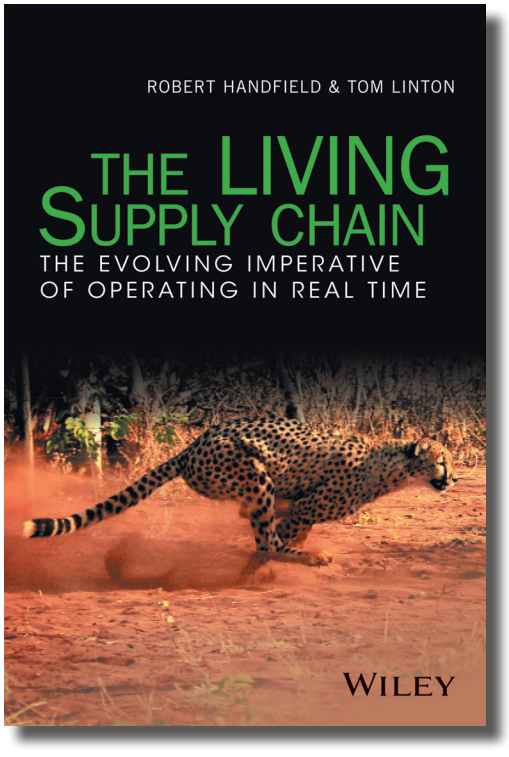
The LIVING Supply Chain



A new book argues that supply chain ecosystems adjust and evolve in ways similar to how the natural world behaves.

BY ROBERT HANDFIELD AND TOM LINTON

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The story behind the book

On a wet morning in January 2016, I sat next to a cozy fire in a Portland coffee shop, with a warm cup of coffee and an open laptop. I thought about what I had seen the day before on a tour of the Flex Pulse Center in Milpitas California, and the discussion I had with Flex's chief supply chain officer, Tom Linton.

I've known Tom for more than a decade. But what he had shown me the day before was entirely different from anything we had previously discussed. Flex was deploying an experiment of sorts, one that took everything we ever knew about supply chains, tossed it out the window and started from scratch. I had left Tom with a parting comment: "I think we need to write a book about what you're doing here." Tom smiled and nodded.

—Rob Handfield

Our book, "The LIVING Supply Chain: The Evolving Imperative of Operating in Real Time," is about re-imagining what supply chain is, and what it's becoming.

The premise is that supply chains are ecosystems that adjust and evolve in ways similar to the ways the natural world behaves. We have used our creative imagination to envision how supply chains will evolve and adapt to the emerging complex new business environment of the future.

This book also introduces the topic of balance to supply chains, not in the classic context of supply and demand. Instead, as it relates to the values companies increasingly are placing on healthy, honest and transparent supply chains.

The central argument is that balanced supply chains will win and selfish supply chains will lose. I hope "The LIVING Supply Chain" becomes a starting point for a new wave of innovative conversations about what supply chain is versus what it does.

—Tom Linton

Contract manufacturing was the original business of Flextronics. That was during the boom years of the 1990s and the early Internet days. The company largely manufactured PCs for big names like HP, Dell and others.

Contract manufacturing was a volume business with razor thin margins, and relied on the ability to scale up a new product assembly line anywhere in the world. By 2015, Flextronics was no longer a contract manufacturer in the traditional sense, and changed its name to Flex.

"We are in full transition to become a company, that when I think about it, hasn't ever existed before," explained Tom Linton, chief supply chain officer. During a tour of the company's Milpitas, Calif. facility, he continued: "In each of the organizations I've worked in, I liked to experiment with organizational models—and this is the biggest experiment of them all. And I believe we are achieving an essential alignment of procurement and the supply chain organization that is unique. We are influencing and shaping Flex's corporate strategy, but we are also totally supporting it."

Tom went on to say: "we are a capability supply chain company. Supply chain is our business. But it is supply chain on steroids."

The company has 230,000 employees and 5,000 customers in 18 different industries. It produces at least $1billion of product in each of 12 verticals. Flex makes cell phones, the Kindle, Go-Pro cameras, Microsoft X-boxes, Fitbits and much more. But the Flex name never appears on any of those products.

"We are one of the biggest companies nobody has ever heard of," explained Tom. "And we are involved in the downstream supply and manufacturing side, as well as the upstream quoting to our customers when they come to us for a new product."

In short, Flex manages all manner of supply chain risk from complexity to disruptions for its customers. And as a manufacturer across so many of the largest global industries, Flex has the power of global insight.

