Your Supply Chain Is Calling You

How Can We Manage Supply Chains in an Age of Digital Everything and Millennial Complexity?

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Audience:

This is a two-part series.

In Part One, *Digital Displacement?*, we explored the impact of Digital Manufacturing and IoT on Manufacturing.

In this report, *Your Supply Chain Is Calling You*, we explore the effect that complexity and connectedness—*digital everything*—is having on Supply Chain Management.

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Your product is smart and connected: Remote monitoring senses a faulty part. Your supply chain responds—a new part is automatically found in a warehouse. It is drop shipped to the customer site. In parallel, the service technician is alerted, scheduled and routed to the customer.

For some, this is not such a new scenario. But just extend this idea a wee bit. Your channel partner puts in smart displays and RFID. They expect you to monitor and automatically replenish the right inventory as customers pull product from the shelf.

Your supply chain is calling you.

Millions of consumers sign up for the app, scan their bottle and then expect a new carton to be delivered to their current location. Or: their washing machine runs out of soap and you have to dash over to replenish it.

When this supply chain calls, can you respond?

We are in a world of increasing connectivity and complexity. Billions of products and customers are connecting and will drive trillions of transactions, redefining the supply chain. Point of sale at stores is being replaced by points of sale at millions of locations—wherever the customer happens to be at that time.

Are you ready for the digital supply chain?

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Your Supply Chain Is Calling *You*

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A World of Endless Aisles, Infinite Catalogues, Infinite Choices

In a digital world where connected customers are browsing the web on their mobile apps looking for products and services, they have infinite choice.

Infinite Choice!

Customers *search* a retailer with their mobile app, looking for your product, and find that it is not in stock. You want to capture that sale. With infinite choice and consumers who cross channels and brands, it becomes harder to capture and retain customers. But do you really plan to produce and stock this inventory as you continue to generate new ideas and new product releases? In a world of infinite choices the answer *may* be *yes.*

Location Aware?

Consumer *point of sale*[1] is moving beyond the fixed location of store or office to *wherever* the customer happens to be. The supply chain—customers—are calling. To respond, business networks are being built that are location-aware and can respond same day—or in minutes—to customer demand.

These realities[2] require a new model to understand customers and their demands. They also require new production and fulfillment methods to ensure customer-centricity—with profit. In this Omni-connected world, manufacturers, rather than divorcing themselves from customer complexity, need to get more connected to remain competitive.

[1] Customers want fulfillment to their unique location. In Part One, *Digital Displacement-2018,* we discussed the fact that manufacturing is no longer 'a place.' This is even truer for sales and consumption locations.
[2] This is discussed in *Digital Displacement-2018.*

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Is It a Chain?

As Peter Lucas, author of *Trillions,* stated, "We are entering an era of unbounded millennial complexity." He was not referring to fickle fast-fashion shoppers, but the trillions of devices that will have built-in sensors and microprocessors on every person and thing, creating a trillion-node web. To support this infinite digitally-connected web requires us to rethink how we are organized: people, facilities, partnerships and information, and how we run our supply chains.

The reality is that many of the relationships and information flows that are used to design, build, and ship products are not linear, tight interlocking links at all. Today, we are offering our customers choice—customization of products, services and channels. That means a flourishing of supply chain networks that enable segmentation of chains. Segmentation can support unique market requirements and also acknowledge that *any single order may take a unique path from source to fulfillment.*

Beyond dynamic choice, we do know that the world experiences both planned and unplanned events that don't occur in a serial fashion. Global events influence trends and demands, increase risks, and impact how we manage operations. With digitally connected processes and products, dynamic signals challenge the established modus operandi.

Today's order-to-fulfillment looks more like a grid[3] with decision paths that are based on a myriad of channels: unique components sourced from a vast network of suppliers and transported by multiple carriers with complex in-transit hand-offs. This has to work for economic scale *or* that one-time order.

Big Ideas? Big Data?

