The Future of Supply Chain Management in a Demand Driven World

By Keith Launchbury, CFPIM, CIRM, CSCP, DDPP, DDLP
The supply chain is the heart of a company's operations. To make the best decisions, managers need access to real-time data about their supply chain, but the limitations of legacy technologies can thwart the goal of end-to-end transparency. However, those days may soon be behind us. New digital technologies that have the potential to take over supply chain management entirely are disrupting traditional ways of working. Within 5-10 years, the supply chain function may be obsolete, replaced by a smoothly running, self-regulating utility that optimally manages end-to-end work flows and requires very little.
The Constraint in most Supply Chains is Legacy Technologies

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The Fourth Industrial Revolution

1st: Mechanization, water power, steam power
2nd: Mass production, assembly line, electricity
3rd: Computer and automation
4th: Cyber Physical Systems
The Top 10 Problems with “Supply Chains”

1. Supply Chains assume linear relationships
2. Supply Chains only flow downstream
3. Supply Chains are rigid and inflexible
4. Supply Chains are not integrated
5. Supply Chains plan at the speed of night
6. Supply Chains are cost driven
7. Supply Chains contain far too much waste
8. Supply Chains are too slow
9. Supply Chains contain too much risk
10. Supply Chains are not intelligent
Most Businesses make decisions based on forecasts and costs

• The obsessive focus on reducing costs causes businesses to make the wrong decisions based on mass production and mass consumption
• Planning systems based on forecasts lead to excess inventory and material shortages
• Economies of scale lead to bigger batches, bigger containers, bigger ships and bigger problems
• Efficiency based measurement systems reward maximum utilization, highest output and lowest cost, this leads to higher levels of unsold inventory and does not reward customer service or product flow
Customers do not care about your costs

Customers care about timely, accurate and effective delivery of a service or product at a reasonable price.
Customers care about the potential for loss or delay during transit.
Hanjin, the world's seventh-largest container carrier, filed for bankruptcy in August, 2016 stranding $14 billion worth of cargo at sea as the company lacked cash to pay cargo handlers, tug operators or ports.
Thinking outside the Box

The Munich Maersk is a huge (1200 feet long, 200 feet wide) state of the art Container Ship with a capacity of 20,568 TEU containers, it has a crew of 28 and all the loading and unloading can be done by 1 person.
The Cost of Transportation is out of this World

Shipping a 170lb package with DHL express from Shanghai to London takes 3 times longer, costs four times as much, as buying a human of the same weight an airline ticket!
Adrift in a Sea of Paper

- Dealing with customs clearances, insurance, transfers between sea, road, rail, and air carriers creates a lot of revenue for middlemen.
- There are physical, procedural, and bureaucratic holdups which require freight forwarders to handle.
- Systems are not integrated.
- Systems are outdated.
- Global Logistics is now a $43 trillion industry (2014).
- There is no website for comparative shopping of the best freight rates.

Source: The Economist April 28, 2018
No wonder Shippers are

- 66% of US importers complain that 25% of their shipments arrive late
- 42% said that they spend over 2 hours to arrange the necessary paperwork to arrange a shipment
- 83% say they struggle to track items as the move across the world
- Amazon Prime can deliver to your house at a set time
- But you have no idea when your international shipments will arrive

Source: The Economist, April 28, 2018
But this is about to Change

• The Uberization of Commercial Transportation is on the horizon
• US truckers are running empty for more than 25% of the time they are on the road
• This wasted capacity = 200,000 trucks driving 600 miles every day

• Uber Freight, Cargomatic and TruckerPath are apps to match cargo loads with unused truck capacity
• The vision is to extend these applications to global point to point solutions using multi-modal platforms
Technology is now replacing people employed in traditional supply chain functions

The trend is clear: Technology is replacing people in supply chain management — and doing a better job. It’s not hard to imagine a future in which automated processes, data governance, advanced analytics, sensors, robotics, artificial intelligence, and a continual learning loop will minimize the need for humans:

But when planning, purchasing, manufacturing, order fulfillment, and logistics are largely automated, what’s left for supply chain professionals?
Machine Learning

