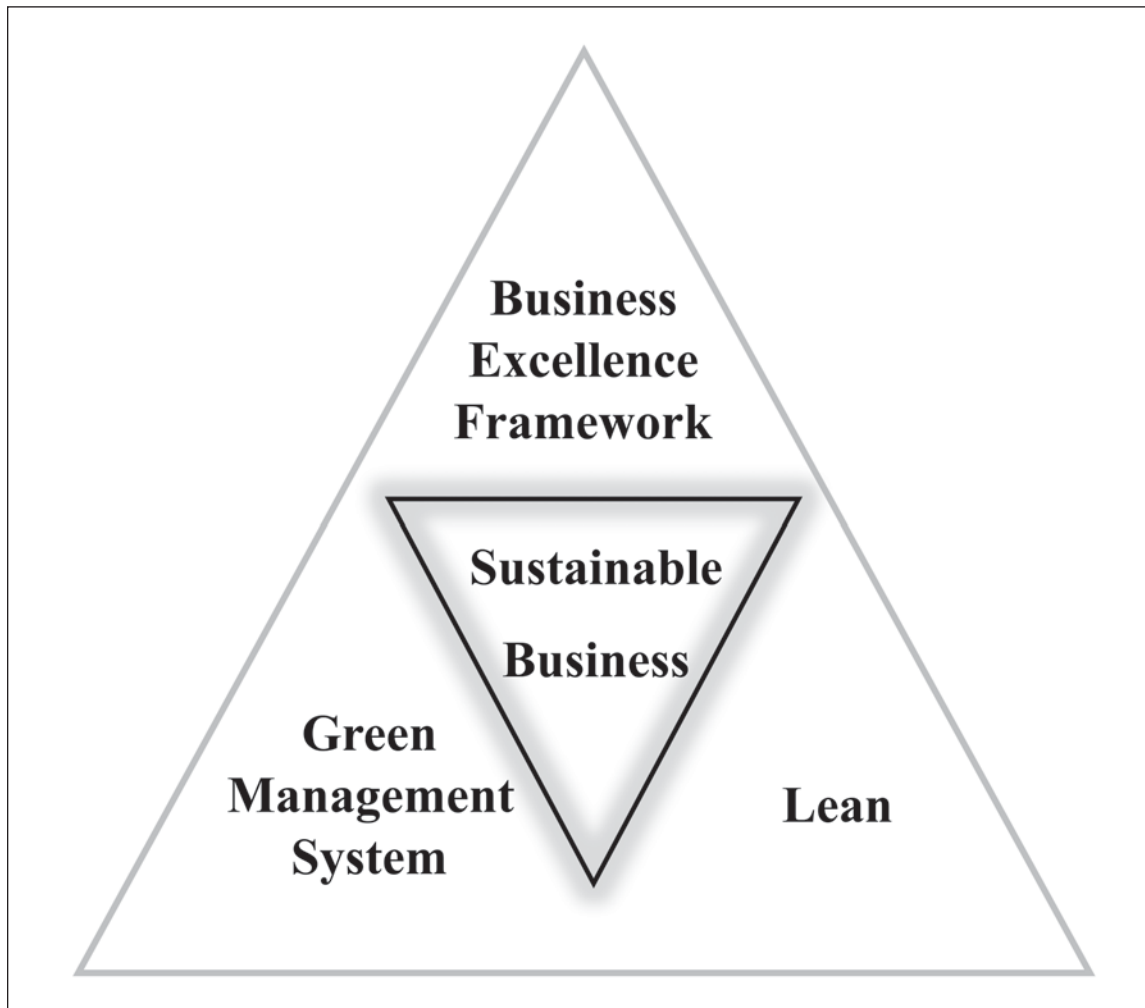
Linking Lean to Continual Improvement Drivers

It is critically important to align lean with programs that create a demand for continual improvement. When linked this way, lean becomes the preferred means for achieving process improvement.