As a result, Flex triangulates across operations strategies, geographic strategies and product strategies like no other company. The company is in a position to predict how technologies, consumer behavior, supply chain innovations and or digitalization in one sector (say consumer products) may appear in automotive or medical products tomorrow. For example, who ever thought people would play music from their portable phones in automobiles?

As chief supply chain officer, Tom runs an end-to-end supply chain. And end-to-end here truly means end-to-end.

It includes customer-facing flows, supplier and material-facing flows as well as all the sourcing and logistics in between.

Linton elaborated: "Flex's supply chain organization controls sourcing on direct and indirect procurement as it manages all of our materials at over 120 global site locations. This includes all the intellectual property, inventory, cash cycle, days sales outstanding, days payable outstanding and the entire financial workflow of the organization." When Tom presents to leadership, he is effectively talking to them about managing the balance sheet and the income statement, as well as supporting incoming revenue.

The intelligent piece of the real-time supply chain needs to be combined with a number of other cultural values within the organization.

This level of oversight allows Tom to align organizational capabilities and financial outcomes with procurement and supply chain strategy. In so many supply chains, the different pieces of the supply chain are often mis-aligned. Information systems have for years tried to "integrate" these disparate pieces. However, this often results in mis-alignment of decisions, primarily because of political reasons.

Every function has its own agenda, its own performance measures, and its own culture as it operates in a silo. Putting in an ERP system to integrate these parts does little to address the true disparities that exist.

Tom put it this way: "All of the pieces, for the first time in my career, are fully aligned. It is like a big chiropractic alignment, and when it happens, it is truly the secret sauce of successful organizations. We have true visibility to all financial flows, which ensures that we are profitable."

When you look at companies like Cisco, Microsoft, Apple, or others, these companies all have a huge market cap, but have no manufacturing or development activities to speak of. Flex manages all of these activities for them, which means it has to run a top-notch end-to-end supply chain.

So even though you won't see a "Made by Flex" label on these companies' products, Flex is in the background ensuring that it all comes together. This is one reason that Flex and other contract manufacturers are emerging as the fabric of the emerging trend towards the intelligence of things.

The other interesting anomaly is that top 25 lists of the best supply chains at Gartner often list these very same companies. "We manufacture for many of these companies, and actually hold a lot of their assets for them," said Linton. So when Gartner measures the top supply chains, one of the criteria they use is the ratio of the company's revenues to its assets. All these companies are asset-light—because Flex is holding their inventory for them."

Now that really piqued Rob's interest as an academic. If Flex, and others like them, hold all of the inventory and material and shipping flows for these big companies—how does that work? How can one company manage so many manufacturing processes and so many customers?

Rules of LIVING supply chains

The Flex supply chain structure is part of a massive change and evolution that is occurring in today's supply chain world. These changes will occur sometimes quickly, sometimes slowly, but will undoubtedly come into being in the next decade.

The changes we are writing about in the book "The LIVING Supply Chain" are not just about technology—they are about true evolution in a biological sense. In fact, many of the changes have been captured in a set of statements we have called the "Rules of LIVING Supply Chains."

This was the thinking that led us to begin this book. We want to determine how digitization can be exploited to drive competitive value. We have come to the conclusion that the intelligent piece of the real-time supply chain needs to be combined with a number of other cultural values within the organization. From there, it extends upstream and downstream in the supply chain network.

A good acronym that captures these concepts is "LIVING," and is the basis for this book.

Live. Do you have a real-time (LIVE) view of your information?

Intelligent. Are you able to connect the essential leverage points in your network through Cloud, mobile and other mediums that provides a platform for analytics? Can you track the DNA of your supply chain at a part number level globally? Can the system evolve to link to the objects in your supply chain?

Velocity. Is your entire enterprise and network focused

on moving assets faster than ever before in its history?

Interactive. Is there a common governance structure that defines how observations are translated into issues, monitored, validated and translated into specific actions and responses?

Networked. Is your multi-enterprise supply chain networked in such a manner that a common and aligned view of business priorities and actions is aligned with trusting relationships common to everyone?

Good. Is your network truly good, with a common cultural understanding that transcends borders and seeks to establish good relationships as long-term assets that drive growth and transparency anywhere in the world?

These new rules are aligned with many of the rules that dictate how species, humans and genetics have evolved. They represent a natural evolution rather than a radical one. They are occurring because the world of global trade has reached the limits of its growth without re-shaping the way it operates. Welcome to the LIVING supply chain that operates in real time.