We have had analytics of various degrees quite a long time in supply chain. But there are many lessons to be learned from hyper-scale companies such as Google, Amazon, Alibaba or Facebook, often the source of big data. They are big influences whose analytics catalyze whole ecosystems of innovative new products and services.

It is important to consider the effect that this grid-*reality* has on our processes and systems. Information needs to be able to flow dynamically and uniquely end to end and provide *rich* data[4] that include conditions and influences on markets and alert us about our volatile world.

Does this imply a one-system approach to managing the grid? That is not realistic—corporations have a history of multiple software installations. *What is surely needed—at minimum—is a flexible foundation that unites processes amongst trading partners, one that breaks down traditional silos* and provides the connectivity and visibility required to respond.

[3] The term supply *chain* is giving way to supply *networks or grids* in response to this reality of changing relationships and technology.
[4] Beyond two-dimensional data, context-aware information.

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The Need for Planning in the Digital Supply Chain

Business cycles are much faster and supply chains are more complex. As one VP of Supply Chain stated, "Marketing used to plan promotions weeks out. Now they plan it on Monday and post on the web for Wednesday. So rather than have two weeks to purchase, price, and get on the shelves in the stores, we have 48 hours."

Consumer electronics now designs, integrates a myriad of partnerships, manufactures, distributes and then begins again, all in a product lifecycle of six months. That used to take five years. Speed to capture market share is now the rule in many industries.

So with so much speed in this digital world, is there a need for planning? Yes, but it will be different. Beyond supply-side planning, manufacturers need to think more broadly about their markets. Manufacturers may have vague notions about demand variability, but they don't really know *why* it is occurring.[5] Traditionally at arm's length from end-customers, they relied on channels. *Those days are over.* By leveraging web data, mobile, and other methods, manufacturers can have *direct engagement* with their markets and customers.

Global economic forces, a new generation of buyers, and an emphasis on sustainability have executives redefining their corporate cultures and finding new source markets for their supply chains. However, these plans for longer term change are often shelved due to day-to-day challenges, causing a mismatch between executive goals and operational activities.

Analyze This!

- Having new channel partners who sell different products may mean lower demand per channel, but more channels and longer-life sales, creating that long-tail demand.
- The web is an infinite catalogue where many products will have much longer lifecycles with much lumpier demand.
- Rich data streams from events, social, and geospatial dynamics influence demand and become a new source of customer insights.
- Demand signals will originate from things—machines that talk to your supply grid.
- Web-based searching creates dynamic pricing, intensifying competition.

Understanding Demand

Both businesses and consumers are looking for more customized products, services, and fulfillment. In a world of infinite catalogues, a consumer may be looking for products at the edge.[6] A new generation of buyers is making decisions that are influenced by social, search and lifestyles—beyond traditional media and limited shelf presentations. And yes, many of the traditional influences

[5] For example, in an unconnected world a manufacturer may have been divorced from the knowledge that the consumer just purchased a new $600 kitchen appliance, when really, they only needed a rubber gasket for the existing product they already owned. No replacement parts? Lost brand and lost customer. In consumer markets, most manufacturers are not connected to shoppers and have no way to identify them individually. Aggregate demand planning measures used by manufacturers don't yield understanding of customer drivers. They also mean retailers can easily substitute other brands.

[6] By this we mean at the edge of your forecast curve—i.e., style, size curve; lower attach rates and so on.

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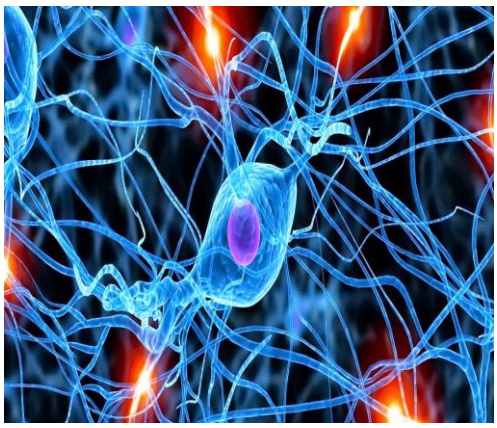
such as lifestyle, seasonality and so on will continue to be part of the picture. But that has never been truly reflective of who customers are and what they really want. In addition, the long tails, those less-often purchased items, can still represent significant sales.