Operating with lean as an essential part of the organization’s integrated management system and business excellence framework can provide a solid foundation for a business sustainability program (see **Exhibit 1**).

Both management systems and business excellence frameworks include numerous elements that promote continual improvement, while also ensuring compliance with applicable laws and

Exhibit 1. Lean Supports Business Sustainability



standards. The sections that follow describe how lean can be linked to some of these elements.

As the discussion makes clear, such linkage allows lean to be used more effectively, while also allowing the organization to benefit from a powerful mechanism for driving continual improvement forward.

Policy Statements

Very few companies have a policy statement to guide their journey toward lean. By contrast, every organization that uses a management system standard has a policy statement, since the standards all require them.

It would be easy to add lean to a company's existing policy statement, identifying it as the preferred means for addressing continual improvement. This would be useful because a policy statement is a key part

of training and defining the roles and responsibilities of every employee involved in a program, including top management.

Selecting Opportunities for Improvement

In many cases, lean practitioners select opportunities for improvement that they want to work on often without using a structured selection approach. Management systems, on the other hand, examine all opportunities for improvement. Risk management is then used to select the most significant improvement opportunities. Objectives and targets are determined from this subset of opportunities.

Management generally considers it important to have a proper focus for lean activities—a focus that may sometimes be lacking in many lean programs. Using a more structured opportu-

nity-selection approach can help ensure that lean tools are applied to addressing the opportunities that really matter to the company's business success.

Lean practitioners use a "future state" value stream map to help direct their path to improvement. Too often, however, this future state is determined by the lean practitioner, without adequate input from the rest of the company. Using systematically selected objectives and targets for the future state provides excellent direction for lean-driven improvement projects.

Moreover, objectives and targets can be "stretched" the following year. A new future state based on these stretch goals can then drive continuation of the lean project.

Legal Requirements and Organizational Policy

Legal requirements and organizational policy may rule out certain lean options. Management systems help ensure that organizations maintain compliance with these constraints by requiring them to list all applicable requirements and create programs to comply with them. Without a link to the organization's management system, however, this information is rarely available to lean practitioners as they seek continual improvement.

Suppliers and the Value Chain

Maintaining mutually beneficial relationships with suppliers is one of the "Eight Quality Management Principles" of ISO 9000. Asking suppliers to take part in your organization's lean activities—and encouraging them to take up the lean cause in their own businesses—is a good way to develop the value chain.

ISO 9001 also requires organizations to involve purchasing departments in quality programs. Working with the purchasing function can help lean practitioners gather key information and standardize improvements.

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Action Plans

Business excellence frameworks emphasize the use of formal action plans that are developed by teams of employees. Using this structured approach to planning for a lean event or a 5S³ implementation offers an opportunity to involve employees in the lean program.

Lean events should not be spontaneously generated. Remember the old saying, “Failing to plan is planning to fail.”

Documenting Initiatives

It is important that all lean initiatives be properly documented, with records maintained to memorialize the knowledge that was created as a result of the lean event. Without such documentation, knowledge can easily be lost when employees leave the company. Business excellence frameworks focus on using the organization’s knowledge when designing new projects and training employees.

Monitoring and Measurement

Complying with monitoring and measurement requirements (such as those found in ISO 14001 Section 4.5.1) can help a lean initiative demonstrate its value to the organization. Data collected from lean events can be analyzed to identify patterns and ongoing issues.

Use of structured monitoring and measuring requirements can also help ensure that information is obtained in a consistent manner, making it more usable to other projects. Knowledge gained from analyzing this information can help when implementing projects targeted at corrective and preventive action.

Creating Value With Lean-to-Green

The discussion above focused on benefits that can be gained by placing lean within the context of an integrated management system and a business excellence framework. Now let’s look more

closely at how lean-to-green can create value for an environmental management program.

Addressing Environmental Objectives and Targets

A key requirement of ISO 14001 relates to developing objectives, targets, and a program for achieving them (Section 4.3.3). Many of the projects included in such a program can be conducted using lean.

