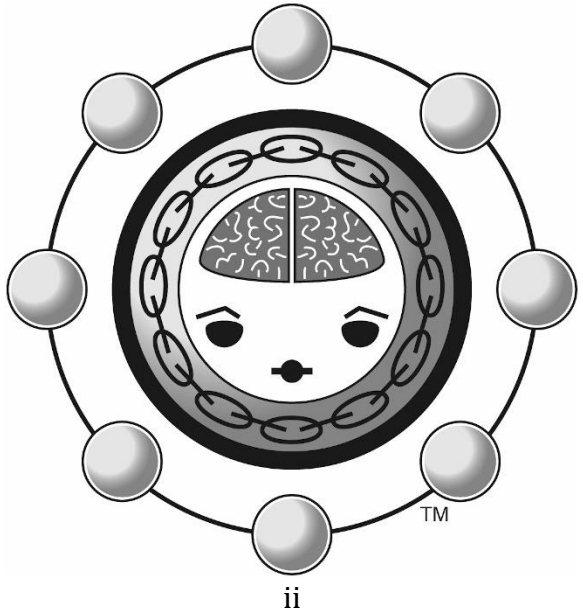
The Shaman's Journal 2019



The Shaman's Journal 2019

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DEDICATION

This book is written for supply chain leaders. The goal is to help organizations to think differently and drive new outcomes.

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Foreword

This is the sixth consecutive year publishing the Shaman's Journal. It is a compilation of best-read blog posts from the prior twelve-month period.

I am humbled that the Supply Chain Shaman blog, now in its tenth year, has over 19,000 readers. I give thanks for the confidence of business leaders in helping me achieve my goal.

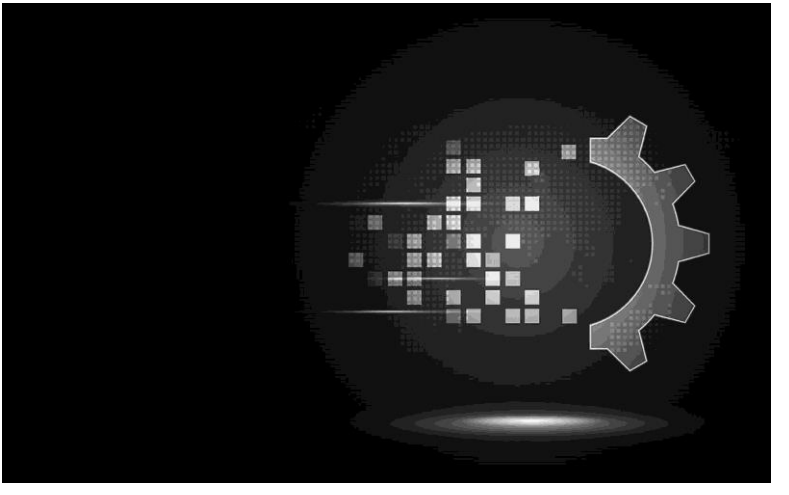
a.k.a. "The Supply Chain Shaman"
Founder of Supply Chain Insights

Section 1

Digital Innovation

Digital Innovation

Opportunities abound. The term digital, while used frequently, lacks a standard definition. This is a barrier. To drive forward momentum, companies need to forge a strategy and define a digital roadmap. Here, we define the term digital as redefining the atoms and electrons to drive value.



Driving Transformational Change

There are over 10,000 change management books for sale on Amazon. So, you might ask, *"Why are so many people writing about change management?"* This question is followed by, *"Does anyone read the books? And, if there are so many unread books, why is Lora writing about change management?"* These are good questions.

Background

Three weeks ago, I attempted to put my life back together from a recent move. Each morning, when I woke-up, I faced an endless pile of boxes. *"Ugh,"* I muttered under my breath as I shuffled from my bed each morning. I started with 350 boxes and gradually worked through about a third. The pile seems to never end. I hate moving as much as I hate taxes.

To lighten the task, I pretend that each box is a gift to myself. Unsure what it is inside the box when I start to open it, I find that each is a connection to my past. My challenge to myself is *"How did I accumulate so much stuff? And, what do I really need?"*

No doubt. Moving is tough. I took a week off from work to try to get my life in order. However, I went right from the fire to the frying pan. The week following the move, I facilitated the 2018 Supply Chain Insights Global Summit.

The coordination of the Global Summit is taxing both mentally and physically. While I love seeing and working with supply chain leaders, there is no way to sugarcoat the work. It takes a toll on my body.

Driving digital transformation is important. New technologies offer great opportunities for process improvement, but the challenge is change management. Here I share thoughts on change management before and after the conference.

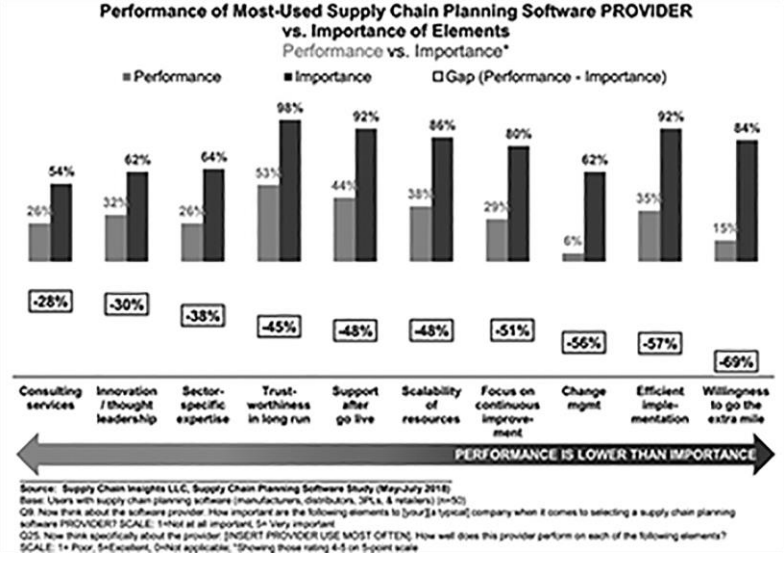
My Thoughts Before the Global Summit

As I complete the mindless ripping of tape from boxes and sorting through the contents, my mind wanders. I thought about the chart in Figure 1.1 and the challenge of change management. I am questioning the business leader's expectation of software leaders in

driving change management. Much to my amazement, in a recent study, I found that business leaders have high expectations for technology providers to lead change management in projects.

Many questions circle my mind. "*Why are business leaders not taking more ownership of change management? And, what makes it so hard? Why would they expect a software provider to lead change management efforts?"*

Figure 1.1. Gaps in Supply Chain Technology Provider Performance in the Eyes of Business Users



Change management is the toughest part of a project, and I feel bruised from recent client experiences. Let me share why. Recently I coordinated a change management project for a major manufacturing company. I don't like doing this kind of work, but a friend begged me to help.

The team worked hard. They made a lot of progress, but the impact was small. Why? The business leader while saying all of the right things at the start of the project was not present to lead the effort. The leadership team missed the check-ins and failed to follow-up on their action items. The result? Frustration for all.

The goal of the project was to test and learn. With demand management as an opportunity, the focus of testing new solutions to understand the potential impact was the focus of the team. There was clear communication that the team could fail forward, but the group was so "scared for their jobs" that failure in a test and learn mode was not a viable option.

Change management *is a systematic approach to dealing with the transition or transformation of an organization's goals, processes or technologies.*

The absence of leadership hindered project ideation. As a result, the team searched for a *"safe path forward."* We attempted to execute a series of small incremental learning projects, but the supply chain planning team wanted a defined project plan with a well-defined *"as is"* and *"to be"* state with a set Return on Investment (ROI).

I pushed hard against the business objectives but hit the change management wall. In many ways, the process of unpacking was cleansing. A way to heal from a tough assignment.

I strongly believe that **only** a business leader can drive a business transformation. A third-party can help, but cannot lead the effort. I felt even more strongly on this belief post-conference.

Change Management Insights

I hand pick the case studies for the Global Summit. Over the course of the year, I look for the best presenters and develop the program based on what I see.

This was the fifth year of the conference. Over the course of developing the program, I see four characteristics of leaders able to drive change:

Ownership. Passion exudes when a business leader drives change. I smiled during the presentations by business leaders at the summit. Pride filled the room. These projects were clearly business-led.

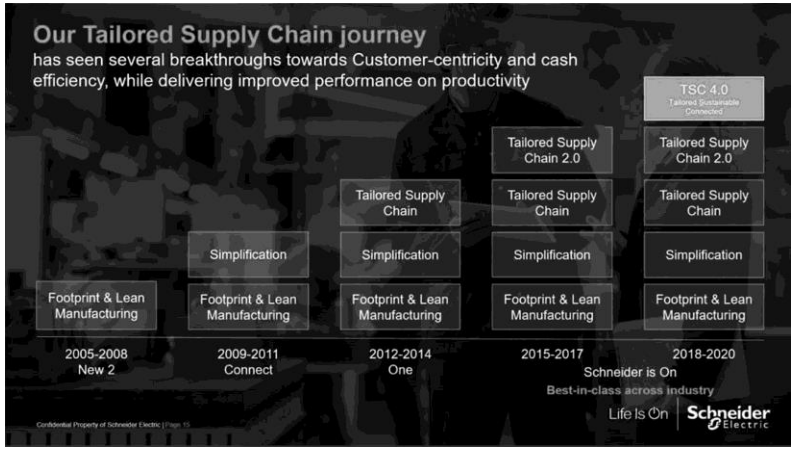
Focus. While technology is an enabler, the best-case studies focus on transformation using technology. The focus is on outcomes, not digital innovation. The best change efforts focus on solving hairy, business problems and improving business results. (For clarity on the importance of what may seem like a nuance, please listen to the case studies in the podcasts at the bottom of this post.)

Definitional Clarity. Nick Lynch, Shell tells a great story to make this point. I think that there are many labels for an S&OP-like process, but I like Nick's story of renaming the S&OP process Integrated Business Value (IBV). Nick's argument was simple. When business leaders ask commercial teams to help with planning, they question the effort because they do not see planning as a part of their job. However, when the focus is on joint value, the culture changes. The focus shifts to outcomes.

Roadmap. At the Summit, leader-after-leader posted their multi-year journey. It was clear that painting a clear picture of change transformation

(shown in Figure 1.2) was essential to align employees to drive the outcomes. To understand, let's reference the Schneider case study/timeline from the conference. This is an excellent example of an actionable roadmap.

Figure 1.2. The Schneider Electric Roadmap



For Schneider, each phase was two-to-three years in duration. Change takes focus and time.
As Mourad TAMOUD, SVP of Schneider Electric spoke, it was clear. This effort was leader driven.

While technologists can help, they should never be asked to lead change management transformation efforts.

Moving is a good time to reflect on life goals and drive change in personal habits. In this move, I am doing both. I know that I will never again put myself in the position of driving change without the support of a visionary business leader. I also now have a greater appreciation for the difference in academic approaches and lasting outcomes. There is no substitute for a visionary leader.

Building Outside-in Processes

Last week, I spoke at a conference in Philadelphia, PA. During the presentation, I spoke on the future of supply chain management, and the building of outside-in processes. In my discussion, I used the chart in Figure 1.3

Figure 1.3. Shifts in Traditional Supply Chain Processes in Building of Capabilities for Supply Chain 2030

Traditional Thinking	Shifts Driving the Digital Transformation
Inside-out Processes	Outside-in Processes
Focus on Efficient Organizational Silos	Design of Value Networks
Use of Transactional Data with a Focus on History • Batch Processes • ERP Architectures • Linear Optimization	Use of Multiple Data Forms: • Design of Processes to Enable data to Move at Multiple Speeds • Use of Unstructured and Structured Data • Open Source
Focus on Response	• Shifts to Sensing to Drive an Intelligent Response
Process Standardization	• Autonomous and Localized Processes

To make my point, I stressed seven points:

New Forms of Data. Defining outside-in processes requires the use of new forms of data--sensor data, unstructured sentiment, rating/review data, return data, point of sale data, weather. These new data types do not fit neatly into the old and traditional architectures or existing processes.

Rethink Demand. Demand is a river or stream. The stream rises from the customer's customer and flows to and through the enterprise to suppliers. In all relationships, there are rocks in the river. It is never smooth. Companies that are good at demand management understand the need for design—form & function of inventory and push/pull decoupling points—-and the orchestration of demand to make better decisions in sourcing, transportation, and delivery.

Redefine the Role of Orders. Orders are not a good representation of demand. In process-based industries, the order changes two-to-three times and 25-30% of orders at any point of time are incorrect.

Trust but Verify. Retail forecasts are never a good source of data for the manufacturer. Before using, test the forecasts to understand the bias and error. Trust, but verify.

Focus on Probability. Demand data is not a finite set of well-defined time-phased numbers. How so, you might say. Each demand number carries a probability of demand.

Move Past Buy/Sell to Sense Purchase. While we have spoken of retail/consumer products collaboration in value chains for the past three decades, the industry still operates in a buy/sell relationship with consumer sales teams working

hand-in-hand with buyers at retail. The more holistic development of programs--CPFR, VMI, data sharing--is at a standstill.