Think of the value of *knowing* that customer demand exists at *that* location. *Here is why you, as a manufacturer, should seize the digital opportunity*: Becoming digital can connect you to the world of *your* customers, leaping over your traditional channels to understand and fulfill *your* customer's needs.

More manufacturers today are opening more direct-sales channels, getting into the Omni-game. But to be successful in Omni-channel means to have accurate demand analytics by channel so that investments pay off. Demand analytics need to be infused with new sources of data and an understanding of new influences. All these influences will require more from planners.

Surely this is not the type of planning that we have done in the past.

What's Needed in Planning?

- New market analytics
- New context-aware streams of data from the web, search, social media and location-based sources
- Inventory planning, replenishment, and allocation systems—a breakaway from spreadsheets
- New demand modeling—new ways to analyze customer groups—by *location.*
- Long tails and short lifecycles

New Forecasting Systems?

Will we have to throw out all our forecasting systems? No. But traditional models need to be enriched with a deeper understanding, not just of customer segments, but the events that influence their buying patterns.[7] The inclusion of more context-aware information is a sea change in how planners work today.

Broader access to information across functions and enterprises informs decision making. Across the grid, if you will, events fire off just as in neurons in the brain, sending signals to partners' real-time analytics. Clearly this means that more integrated, collaborative planning is required. But it also means a lot more and different types of data. Supply chains will be infused by big data: web, visual assets, temporal data (social, location-based, weather and so on) and analog data from sensors and RFID to create a rich fabric—immersing us in our real world. This data can be digitized, captured and stored in 'data lakes,' reservoirs to draw on to derive insights and inform traditional approaches. Over time, our systems learn and analytics become smarter and can propose ever more precise options so that planners can reduce the time they spend chasing errors and spend more time on strategy, communication, and decision making.

[7] If certain conditions are *not* present, why forecast for them?

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The Need for Dynamic Fulfillment Models

Many of the gains that companies make in initiatives such as managing their inventory or rationalizing their supply base are eroded if they lack intelligent execution on the fulfillment side. Unfortunately, that is often the condition today. In fact, last-mile fulfillment is more than three to five times the cost of the inbound. This has created an unprofitable situation just as customers are demanding same-day/next-day, free shipping. *Connected products and location-based mobile sales will increase demand at the last mile, transforming fulfillment models.*

Inbound

Globalized and outsourced manufacturing has created an inbound distribution chain that is littered with warehouses and depots. Of course, as products, customers, and fulfillment models change, companies rethink these models. With our growing markets there are more sales and hence, there is more inventory to manage. How and where will it be stocked in order to fulfill the changing demand and service requirements of the customer base?

This is one area where that accurate picture of the supply chain becomes essential. In order to respond in a timely and profitable way, firms need the ability to bring end-to-end optimization and intelligence seamlessly into their day-to-day execution, blending different modes of manufacturing and fulfillment.

Omni-channel

Omni-channel as a concept is not new to manufacturers. But there are new modes and new approaches to managing it. Bolder manufacturers have stepped out to sell direct, putting suppliers in the fulfillment spotlight. And channel partners may be leaning on the suppliers to support Omni-strategies such as providing inventory visibility through RFID; or drop ship, faster direct store delivery for *pick up from store;* unique packaging and so on. Every day, another retailer or OEM is transferring their shipping from their DC to the supplier's warehouse with a drop ship strategy.[8] That means *manufacturers will shoulder the cost of last mile and be held accountable for exceptional fulfillment services.*

Surely, it is already a different world than yesterday.

New Logistics Strategies?

