

The practices of quality management have proven to be very beneficial for providing a framework for corporate efforts to create sustainability—regardless of the size of the organization.

The Role of Quality Management in Ensuring a Sustainable Planet

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There is an increasing interest in global organizations to consider how their operations impact the sustainability of this planet. Events are sponsored regularly to demonstrate corporate commitment to this essential philosophy for ensuring the future viability of mankind and its environment, and articles describing how organizations are getting involved in the sustainability movement and the best practices they have implemented are sharing the learnings that are being obtained.

Whereas actions related to the development and implementation of appropriate protective policies are the focus of political leaders, organizations tend to be more actively engaged in

applying the principles and tools of quality management in their efforts. At this point, however, large and globally active organizations are most commonly involved, despite the reality that small- and mid-sized businesses represent the largest segment of organizations. Fortunately, the use of quality management methods offers implementation approaches that can be aligned with the organization's size and maturity, which is helping the sustainability movement to gain momentum and wider usage. This may not be enough, however, to address the issues of global warming, mass extinction of the species, etc. So, this article provides a new definition of sustainability that

Figure 1: United Nations Sustainable Development Goals



can be used as a starting point for developing quality-based economic and social systems.

Issues Affecting the Sustainability Efforts of Small- and Mid-Sized Organizations

Having a model that is supported by proven methods is a key to encouraging implementation of sustainability initiatives. Although many large organizations generate their own unique models, this is not a practical approach for most small- and mid-sized organizations. Fortunately, the United Nations Sustainable Development Goals (SDGs)¹ are widely accepted and are available for immediate application (see Figure 1). This system comprises 17 goals with 169 associated targets and are intended to be achieved by 2030. Although the SDGs were directed at member states, the United Nations Global Compact² is aimed specifically at the corporate world. It includes the Science-Based Climate Targets to which companies can subscribe.³

Despite these activities and many available publications, however, small- and mid-sized companies are generally familiar with sustainability only as a purely environmental issue, and they tend to focus almost exclusively on avoiding violations of environmental laws and the associated costs of doing so. The following three reasons help to explain this reality:

- Organizations that are active in sustainability efforts tend to focus on systems and methods that the typical small-/mid-size organization is unaware of or are beyond its capabilities.

- It takes time to become familiar with the sustainability body of knowledge, but operations consume most of the available time of staff members.
- Most of the published information on sustainability focuses on the macro-level planetary scale. It unwittingly downplays the value of smaller improvements.

This limits the opportunities associated with combining small improvements with breakthroughs—an approach that has been proven successful in quality and process improvement programs. For example, 99 percent of all European Union businesses are small- or mid-sized. If the resources of these organizations were devoted to engaging all of these business' stakeholders in sustainability projects that could be integrated with their regular work, the accumulated contributions would be substantial.

System Boundaries and Definitions

Sustainable development was defined by the Brundtland Commission in 1987 as "...development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs."⁴ The three building blocks of sustainable development are financial, environmental, and social sustainability. In some areas, the basic aspects of social sustainability, such as non-discrimination and child labor limitations, are actually regulatory requirements. Although this article focuses on small- and mid-sized organizations, larger businesses also can benefit by applying the suggested approaches. Just because large organizations are more likely

Table 1: Overview of Sustainability Status and Quality Tools

Sustainability Status	Financial Sustainability	Environmental Sustainability	Social Sustainability	Quality Methods and Tools
Awareness Operational sustainability Remove false contradiction between sustainability and profitability	Focal point and driving force	Start to reduce harm	Fulfil local legal requirements	Add environmental goals Savings from improvements Seven plan-do-check-act (PDCA) tools Basic lean principles Define, measure, analyze, improve, and control (DMAIC) problem solving
Adoption Strategic sustainability Sustainability incorporated in mission, vision, and objectives	Added benefit	Driving force Focus on reducing harm	Expand on legal requirements using the sustainable development goals (SDGs)	Integrate systems fully Expand companywide Add Design for Six Sigma Add theory of inventive problem solving (TRIZ) Expand lean and total productive maintenance
Achievement Holistic sustainability Integrated sustainability as the driver and primary company value	Logical consequence	Focus on improving the global ecosystem	SDGs as basis for full social responsibility	SDGs as basis for targets Ecosystem improvement Empowerment through values

Adapted from “Social Responsibility Beyond Marketing”⁵

to sponsor sustainability initiatives does not mean that their systems are performing well in all cases!