Use Channel Data. Point-of-sale data, testing first conducted in 1968 at Marsh Supermarkets (see picture), is still not used by consumer products companies to determine demand. (In most companies the data sits in the sales account teams.)

The value proposition of POS data usage is unclear. The value proposition is three-fold: a) decreasing demand latency to sense the effectiveness of trade promotions, and new product launch sooner (four-to-six weeks earlier) to improve out-of-stocks, b) ability to manage localized assortment and the c) facilitation/management of test and learn programs.

At the end of the speech, I looked down at the timer on the floor and saw, much to my dismay, that there were only five minutes left for questions. While I normally finish early, I almost ran out-of-time reducing the time for questions.

I faced the audience, shrugged my shoulders and sighed. I value dialogue with audiences and hate to cut it short.

Answering the Question in the Audience

When the facilitator for the event asked for questions, I looked back and saw Pat's raised hand. Pat is a frequent speaker on demand management. I knew that any question from Pat would take more than two-to-three minutes to answer.

Pat started by stating that "He believed in the power of point of sale data." His question was, *"Is there a maturity model?"* In essence, Pat was asking, *"What are the steps to maximize value?"* We spoke for a while, and after the session, I wrote the steps on the back of a napkin for Pat.

Outside-in processes recognize that the order is not the best signal for demand. The focus is on improving demand sensing, demand translation (into manufacturing, transportation, and material processes) and the execution of demand orchestration strategies.

I quickly scribbled the model in Table 1.1. Traditional supply chain processes are supply focused. The concept of managing demand data outside-in with a focus on minimizing demand latency is a tough concept for teams. It is a paradigm shift.

Table 1.1. Demand Maturity Model

	Point of Sale/Channel Data	Demand Management/Demand Sensing	Use of VMI and Channel Processes
Step 1	Experimentation with point of sale data.	Separate demand systems in account teams and the enterprise that do not connect. Focus on reducing error and bias.	VMI/CPFR as an order management process in sales teams.
Step 2	Deployment of a Demand Signal Repository (DSR) platform across sales teams.	Management of multipin demand streams of demand data into the forecasting system. Exception management based on indicators. Focus on improving Forecast Value-Add Analysis	VMI recognized as a demand signal and harmonized with downstream data.
Step 3	Pooling of unstructured and structured data into a data lake combining demand data from all channels.	Experimentation with schema-on-read with a data lake combining structured and unstructured data. Focus on improving time and accuracy to read markets.	Experimentation with cognitive computing using downstream data to drive demand.
Step 4	Models focus on market drivers. Data models built on outside-in processes. Test and learn strategies implementation to drive growth using downstream data.	Use of cognitive computing and machine learning to maximize the value of downstream data and drive insights across sales teams, finance and supply chain. Demand sensing in the short-term horizon synchronized with a longer-view tactical plan. Focus on executing growth strategies.	Pull-based signal based on sensor data: no order. Localized assortment. Cross-functional listening posts to understand local markets based on sentiment analysis.

We then discussed insights from three case studies:

Market Sensing. When summoned to a major chemical company during the Great Recession of 2007, I faced a panel of economists that wanted to know if the rebound would be a "U", a "V", or a "W". I laughed considering it ironic that these economists were asking me. (I sat on the back row of my Wharton MBA classes.)

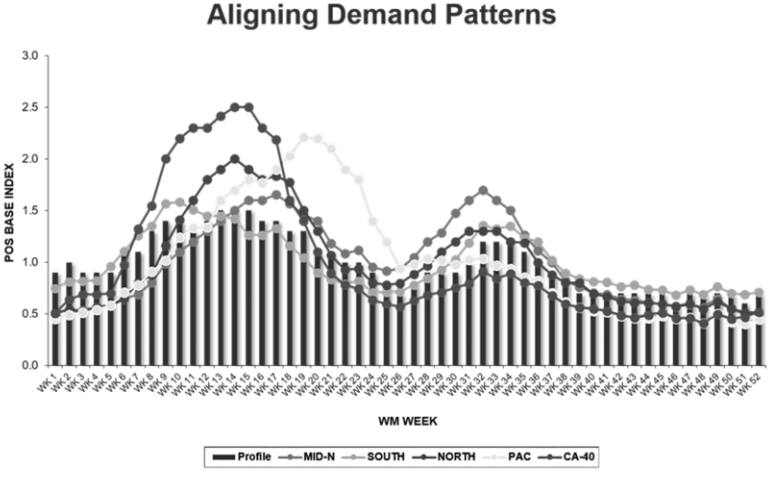
The demand latency for their products was 180 days. The company manufactured paint pigments. The products were a part of the automotive and building supply chains. For both value chains consumer purchase data was readily available, but not used. The company made decisions based on orders and were unaware that there was an extreme market bullwhip effect in the signal.

I worked with the company to implement a process for market-driven forecasting. This worked well through the recession but was not

maintained when the company upgraded to the next version of ERP.

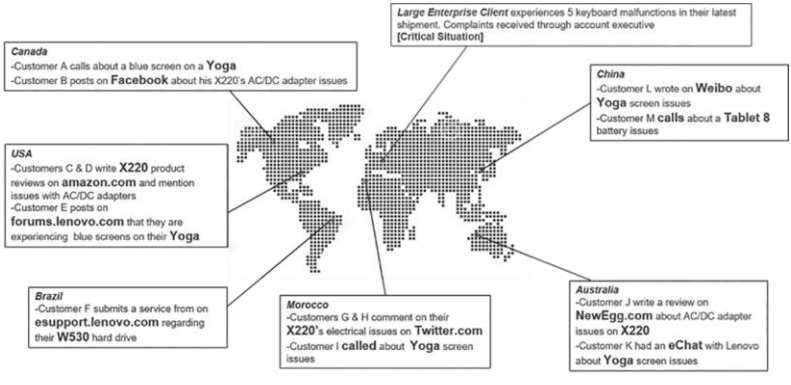
Demand-Driven Replenishment. The second is a story of allergens. The demand latency for this product is 120 days. (Demand latency is the time for the translation of shelf take-away to order visibility.) Demand drivers include pollen counts, pollution and allergen triggers. As a result, as shown in Figure 1.4, distribution shifts are swift and volatile; and the company struggled to reduce shelf out-of-stocks. To maximize out-of-stock issues, the company built outside-in processes with a focus on seasonal triggers. The focus on localized assortment and market-driven replenishment increased sales by 5.8%.

Figure 1.4. Allergy Case Study



Listening. A third case study is the use of sentiment data and the building of listening posts by Lenovo. In this work, shown in Figure 1.5, the company is looking for supplier issues and consumer satisfaction of new product launches by mining unstructured data for review in weekly meetings. This practice improves customer satisfaction and mitigates potential recalls.

Figure 1.5. Listening Post Example



This journey is ripe as a digital transformation project. I always love a discussion with an inspirational leader like Pat, but I love successful business transformation even more.

Healthcare: A Call For Action

In 1960, when I was in the first grade, healthcare spending was 5% of the US economy. Today, it is 17.9%. By 2025, the projection is 19.9%. Yowza! This is trillions of dollars. To put it into dollars and cents, health care spending rose 4.3% to $3.3 trillion in 2016 or a cost of $10,348 per person.

Being a supply chain gal, I think that supply chain leaders can help. My worry is that they are not. In this blog post, I want to drive a call for action.

In Table 1.2, let's look more closely at the healthcare value chain. To understand the chart, let me explain the format. The first value is the average for the period of 2010-2016 while the second number shows the average change comparing 2016 to 2010. For example, for the period of 2010-2016, pharmaceutical company margins averaged 22% (the highest of any industry). Comparing 2010 to 2016, the operating margin improved by 4%. In contrast, the average margin for a hospital is

10% for the period of 2010-2016, but the 2016 margin is down 13% when compared to 2010.

Suppliers to the healthcare value chain enjoy high margins and continue to drive higher profits. However, no pharmaceutical or medical device company has stepped up to redesign the healthcare value chain to improve outcomes and reduce overall costs. In comparison, in the consumer products value chain, P&G, Coca-Cola, Wal-Mart, and Wegmans championed many industry value-chain initiatives.

Table 1.2. Healthcare Value Chain Analysis

Industry Snapshot (2010-2016): Healthcare value Networks

Industry	Year-over-Year Revenue Growth	Operating Margin	Inventory Turns	Cash-to-Cash	Return on Invested Capital (ROIC)	Revenue per Employee (K$)	SG&A Ratio
Pharmaceutical	04% ↓116%	0.22 ↑4%	2.36 ↓9%	136 ↓511%	16% ↓9%	562 ↑346%	29% ↓42%
Medical Device	07% ↑137%	0.18 ↓19%	2.42 ↓119%	168 ↓192%	13% ↓6%	313 ↓111%	36% ↓02%
Hospitals	09% ↑24%	0.10 ↓13%	13.59 ↑387%	-1 ↓47%	05% ↓26%	144 ↑274%	36% ↑05%

Source: Supply Chain Insights 2017, Derived from Ycharts

In national news, we are discussing *"Who pays what."* Instead, I think we need to aggressively attack overall costs. We have a system that is not affordable.

The focus is on "efficient sickness"--checking in and out of hospitals. Instead, I think we need to focus on wellness. This would be a huge transformation.

A baby step is the better management of inventory. Today, it is just too hard to find things in a hospital. In recent research, we find that senior leadership spends 17 hours tracking materials while the non-senior team spends 23 hours of 40-hour workweek

tracking materials. As shown in Figure 1.6, this is significant and a cost drain. It is 30X more manual effort than a counterpart in manufacturing-based supply chains.

Figure 1.6 Manual Tracking of Supplies in a Hospital

I remember the days when I first ran a warehouse for a manufacturing company. It was before warehouse management. In those days, it was impossible to track inventory in the warehouse. I shudder thinking about all of the time that I spent trying to find inventory.

Hospitals benefit from the e-commerce warehouse capabilities —picking of individual items that occurred over the last decade. No doubt about it. A good perpetual inventory signal is essential to supply chain excellence.

Inventory management starts with effective scanning. I visited a hospital last month and only about 2/3 of the items scanned on receipt. This is a pre-requisite for a good perpetual inventory signal.

A hospital is a warehouse that needs automation. To move forward, a hospital network should deploy

cloud-based warehouse management quickly to help the organization.

In consumer goods, Wal-Mart and other large retailers drove bar code scan compliance using fines and penalties to drive improvement. In healthcare, there is no powerbroker, and the richest manufacturers are not trying to address the larger issues within healthcare to improve the cost structure. Maybe the new initiative driven by Berkshire Hathaway, JP Morgan, and Amazon will help. They certainly have a daunting task ahead.

Solving this problem will take a village. It is one that I hope all supply chain leaders in healthcare will support. Let me know your thoughts.

The Stupidity of a Bi-Modal Strategy

Yesterday, I prepared a presentation to teach digital supply chain management for a local university.

Putting it together was like pulling teeth. It took the entire day because I had to carefully piece together prior research from cloud-based archiving. Why? I lost my laptop last month. The good news is that cloud-based services like SlideShare, Dropbox and Box enabled me to easily put together prior research. The bad news is that it took a looooooong time.

As I put together the materials, I reflected. I pondered how digital innovation helped my research model evolve over the last seven years. My focus to help business leaders to better understand the potential of new technologies. I write for the early adopter supply chain leader.

My business model could not exist without digital innovation. I use my LinkedIn Group of 312,000 people as a research panel. The final research is shared as a form of marketing.

The research is independent (no advertising). It is differentiated from the research of other groups trying to push an agenda. Or academic research that is focused on backward-facing models. It is not altruistic. The open content model allows me to make money on speaking, advisory work with supply chain leaders, and small events. It is hard work but fulfilling.

In contrast, when I was an AMR Research analyst (now Gartner), published research was based on a paid research panel. In this process, I could not confirm the role or company of the respondents. There was no ability to correlate results to financial balance sheets. Now, I have access to a panel that can be accessed easily and verified. Using public balance sheet data, I can correlate how business choices drove results. Digital transformed my model, and I strongly believe that it has applicability to most business leaders.

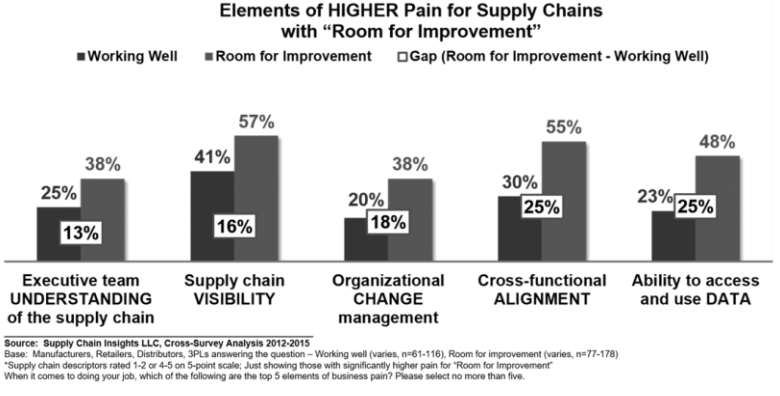
Can Bimodal Work?