- **ERROR**
  - Assumes last year’s or last month’s demand value will occur again this month
  - Fits a forecast curve through historical demand quantities
  - Incorporates seasonality, trend data, and moving averages
  - Is often done in Excel

- **Accuracy**
  - Statistically predicts monthly or weekly demand patterns
  - 30%
  - Hierarchy and causal effects are incorporated into the forecast
  - Becomes a nightmare to manage in Excel
  - 50%
  - Leverages more granular and downstream data to get a cleaner demand signal and reduce volatility and bullwhip effect

- 85%
- Includes techniques that are usually associated with short-term demand sensing to dramatically increase long-term accuracy

- 15%
- Takes advantage of extended and even big data to further increase accuracy
- Relies on powerful models to consider demand drivers such as promotional details, new product introductions, social media, etc.

- 10%
- 90%

- Purely reactive

- Evolution of human intelligence
Artificial Intelligence

Machine Learning

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning
- Deep Learning
  - Neural Networks

Reasoning

Natural Language Processing (NLP)

Planning
Areas of Applicability for Supply Chain Digitization
The World needs Strategic Flow Network Designers

In the short term, supply chain executives will need to shift their focus from managing people doing mostly repetitive and transactional tasks, to designing and managing information and material flows with a limited set of highly specialized workers.

In the near term, designers will be needed to set up strategically buffered product flow networks, and analysts who can analyze data, structure and validate data sets, use digital tools and algorithms, and manage demand effectively will be essential.
The Digital Control Tower

A Digital Control Tower is a virtual decision center that provides real-time, end-to-end visibility into global supply chains.
Demand Driven Supply Chain

The flow of information and products across a hypothetical supply chain

**Traditional supply chain**
- Demand spikes 250%
- 1–2 days
- Total: 10–18 days

**Demand-driven supply chain**
- Demand spikes 250%
- 1–2 days
- Total: 4–8 days

Real-time information—no delay in passing information across the supply chain

Sources: BCG analysis and case experience and expert interviews.
Demand Driven Adaptive Enterprise

RELEVANT RANGES

- Operational
- Tactical
- Strategic

Tactical Reconciliation

FLOW-BASED METRICS SUITE

- Operational
- Tactical
- Strategic

Actual Demand

Market Driven Innovation

Demand Driven Operating Model

Demand Driven S&OP

Adaptive S&OP

Operational

Tactical

Strategic
Increased Product Flow to Market & Increased Profit in Return
What is important to Flow

- Visibility to the relevant information
- Velocity of the product and cash flow
- Variability impedes steady product flow
- Value is defined by the customer
- Product that has no value does not flow
- Your customer values flow not storage
Sources of Variability

- Supply Variability
- Operational Variability
- Management Variability
- Demand Variability

Organizational Output

Source: Demand Driven Institute
Mitigating Variability

• The only way to stop the Bullwhip Effect is to stop distortion from being passed between the parts of the system IN BOTH DIRECTIONS

• This is accomplished by “decoupling” and then “buffering” the “decoupling point”
SMART Buffers

- Strategic
- Managed
- Adaptable
- Robust
- Tolerant
Buffer’s Protect Product Flow
3 Buffer Types to Protect Control Points

Stock

Time

Capacity
Buffers Protect For

- Customer Tolerance Lead Time
- Market Potential Lead Time
- Demand Variability
- Supply Variability
- Inventory Leverage and Flexibility
- Critical Operations Protection
Buffers are intentionally flexed up or down in anticipation of planned events or seasons.

**Recalculated Adjustments**

Buffer levels flex as Average Daily Usage (ADU) is updated.

**Demand Adjustment Factors**

Buffers are intentionally flexed up or down in anticipation of planned events or seasons.
Product Flow Networks start with Demand Driven Planning

Demand Driven Planning is a visual product flow positioning and protection system, designed to improve business performance and increase return on working capital.
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# DDP’s Proven Benefits – Camelot Benchmark Study

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<th>Proven Business Benefits</th>
<th>Overall</th>
<th>Life Sciences</th>
<th>Chemicals</th>
<th>Consumer Products</th>
<th>Industrial Manufacturing</th>
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Demand Driven Planning provides the information skills and analytical tools that empower Intelligent Product Flow Networks.