It is important to ensure coordination between lean practitioners and the environmental professionals who are responsible for ISO 14001–driven process improvement. Projects aimed at achieving environmental objectives and targets should not be outsourced to the lean group or to outside consultants.

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Using lean on environmental projects will help create a cooperative approach to continual improvement. It will also help auditors understand how improvements have been made to the organization’s environmental management program.

Full Involvement of Employees

Within business excellence frameworks, there is a criterion that promotes the full involvement of employees in all aspects of running the business, including process improvement. The theory is that it is not good enough to tell employees what to do and then expect them to do it. Rather, employees should be involved in planning programs as well as in implementing them.

For example, employees should be involved in determining the ISO 14001 objectives and targets discussed above. These goals should not be established exclusively by management or by environmental professionals.

Under the business excellence model, an organization should not operate a lean program that simply dictates activities for workers to complete. Instead, there should be objective evidence that employees are fully involved in developing and implementing the program, from the conception of planning all the way through to measurement of results. Within this model, lean practitioners and consultants become facilitators of lean efforts, not dictators of prescribed activities that might work well in another setting, but may not be suitable for the current organization.

Corrective Action and Root Cause Analysis

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Management system standards have requirements for implementing corrective action (see, e.g., ISO 14001 Section 4.5.3). The best foundation for corrective action is root cause analysis, which seeks to understand the ultimate source of the problem to be addressed.

Despite widespread interest in root cause analysis techniques, most corrective action programs fail to use them. Reasons typically offered for this failure include the following:

- “We don’t have time to think long-term right now.”
- “Fixing root causes is likely to be too expensive.”
- “Root cause analysis requires thinking.”
- “We can buy solutions that dispense with root cause analysis.”
- “Getting to root causes would require us to work with other ‘kingdoms’ in the organization.”

Lean is well suited to root cause analysis because it is designed to identify waste of all types (whether in time, resources, or materials). The

basic idea is to identify and fix the true source of any given operating problem, whether it is located within the facility or elsewhere in the supply chain. This is very different from adopting an engineered solution that is designed to simply address immediate symptoms.

Preventive Action and Emergency Preparedness

Management system standards place emphasis on preventive action. Taking such action is appropriate for operations where nothing has (yet) been outside of conformance with the management system.

Once again, lean is well suited to the task. Lean can be used to analyze what could go wrong with an operation and then work to prevent those problems from happening. By lowering the likelihood of nonconformance (and the severity of the impact should nonconformance arise), lean helps to reduce the risks associated with the operation.

There is a lean tool known as mistake-proofing (poka-yoke). It is perfectly suited for a preventive action program. It can also be used within an emergency preparedness and response program, such as that required under ISO 14001 Section 4.4.7.

Management Review

Management system standards also emphasize regular management review of the system’s operation (see, e.g., ISO 14001 Section 4.6). When management adopts lean as the organization’s preferred method of process improvement, it puts itself in a better position to understand improvements that have been made using lean.

This improved understanding helps when participating in periodic management review sessions. In turn, better organized and focused review sessions will reinforce positive impressions

about the lean program that management has initiated.

How This All Plays Out: Facilitating Communication, Collaboration, and System Integration

Environmental managers often claim they are too busy to learn about lean, with its arcane vocabulary of Japanese terms (e.g., waste is called “muda”). After all, they insist, the company is too keenly focused on meeting its commitment to regulatory compliance.

Lean practitioners also frequently claim they are too busy to learn the universe of acronyms that make up the vocabulary of the environmental manager.

Each group tends to be comfortable operating in its own silo—not unlike other functional groups in the company, such as quality, maintenance, human resources, and purchasing.

Using an Integrated Management System to Establish Communication and Collaboration

These divisions—which are found in so many companies—highlight the need for integration of management systems. An integrated management system provides an excellent way for these “kingdoms” to establish lines of communication and collaboration.

An integrated system focuses intensely on objectives and targets, which have been carefully selected to help the business remain competitive and sustainable over the long term. This common purpose often lowers the barriers to collaboration.

