

Supply Chain Digest

Here Soon, Technology that will Dramatically Impact Supply Chains
January 29, 2009

One of the most compelling presentations I heard in 2008 was by former government official, now a futurist of sorts, Jack Uldrich, who was the luncheon speaker on the final day at the CSCMP conference in Denver last October.

The presentation was on how rapidly many areas of technology are advancing, often still below the radar for most of us, and the wide ranging impacts these changes will have on our lives, our supply chains and our businesses. It was fascinating – and scary (in a good sort of way).

As I wrote at the time, “The message – get on top of what is going to happen in these [technology] areas right now, or you may go the way of the dinosaur in just a few years.”

Gilmore Says:

The potential for robotics in manufacturing and logistics is immense. Not only as a cost reducer, but potentially allowing more affordable customization, more on-demand production, or changing the cost dynamics of outsourcing.

I also promised then more details soon – and here they are.

Uldrich was kind enough to have the publisher send me a copy of his book on all this, called *Jump the Curve*. It makes for powerful and compelling reading.

In the opening, Uldrich himself says that the idea for the book came from an interview he read with a Microsoft exec who predicted that the technology revolutions in this century would come from the areas that will enjoy exponential growth – just as basic computing power did over the last few decades.

It turns out there are more of those areas than we might realize, zooming along at a rapid pace and likely to soon gain real critical mass. Most have the potential to improve or change how we manage supply chains, and also to have profound impacts on our businesses. These technology changes, almost breathtaking in potential, will put many companies out of business, while spawning hundreds of new ones that create or embrace these new technologies.

First, a short lesson about the unique attributes of exponential growth. Uldrich notes in the book an example using a water lily. Lets say you have a single water lily in a pond that will grow to cover the entire pond in 30 days. Guess how much of the pond would be covered in 20 days? Much, much less than most people guess – just .01%! In fact, at day 25, just over 3% of the pond would be covered. The growth in the last five days is astounding.

The point is that rapidly growing technologies (or trends) can stay small for a long time when starting from a tiny base, but then suddenly explode – leaving many companies unprepared.

Let's look at just a few examples of what Uldrich sees as the game-changing technologies.

Robots: Uldrich says that an “extraordinary amount of progress is being made in the field of robots.” When hearing about robots, many of us think about the failed, hugely expensive mistake GM made in trying to go robotic in the 1980s. But we would be making a mistake. Here at SCDigest/Distribution Digest, we have been commenting, for example, on the clear rise of robotic-related technology in distribution for more than a year now.

From surgery to military operations to even the home, “I, Robot” has already come or will be here soon. Stanford students, Uldrich said, have built a robot that can assemble an Ikea bookshelf; the number of personal robots, still in their infancy, really, employed to do vacuuming, scrubbing and other household or industrial chores, is expected to grow from 2 million worldwide in 2007 to 9 million this year – now that’s exponential growth.

The ramifications are huge, and certainly for the supply chain. The potential for robotics in manufacturing and logistics is immense. Not only as a cost reducer, but potentially allowing more affordable customization, more on-demand production, or changing the cost dynamics of outsourcing. Seegrid, for example, last year released an AGV-like robot for materials handling that uses an optical system for navigation. Given rapid advances in computing power, sensors, etc., these types of innovations in robotics will continue rapidly.

Computing Power: We have plenty of powerful computers already, but we are still just scratching the surface. Uldrich says that an entry level Cray Supercomputer – incredibly powerful machines – can now be purchased for as little as \$25,000, and are heading further south.

This kind of affordable computing power, for example, now enables one retailer to complete a complex, store-level, replenishment optimization run in just a handful of seconds, a process that used to take almost a full shift in the past.

This power and speed comes right at the time that we are facing the need for ever real-time supply chain management. In Denver, Uldrich said that this will make it possible for manufacturers, for example, to continually re-optimize production schedules in a way that simply isn’t possible today. This raw computing horsepower will be enabled by a new generation of software that is being developed using such techniques as “genetic algorithms” that can take advantage of this power and solve problems that machines simply couldn’t handle before.

Nanotechnology:

This is the most incredible area of all.

In short, nanotechnology is the science of being able to manipulate atoms – something we have only fairly recently learned how to do, but the ramifications of that capability are endless and profound.

At CSCMP, Uldrich took a can of Coke and poured it on his tie, then held it up – dry and fresh looking as the day he bought it, the result of a nano-based coating on the fabric. And who would have thought dry cleaners might be a victim of nanotechnology? But they could be, as might apparel makers, as customers find clothes stay new looking for a lot longer and don’t need to be replaced as often. In fact, the maker of this treatment, **Nano-Tex**, has already coated more than 100 million garments.

Scientists have the ability right now to make actual, real diamonds using nanotechnology – what is a diamond but a string of carbon atoms, after all? Will they be able to do so affordably and in volume? Not only does this possibility have the big diamond miners and brokers like DeBeers very worried, but it could change the whole perception of diamonds. What if everyone can have a two carat, perfectly clear engagement ring for \$99 or something? Will something emerge to take the place of diamonds for someone who wants status?

Dupont has developed a new nano-based coating for automobiles that it calls a “liquid solid.” Uldrich says that “Because the coating can be applied so thinly and so quickly, it is expected to cut the materials and energy usage by 75% and 25% respectively.”

The potential of nanotechnology to change our lives and business is incredible. Right now, it is just at day 5 or 10 of the lily pad curve and, hence, largely below the radar for most of us. But the pond could be getting full very soon, which is Uldrich’s point.

Uldrich even expects RFID to hit this kind of exponential growth curve soon, and by some measures, though still relatively insignificant in the total scheme of things, RFID is already seeing that kind of growth now.

So what to do?

Again, the main message is to be vigilantly aware of these technologies, and to understand the threats and opportunities they provide.

Uldrich offers a host of more specific ideas on how to “jump the curve,” – 50 of them in fact – but as we are out of space you will have to either get the book or wait a few weeks for our interview with Uldrich to hear some of them.