Never in my lifetime have I seen the coalescence of so many promising new technologies that can transform supply chain management. The bad news? Many organizations are attempting to use new approaches to make their current supply chains faster. ...or hands-free. ...or paperless. In other words, a continuous evolution versus adopting a step-change in thinking. Much of the flurry is stimulated by an erroneous belief that companies can implement bimodal supply chain strategies.

Before I start my diatribe on bimodal, let me share a story. In my travels, I work with many companies. The focus is on rethinking supply chain strategies. The reason? Companies struggle to drive improvement. At 95% of companies, balance sheet results at the intersection of growth, operating margin, inventory turns and Return on Invested Capital are going backward not forward.

It is hard for companies to drive improvement while performing above their peers in these important metrics. Overcoming this challenge requires strong leadership. Supply chain excellence requires focus.

Figure 1.7. Comparison of High and Low Performing Supply Chains



In our research, we find that companies with better financial results have a better understanding of the supply chain by the executive team. The focus is on cross-functional process evolution and day-to-day activities are steeped in data-driven discussions. In contrast, stragglers are reactive. They push functional agendas focused on source, make or deliver.

These differences are contrasted in Figure 1.7. (In this research, we considered 60 factors. There is no correlation to large projects like the implementation of

Enterprise Resource Planning (ERP) or specific technologies. Instead, it is all about leadership and talent development.)

Reflections

I often use myself as a research instrument. When I stand in front of supply chain groups, I reflect and share my experiences. When I experience organizational patterns in more than fifteen groups, I take note.

This is the case for my experiences last month. In my sessions, companies articulated a brilliant digital strategy, the issue for execution was resources. Many were following a bimodal strategy. I see this time and time again.

A focus on current projects focused on incremental momentum for digitalization--making current processes faster--versus digital transformation. It drains resources. The pull is strong like the Rugby team pulling on the rope in the header image. Continuous improvement of existing processes is known. Digital innovation is new and a bit scary for teams.

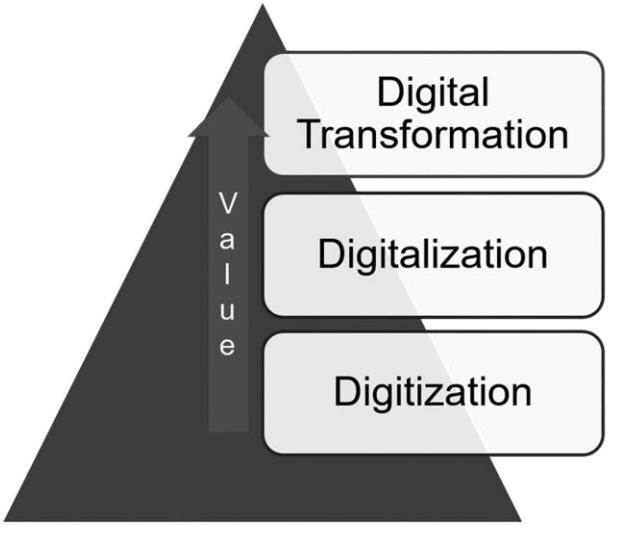
Digital Supply Chain Transformation Definition: Rethinking the atoms and electrons of the supply chain to improve value.

When I ask how supply chain teams can transform the atoms and electrons to improve outcomes (my definition of digital transformation), most teams struggle. Supply chain strategies follow business strategy, and companies are not clear. Most organizations are knee-deep in continuous improvement programs. The efforts

focus mainly on cost reduction. For some, it is a misguided foil for digital transformation.

In discussions on digital transformation, I ask, "*Should companies sell products or package solutions?"* For Ford, this translates to strategies for selling rides versus cars. For healthcare, the question is, *"How can hospitals digitally print medical devices in hospitals?"* For a manufacturer of heating systems, *"Should we stock spare parts or print on demand?"* In AgroSciences, *"It is the focus on selling seeds or crop yield?"* The narrative goes on and on.

Figure 1.8. Stages of a Digital Strategy



Shown in Figure 1.8 are the stages of digital innovation.

Why will bimodal not work? Groups are busy. The teams are caught up in the endless cycle of continuous improvement, technology upgrade challenges, and functional programs. Available resources are a constraint. I see this over and over again. *When groups are tasked to do both the urgent and the important, the urgent always wins.*

In the digital supply chain transformation, companies learn from the past to unlearn to drive transformation. Let's face facts. We don't have the best practices in the supply chain. The industry is full of traditionally-accepted processes propelled by technologists and consultants advocating large, self-serving projects. Unfortunately, there is no Hippocratic Oath to do no harm. Most do not hold themselves accountable to the balance sheet. If we did, the discussions would be far different.

When companies focus on both the urgent and the important, the urgent always wins.

What Is A Bimodal Supply Chain Strategy?

There is a nasty rumor in the market that companies can adopt a bimodal supply chain strategy with a focus on both continuous improvement of current processes and the building of digital transformation strategies. I don't think so. I think that we are fooling ourselves. The reason? The urgent always wins. We are better at product innovation than process redefinition.

Bimodal - Having or exhibiting two contrasting modes or forms.

How Do Companies Move Forward?

Instead, projects should be treated as small sprints managed by stage-gate governance. Adopt a new approach. Just as we manage new product launch through funding and progression through stage gates, digital transformation is similar. The greatest process innovations happen when:

1) Don't Restrict Digital Innovation Projects to Fixed ROI. Process innovation requires funding. The greatest innovations happen when experimenting and driving innovation with new technologies. In these cases, the ROI is never certain.

2) Get Clear. Companies cannot confuse digital transformation with digitalization. When focused on digitalization there is an opportunity cost to the organization--there will never be enough resources to drive digital transformation.

3) Focus on Outcomes. Supply chain strategies need to follow business strategies. In the absence of clarity, supply chain leaders should share examples with business leadership. They must side-step the organizational momentum focused on continuous improvements, system upgraded and process improvement. This is linear thinking.

4) Admit Failure. Forward-thinking can only happen if we accept the failures of current and traditional approaches to supply chain thinking. Customer service levels and inventory levels are worse in most companies that I work with than ten years ago. Companies need to rise above the groupthink of large consultants and technologists. Don't let your ERP migration strategies or a pretty

PowerPoint by IBM on blockchain coopt your digital transformation programs.

5) Patience. Digital transformation takes time. It must be nurtured. I remember when Amazon was a seller of books. In 1998, when I signed up for Amazon services, I never imagined they would power movies for my television while delivering groceries to my home. The supply chain transformation defined and drove the Amazon effect, but it was based on Bezos' vision. Digital transformation is uncomfortable. Much like walking in new shoes, it takes time.

My conclusion? It is just not feasible to do the important while entwined in the urgent. Digital transformation needs new leadership to ensure available resources. One of the most important questions for this leader is *"What should we stop doing to be able to drive a digital vision?"* Or, "*How do I organize teams to focus on the important work of transformation?"*

The decision on where the organization is **not** going to focus is as important as where the organization will align to do work. Conscious choice is a gift to the organization.

Tales from the Road

I rocked on the balls of my feet, took a deep breath, shook off my feelings of anxiety as I faced the audience. It was time to speak on Next-Generation Supply Chain processes.

Being a good speaker is a goal of mine. Presentation skills require work. For me, they do not come easily. To learn, I watch and attempt to emulate great speakers. In my spare time, I work with a coach. On average, I speak to audiences thirty times a year.

To start the discussion on this spring morning, I asked the audience, *"How do you define supply chain excellence?"* As the words sprung from my lips, I smiled knowing that this simple question was tough to answer.

For over a decade, I have attempted to answer this same question. To find answers, I have interviewed over 1000 manufacturing companies, analyzed over 9000 quantitative responses and combed through fifteen years of financial data. The answer sounds easy, but it is not.

The audience squirmed in their seats as silence hung heavy in the air. I let the audience wallow uncomfortably as they struggled to formulate an answer. Slowly voices started to speak with hesitation. *"Lowest cost,"* was the first response followed by the *"reliability of shipments."* As the audience warmed up, these responses were followed by the response of *"the shortest lead time"* which led to a discussion on supply chain agility.

The answers then started to come fast and furiously. The spontaneous brainstorming yielded twenty-five different responses.

Bottom line? A commonly-held definition of supply chain excellence does not exist in the industry. Instead, it needs to be defined for each company based on the supply chain strategy.

Each company usually has five-to-seven supply chains based on rhythms and cycles. Most companies focus on lead times and cycles, but not on the rhythms. The most mature design supply chains selective apply tactics based on both.

The best supply chains are fit for purpose based on design. What are the rhythms and cycles? There are many, but here I share examples in Table 1.3.

Table 1.3. Rhythms and Cycles of a Supply Chain

Rhythms	*Cycles*
Demand predictability	Material lead time(s)
Supply volatility	Finite capacity planning scheduling
Production reliability	Delivery lead time (s)
Seasonal demand	Product lifecycle (s)
Consumer sentiment	Cure time (s)
Bottlenecks	Order cycle time (s)

The Discussion

On a beautiful morning, as the mist rose in the canyon through the window of the conference room, I shared research with the group from the Supply Chains to Admire research. I asked for companies in the room to accept the fact that 95% of public companies are stalled at the critical intersection of customer service, cost and inventory turns. In the discussion, we discussed the *"Why?"*

A gray-haired CEO on the front row asked, *"Could it be that supply chains are more complex and global? "*

"Yes," I responded.

The group continued by asking, *"Have we lost discipline in managing supply chain trade-offs?"*

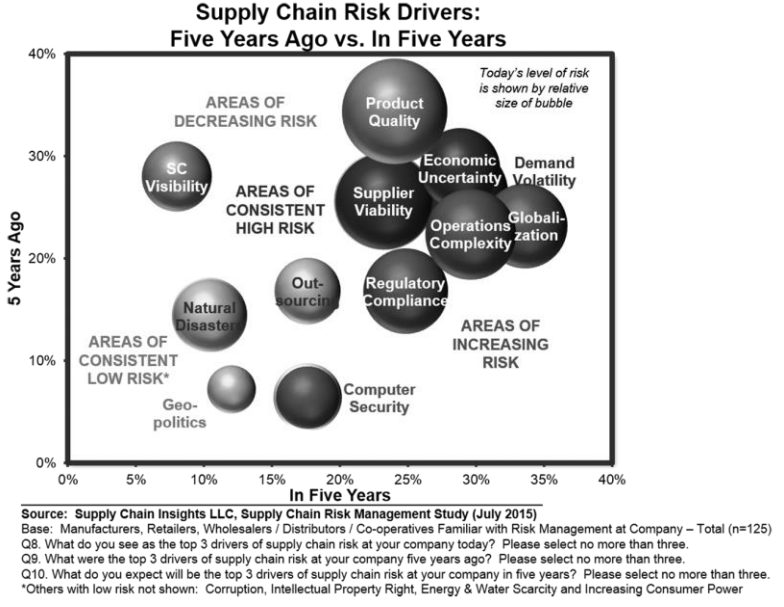
My answer again was a resounding, *"Yes."*

I shared six observations:

1. As supply chains moved from a regional to a multi-national/global focus, it increased not only the size and scale but also supply chain complexity.
2. Product portfolios grew to elongate the tail of the supply chain making it much more difficult to forecast and translate demand.
3. Most companies implemented planning as a technology, not as a decision support system. As a result, too few companies know how to test a planning system to understand if the system is recommending a good plan. As a result, many companies degrade the forecast by 10-30% increasing error making it much more difficult to manage the supply chain.

4. Supplier viability deteriorated due to the elongation of payables, climate change, and trade issues.
5. There is a weakening in supply chain talent in the area of planning. Talent is scarce and the number of people understanding planning is a constraint.
6. Demand volatility is a growing risk.

Figure 1.9. Supply Chain Risk Drivers



Source: Supply Chain Insights LLC, Supply Chain Risk Management Study (July 2015)
Base: Manufacturers, Retailers, Wholesalers / Distributors / Co-operatives Familiar with Risk Management at Company – Total (n=125)
Q8. What do you see as the top 3 drivers of supply chain risk at your company today? Please select no more than three.
Q9. What were the top 3 drivers of supply chain risk at your company five years ago? Please select no more than three.
Q10. What do you expect will be the top 3 drivers of supply chain risk at your company in five years? Please select no more than three.
*Others with low risk not shown: Corruption, Intellectual Property Right, Energy & Water Scarcity and Increasing Consumer Power

As I ended the presentation with the image in Figure 1.9 outlining these shifts, I asked for questions. Here I share the Q&A to help groups learn.

Questions from the Audience

The group was animated as we entered the Q&A portion of the presentation.

Q. Have Companies Successfully Integrated Customer Relationship Management (CRM) and Demand Planning?

A. The short answer is No. The focus of a CRM application is improving sales efficiency to drive revenue. By definition, CRM is a functional application.

Efficient functions do not yield effective organizations. Historically, applications focused on making all functions--sales, marketing, customer service, operations, and supply chain--more efficient; do not make the organization more effective.

