



SPOTLIGHT / EXECUTIVE COMMENTARY

The LIVING Supply Chain

What supply chain managers can learn from wolves in Yellowstone

By Robert Handfield and Tom Linton

The era of the digitized supply chain is bringing about unprecedented levels of change in global trade. The rapid digitization of the communications infrastructure, cloud-based computing, mobile technology and the rise of the digital ecosystem will enable transparent, real-time supply chains to have a significant influence on the way humans work and on our daily lives. This impact, we believe, will not be driven as much by technology, however, as by our mindset and our willingness to adapt.

In our new book, “The LIVING Supply Chain” (coming Summer 2017), we examine the changing dynamics of today’s supply chain. We also provide a framework for organizations to exploit new digital, mobile and cloud-based technologies by reimagining supply chain networks as LIVING (Live, Intelligent, Velocity, Interactive, Networked and Good) ecosystems.

To best understand the concept of the supply chain as a LIVING network of entities that rely on their mutual balance to remain healthy, it is helpful to draw a parallel to the evolution of ecosystems in nature.

In the 1920s, ranchers protecting their livestock wiped out the majority of the gray wolf population in Yellowstone National Park. With the region’s largest predator eliminated, a



phenomenon that naturalists refer to as a “trophic cascade” set into motion. The elk population became overabundant. The overfeeding of the elk on trees and vegetation in the park upset the natural food chain. The land could no longer support the unchecked growth of the elk population. In 1974, officials established a program to reintroduce wolves to the park. Over time, this restored the balance between predator and prey in

Yellowstone and resulted in a healthier ecosystem.

The greatest impact of the digital era on the supply chain will not be driven by technology, but by the willingness to adapt to a new reality.

In much the same way, we believe that humankind needs to seriously consider letting the natural rules of evolution play out in the world of supply chain commerce as well. Today’s supply chains require competition to thrive but also require a degree of harmony. This is an important concept to remember, as we face a new world order that is increasingly localized and closing borders.

The “natural rule” of evolution emphasizes open and free trade and open forces of competition, which can spur innovation and continuous improvement. In this new fast-moving, digital economy, unbalanced supply chains can cause a cascade of economic unsustainability.

The ability to visualize what is happening in your end to end supply chain in real-time, through the massive shifts in cloud computing, big data, visualization, and mobile technology, has dramatically altered the way supply chain professionals can monitor the health of their ecosystem. Managers, who think about not just the technology changes, but also the shift in mindset as we move more towards “federated,” integrated networks, will be the ones that will avoid extinction in the massive shifts that lie ahead.

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This is about developing and sustaining a deep understanding of the components of customer value while making pre-emptive strategic plans that can better respond to sudden shifts in customer requirements and market conditions. This nimble response will be enabled by a series of dramatic shifts in the way we monitor not only the specific needs of customers for materials, information, services, knowledge, and capability but also to the intangible elements that drive the cost to provide this level of service. We are moving to the era of real-time supply chains that involves understanding and predicting what internal users and customers will need right now, even before they recognize that they need it.

The Next Frontier

Rate Your Supply Chain Ecosystem

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 provide a platform for analytics?

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 aligned with trusting relationships common to everyone?

Good: Is your network seeking to create good by the application of transparency that can drive improved sustainability, integrity, human, and labor rights and expose fraud and counterfeit activities in your global supply chain?

If you answered "Yes" to all, or most, of the above, your supply chain is the picture of health. Two or more "No" responses could mean you need to think about how to leverage data in your supply chain to drive greater alignment in your end to end network.

There are two key core elements of real-time supply chains: velocity and visibility. Velocity is the ability of an organization to drive working capital rapidly from suppliers through end customers. In a single-digit growth world, velocity becomes the only thing that matters. Visibility is 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, and empower these individuals to interpret information and rapidly make decisions in response to data. In concert, velocity and visibility move supply chain activities towards a frictionless and sustainable future. They are the ingredients for driving growth in a flat economy. These principles are not new. Many of the concepts around “lean production systems” have emphasized flow and visibility; however, in the context of supply chain digitization, these concepts have a new meaning and importance.

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Velocity and visibility are only possible to the extent they are today because of the evolution of technology. The establishment of the Internet spurred the explosion of information and the plethora of supply chain management tools and applications now harvesting data, and driving the evolution of “cognitive” computing. This disruption has not fully matured, though, in fact, it is only just beginning.

As organizations start to engage and mediate impacts upstream and downstream, the power of inexpensive cloud-based computing, distributed computing “at the edge,” and the growth of a digital ecosystem will become evident. Those companies who harness these technologies through collective innovation with their supply chain partners will be the ones that not only survive but thrive.

Related Resources

- SCRC Blog: [Supply Chain View from the Field](https://scm.ncsu.edu/blog/) (<https://scm.ncsu.edu/blog/>)
- Video: [Competing with Visibility and Velocity, Tom Linton](https://www.youtube.com/watch?v=JBr4b2Wwbu4) (<https://www.youtube.com/watch?v=JBr4b2Wwbu4>)
- LinkedIn Post: [IoT's Biggest Impact –The Supply Chain](https://www.linkedin.com/pulse/iots-biggest-impact-the-supply-chain-tom-linton) (<https://www.linkedin.com/pulse/iots-biggest-impact-the-supply-chain-tom-linton>)
- Article: [Mapping the Landscape of Future Research Themes in Supply Chain Management](http://onlinelibrary.wiley.com/doi/10.1111/jbl.12131/full) (<http://onlinelibrary.wiley.com/doi/10.1111/jbl.12131/full>)



Robert Handfield, PhD

Bank of America University Distinguished Professor of Supply Chain Management, Poole College of Management – North Carolina State University

Rob Handfield is the Bank of America University Distinguished Professor of Supply Chain Management at North Carolina State University, and Executive Director of the Supply Chain Resource Cooperative (<http://scm.ncsu.edu>). He also serves as Faculty Lead for the Manufacturing Analytics group within the International Institute of Analytics, and is on the Faculty for Operations Research Curriculum at NC State University. Handfield is the author of several books on supply chain management, the most recent being *The LIVING Supply Chain: The Evolving Imperative of Operating in Real Time*, co-authored with Tom Linton, available at www.wiley.com.



Tom Linton

[WEBSITE](http://www.flextronics.com) (<http://www.flextronics.com>) [LINKEDIN](http://www.linkedin.com/pub/tom-linton/2/998/6b6) (<http://www.linkedin.com/pub/tom-linton/2/998/6b6>)

Chief Procurement and Supply Chain Officer – Flex

Tom Linton is the chief procurement and supply chain officer for Flex (NASDAQ: FLEX), a \$24B, industry-leading, Fortune Global 500 end-to-end supply chain solutions company with a global workforce of 200,000 and operations in over 30 countries. Mr. Linton serves as the Chairman of the Board for the Institute of Supply Management (ISM) and serves as Vice-Chair of the World Economic Forum's Global Logistics and Supply Chain Council. Linton co-authored the new book *The LIVING Supply Chain: The Evolving Imperative of Operating in Real Time*, with Rob Handfield, available at www.wiley.com.