With a universally accepted framework in place, I have seen a remarkable degree of cooperation on well-defined, multifunctional projects. The silos are not “busted,” but employees from different parts of the organization show an open willingness to help one another out in order to enhance results and meet the expecta-

tions set out in the business excellence framework.

Momentum Toward Continual Improvement

Management systems typically are based on a three-year cycle (this is especially true of systems that are registered through third-party organizations). After a program is registered, there are surveillance audits once or twice a year until the registration needs to be renewed. In the meantime, internal audits and management reviews keep the program active.

This system of ongoing audits and reviews helps maintain momentum for continual improvement over the long term. Lean programs that want to remain vital and enhance their value to the organization could benefit from being part of such a system.

Accommodating Lean Practitioners

In the early phases of lean-to-green cooperation, I often emphasize to lean practitioners that the program does not prohibit them from selecting lean opportunities outside the scope of the established objectives and targets. As lean practitioners learn how important they are to meeting the organization’s commitment to continual improvement, they increase the time they spend operating within this framework.

Preventing Environmental Professionals From “Owning” ISO 14001

As noted earlier, your organization should strive to create an integrated management system that encompasses environmental, quality, and occupational health and safety. Regardless of how your management systems are organized, however, it is important to make sure that environ-

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mental professionals do not “own” the ISO 14001 program. Encouraging cooperation between environmental and lean can help ensure this.

ISO 14001 clearly states that environmental management must be part of the organization’s overall management system. This does not diminish the importance of the role that environmental managers play within the management framework, of course.

The Devil Is in the Details: Making Lean-to-Green Succeed

Lean-to-green should not simply be a “reincarnated” lean program. Instead, it needs to be a cooperative effort driven by EHS, lean, and employees throughout the company. Managers’ interest in lean-to-green will be sustained if they see that it is a valuable approach and if deployment leads to definitive results and objective evidence of improvement.

Building Synergy With Other Programs

While this discussion has focused specifically on lean, it is important to note that the same arguments could be made with respect to a Six Sigma program or a Lean Sigma program. The key point is that process improvement initiatives should not be separate from programs that demand continual improvement. These approaches work best when they work together.

The Importance of Risk Management

Many organizations focus intensely on measuring the financial implications of process improvements, through methods such as lean accounting. Fewer consider the value of reducing risk.

In my view, risk reduction is every bit as important as direct financial gain. A program that reduces regulatory, reputational, and operational risks will be well received both by management and workers.

Companies that are seeking to reduce risk will find it helpful to use a risk management standard, such as the Australian standard AS4360. An insurance professional can help convert risk reduction into financial terms.

Lean-to-Green: Creating Its Own Demand

When implemented the right way, lean-to-green becomes a very attractive and valuable program. It is framed by the organization’s management systems and business excellence programs and driven by a commitment to continual improvement.

Management system standards help link lean-to-green efforts into the organization’s business operating system. Internal auditing programs and regularly scheduled management reviews constantly reinforce the value of lean-to-green. Involving employees in developing the program allows lean-to-green to become part of what they do every day, instead of being just an “event” that is staged in their work area every once in a while.

Once the lean-to-green program is established, its value becomes readily apparent. Managers want it, the “kingdoms” want it, employees want it, and stakeholders want it. Something that popular is bound to succeed and be maintained over the long term—while it continues to promote business competitiveness and sustainability.

Notes

1. The process management approach discussed here is sometimes referred to as “lean manufacturing” or “lean production.” This column, following more recent practice, calls it simply “lean.”
2. See Pojasek, R. B. (2008, Summer). Quality toolbox: Creating a complete business management system. *Environmental Quality Management*, 17(4), 87–95.
3. 5S is a tool that helps workers maintain a clean and orderly work environment. See Pojasek, R. B. (1999, Autumn). Quality toolbox: Five Ss: A tool that prepares an organization for change. *Environmental Quality Management*, 9(1), 97–103.

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