

BY RON SULLIVAN, CFPIM

Enduring Success

Using the APICS body of knowledge to achieve greater sustainability

Business depends on the natural environment. The environment provides the raw materials we use and a sink for our waste. As growth in population and consumption result in using a larger portion of the planet, our role in maintaining it also expands. Issues such as climate change and species extinction are just two of myriad problem areas. Nevertheless, many organizations are reporting benefits from their sustainability efforts, including reduced cost, less risk, increased sales, and heightened brand value.

The world's economies and businesses are the most significant forces on both sides of this equation. More efficient use of resources is not enough; we also must use resources more effectively. APICS practices have much to offer in this context. As an organization of professionals who hold the keys to techniques that can make a difference, it is time to add "sustainability" to the *APICS Dictionary*.

The current environmental situation both extends and modifies the way we operations management professionals do our jobs. We have been providing supporting practices for many years via now-traditional processes that improve technology and minimize waste, such as

- quality improvement and waste elimination methodologies
- value stream analysis
- theory of constraints
- enhanced supply chain management
- managing more effectively with data.

However, some new perspectives are needed. From a macro perspective, these include new roles for companies, new products, and a new place in the economy. From a

micro point of view, company leaders should extend lean concepts and study limits of supply, in addition to finding new ways to meet demand. The principal strategy will be to make our society and our world sustainable.

Sustainability, the environment, and business

If you work for one of the more than 2,000 companies that have published corporate social responsibility reports, you may have noticed a broader sense of conscientious business purpose. Not long ago, we all learned one response to the question "What is the purpose of business?" Today, in addition to the initial answer to this question (profit for shareholders) we recognize other stakeholders—employees, customers, communities, and the environment. Corporate social responsibility is driven by the triple bottom line of economic prosperity, social justice, and environmental quality—in short, profit, people, and planet.

A tool frequently used in corporate social responsibility reports is the calculation of the corporate footprint. This provides a measure of resources used so that progress can be evaluated. The footprint expresses resource consumption and waste assimilation in terms of the productive land area, such that, instead of dollars, we get hectares. (A unit of the metric system, 1 hectare equals 10,000 square meters or 2.47 acres.) Comparing the footprint with the land available rates the sustainability of the current level of consumption.

Sustainability and information

Sustainability drives the need for more and better data. A good example of the fit between the data with which we

are used to working and those needed to manage sustainability is life cycle analysis. Life cycle analysis provides new information on the manufacture of products, such as the parts and resources drawn on, financial impact, energy use, and waste. The domain of information also includes byproducts through the supply chain out to the end user and, finally, disposal.

Value stream analysis is another excellent source of useful data. The tool has long-enabled users to ferret out waste in the form of useless moves and wait time. The new mission should be to manage and eliminate wastes previously ignored, such as transportation, packaging, and anything that ends up in the landfill instead of being recycled.

Along these same lines, the acts of developing information systems and improving processes have provided us with a pretty good understanding of systems analysis. But managing new responsibilities requires change in our information systems.

Consider the material requirements planning (MRP) calculation, which was born in a time when we did not have much computing power. Difficulty dealing with byproducts and coproducts resulted from a bill of material based on the parent and component relationship, a one-to-many connection from a data-definition perspective.

One way to overcome this limitation is to move from a material-based to a process-based calculation, in which one process can have many components and many products. Today, we have the computing power to do this. The result would be a system that enables users to identify resultant byproducts, while planning the demand and

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supply of a product. This system also would support life cycle analysis.

Consider the source

In many cases, the actual customer consuming the product is a bottleneck. But what happens when our bottleneck is based on raw material? Instead of optimizing the sales and service processes, we would need to perfect the supply chain.

Excellent examples of this approach include Starbucks working with its coffee suppliers and Boeing making long-term contracts to protect its supply of titanium. In a finite planet with increasing resource consumption, working within the supply chain is the key to optimizing constraints.

A critical balance

Situations will arise, in which, even after optimization, the rate of consumption for a product is not sustainable and must be reduced. As APICS practitioners, we perform a vital task through the balancing of supply and demand. As a society, we stimulate demand and dedicate our production efforts to meeting those requirements. Why? In part, it is driven by the goal of prosperity for our people; in part, it fits the agenda of the corporate need for growth—a need for business.

If we meet constraints in supply, then demand managers will see emphasis on techniques to allocate scarce product. For example, during the OPEC oil embargo of the 1970s, the supply of many petroleum-based products was less than demand. The producers and distributors frequently allocated the supply based on buying history of the customer, and few were able to get as much as they needed. Raw material was the constraint. Today, in this era of sustainability, the actions taken will be more extensive and include those discussed here, as well as product design based on design for the environment.

A model for the future

Sustainability is a concept that includes modeling. This is a critical process because efforts to emulate living systems have definite application for business. Resilience thinking helps us understand cycles of complex adaptive systems as they grow, mature, and are renewed. Resilience deals with the limits of a given regime and identifies thresholds (tipping points) and alternative states. The approach

Learning More

More information about sustainability is freely available on the Internet. Lester Brown's *Plan B 2.0* can be reviewed or downloaded from www.earth-policy.org. Hunter Lovins's *Natural Capitalism*, written with Paul Hawken and Amory Lovins, can be reviewed or downloaded from www.natcap.org.

In addition, the following organizations provide information on the sustainability initiative:

- The International Organization for Standardization ISO 14000 series provides guidance for developing an environmental management system and for life cycle analysis at www.iso.org.
- The Global Reporting Initiative provides structure for corporate social responsibility at www.globalreporting.org.
- The World Business Council for Sustainable Development offers information on sustainability efforts at www.wbcsd.org.
- The Business for Corporate Responsibility provides socially responsible business solutions at www.bsr.org.

can improve sales and operations planning and disaster recovery, for example.

Although models have limitations, building one provides insights, reveals potential problems, and gives direction. In an early study, “The Limits to Growth,” Donella S. Meadows, Dennis Meadows, and Jorgen Randers modeled population and resource use. Just as we experienced an agricultural revolution about 8,000 years in the past and an industrial revolution during the late 18th and early 19th centuries, the study’s authors say the next revolution is sustainability. Their guidelines should sound familiar to the APICS practitioner—improve signals, speed up response time, minimize the use of nonrenewable resources, prevent the erosion of renewable resources, apply maximum efficiency, and slow and eventually stop exponential growth of population and physical capital.


The macro and the micro

Finally, it is important to look at sustainability in our companies from both macro and micro perspectives. Most of the topics mentioned here deal with the micro perspective—tools and techniques used within a company—and focus on reducing, replacing, recycling, elimination of toxic materials, improving building efficiency, and energy conservation.

However, operations management professionals also must consider the macro perspective. We must think about

how our company will fit in an economy that will be transformed to meet the needs of a sustainable society. Big shifts are already beginning—moving from fossil fuels to renewable energy, shifting from physical to electronic products, changes in transportation, and elimination of toxins in products and production. Many products must be phased out and replaced by ones with more environmentally sound designs.

Business strategies will evolve to include making our society and our world more sustainable. Our role within those businesses is to support these strategies, with resulting changes, shifts, and extensions to our processes.

The APICS body of knowledge has addressed business problems for 50 years. Sustainability is just the latest focus. It extends the body of knowledge, offering important new insights and expanding our intellectual capital. Imagine a future in which our efforts are supported by a new body of knowledge, perhaps even a sustainability certification provided by APICS. 

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