- Pop-up and seasonal warehouses are growing, experimenting with pick and ship processes and locations.
- Network-wide fulfillment optimization: regional logistics are flourishing with unique inventory based on local demand.
- Last mile logistics: fast shipping options to the end customer; resource, load planning and route optimization to select the best cost/service options; integration throughout the delivery with mobile and telematics to provide visibility to the shipper, carrier and the consumer.
- On-site customer services: selling direct may mean product installation and ongoing services.
- Analyzing options for private fleets, for-hire or new 3PLs.
- And autonomous vehicles, robotics and other automation to ensure exceptional customer service.

[8] Or they are charging the suppliers for warehouse space at the DC!

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The Supply Chain as Operating System

Today, the Chief of Supply Chain, VP of Manufacturing, the Omni-channel executive and the Chief Information Technology officers are business partners forging the path to a new business and operating model for the enterprise, catalyzed by the convergence of many changes. Their goal is to increase competiveness, productivity and enhanced market position.

This partnership needs an operating system for internal and external collaboration. Relying on the grid analogy, if we think about the energy grid, the phone company's communications grid, or a large transportation control grid, we understand the concept of control rooms monitoring and managing the grid's flow of power, information, and so on. The control room is the core of operations. Mostly, things work automatically, but if there are exceptions, the monitoring system alerts personnel that their attention is needed. Doesn't today's manufacturer also need such a concept?

A connected enterprise does not mean people are not involved. In fact, they are more needed than ever. But we need them to *solve more complex problems.* With the new operating system, managers monitor multiple information streams to see markets, customer trends, production, and source market opportunities.

The network of new types of partnerships such as telecom companies who track and create consumer analytics, logistics companies who actually touch customers, suppliers who develop new materials, and innovative customers who design, can all be part of this operating system.

Not only does monitoring the system let managers know "how are we doing," but allows them to strategize and fashion their future.

What's Needed in Fulfillment?

- Rethinking the definition of *Point of Sale*
- Integrated demand forecasting and transportation planning
- More dynamic and frequent network design and optimization
- Network-wide inventory management to support Omni-channel fulfillment
- Automation of the warehouse to synchronize with transportation, load planning and shipment scheduling
- Alignment of warehouse and store picking and packing strategies for Omni-fulfillment
- Revising labor management strategies for a greater role in Omni-channel
- Best method/optimization for fulfillment
- Parcel and last mile strategy.

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Impact on Supply Chain Managers

The role of the supply chain manager has been changing over the last two decades. In fact, two decades ago we did not have VPs and Chief Supply Chain Officers. Supply chain was functionally diffused or reported to the CFO. Now this is an executive post, often reporting in the core CEO team. This is a reflection of the potential—and real—benefits that supply chain can deliver to the enterprise.

And yet…

Many supply chain managers are reluctant to embrace the technology era we are in. *Process automation* of the chain is essential. Employees—and we will get to them next in this article—are absorbed with unproductive activities such as solving data errors, chasing lost or late orders, reconciling shipment data against the customers' receiving data, building and correcting error-prone spreadsheets, and so on. We are building bigger call centers rather than furthering the business goals.

Managers *need* to become more professionally effective—tech savvy globetrotters—if they are to fulfill *their mission*. The supply chain manager's role includes strategic decisions about what markets the company should be in, plant openings and closings, new product launches, sustainability, and designing the supply chain networks of the future. And some are being drafted to run Omni-channel operations, reflecting their broad knowledge about world operations.

Supply chain managers will need to break the internal enterprise barriers, which seems, paradoxically, more difficult than collaborating with partners. This calls for great—greater—people skills. Supply chain managers drive integrated decision making, weaving together procurement and transportation, or sales and custom product sources. This also means they need to explain performance drivers and metrics *in terms that business partners and cross-functional executives can understand*. That calls for multi-view, role-based, personalization of analytics and a personal command of the CEO's language.