The Sustainability—Quality Matrix

Of course, each organization needs to start its intentional sustainability efforts in a way that recognizes the results of previous initiatives—even if they were not part of an overarching program. Table 1 shows a sustainability-quality matrix that describes three levels of attainment.⁵ This matrix can be used for organizational self-assessment prior to launching a formal sustainability program. Each level is described in more detail below.

Awareness—Operational Sustainability

The need for financial sustainability offers the best platform for encouraging chief executive officers of small-/mid-sized organizations to recognize the value of sustainability efforts. Fortunately, this introductory pathway also links well to the use of quality management practices as drivers of sustainability results. Most corporate executives are well-aware that quality management contributes to improved customer satisfaction and process effectiveness and efficiency—sources of high organization financial performance. Therefore, once they understand this connection, they are likely to be ready to think about sustainability in different terms—ones that align better with their perceptions of the most important considerations for their organizations.

Furthermore, quality improvement projects often not only enhance the organization’s financial sustainability, but they also have substantial impacts on its environmental sustainability. For instance, improvement projects can reduce material and energy

usage, lower water consumption, etc. This demonstrates that environmental sustainability is far more valuable than avoiding regulatory penalties. In fact, it provides opportunities for the organization to attain higher profits while simultaneously reducing the deleterious effects of its operations.

In the awareness stage of the maturity model, the entire organization learns to focus on conducting the current infrastructure in a more sustainable way; this operational focus opens up possibilities for strategic initiatives that are more impactful as the organization’s maturity increases. Because quality/process improvement and sustainability projects can be combined without overburdening staff resources, small-/mid-sized businesses find this approach to be more financially sustainable in the long run. The rising costs associated with non-sustainable behaviors, including the use of energy and water, also make these efforts more attractive to small-/mid-sized corporate leaders; ultimately, these projects not only can lead to a current reduction in consumption of precious resources but also to future cost avoidances.

Some actions that can be taken to begin to build sustainability into the management and process improvement systems of an organization are listed below:

- Developing an integrated set of objectives that include environmental considerations in addition to existing quality and operational objectives.
- Building environmental considerations into existing quality procedures and instructions.
- Creating separate entries for environmental improvements in the existing quality cost system.

- Evaluating the sustainability factor associated with each improvement action.
- Starting improvement projects specifically directed at environmental improvements.
- Applying the seven basic tools used with the PDCA approach.⁶
- Implementing lean principles to boost the sustainability efforts by reducing/eliminating all types of waste.

Note that the awareness level involves very basic quality methods that should be attainable for an organization regardless of its size. These systems do not need to be certified, which can add costs that prevent small-/mid-sized companies from adopting them. One of the key success factors at this maturity level is ensuring that integrated improvement projects address quality, environmental, and financial results simultaneously.

Adoption—Strategic Sustainability

At this level of the maturity model, sustainability initiatives are integrated into corporate strategies, driving organizational success and financial performance. Sustainability becomes part of the mission and vision statements and is considered when decisions are made. The culture reflects an expanded view of how sustainability can impact current and future results. The sustainability program addresses not only issues that require corrective action but also opportunities that prevent attaining high performance.

This follows a path similar to what is represented by the Lean Six Sigma methodology. Corrective action projects use DMAIC and preventative efforts follow the Design for Six Sigma model. This progressive, two-stage improvement sequence occurs in many other quality management approaches, including total productive maintenance⁷ and 5S, which usually begin in a specific function and expand to other work areas across the company.

In addition to achieving financial and environmental sustainability, this maturity level considers social responsibility. The SDGs become a source of inspiration for setting targets and taking appropriate actions. Many organizations undertake local community projects during this stage of development.

The following quality management tools and practices are added to those implemented during the first stage, expanding the organization's capabilities. Here are some of the methods that are frequently added:

- Including sustainability in the mission and vision statements.
- Making an integrated set of environmental objectives that become the central point of company targets.
- Developing a fully integrated management system that consists of quality, environmental, safety, and social responsibility aspects.
- Making sure that all functions/business units are involved in the sustainability action.
- Giving specific attention to how sustainability impacts the design and development of new products and processes.

- Developing a life-cycle cost system that not only looks at reducing current costs but also evaluates future total costs.
- Expanding improvement actions beyond regular operations.
- Using methods that go beyond correction to prevention.
- Applying tools, such as TRIZ, to encourage thinking beyond the current product/service solution.
- Implementing lean principles across the company.