Let's take some examples. The data models within CRM do not flow well to demand planning; and the sales teams, by definition introduce high bias and error due to sales incentives. My take? Traditional CRM approaches are not worth the trip. Instead, focus on being market-driven (use of customer signals back into the supply chain) not a sales-driven effort (a focus on sales efficiency).

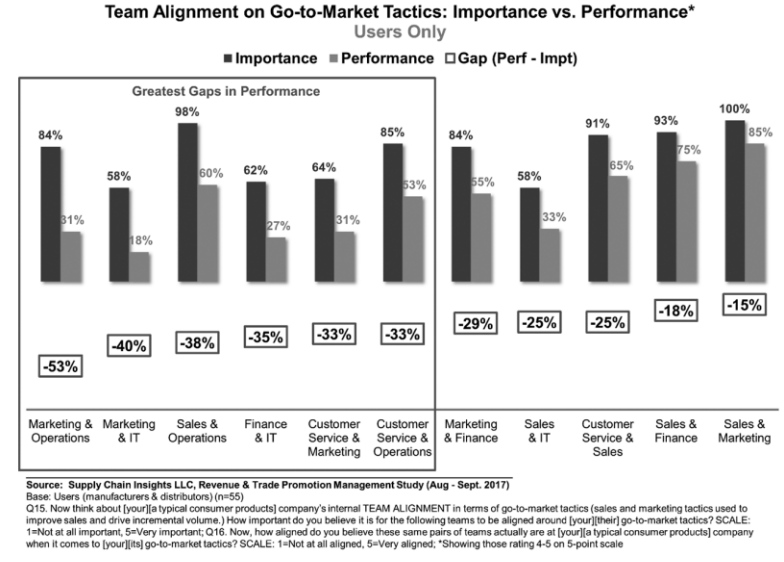
Q. What Do I Think of the Current State of Supply Chain Management Education?

A. At the end of the discussion, I shared that the supply chain is a complex non-linear system and the need for a balanced scorecard. This prompted a gray-haired CEO, to raise his hand. He asked me to comment on the current state of education.

I thought long and hard. My struggle? I want to support higher education, but I have doubts. Supply chain leaders need strong analytical skills that I don't believe that they are getting in the marketing department in the school of business. I find it ironic that the function with the least synergy with supply chain operations

(marketing) is responsible for the supply chain curriculum in today's supply chain program. The lack of organizational alignment is shown in Figure 1.10.

Figure 1.10. Organizational Alignment



Q. With the Evolution of the Internet of Things and Better Market Signals Will We Still Need to Forecast?

A. The simple answer is *"yes."* When it comes to forecasting, there is more confusion than understanding. One misunderstanding is that all items are "pull" and replenishment is a flow from the market. The reality? It is not that easy. Most organizations have a mix of push and pull. Items like a new product launch, trade promotions, and market displays are "push." We cannot broad brush the requirements.

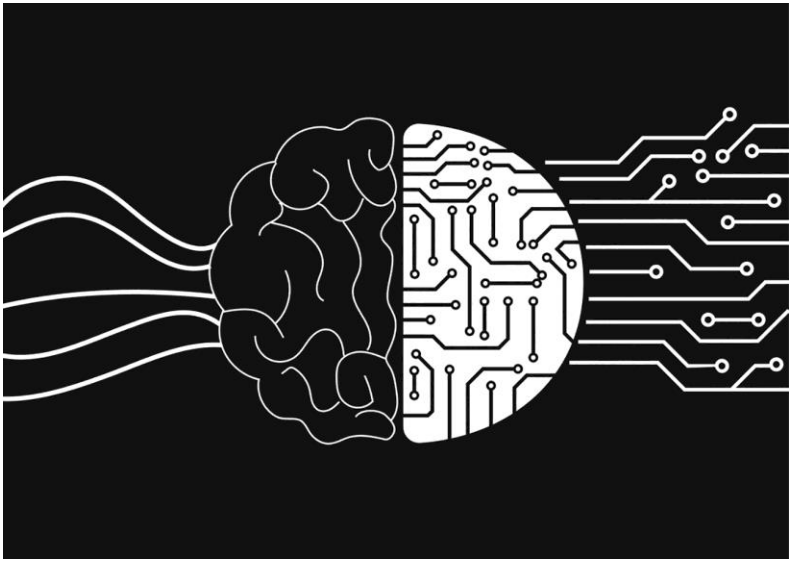
The most critical role of forecasting is the translation of demand error to aggregate buying strategies in sourcing. In short, while the Internet of Things will aid short-term replenishment of pull-based items (deployment), it will not be a replacement for

forecasting; and companies that win will use forecasting to help aid orchestration from the market (customer) to market (procurement) to develop buying strategies and go-to-market planning.

Q. The Terms Used Are Foreign to Me. I Feel Lost. How Can I Keep Up with New Technology Approaches?

A. My answer? This is a great question. Join the club. You are not alone. My advice is to raise your hand often at conferences and ask the tough questions when you don't know an answer. Network and be a sponge. In the process, learn from the past, to unlearn to rethink the future. If you think that you know the answer, you're learning curve will be slower.

I hope that this helps. I will be teaching this Thursday and speaking on the future of analytics next week. Maybe, I will see you in my travels. If our paths cross, please take the initiative and introduce yourself. I would love to hear from you.



Driving Digital Metamorphosis

Metamorphosis, by definition, is a change of the form or nature of a thing or person into a completely different one, by natural or supernatural means.

The best example of metamorphosis is a butterfly. The beautiful butterfly begins as an ugly larva. To grow into an adult, they go through four stages: egg, larva, pupa, and adult. Each stage has a different **goal** - for instance, cater*pillars need to eat a lot, and adults need to reproduce.*

"Can a company reinvent itself? " asked Laura at a recent client meeting. *"Seldom,"* I responded. As I spoke and looked into her eyes, I wracked my brain for examples of companies' metamorphosis.

We each talked out loud and struggled to find examples. Shortly, we admitted defeat. My examples, while showing promise were not a metamorphosis. Dow Corning built Xiameter. We spoke of Land O'Lake's new vision for agriculture and Cisco System's journey to move from products to software. I also referenced TSMC's design network and its vision to transform its role in the semiconductor industry. In the end, we concluded that true disruption usually starts with a new business model from start-ups like Amazon, Google, and Tesla.

While companies speak of customer centricity and outside-in processes, traditional companies struggle to disintermediate channel relationships.

Reflections

Through the process, the group was quiet. Then Ralf, a leader from a large process company, commented*, "We have been very focused on effectiveness and efficiency. We do not know what digital means. How do I change the basic paradigms in the human mind of my team?"* Peter, at another company, stated, "*We do not have a word in the German language for Digital Transformation. As a result, we are very focused on digitization. I think that we are trying to put today's processes on steroids."*

The conversation went round-and-round. My observation is that many companies want to become digital, but they lack a clear definition. They confuse the term digitization, digitalization, and digital transformation. Here are the definitions that I use with clients:

> **Digitization:** Conversion of data elements into digital workflows. Conversion of paper-based processes to bits and bytes.
> **Digitalization:** The conversion of work processes into digital flows using the Internet of Things,

Sensors, Wearables, Robotics, Open-Source Analytics, Cognitive Computing, and 3D Printing.
Digital Transformation: The transformation of the atoms and electrons of the supply chain to define/deliver new outcomes. This third stage uses the confluence of technology innovation, but the focus is on organizational transformation to deliver new value propositions. An example is a move from selling books to building an environment for writers to product online digital editions. Amazon did not just sell books online. Instead, they redefined processes for book creation. Apple did not just deliver a phone. The company redefined entertainment possibilities.

Start by Questioning Outcomes

While many companies speak of driving a supply chain digital transformation, few feel empowered to question the outcomes. Many get stuck in an analytic paradigm focusing only on improving data quality and analytics. What is the outcome? In short, it is what is sold.

Traditionally, the focus of the supply chain was squarely focused on the mass customization of products. The desired outcome was the successful replenishment of an item sold at a location. What if this could change? Let me give you some examples. The traditional agricultural company sells seeds and additives to improve crop yields, but what if they sold a service to farmers guarantee crop yields? The automotive supply chain traditionally sold cars, but what if they shifted based on the dynamics of the market of the collaborative economy to selling rides? The post office delivered letters, but FEDEX built a new model on guaranteed delivery of overnight mail. The traditional automotive part distributor stocks parts, but what if they could print

parts on demand? Hospitals focus on efficient sickness: check-in, bed management, and check-out. What if there could be a shift to wellness?

The first step in driving a digital transformation is to define the outcome and imagine what could be. Define the atoms and electrons of the supply chain and what it means for customers.

Driving Transformation

In driving the transformation, teams need to question existing paradigms.

A struggle for the supply chain group is that the term supply chain in many organizations is often defined as another function within a functional world. As a result, the team does not feel empowered to question the outcomes and redefine flows from the customer back.

Likewise, no function within the company feels empowered to drive this change. Change this by building a cross-functional team and empowering holistic thinking.

The worst place to start to drive digital innovation is with the Information Technology (IT) team. In the organizations where I do advisory work, these efforts struggle the most. Why? The steady march for IT standardization, along with the failed promises to deliver value is a problem in most organizations. To compound the issue, a common mistake is using the digital transformation platform to continue their work on IT standardization and ERP upgrades. This type of focus is doomed for failure. The answer to digital transformation will not come from a technology vendor or an IT organization.

Organizational Models

In several companies, I am working hand-in-hand with business teams trying to redefine outcomes. The companies are taking different approaches with more promise.

Industry 4.0? Industry 4.0 initiatives typically focus on driving digital manufacturing outcomes. The manufacturing process redesign combines the use of the Internet of Things from pumps, valves, motors, etc. along with analytics, robotics and 3-D printing to redefine manufacturing to improve uptime and drive capacity improvements and quality yields.

Normally, there is a redefinition of maintenance from a focus on the mean time between failure to equipment sensing and repair based on real-time information. I am also intrigued by the use of blockchain and open-source analytics to automate track and trace and improve quality. These initiatives —within the world of manufacturing —are usually well-funded and moving forward with few issues.

Newco? Spin-off Another Company? When craft beer became a threat to AB/INBEV, the Company formed Zx Ventures. The new start-up staff, composed of young innovators, was tasked to redesign the beer experience. The new company started in 2015. Now in its third year, I see the Newco actively questioning the status quo. I think that it is too early to judge the impact.

Digital Overlay Team? At Corning, there is a digital overlay team designed to help groups within the company drive digital initiatives. While there is always a tension between the layers of the traditional company structure and the digital

overlay team, we are seeing progress in Corning's thinking.

Sprints. Sandeep Dadlani moved from Infosys to Mars to drive digital innovation. His focus is on data science using design thinking through a series of sprints. A sprint is a small and focused effort to test a new approach. The focus is to solve business problems through new approaches based on business value.

Innovation Centers? In 2019, Dow opened the Dow Innovation Center. This work is championed by Jim Fitterling, the new CEO. The concept is experiential learning. The driver is fear. Jim is worried that Dow will be "Amazon'd" and face a new competitor that will redefine the chemical industry. He wants to be the first to innovate. At the innovation center, Dow employees can experience new technologies and ideate on the application in their business through hands-on use cases and team facilitation/ideation.

Recommendations

Which method works best? We don't know. However, no matter the approach here is my guidance from observing the teams at work:

Build A Change Engine in the Business. Create an environment that embraces change. Reward change agents and unleash creativity through corporate programs like test and learn to fund shark tanks, lunch and learns and ideation days. Curtail funding on the status quo. Let the imagination and spirit flow.

Free the Team to Do Work. It is hard to do digital innovation as a second job. Fund it. Staff it and enable progress.

Have Fun! People like to have a good time. Stories, podcasts, songs, and events help to drive celebration and communal spirit. Celebrate success. I used to work for Dreyer's Grand Ice Cream and we had a principle termed HOOPLA. As an employee, I always found it amazing that even in tough times the founders embraced the principle of HOOPLA. It made a difference.

Build a Cross-Functional and Diverse Team. While many companies only seek millennials to staff digital initiatives, I caution to focus on diversity. This includes different thinking types, backgrounds, and experiences lead to better outcomes. Make sure that there are no disenfranchised employee groups.

Focus on Value. As you go, market and communicate value. Don't focus on digital for digital sake. Lead by using digital innovation to drive value.

I hope this helps. I hate to see leaders in a fog.

Section 2

Improving Sales and Operations Planning

Improving Sales and Operations Planning

Sales and Operations Planning (S&OP) is a pivotal supply chain process to drive value. In the implementation and evolution of S&OP, change management issues abound.

March of the Lemmings

Lemmings are misunderstood. So are supply chain leaders.

What is a lemming? Simply put, a lemming is a small rodent. Active in Arctic tundra ecosystems, they are part of the superfamily Muroidea, which includes rats, mice, hamsters, and gerbils.

