Building on Supply Chains that Deliver on the Green Promise

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OVERVIEW

The traditional supply chain is inadequate in a world that is concerned with limited resources and climate change. The new “green” supply chain extends corporate social responsibility back to how suppliers use energy and forward to how customers use and dispose of products. As public awareness grows, companies who embrace this change will win competitive advantage and financial reward.

CONTEXT

These two MIT logistics experts described how a broader definition of corporate responsibility is causing companies to transform their traditional supply chains.

KEY LEARNINGS

A company’s social responsibility is also a fiduciary one.

The running debate between serving societal needs and maximizing shareholder value is misplaced. Although Milton Friedman (the leading thinker behind the shareholder value argument) correctly maintained that shareholders hire managers to make money, that objective must respond to today’s public priorities and market expectations about environmental impact.

To the traditional business hurdles of meeting and exceeding competitive and governmental demands, managers must now add the social demands of civil society and the finite nature of resources.

In this context, corporate social responsibility becomes a bottom-line matter of:

- **Reputation enhancement**, leading to quicker local permitting and favorable regulatory treatment. This can range from the Warner Foundation’s philanthropy to Cisco’s networking academy for disadvantaged students.

- **Human resources development**, stimulating employee pride, retention, and positive work attitudes. Costco shows the way here.

- **Partner loyalty**, enabling greater supplier cooperation. During a crisis, Toyota’s long-time suppliers trusted the manufacturer’s intentions.

- **Brand cultivation**, trading on the perceived value of fair procurement and environmentally responsible manufacturing. Starbucks is a model for this.

- **Risk mitigation**, recognizing that, while costs might be somewhat higher for ethically produced products, the economic penalties for unethical behavior are far larger.

Remember, though, that any corporate moves in this direction establish future public expectations; once you start, you must continue. Wal-Mart impressed the public with its response to Hurricane Katrina; now its prompt involvement in disasters is expected.

Green supply chain management doesn’t end with delivery; it extends into product use and recovery.

The traditional supply chain involves all parties who directly or indirectly fulfill a customer request. Suppliers include those who extract and transform raw material, procure components, manufacture products, and deliver them to customers.
The green supply chain doesn’t stop there. It extends into the
days customers use the product and ultimately dispose of it,
offering the opportunity to recover and reuse the materials.

“Green” Supply Chain Management

Reduce Resources
Extract → Transform → Procure → Make → Deliver → Use → Recover
Renew
Waste Eliminate

As the accompanying chart shows, a “green” supply chain is
ideally a closed loop that (1) reduces initial resource inputs and
renews them during the recovery phase; and/or (2) eliminates waste outputs or reuses them, which further extends resources.

“The beauty of the green space is that
tow companies are actively looking for bright new
ideas. Everyone knows that sustainability is
coming, but they don’t yet know how to do it.”
—Edgar Blanco

Typically, a green supply chain focuses on:

Energy. Reducing energy use and exploring renewable
alternatives.

Water. Cutting water volumes and countering contamination.

Greenhouse gases (GHG). Scrubbing or sequestering GHGs.

Waste. Minimizing the impact of waste disposal.

Green supply chain strategies evolve from “eco-
efficiencies” to new business paradigms, with greater
impact at each level.

The “green strategies” vision invokes a broader view of supply chain responsibility, developing through five increasingly
significant levels:

1. Process level. This entails rethinking a supply chain’s
processes to make it greener. For example, Fiji Water used
to ship its bottled water to Los Angeles, then truck it to
various East Coast destinations. After evaluating the
greenhouse gas emissions from trucking, it began shipping
via the Panama Canal directly to Philadelphia, spending
more time en route but dramatically cutting the carbon
footprint. Other process-level improvements include
retrofitting buildings to make them more energy efficient.

2. Materials level. This level is about focusing on the types
and amounts of materials used. It begins with product
design and extends to reusing materials. Since 2008, HP’s
Planet Partners Program has used 15 million pounds of
recycled plastics in toner cartridges, saving raw material
costs and acting as a learning platform for other HP plastics
applications. In the product-redesign area, Procter &
Gamble developed concentrated detergents, reducing water
usage, weight, and shelf size.

3. Traditional supply chain level. This involves mapping out
an entire supply chain from a product’s beginning (i.e. the
farm) until its disposal. This extends beyond a company’s
own supply chain to include the entire supply chain of its
suppliers and customers. Chiquita Banana looked at its fruits’ entire lifecycle, identifying farming practices and logistics as the two areas with the most opportunity for improvement. When Coca-Cola mapped its use of water, it discovered that its own supply chain used 5 liters of water to produce 1 gallon of Coke, but its sugar suppliers were using 200 liters of water per liter of product produced. So, the company has focused on decreasing the water required to grow sugar.