Moving past world-class supply chains

For many years, there has been a drive toward a world-class supply chain organization. In fact, you probably use those words in your company.

Unfortunately, world class still emphasizes distinctions in the organization. Purchasing, operations and logistics are still viewed as disparate functions, and arguments break out over which area has dominance over the others. The three functions were lumped together as supply chain, but have not stopped working independently of one another. Technology integration was supposed to bring them together but didn't most of the time.

In the end, there are some real problems with the world class view of the supply chain. We need a new view. That's where the LIVING supply chain enters the fray.

To begin, it is important to emphasize that managing supply chains is no longer just about cost optimization. It is also about a deep understanding of the components of customer value, not to mention making decisions quickly in response to sudden shifts in customers' requirements.

While cost optimization may certainly be one element of this equation, value has many differential meanings. Managing the supply chain first and foremost requires that managers act as internal consultants who spend most of their day listening closely. They must listen not just to the explicit needs of internal customers for materials, information, services, knowledge and capability, but also to the intangible elements customers need.

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In a sense, real-time supply chains involve understanding and predicting what internal users and customers will need even before they themselves recognize the need. Velocity and speed are integral capabilities that require quick response to customer needs to create the right capability.

Velocity and speed are promulgated by evolutionary economics. Biologists emphasize that organisms and creatures that are quick to respond will evolve more quickly and will survive. Those that don't will die out.

One of the best books to cover this concept is "The Serengeti Rules," written by biologist Sean Carroll. We have applied them to enterprises and their supply chain ecosystems. We propose the idea of a LIVING supply chain as one of a set of networked enterprises that are subject to the same rules as biology.

These observations comprise the elements of the first Serengeti Rule.

Serengeti rule No. 1: Not all species are equal. This rule proposes that some species exert effects on the stability and diversity of their community that are disproportionate to their numbers or biomass. These are termed keystone species based on the magnitude of their influence on the food chain.

We have applied this biological rule to create a rule for the emerging supply chain network ecosystem.

New supply chain rule No.1: Not all enterprises are equal. Firms that respond to changes in their environment more quickly by embracing *velocity, real-time transparency and rapid response* to change will adapt more quickly and will survive. Those that do not adopt these principles will become extinct.

It starts with a simple concept: Speed and velocity are more important than everything else.

Speed drives business value and inventory turns, reduces working capital, produces cash (monetizes) assets and makes customers happy, which in turn further drives

top line revenue. Supply chain optimization typically involves turning the knobs on a supply chain design that is broken. But creation of real-time supply chains provides a means for creating value that the customer cares about. In today's fast-paced environment, velocity is something customers value.

Companies that have speed enabled by real-time visibility will experience improved customer satisfaction. What customer doesn't want to have the product they ordered online to arrive more quickly? This also has the effect of reducing costs, as agility and nimbleness allows companies to move quickly to address situations that may end up costing them a lot of money.

Velocity is the ability of an organization to flow working capital rapidly through its end-to-end supply chain. Working capital is generally in the form of inventory, which is an asset that doesn't produce any revenue or cash.

Speed also reduces inventory as working capital moves more quickly, and reduces obsolescence along with excess inventory. Inventory is a substitute for lead time. As lead time shrinks, so does inventory. Finally, speed frees cash flow by operations. Companies with more cash flow can re-invest in the business, acquire another company or buy their stock.

All of these outcomes make the company stronger, and more able to withstand the challenges of the global ecosystem. As predicted by Rule No.1, enterprises with higher velocity are stronger, more nimble, in better financial health and capable of growing by leaps and bounds. Slower firms will slowly go out of existence.

Visibility drives velocity

There is more evidence than ever that the old rules of strategic supply chain management are fading away. Transparency is the new law and collective innovation of enterprises in the global network is the driver for growth. Quite simply, visibility drives velocity.

This requires an ability to think strategically in terms of the entire supply chain, including supply chain partners. It also requires a close working relationship with these partners to drive collective growth and profitability. This approach is equivalent to another law of the Serengeti desert.

Serengeti rule No.2: Some species mediate strong indirect effects through trophic cascades. Specifically, some members of food webs have disproportionately strong (top-down) effects that ripple through communities and indirectly affect species at lower trophic levels. An example is the wildebeest, which impacts grass populations, predator populations and populations of other herbivores like giraffes and hippos.