A lemming population rises and falls. Sometimes there are large migrations that result in mass drownings. Over the last decade, the sharing of videos of lemmings jumping into the sea emerged as a metaphor for business leaders blindly following a disastrous path. In this blog post, I share quantitative research, mixed with stories, of Sales and Operations Planning (S&OP). Let's face it, we have acted as lemmings over the last decade in the implementation of S&OP.

The Preamble

As an industry analyst in the supply chain planning market for fifteen years, this month, I will publish my tenth report on S&OP. The first report was published when I working at AMR Research (now Gartner) in 2004. (Being the original author, I laugh when technology companies attempt to explain the Gartner S&OP maturity model to me in briefings. I get it. I wrote it. If only I knew then what I know now.)

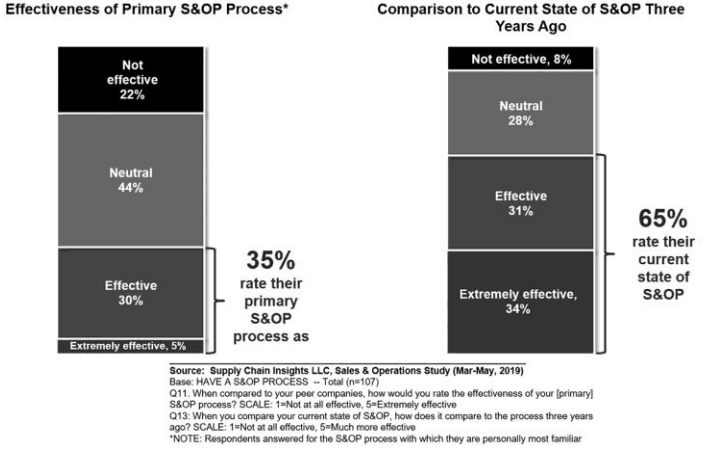
The Research

Topline results of recent research on S&OP processes? Manufacturing companies are statistically less satisfied with their S&OP processes in 2019 than they were in 2016 at a 90% confidence level. As shown in Figure 2.1, progress is stalled. (The slide is precipitous.)

Let me start by sharing some insights on research methods. This research is based on my LinkedIn Group as a research panel. This is very different than the work that I did at AMR Research where the panel was hosted by a third-party firm. The difference? I know all my respondents and I can validate their employment. This was not the case when I worked at Gartner or AMR

Research. When a third-party panel is used, the researcher cannot validate the respondent data.

Figure 2.1. Effectiveness of S&OP Processes in 2019 and 2016



This research is based on a sample of 107 manufacturing respondents. This chart reflects their responses to the effectiveness of their 2019 S&OP processes to the perceived effectiveness of their processes in 2016. The comparison comes from the same study with the same population.

In parallel, I have analyzed the 2019 effectiveness of a tracking study. This study of 120 manufacturing respondents was fielded in 2015. In the research, I used the same question on effectiveness. The results are very similar to what is shown in Figure 1 (varying by only 2-3% on effectiveness). So, I feel confident saying that the effectiveness of S&OP declined over the past three years for manufacturing companies greater than 5B$ in annual revenues. The quantitative research also matches my personal experiences with clients.

What Makes a Difference?

These results raise the question of WHY? Was it technology? Process definition? The difference cannot be explained by the type of technology used, or the consulting partner driving the implementation. All companies--with effective and less than effective processes struggle to get access to data, and lack alignment between commercial and operational teams. Effective S&OP takes work. The best results happen with enlightened leadership.

We are still testing the early research findings, but the role of the budget and the impact of financial leadership shows some statistical significance between effective and less successful S&OP processes. The differences are shown in Table 2.1.

Table 2.1. Differences Between Effective and Less Effective S&OP Processes

Company's Financial Budget		
	Effective S&OP	Other
	A	B
The budget is an input to the S&OP process, but does not constrain it	50%	37%
The S&OP process is an input to the budget, but is not constrained by it	33%	24%
Revenue goal alignment is determined by the data output of S&OP	23%	46% A
Budget goals drive and constrain the S&OP process for inventory	17%	22%
Cost goals in the budget are updated based on the output of S&OP	13%	19%
We do not use financial data in our S&OP process - ANCHOR	10%	6%
Other (please specify)	10%	6%
Don't know ANCHOR	3%	-

Source: Supply Chain Insights LLC, Sales & Operations Study ((Mar-May, 2019))
Base: HAVE A S&OP PROCESS -- Effective S&OP (n=30), Other (n=54)
Q21. Which of the following describe the role of your company's financial budget in your [primary] S&OP process?
AB Higher than other group at 90% or higher level of confidence

The tight coupling of the budget to the S&OP process is detrimental. The budget is obsolete when published. Why? Markets change. They are not static. S&OP's role is to maximize opportunity and mitigate risk while following the principles of the budget. What does

this mean? For example, instead of integrating cost data, analyze costs based on mix variance against the goals of operating margin. Similarly, analyze inventories based on strategy versus integrating budget data. The focus is on balance sheet performance. Only lemmings tightly integrate financial data to supply chain analysis.

Businesses are complex. A manufacturing company with annual revenues greater than 5B$ operates seven S&OP processes and is dependent on five technologies. Only one in two companies execute the plan developed in the S&OP process. My take? Opportunities abound. Companies have not improved organizational alignment or S&OP execution over the last decade.

Sharing Stories

In my interactions with clients, I encounter many scenarios where I shake my head in disbelief. No, I am not surprised by the results of this preliminary research finding. Let me share some stories to help you understand my point of view.

> **Governance.** I work with one company with 27 divisions and complex vertical integration between regions, divisions and third-party organizations. When I started working with this large company, regional commercial teams drove decisions. With the implementation of S&OP, each region defined very different processes--different calendars and planning engine hierarchies. As a result, the company, at the end of the five-year implementation, is unable to roll-up data to a corporate level to analyze the forecast or capacity planning. The gap? The lack of clarity of regional/global governance and the need for consistency in technology deployment.

Modeling. A large system integrator implemented planning in a chemical company for services of $5.4M without a material balance. (A chemical company's supply chain backbone is a material balance. Yield, grades, and process flows are essential to the modeling.) As a result, demand translation into supply was not possible. The consultants, with a consumer product industry background, did not understand the concepts of grades, tolling, reverse bill of materials, and envelope flows. As a result, they implemented the wrong model. S&OP is industry-specific requiring domain expertise. In contrast, I recently interviewed a successful project implemented for substantially less by internal resources with minimal involvement of the technology provider. Training, a focus on modeling and leadership goal clarity drove business results.

Focus on Planning Excellence. A large food manufacturing company has fourteen poorly implemented planning instances. The technologies, implemented by a large system integrator, degraded the forecast by 31%. The implementation focused on implementing the technologies versus driving process excellence. The demand management technology lacked backcasting testing (use of history to tune the forecasting engines), and the organization was not holding themselves accountable for Forecast Value-Added (FVA) measurement. The leadership team openly admitted that they did not know how to measure and manage demand.

Get Rid of the Fire Fighters. A supply chain team improved forecast accuracy by 22% but did not improve inventory or customer service. The reason? Internal measurements rewarded firefighting and reactive behavior.

The COO had a monthly reward system for the most responsive plant scheduler. He asked customer service each month which plant scheduler was the most responsive to customer demand and invited this plant scheduler to lunch at the corporate office. There were 35 plants in a global organization and having lunch with the COO was a big deal. The program may sound good, but it resulted in the short-cycling of the manufacturing equipment. of costs.
When organizations are reactive, S&OP performance is statistically less effective. The COO effectively built a program to reward firefighting.

Figure 2.2. Characteristics of Effective S&OP Processes When Compared to Less Effective Processes

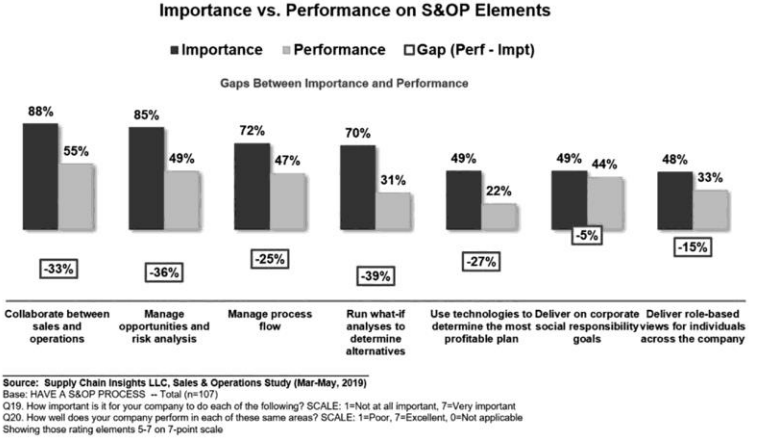
Supply Chain Descriptors*				
		Effective S&OP	Other	Gap (Effective – Other)
		A	B	% Point Difference
POSITIVE ATTRIBUTES	Agile	23%	22%	+1%
	Outside-in	27%	31%	-4%
	Proactive	37%	26%	+11%
	Risk-taking	23%	24%	-1%
	Controlled	30%	22%	+8%
	Aligned	20%	28%	-8%
	Working well	57%	43%	+14%
NEGATIVE ATTRIBUTES	Fixed	33%	37%	-4%
	Inside-out	30%	26%	+4%
	Reactive	27%	43% A	-16%
	Cautious	37%	41%	-4%
	Uncontrollable	43%	43%	0%
	Independent silos	33%	37%	-4%
	Room for improvement	13%	30% A	-17%

Source: Supply Chain Insights LLC, Sales & Operations Study ((Mar-May, 2019))
Base: HAVE A S&OP PROCESS -- Effective S&OP (n=30), Other (n=54)
Q29. For each of the following pair of words, please pick the one that best describes your company's supply chain today.
AB Higher than other group at 90% or higher level of confidence

Fads. In the supply chain, there are many fads that drive the Lemming cycle. One alive and well today is the concept of the connected Supply Chain. The data from sales and finance were tightly connected, but they could not understand the implications of mix variation, or model a feasible plan.

Connecting data is easy. Effective modeling-- simulation and development of playbooks-- is more difficult. One of the largest process gaps of S&OP processes is "what-if modeling." To understand the gaps for the respondents, check out the gaps in Figure 2.3.

Figure 2.3. Performance and Importance Factors of S&OP



Source: Supply Chain Insights LLC, Sales & Operations Study (Mar-May, 2019)
Base: HAVE A S&OP PROCESS -- Total (n=107)
Q19. How important is it for your company to do each of the following? SCALE: 1=Not at all important, 7=Very important
Q20. How well does your company perform in each of these same areas? SCALE: 1=Poor, 7=Excellent, 0=Not applicable
Showing those rating elements 5-7 on 7-point scale

Conclusion

As companies act like lemmings-- believing that large technology projects drive supply chain excellence--we will perpetuate this trend. Instead, small projects implemented by knowledgeable supply chain leaders drive competitive advantage. The answer? S&OP is 60% change management, 30% process and 10% technology.

Don't blindly follow the crowd. Avoid large projects from big system integrators. Focus. Align and be aggressive in driving process excellence to build sustaining value.

Let me know what you think. I welcome your feedback.

Sales and Operations Planning: Making Decisions at the Speed of Business

Yawn.

I spent time this week completing reference calls on the use of S&OP technologies.

Seeking the next sequel in technology adoption, I want to write about how the confluence of new technologies changed companies' abilities to improve decisions. Based on the reference calls, I am not sure that this will be possible.

What am I hearing? Eerily the case studies sound the same as the ones heard when I completed S&OP research in 2004. Fifteen years later, I expected more. As an analyst in the space for more than a decade, I struggle with why we are not making more progress in the

adoption of new technologies for an important process like S&OP.

So, to find the new sequel, I also interviewed new technology entrants. In these interviews, I find a different problem. The solution overviews littered with vagueness --terms like "digital", "digital transformation," and other hyperbole-- pollute the positioning of software solutions. As the bright teams spin their message, I struggle to understand what is new. And, when it comes to their case studies, I do not find the step change.

As a result, after three months of research, writing the sequel on the development of S&OP technologies is a challenge. The reason? Not much has changed in technology approaches; and most companies, over the last decade, went backward not forwards on S&OP maturity. Why? There are many reasons:

Business Complexity. Companies average ten ERP and five Advanced Planning Solutions. Getting to data is a barrier for 60% of business users. In parallel, the movement to global processes and the elongation of the long tail of planning increased complexity making modeling more difficult.

Dependency on Excel. Due to the shortfalls in the evolution of Advanced Planning, 68% of business users use Excel spreadsheets as the primary mechanism for planning. This is especially true for processes dependent on the ERP-based solutions from Infor, Oracle, and SAP. The result? Siloed thoughts. Excel--while widely used for planning-- is not equal to the challenge of modeling complex supply chains.

Clarity on Supply Chain Strategy. Driving supply chain excellence is a balancing act. Teams continuously balance cost, customer service, asset utilization, and inventory. Companies making

progress are clear on the definition of supply chain strategy. For most --hamstrung by silo-based strategies for source, make and deliver-- there is no clear definition of supply chain strategy.