Achievement—Holistic Sustainability

Initially, many organizations will perceive that the adoption level of maturity represents their maximum level of attainment; however, that does not need to be the case. The most important aspect of this level is the recognition that doing no harm is no longer a satisfactory outcome of sustainability programs. The reality of achieving a sustainable planet is that even if the most advanced companies in the most advanced economies eliminate the harm their operations cause, more may be necessary to safeguard the planet and improve the ecosystem sufficiently to meet the needs of future generations.

Clearly, at this maturity level, the objective has shifted to improving the overall ecosystems. The three components of sustainability become fully integrated at this stage. As might be expected, this stage goes beyond technical/operational issues and strategies; the focus shifts to becoming a value-driven organization.

Once again, the applicable quality concepts and tools are expanded to include practices such as the following:

- Committing to holistic sustainability as the fundamental company value, the starting point for mission and vision statements as well as for company targets.
- Setting targets based on the SDGs to improve the ecosystem, which then are evaluated regularly and fit into a total corporate social responsibility system.
- Empowering every employee to address all situations that go against sustainability requirements.
- Conducting improvement projects that aim at creating a better environment and a better society.

From Sustainable Development to Sustainability

The sustainability maturity model that has been presented in this article provides three stages for sustainable development that can be implemented by organizations of all sizes over time. Although those efforts are important to saving the planet, they are not sufficient to attain long-term success. Some attempts have been made to move the bar even higher by implementing environmentally appropriate performance goals. For instance, the United Nations' Paris Climate Agreement of 2015 was originally viewed as a victory in the battle against climate change. It included specific goals for global warming that slowed down the upward trend and were intended to work in parallel with achievement of the SDGs. Unfortunately, progress has not met

the agreement's aims, thus far, as described by the UN Secretary for Climate Action, António Guterres, "Commitments so far could still see temperatures rise by 3°C or more. So we must do our utmost to increase ambition and action until we can bend the emissions curve and slow down global warming."⁸

One of the roadblocks to fulfilling these sustainability goals is the rate of high economic growth. Ultimately, the question that must be asked is "Is unlimited economic growth possible on a planet that has physical limitations?" A deeper investigation of the SDGs makes clear that there are conflicting goals related to these two critical areas (see Figure 1). Studies currently are underway to evaluate environmental Kuznets curves (EKC), which describe a hypothesized relationship between environmental quality and economic development. An analysis of these results indicates that environmental degradation tends to get worse when modern economic growth occurs up to a hypothesized point; however, there is disagreement among experts regarding the efficacy of this theory and its practical application.⁹ At the same time, other researchers are reporting evidence that the EKC may have merit when considering greenhouse gases.¹⁰ Clearly, more research is required, and it needs to consider the impacts of the ratio of people living in developed countries versus in developing countries, which seem to affect the calculations. Until fundamental relationships between causes and effects can be established reliably, attempts to generate planet-wide sustainability are not likely to be accepted as scientific fact and to serve as the basis for regulatory policies as well as national and corporate actions.

The Brundtland Commission's definition of sustainable development focuses on meeting present needs without compromising the ability of future generations to meet their requirements. Although this description is widely accepted, it has the following two weaknesses when the long-term, big-picture perspective is considered:

- First, it is anthropocentric because it addresses only the needs of humans now and in the future.
- Furthermore, it accepts the commonly stated needs as being unquestionable, and it does not indicate the need for a process that aims to manage those needs. For example, there is no discussion of accountability for consumption or encouragement of reducing depletion of vital resources.

In order to protect the overall ecosystem that supports all species, sustainability efforts must expand their applications to ensure a holistically sustainable society that is operating in the achievement stage. The Brundtland Commission's current definition is too limited to drive this outcome. A possible new definition for sustainable development might be that the present generation takes the necessary actions required to ensure the next generation's ecosystem continually improves.

Quality management systems have experienced the need for a similar transformation in scope. It is now fairly common to read

articles that address how these systems can impact the quality of life.¹¹ At this point, however, most of those perspectives still focus on mankind and need to be expanded.¹²

Ultimately, accomplishing this proposed definition of sustainability is strategic and requires no boundaries in system design and execution. Whenever the existing system no longer fulfills the needs of the ecosystem, quality professionals can help build their organizations' approaches to achieving this higher level of success. ■

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