The equivalent rule in supply chain terms is as follows:

New supply chain rule No.2: Enterprises that mediate indirect effects upstream and downstream in the supply chain through aligned strategies will thrive. Those that do not will slow and become extinct.

We propose that in a supply chain some companies mediate strong direct and indirect effects. Those companies that do so rely on transparency and rapid response to events in the supply chain. By promulgating the ability to rapidly adapt to uncertainty and change in the ecosystem, companies will ensure that other enterprises (creatures) that they depend on, and which depend on them, will mutually benefit and thrive. Those that continue to operate in a silo (and fail to view the supply chain as an ecosystem) will slow down and not be able to adapt.

Organizations that have adopted an approach focused on velocity, visibility, real-time response and digitization have seen rapid growth in a flat economy. Amazon, Apple and Facebook are leading examples. So is Flex.

Two key concepts—velocity and visibility—reflect the core elements of real time in supply chains.

Velocity is the ability of an organization to flow working capital rapidly through its end-to-end supply chain. Working capital is generally in the form of inventory, which is an asset that doesn't produce any revenue or cash. Thus, the object of the real-time supply chain is to achieve velocity in every aspect of how companies run their businesses.

Visibility enables velocity through the relative transparency of events, material, and flows to all key decision-makers in the extended supply chain. Visibility allows individuals to see what is going on, empowering them to interpret information and rapidly make decisions in response to data.

These principles are not new. Many of the concepts around lean production systems have emphasized flow and

visibility. However, in the context of the digitization of the supply chain, these concepts have a new meaning and impact.

The drive behind LIVING supply chains

The focus on speed is an element that is essential to the real-time supply chain. Every action should be focused on driving increased velocity of materials through the system.

Tom explained: "I tell my people, if you wake up and go to work, and are confused as to what you should focus on that day—focus on speed. Speed will drive all other financial benefits that we need to be paying attention to. It will drive up customer satisfaction, as customers get their products sooner, and get new innovations that come to market sooner. It will drive out excess inventory and improve our balance sheet. And it will speed up our cash to cash cycle, which makes our shareholders happy."

There are some important issues that follow from this principle of velocity.

1. The first is that the centralized control tower is giving way to a new layer of capabilities. This is not the current control tower of internal historical data managed by senior supply chain executives guessing what is coming next. Instead, supply chains are becoming more vertical virtually. That means as we become more reliant on our partners, we need to create a virtual form of vertical integration through greater connectivity.

2. The second big change is Cloud computing. Probably the single, most important component of running a global supply chain, Cloud computing allows something very special to happen—business process convergence. In the past, we automated separate business processes, each operating with one another based on commercial invoices, purchase orders and transactional documents. As these automated processes now start to link with one another in the Cloud, these traditional transactional documents become obsolete.

3. The third big change is that labor arbitrage will no longer be a relevant strategy. Global labor costs are quickly becoming regionalized just as manufacturing will increasingly become regionalized.

4. The fourth big change is that unpredictability is entirely predictable, which means that we need to be more influenced by the use of tools to be better able to respond to unpredictability.

5. The final big change is to change our entire cultural and psychological mindset when it comes to the supply chain. The book "Non-Zero" by Robert Wright starts with a premise that the world is not moving to a zero-sum game, but to a non-zero sum outcome.

Look for instance at the Inuit people. When they killed a whale for food, they shared it with all of the other tribes. All of the tribes were trying to survive, so they formed alliances and states. By working together, they were able to move ahead collectively. That same approach can work in the supply chain if you partner with those who you respect and trust the most.

Big changes coming

There is an increasingly common set of discussions that are also evolving around the digitization and active tracking of product and materials in the network, and not just in the boardroom at Flex. We have had several other conversations with executives at other companies around the increasing focus on the digitization of supply chains that were moving towards becoming live, fast and intelligent.

But what does this mean exactly for the impact of multi-enterprise networks of organizations working in the supply chain?

The idea of a LIVING network is a powerful metaphor for what is going on at Flex. Flex recognizes that the Intelligence of Things is the key driver for change in the new era, not the Internet of Things. The Internet is just the utility that keeps data flowing in the system.

The emergence of more automation, 3-D printing, hyper regionalization and omni-channel customer service will be explicitly considered within an organization's technology roadmap. Our implicit assumption is that these technologies will be coming to fruition in the next two years to five years

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That said, the emergence of organic, LIVING supply chains suggests that today's supply chain will live, change and evolve differently than in the past. You don't want to lose sight of velocity and visibility as the key for supply chain survival in the Serengeti.