Employee Turnover. Many organizations are in their second and decades of using advanced planning. Employee turnover eroded the knowledge base. A solution well-implemented in two decades ago is not equal to the challenge of the business today. For example, in many of my clients, a well-implemented demand planning solution two decades ago is now degrading the forecast 10-15%. Companies have not maintained the engines or implemented measurement discipline.

Hype. Terms like connected planning and DDMRP add to the confusion. Sales and Operations planning is a cross-functional process requiring more insights than financial budgets and/or material plans.

Am I right? As a researcher, I validate observations through quantitative research. Combining qualitative interviews, quantitative studies and post-study reviews with supply chain leaders helps me gain clarity. I am on this journey.

What to Do?

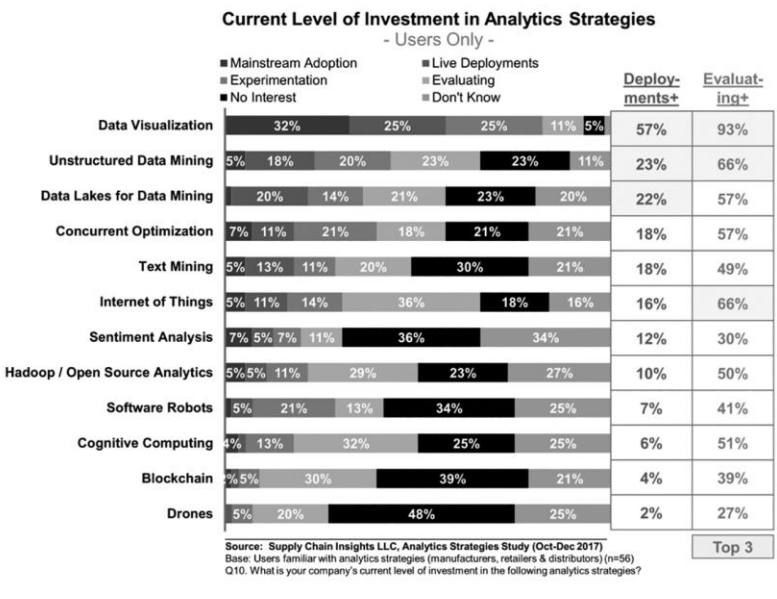
My advice to business users?

Take a pause. Maximize the value of today's solutions. Don't rush to buy. Let the noise clear. We are the cusp of the redefinition of planning. The combination of cloud, cognitive computing, and open-source analytics is evolving. Innovation

over the course of the next two years will make today's solutions obsolete. Advice? Focus on maximizing the use of your current technologies by cleaning data, improving forecast measurement and building planning master data.

Invest in Descriptive Analytics. Allow business users access to data through the use of descriptive analytics. Layer descriptive analytics technologies on top of planning technologies. To improve S&OP execution, focus on helping business users access data at the speed of business. This means less focus on traditional reporting, ERP and portal strategies. Make discussions data-driven using descriptive analytics layered on top of complex technology landscapes. The average company has five-to-seven S&OP processes and seven-to-eight advanced planning technologies. As a result, as shown in Figure 2.4, getting to data is a barrier.

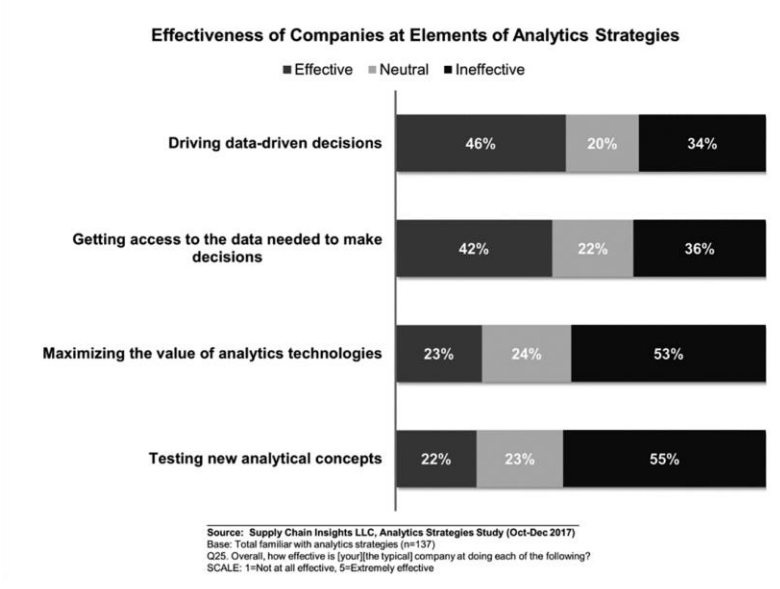
Figure 2.4. Current Focus of Analytics Investment



Focus on Self-Service. Using new forms of descriptive analytics, helps business leaders get access to data. Focus less on traditional reporting and more on helping senior business leaders get to data at the speed of business. For most companies, this is an issue. Remove the barriers for employees to get to data.

I was at a company last month with a goal of customer-centricity but struggled. The reason? Commercial teams would not share customer data with the supply chain teams. The sad reality? There are political barriers.

Figure 2.5. Barriers in Getting Access to Data to Make Decisions



Governance. Get Clear on How to Make Decisions. As the supply chain becomes more automated and less dependent on spreadsheets, governance grows in importance. Spend time

answering the question, "Who should make decisions?" In the best S&OP processes, decision-making aligns with the P&L structure based on cultural norms. For example, Unilever and J&J are regional in decision-making; whereas, P&G is focused on divisional, matrix-based decision-making. As the supply chain becomes more and more automated, governance clarity becomes more and more important.

Summary

Advancement in descriptive analytics is outpacing innovation in decision support. Maximize the value in the short-term while attempting to drive the greatest value of currently deployed solutions. Wait for the market to mature. The coalescence of cloud, cognitive computing, and open-source analytics is at its infancy, there are promising signs.

Five Reasons We Have Not Made Progress on Inventory

The highway numbers roll ahead of me. There are endless mile markers. It is a long day.

Today, I am cruising major freeways traveling from Chicago to my new home in Pennsylvania. Against my friends' advice, I decided to drive to speak to 120 business leaders at a technology event. The rain delays through the summer soured me on air travel.

The sun is shining. The fall harvest—on either side of the road—bountiful. As I press the pedal to the floor at 80 miles-per-hour, I munch Cheetos puffs (one of my favorites) and think about the session I just finished.

The cheese on the puffs stains my hands like I feel that misguided past practices have indelibly colored supply chain practices. At the session, we discussed why companies have not made more progress on inventory management. Note in Figure 2.6, that eight industries

have gone backward and four moved forwards. In most value networks, downstream partners have progressively pushed costs and waste backward in the extended supply chain. In the case of the Apparel and Automotive industry, there is a slight improvement, but they have shifted inventories to suppliers.

Figure 2.6. Days of Inventory Pre and Post-Recession

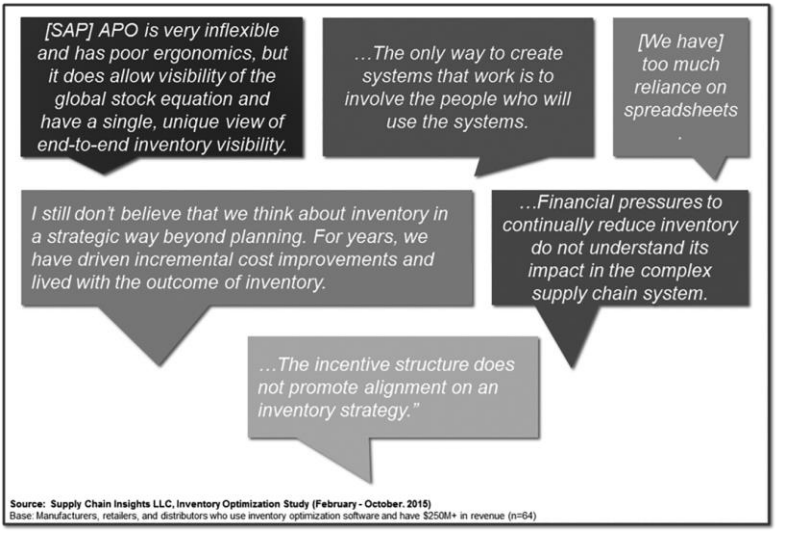
Days Of Inventory By Industry: Comparison By Time Period					
Industries	Years				Difference (2014 - 2018) vs (2004 - 2006)
	2004 - 2006	2007 - 2008	2009 - 2013	2014 - 2018	
Beverage	102	109	138	167	65
Pharmaceuticals	144	154	172	203	59
Medical Device	107	123	142	151	44
Semiconductor	60	70	80	89	29
Household Products	56	58	60	79	23
Beauty	117	124	131	139	22
Aerospace & Defense	86	80	91	106	20
Automotive Parts	52	58	66	71	19
Chemical	64	63	68	80	16
Automotive	45	51	53	55	10
Food	51	51	59	60	9
Broadline Retail	70	73	72	78	8
Apparel Retail	74	77	77	80	6

Source: Supply Chain Insights, LLC, May 2019. Data Sourced From Y Charts.

Why Have We Not Made More Progress?

When we ask business users open-end questions in quantitative surveys, shown in Figure 2.7 are the most common responses. It is not one issue. Business and IT teams lack alignment. The technology teams, focusing on implementation and go-live dates, believe that inventory technologies and processes are equal to the challenge. There are many.

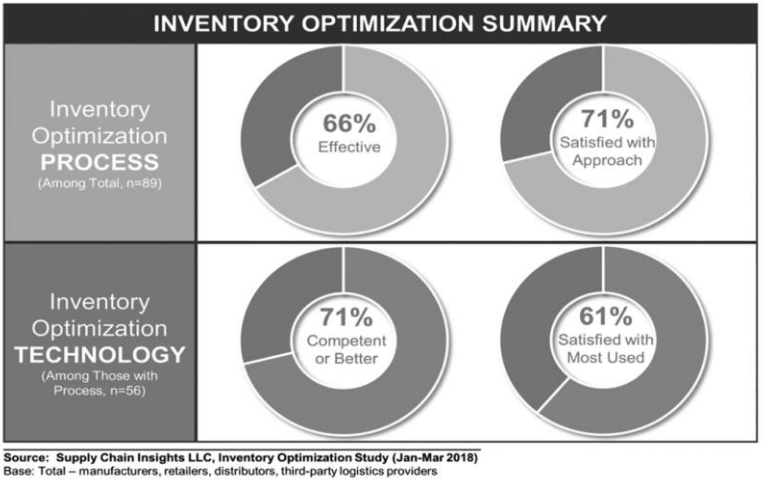
Figure 2.7 Quantitative Open-End Responses



The focus is ongoing live versus "does it work." As a result, many technologies post-implementation do not move the ball forward. I was speaking to a frustrated CFO last week that said, *"If I had 1% of the money spent on technology to improve inventory management, I would be a rich man."*

I smiled and bit my tongue. I wanted to say, *"You let the consultants influence you to buy the wrong technologies based on IT standardization. Your teams did not know enough to understand the consequences of their decision on business results."*

Figure 2.8. IT View of the Current State of Inventory



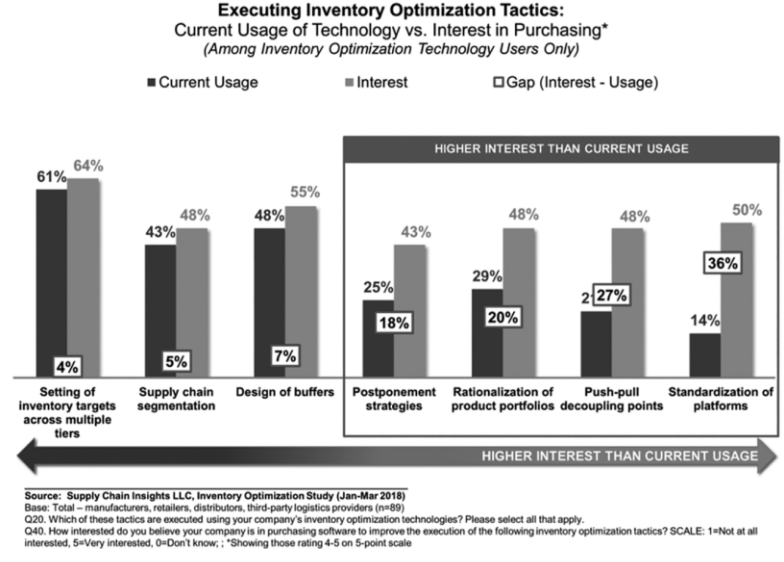
Five Reasons

As I sorted through years of research on the topic, I came up with five reasons: holistic thinking, planning system satisfaction, over-dependence on spreadsheets, rise in complexity and organizational alignment. Here I share the key points from the discussion:

> **Holistic Thinking.** With the increase in demand volatility, inventory increases in importance as a shock absorber of variability. It is the most important buffer. While there is a lot of hype on material buffers and supply, the greatest opportunity lies in the management of demand data and treating demand not as a static set of numbers, but as a set of flows. To do this companies need to use channel data to decrease demand latency, and then use pattern recognition and advanced analytics to define buffer strategies. Current investments target safety stock while the

opportunity is in the better management of cycle stock, platform rationalization, and the design of inventory strategies as shown in Figure 2.9.