“To make changes at the supply chain level, you need to engage with partners in new ways.”
—Edgar Blanco

4. Functionality level. This goes beyond making an existing supplier chain greener; it entails developing alternative products and supply chains. An example is Better Place. This company wants cars to produce zero emissions with electric and battery-powered cars. But, this requires an entire new supply chain to acquire, distribute, charge, and dispose of batteries.

5. Customer level. This is highest level among all types of green strategies, as it results in new business paradigms. Other factors must be in place before this top stage, which makes a company’s supply chain “transparent” by sharing metrics with both suppliers and consumers. MIT has developed an open source tool, Sourcemap, that enables manufacturers to map their products’ environmental impact. (www.sourcemap.org.)

As companies reach beyond “eco-efficiencies” such as energy conservation and product re-design to new business models based on sustainability, they can become leaders in their fields.

“You may have to find new partners who are interested [in creating a greener supply chain] but you can forge strong new relationships with them.”
—Yossi Sheffi

OTHER IMPORTANT POINTS

Securing management support. An effective way to secure management support for green supply chain projects is to start small with local, low-risk experiments. Demonstrate the results to management for their buy-in and then broaden the green supply chain application throughout the company.
BIOGRAPHIES

Edgar Blanco, PhD
Executive Director, Center for Latin American Logistics Innovation; Research Associate, MIT Center for Transportation and Logistics

Dr. Edgar Blanco is a Research Director at the MIT Center for Transportation & Logistics and is the Executive Director of the MIT SCALE Network in Latin America. His current research focus is the design of environmentally efficient supply chains. He also leads research initiatives on supply chain innovations in emerging markets, disruptive mobile technologies in value chains, and optimization of humanitarian operations.

Dr. Blanco has over thirteen years of experience in designing and improving logistics and supply chain systems, including the application of operations research techniques, statistical methods, GIS technologies, and software solutions to deliver significant savings in business operations.

Prior to joining MIT, he was leading the Inventory Optimization practice at Retek (now Oracle Retail). He received his Ph.D. from the School of Industrial and Systems Engineering at the Georgia Institute of Technology. His educational background includes a B.S. and M.S. in Industrial Engineering from Universidad de los Andes (Bogotá, Colombia) and a M.S. in Operations Research from the Georgia Institute of Technology.

Yossi Sheffi, PhD
Elisha Gray II Professor of Engineering Systems, MIT; Head, Engineering Systems Division, MIT; Director, MIT Center for Transportation and Logistics; Professor, Civil and Environmental Engineering, MIT

Dr. Yossi Sheffi became Director of MIT’s Engineering Systems Division, effective Nov. 15, 2007.

Dr. Sheffi holds a dual appointment at MIT at the Civil and Environmental Engineering and at the Engineering Systems Division. He also serves as Director of the MIT Center for Transportation and Logistics. He is an expert in systems optimization, risk analysis, and supply chain management, which are the subjects he teaches and researches at MIT. He is the author of dozens of scientific publications and two books: a textbook on transportation networks optimization and the business best-seller The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage (MIT Press, October 2005).

Under his leadership, the Center launched many new educational, research, and industry/government outreach programs, leading to substantial growth. He is the director of MIT’s Master of Engineering in Logistics (MLOG) degree which he founded and launched in 1998. In 2003 he launched the MIT-Zaragoza program, building a new logistics university in Spain based on a unique international academia, government, and industry partnership.

Outside the university Professor Sheffi has consulted with numerous governments and leading manufacturing, retail, and transportation enterprises all over the world. He is also an active entrepreneur, having founded five successful companies, and a sought-after speaker in corporate and professional events.

He obtained his B.Sc. from the Technion in Israel in 1975, his S.M. from MIT in 1977, and Ph.D. from MIT in 1978.

Angelia Herrin
Editor for Research and Special Projects, Harvard Business Review

Angelia Herrin is Editor for Research and Special Projects at Harvard Business Review. At Harvard Business Review, Herrin oversaw the re-launch of the management newsletter line and established the conference and virtual seminar division for Harvard Business Review. More recently, she created a new series to deliver customized programs and products to organizations and associations.

Prior to coming to Harvard Business Review, Herrin was the vice president for content at womenConnect.com, a Web site focused on women business owners and executives.

Herrin’s journalism experience spans twenty years, primarily with Knight-Ridder newspapers and USA Today. At Knight-Ridder, she covered Congress, as well as the 1988 presidential elections. At USA Today, she worked as Washington editor, heading the 1996 election coverage. She won the John S. Knight Fellowship in Professional Journalism at Stanford University in 1989–90.

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