



# Deconstruct to Reconstruct: Using the Past to Create the Future

By James B. Rice, Jr.

James B. Rice, Jr. is Deputy Director of the MIT Center for Transportation & Logistics. He can be reached at [jrice@mit.edu](mailto:jrice@mit.edu).

**B**ig Data, cloud computing, driverless vehicles, drones, 3D printing, The Internet of Things: It seems that never a day goes by without the arrival of another paradigm-shifting innovation.

Market and industry dynamics are constantly changing. The emergence of omni-channel retailing, wide fluctuations in energy prices that require supply chain designs to be revisited, and the impact of mega-size container ships on global operations are just a few examples of these changes.

While you likely find this endless stream of new capabilities and applications exciting, you might also be feeling somewhat overwhelmed. It's becoming increasingly difficult to identify how these developments translate into successful supply chain innovations (SCI) that can be leveraged to create competitive advantage.

Don't get discouraged: By deconstructing these shiny new objects, you will find that they are not as revolutionary as is widely assumed. And having disassembled them, you will have a clearer idea of how SCIs can be derived from innovative ideas.

## The Simple Truth

SCIs are often characterized as ground-breaking ideas that bring about dramatic and disruptive changes in the supply chain. The truth, however, is more mundane. The majority of SCIs are what is known as sustaining; they provide incremental improvement in cost, quality, or service.

Also, rarely does an SCI pop out of a laboratory or result from a light bulb idea. More often than not, this type of innovation evolves out of a series of many small modifications that in combination achieve meaningful change in performance (this is what supply chain professionals have always been doing, but we've called it

different things like business process reengineering, Kaizen/continuous improvement, etc.).

Recognizing this truism will help reorient your efforts toward a productive and disciplined approach to innovation. Less thoughtful approaches often result in companies chasing technological silver bullets.

Also, practitioners often make the mistake of conflating process innovation, or SCI, with product innovation. Keep in mind that each one has distinct outcomes that derive from very different sets of processes.

Usually product innovation involves a stage-gate process for the assessment, selection, and development of new product ideas. SCI, on the other hand, focuses on changing or improving an existing process with a clear, predefined outcome, such as the creation of a specific product or service. An SCI could serve to create the same product, but using a different process that might have different economics and performance expectations.

Additionally, there is generally a burst of product innovation at the genesis of a new product, followed by diminishing and increasingly smaller innovations. The pace of development for an SCI takes the opposite direction. Early in the product lifecycle there is some process innovation that increases over time, and then peaks at the point where there is convergence on a "dominant design" for the product and process.

## Time to Choose

Having clarified the nature of an SCI, firms need to choose whether to pursue sustaining or disruptive supply chain innovation.

Why choose? Each one requires very different approaches and skill sets. Sustaining SC innovations come from process improvements infused with the inspiration of learning from others and

adapting methods from other environments to your own. Disruptive supply chain innovation entails changing the dominant design of your supply chain. Yes, changing the way things are done.

Disruptive innovations are hard to achieve if you are part of a big company that has established processes serving large customers that depend on you for reliable supply. Dell changed the dominant design when it started producing to order and selling direct. The previous dominant design was to produce to stock and sell through retailers and distributors. Zara challenged the dominant design when it designed a vertically integrated, near-market, fast fashion business that was capital-intensive and relied on high levels of automation. At the time, the dominant design for mass merchandise fashion products was a low capital, high-labor model, based on outsourcing as part of a long-cycle supply chain.

## Disruptive innovations are hard to achieve if you are part of a big company that has established processes serving large customers that depend on you for reliable supply.

Transformations like these are rare, and almost always the disrupter is not a market leader, as Clay Christensen explains in his seminal work, *The Innovator's Dilemma*.

## Deconstruct to Reconstruct

Now that you have a clearer idea of what type of SCI you're chasing, and what it might entail, you may well have come to realize that nearly all SCIs are combinations or re-combinations of established ideas. The "new" aspect is the combination that is then applied and scaled.

To prove this is the case, try deconstructing some well-known innovations, including the ones mentioned at the beginning of this article. Such an exercise helps you to interpret innovations in the context of the supply chain. It also demystifies innovation, and dispels doubts you might have that harnessing complex, ground-breaking ideas is too much of a challenge for simple operations folks.

Below are some examples to get you started.

- Dell's make-to-order process is a reapplication of make-to-order manufacturing. More than a century ago, blacksmiths used the same process to custom-make horse shoes for each animal. Dell figured out how to do it on a massive scale.

- Zara's vertically integrated supply chain actually harks back to the vertically integrated production model that

was popularized by the Ford River Rouge plant. Also, the retailer applied automated, large-scale production methods to the low-tech approach to manufacturing that had been previously dominant in the apparel industry.

- Amazon's massive online catalog and direct sales are a reincarnation of the venerable Sears & Roebuck's print catalog. Amazon's version has an electronic interface where orders are placed electronically instead of via mail.

- Kiva Systems' robotic warehousing system is genuinely impressive, but its component parts are familiar. These include pick-to-light packing stations supplied by small, QR code-guided AGVs (automated guided vehicles) that use servo motors and ball screws (for mobile shelf pick up), along with custom software that are combined in a devilishly clever way. But again, the basic technology has been around for decades.

Of course, there were many other important factors that contributed to each of these successes. However, the above summaries highlight that the kernel of innovation came from the reconstruction of existing methods and know-how, and not a laboratory.

Occasionally there is a product innovation that also serves as a SCI. A recent example is iBubble. Although this is a clever innovation, it is based on established concepts. Sealed Air used to make protective packing material by trapping air bubbles between two sheets of plastic. The bubbles cushion delicate product in transit. iBubble, Sealed Air's new innovation, is very similar, but the packaging is inflated just prior to use, making it less expensive to ship. Is this a new concept? Hardly. Shipping product in its component form for self-assembly by the end user is a well-established technique. In fact, iBubble is an ingenious application of postponement—delaying the final assembly of a product until as late as possible.

## Take the Right Road

In the words of Yogi Berra: "If you don't know where you're going, you might not get there."

When developing and applying SCIs, practitioners should focus on the process and not the product. Technologies don't change supply chains; technical invention is not SC innovation. Instead, concentrate on how innovative technologies can be applied and scaled to help change supply chains. Recognize the difference between sustaining and disruptive SCI. Choose your objective, stick to it, and secure the right resources and support to achieve it (e.g. process improvers for sustaining SCIs, process dreamers for disruptive ones).

This is the disciplined and productive path to successful supply chain innovation, an approach that will reward adopters given the accelerating pace of innovation. ☺☺