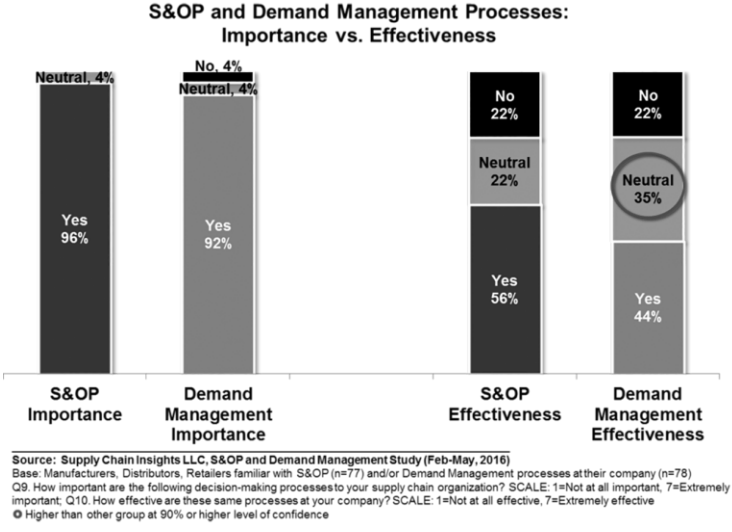
Figure 2.9. Gaps in Inventory Strategies



Source: Supply Chain Insights LLC, Inventory Optimization Study (Jan-Mar 2018)
Base: Total – manufacturers, retailers, distributors, third-party logistics providers (n=89)
Q20. Which of these tactics are executed using your company's inventory optimization technologies? Please select all that apply.
Q40. How interested do you believe your company is in purchasing software to improve the execution of the following inventory optimization tactics? SCALE: 1=Not at all interested, 5=Very interested, 0=Don't know; ; *Showing those rating 4-5 on 5-point scale

Success in Selection of Advanced Planning Systems (APS). I discussed the topic of technology selection for planning at great length in a prior blog. Supply chain planning is all about better math and modeling. Today, since many do not test the solutions and often buy based on IT standardization, the probability of success is about the same as playing the tables in Las Vegas. As shown in Figure 2.9, only one-in-two business users are satisfied. The default? Most planning happens in Excel Spreadsheets.

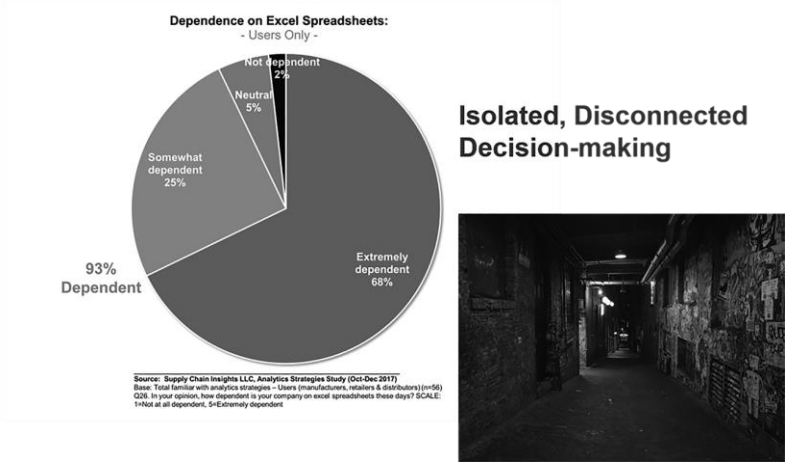
Figure 2.9. Satisfaction with Supply Chain Planning



Dependency on Spreadsheets. This topic was the most contentious at the session in Chicago. Hands quickly went up to defend the use of Excel Spreadsheets. While I firmly believe that today's complex non-linear system cannot be modeled in an Excel Spreadsheet, most business users are so unhappy with their systems that they believe that it is a necessity.

At the event, the attendees cited dirty data, depth of modeling and user training. I understand the issues, but the reliance on Excel is a barrier. I encouraged all the attendees to get to the "Why?" Learn why are user's dependent on Excel? After this understanding, the goal is to tackle and resolve the problems. I firmly believe that Excel spreadsheets lead to Excel ghettos of isolated, disconnected planning. This is shown in Figure 2.10.

Figure 2.10. Use of Excel Spreadsheets.



Increase in Complexity. This is a major issue. Unfortunately, too few companies are taking action. The addition of items, platforms, and new business models often results in the elongation of the supply chain tail.

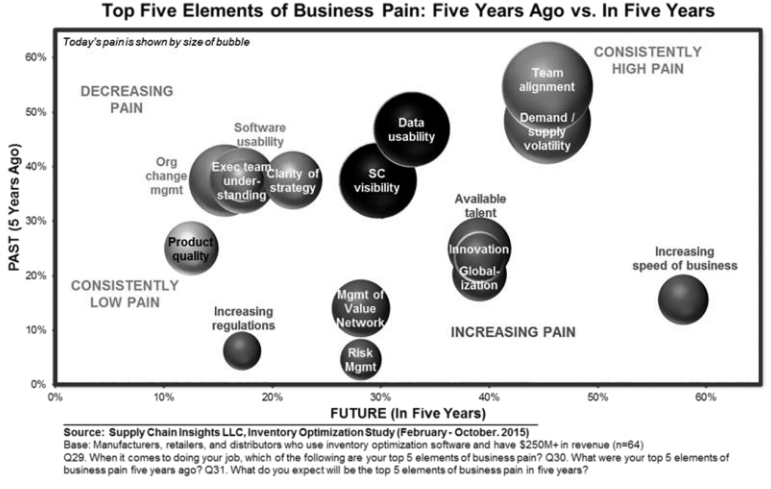
Items in the tail require the definition of inventory strategies to buffer demand variability and drive consistency.

Alignment. In most organizations, inventory is misunderstood. Commercial teams mistakenly think that high levels of inventory will drive sales and minimize customer service issues. The problem is that high levels of inventory often result in customer service issues.

When companies drown in inventory, they often have the wrong stuff. And, without discipline, they cannot get to the right inventory when they need it. In parallel, the financial team often sees inventory as a pocket-book to manage at the end of the quarter. There is an endless cycle of cutting inventory at the end of the quarter, followed by customer service issues.

To combat this barrier shown in Figure 211, education is essential.

Figure 2.11. Elements of Business Pain



As I drove home, I thought about the audience's response. The most pain centered on the discussion of spreadsheets. Excel is so embedded in supply chain processes that companies struggle to give them up. The other area of heated discussion was on data cleanliness. Planning master data--lead times, cycles, yields--are often inaccurate. Paying attention to planning master data is an opportunity for most.

These are my thoughts. I welcome your ideas.

A Walk in the Fog

Woolly descriptions. Fuzzy definitions. Over-arching superlatives. Last week as I spoke in European at an event, I struggled to gain clarity in a world of increased confusion. I am sure that others face the same challenges. Together, we walk in a fog.

Let's reflect. Supply chain innovation is slowly simmering in the face of radical disruption. The supply

chain visionary wants novel and new. Technology providers are pitching old--often wrapped in the cloak of 'digital transformation.' As a result, supply chain leaders continuously ask me to unravel market confusion. The goal of this post is to provide clarity.

Background

Supply chain planning-- decision support for business leaders-- evolved in the 1980s. Over the last four decades, not much changed. Recent releases of Advanced Planning Solutions (APS) refined but did not transform initial software concepts. There is little modernization despite the evolution of new technologies to enable:

> **1) Demand Sensing.** Despite a 2-3X increase in demand latency, there is still a strong belief that the order represents market demand. It does not. Companies talk about customer-centric supply chains, but most leaders are more comfortable in the world of supply than demand. While there is much hype on DDMRP and the use of orders as a proxy for demand, companies need to remember that orders carry latency: and as a result, they are out-of-step with market purchase behavior. The further back in the supply chain that companies find themselves, the greater the order latency, the less that the order reflects market behaviors.
> **2) Insights Using Non-Relational Database Technologies.** When e-commerce giants like Amazon and eBay could not scale using relational database technologies new approaches termed NoSQL evolved. This advancement enabled schema-on-read capabilities and accelerates

cognitive computing to improve supply chain decisions.

3) Outside-in Processes. New forms of data abound--weather data, consumer insights, rating/review information, sentiment analysis—but they are not used. There is no place to put this data in traditional supply chain planning software, and companies are slow to change existing concepts.

4) Real-Time Decisions Using Streaming Data. Traditional planning is processed in batch jobs. Data is latent--often out-of-step with current processes. Black holes abound. New forms of Internet-of-Thing (IOT) data enables information at the speed of business, but companies struggle to build streaming data architectures.

5) A shift from Selling Products to Selling Services Focused on Outcomes. What should we sell? There is a shift from selling traditional products to a focus on outcomes? It redefined the music industry: from selling CDs/records to online music. The transformational wave is slowly transforming the automotive industry from a focus on selling "rides" versus the purchase of an automobile. There is a focus from efficient sickness in healthcare to health and wellness. Service supply chains are shifting to use 3D-printing services for on-demand availability of parts.

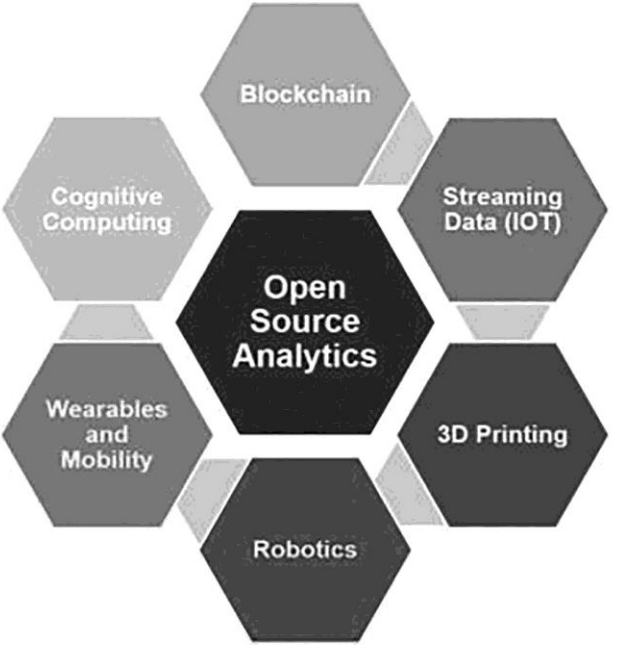
These shifts are profound making many of the methods from the last decade obsolete. Companies struggle with the appropriate naming conventions for this transformation. Is this Industry 4.0? A Digital Supply Chain? Autonomous supply chains?

All I know is that descriptions like this one from Gartner are not helpful:

"Digital business transformation is the process of exploiting digital technologies and supporting capabilities to create a robust new digital business model." (Are you laughing? Do you think that this definition could contain a few more references to digital?)

In contrast, I define the *digital transformation as the redefinition of the atoms and electrons of the supply chain to drive improved outcomes.* Is that right? Nope, my definition is one of many. The key point is to get clear on a definition before you start to build your roadmap for your journey.

Figure 2.11. Evolving Technologies Driving Digital Transformation



In my definition, the atoms of the supply chain being re-defined by 3D printing, the use of algae and fermentation processes to create value from waste streams and recycling. It makes us wonder if we should even manufacturer products in traditional ways? Increasingly, there is a shift from products to services.

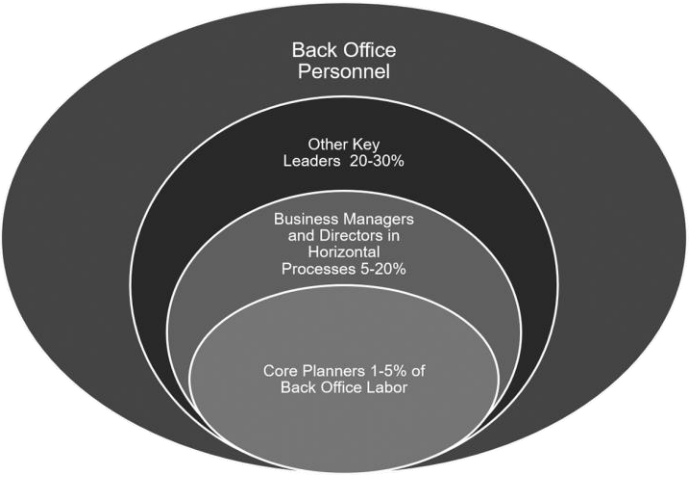
Electrons? The many examples include streaming data, Internet of Things (IOT), new forms of analytics, software robots, wearables, and robotics increasingly add value as computing power increases. A confluence of technology drives innovation.

In your role as a supply chain leader, to get started, focus on outcomes. Define a journey consistent with your organization's cultural bias. For example, if you are an innovator, roll-up your sleeves and test and learn using new technologies. Fail fast and drive forward momentum. However, not all companies are comfortable to forge new paths using bleeding-edge technologies. If you are a late follower, be consistent in your approach. Learn from others and adapt when comfortable.