The New Employee Model

Millennial complexity is not just about creating infinite connections between suppliers and customers. It's about supporting a *new generation of entrepreneurial innovation*. We have evolved from ideas that once were generated in a corporate lab to ideas generated in college dorms. Today, new ideas are born in the homes of the millennials who are barely reaching high school graduation. Many of these people will be, are, or *should be* your employees. They bring a fresh and much needed perspective on the world (your current or future customers), products, their jobs, and how things could be done today.

These new employees are action oriented, mobile, social, and analytical. However, they are not necessarily good at administrative tasks. *They recoil at paper.* They never heard of EDI. It is not a skill taught in IT programs in college.[9] They *will* question you when looking at overly complex screens with systems that present too much unnecessary data.

How can we recruit and provide a thriving environment for the new generation? Statistics indicate that there is a five-year gestation period to train a college graduate to become a *supply chain operative*. That time can best be utilized by immersing them in the rough and tumble of the business—not burying them in paper and outdated technology.

Mentoring them to help them develop analytical and scenario thinking skills will help them thrive and will make personnel investments pay off. Motivating the millennials to maintain careers in manufacturing will take giving them space to create and innovate.

Millennials

- In 2020, there will be ~8.5 billion people. *5.2bn will live in cities*.
- Today about half of the world's population is under 25. These are 'digital natives.'
- The world's middle-class population grew in the last decade and a half by more than 1bn people and will increase by another 1bn in the next 8 years, with almost half the world's population as 'super consumers.'
- Immigration trends of professional workers continue to grow. Tomorrow's workplace will be composed of 15% to 20% of immigrants who arrive in their chosen country with college degrees in hand.
- Estimates are that 20% to 30% of today's jobs will be fully automated in the next 15 years.
- Over one third of the jobs 15 years from now, don't exist today.

[9] When your EDI team retires, who will replace it?

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CONCLUSION

Harness Technology's Power

Think of the technology power and functionality we have today—and its cost (see side bar). On this platform of low cost and increased processing, the most high-speed analytics will be available to every size business.

The opportunity for business is immense. New vibrant, rich data sources provide visibility *as if we were there*. Autonomous/machine learning will allow us to connect, understand and respond intelligently to what we see. The supply chain can overwhelm people with information, feedback, and noise. But harnessing technology's power, this data can (and will) be filtered and understood through advanced analytics and machine learning to create ever more intelligent responses.

Many senior supply chain organizations have embraced the cloud with these new technologies, often calling them their "ERP for the Supply Chain." Though the analogy may have limited appeal, it demonstrates that they are *hearing that call*, and are embracing the need to connect and manage their supply chains in a harmonious way.

Hear the Call, Get Connected

Your supply chain is calling in this new world of digitally connected complexity.

If you haven't yet, it is time to *step out of your four walls and get connected*. Start *socializing with the industry* and learn of the many advances in business models and technology that will provide those needed gains in competitiveness. In this marketplace, observation and participation will increase creativity.

Supply Chain managers, most of all, need to participate, since we will be most impacted.

Those who do not participate in the future will have no role in defining it!

Technology Transformed

The world's 6.8bn cell phone subscribers are the beneficiaries of ever-shrinking costs and ever-increasing power. China has now produced a $30 Android phone, putting advanced computing and communication power in everyone's pocket.

Though at a slightly slower pace, Moore's Law is still bringing ever-faster processing speeds at ever lower costs.

The latest RFID chips cost less than 5 cents to produce and have ranges of 30 feet to ½ mile.

In the 1980s, terabyte data storage cost over $81,000. Only big businesses could afford these large devices which would take up an entire computer room. Today, any consumer can purchase one for under $80.
Or: Google and Amazon will store your data for you in their cloud; no-frills pricing is about 1¢ per gigabyte.

Data search on Google can process up to 60 trillion pages—in less than 3 seconds.

Predictions vary from 25B to 20T things that will be connected to the Internet. One fact is clear: no one knows, and the number is big.

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