Unraveling New Outcomes

As a new world of analytics unfolds, the technology landscape is becoming less ERP-centric. Innovation is redefining business processes. There is normal confusion as technology providers jockey for position on a moving stage. Planning will be connected to the back office through new forms of collaborative technologies.

Figure 2. 12. Connecting Planning Information to the Back Office



Let me explain. Today, these technologies lack deep-modeling capabilities nor do the companies have a strong understanding of supply chain management.

Evolution of Core Planning. The supply chain planning world--modeling for the core planners shown in Figure 2.12 is shifting.

The original models shown in Figure 3 evolved four decades ago, and there is an intense debate in the industry on the need for tactical planning. The debate is often termed on concurrent planning—combining operational and tactical planning—rages. (The average company has two-to-three APS technologies and hence the proliferation of boxes in Figure 3.)

Architectural Shifts. In global companies aligning asset strategies with business shifts, tactical planning is critical. However, in regional supply chains manufacturing assignments are more fixed with less change. As a result, tactical supply

planning is not always needed. Before you join the debate of tactical versus finite planning, ask yourself, *"What does your supply chain require?"* If you need to move the manufacturing load across manufacturing facilities then you need tactical planning. A rule of thumb? Operational processes tend to be more important in regional supply chains and tactical planning more important in global supply chains.

In parallel, some will use the term 'concurrent planning' in a very different way. Concurrent planning is the use of the cloud to enable planners to see entries/changes in the plan in real-time. (There is no consistent definition of concurrent planning in the industry.)

New Form of Analytics. Cognitive computing capabilities improve plans. Traditional best-of-breed technology solution providers find themselves squeezed between ERP-based solutions and new forms of analytics.

Cloud. Cloud is making APS more affordable. The entrance of lower-cost options for supply chain planning is exciting. These are ideal for smaller more regional companies.

Planning Master Data and Testing of Sensitivity for Planning Outcomes. The term digital twin is sexy. However, it lacks a common definition in the industry.

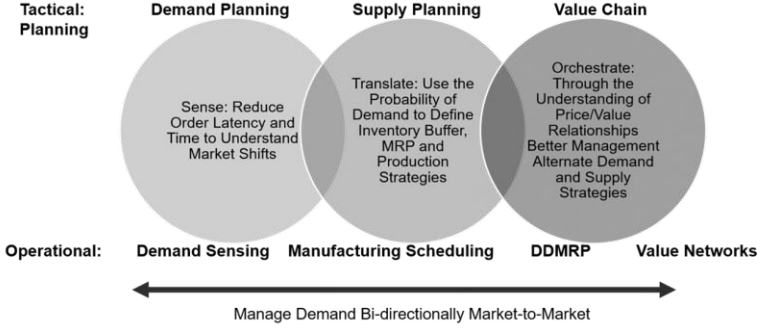
At recent events, I was able to gain insights into three versions of digital twin modeling. The products consume market drivers and ERP data yielding a modeling platform to understand the impact of planning master data –lead times, cycles, yields, etc.—on process excellence. This enables sensitivity analysis and the testing of planning parameters that are often out-of-date

and inaccurate. Bad planning master data yields bad results.

DDMRP. The Demand-driven Institute advances a very different definition of demand-driven than the prior models Demand-Driven Models defined by AMR Research (now Gartner). DDMRP is a form of demand translation—order pattern translation into material buffer strategies. The tactic rectifies the close coupling of the forecast into material requirements (which was sorely needed). The technique is appropriate for material-centric supply chains. While it is an important technique, it is one of many approaches to improve agility. It is a tactic not the end state of a demand-driven strategy.

DDMRP It is less appropriate for asset-intensive and customer-focused supply chains and it should never replace tactical supply planning. Instead, as shown in Figure 2.13, DDMRP is one of many tactics woven into the digital transformation.

Figure 2.13 Demand-driven Models



Redefinition of Transportation Management. The list goes on and on. The promise is the delivery of logistics status information along with

analytics to predict a more reliable Estimated Time for Arrival (ETA). Termed the dynamic ETA the shift is to streaming data driving a more definitive ETA based on sensor data. This is the start of the definition of outside-in transportation processes.

Today, the real-time visibility solutions are outside-in and the enterprise TMS solutions are inside-out. As a result, there is no place to put a dynamic ETA. There is a need to redefine processes. Overtime companies will redefine a new transportation planning market that is outside-in making the current applications obsolete. For me, this is an exciting development.

Business Networks. The focus of the last four decades focused on enterprise solutions. While there was a brief flurry of activities in the building of trading exchanges in 2001-2003, but only 10% survived. Today, these are becoming Supply Chain Operating Networks with mapping, onboarding, and process canonicals. The problem is that there is no easy way to stitch the flows together.

Current flows are one-to-one mainly via documents. One of the barriers is the focus. Companies attempted to integrate data without defining master data portability. With the evolution of the ISO-8000 standards for ALEI (company), SFx (item) and ELNI (location) the data become more portable enabling less mapping and process enablement. Today's Supply Chain Operating Networks operate within islands. Integration is not the answer. Instead, it requires the definition of data to improve interoperability through portability using the ISO-8000 standards for master data.

Deadly Sins:

The technology buyer today is held hostage by deadly sins. These are not new but are becoming a bit more extreme over the last year. It makes me wonder what happened to clear and concise descriptions of company solutions.

Digital White-Washing. Traditional technology providers pitch digital messages. While plastered on the websites, there is a struggle to give me a clear definition of how their solutions drive digital innovation. It is the innovator's dilemma. To innovate the company has to kill existing products to drive digital innovation. Evolution is not the answer. The step-change in architecture and design is quite risky for a public company. Force traditional players to define digital and side-step digital white-washing.

Gobbledygook Marketing. Buzzword Bingo. When in doubt slap an acronym or a new word on marketing collateral. We are in the marketing spin zone. Bypass this issue, but asking companies to define each term. When using the term control tower ask for a definition. In a discussion of visibility, ask for clarity. The lack of clear definitions on these terms adds to the hype cycle.

Over-Promising. Companies are not clear about what they do and what they do not do. Push for answers.

A shift in Selling Models. Buying Software from Non-Software Companies. The business models of software companies are different from consultants and contract manufacturers. The difference? Software creation takes many years, and as a result, software companies focus on long-

term software development. In contrast, it is very hard for a consulting or contract manufacturing company to stay focused on the long-term because of the pull of the urgent. As a result, only buy software from companies with a software model.

Needing a Well-Defined ROI. First movers know that they are testing and learning with no guarantee of a guaranteed ROI. Work with promising technologists to solve the hairy problems that plague the business.

Bottom-line the supply chain planning market is changing. Best-of-breed innovators will drive the step-change in thinking. The next era is market-consolidation and maturation. Slowly companies will start to build networks and outside-in processes that will make much of the software today obsolete.

Summary

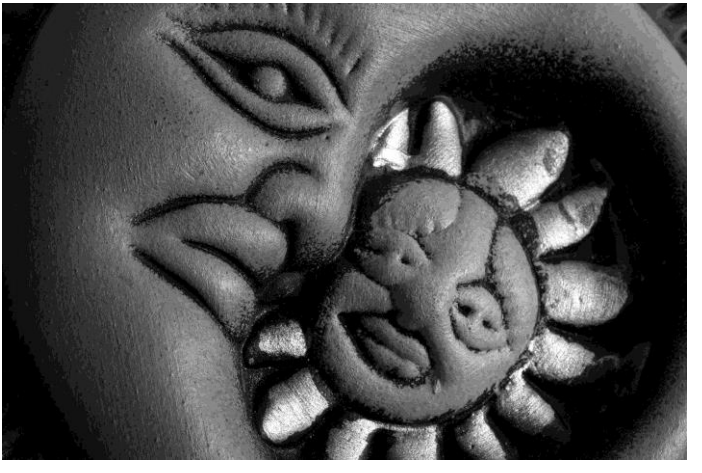
What should you do? Focus on solving use cases. Drive test and learn programs to innovate with new players to drive new answers for tough problems. Don't make the mistake of believing that large players drive this innovation. They will be late followers.

Section 3

Improving Planning

Improving Planning

While working with business leaders to transform supply chains, I follow the trends in supply chain planning and actively blog on how to improve outcomes. Fiercely independent, in the blog, I share insights weekly.



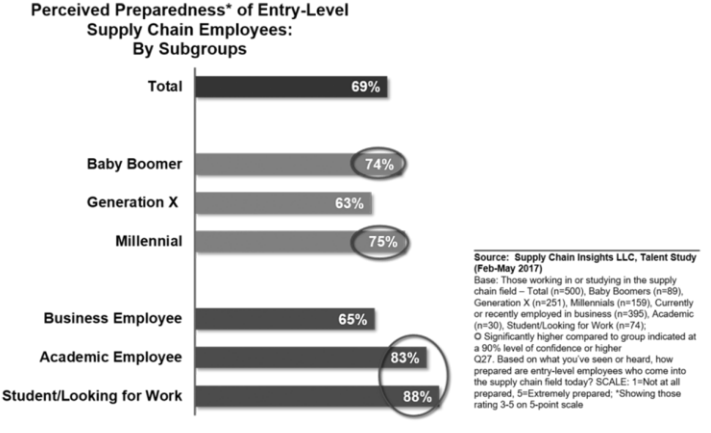
Have You Given Your Demand Planners Some Love?

As I write this blog, Valentine's cards litter my desk. This is the week for love. ...a time to send cards and letters to people we appreciate. It is in this spirit, that I write this post. The most unloved employees in the back office are supply chain planners. As supply chain leaders, I would encourage you to send each of them some love for Valentine's Day. Here I give you some ideas that go beyond flowers and candy.

Background

Each year, when we complete our annual talent survey, we note greater and greater dissatisfaction within the role of supply chain planners. In Figure 3.1, note the lowest satisfaction is Generation X (birth years of 1965-1980) in manufacturing organizations. Note that academics and employees of technology software companies have a statistically significant higher level of job satisfaction. Within the data is the story of planners. The numbers are small but show dissatisfaction.

Figure 3.1. Relative Job Satisfaction



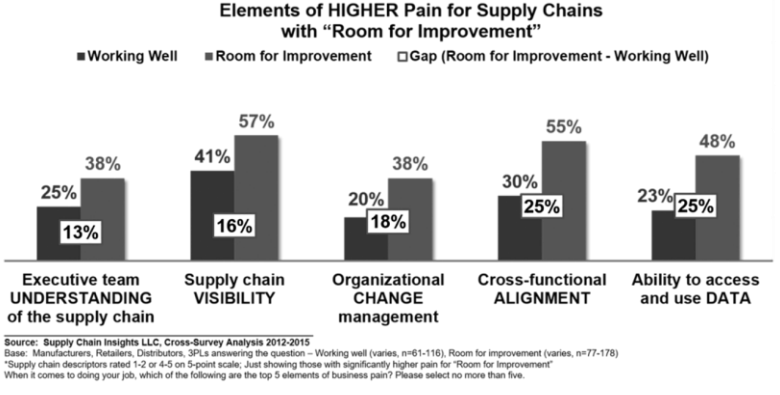
Some Thoughts

Supply chain management is heady stuff. A complex non-linear system is not easily wrangled by the uninformed. For every action, there is an opposite reaction. The response is often surprising.

In Figure 3.2, we share insights on five characteristics of companies with a supply chain working

well. Note the comparison to the larger population. Companies that outperform their peer groups have supply chain executives with a better understanding of supply chain management.

Figure 3.2. Characteristics of High-Performing Supply Chains



Market-driven Focus

Markets go up and down. Supply chains take their sweet time to respond. (It took six months for supply chain executives to sense the market downturn of 2007 and make adjustments to their supply chain. Why? The bad news (declining volumes) moves slowly across an organization while good news (increasing volumes) travels quickly.

Today, companies seek a growth agenda, but the signs are omnipresent. The economy is slowing down. Last week, the *Wall Street Journal* reached out to discuss the rising inventories near the Port of Los Angeles. In my share groups, large manufacturing clients have a Q1 freeze on travel. (Normally the freeze begins

in the third quarter.) I am no economist, but there are signs of a market slowdown.

During a market downturn, the life of a demand planner becomes tougher. As the patterns of declining volumes rise to the surface, organizations struggle in disbelief. The unknowing supply chain leader will send demand planners back to their cubicles to "fix the demand plan." (In other words, concoct a story of growth in a market that slowing down.) Tensions rise as demand planners attempt to do their jobs in an organization that does not want to see the data.

The answer? Embrace the data and use the work of demand planners to see early signs of the market downturn. Use the information to adjust the supply chain to minimize the impact.

The Potential of Policy, Strategy, and Modeling

The supply chain intermingles policy, strategy, and models. However, there is usually a disconnect between these three concepts. While they should be interconnected, despite the fact that supply chain modelers have great insights, they seldom drive strategy. These planners are often stuck at low-levels of the organization struggling with what to tell the "boss" when the strategy decisions are not feasible.

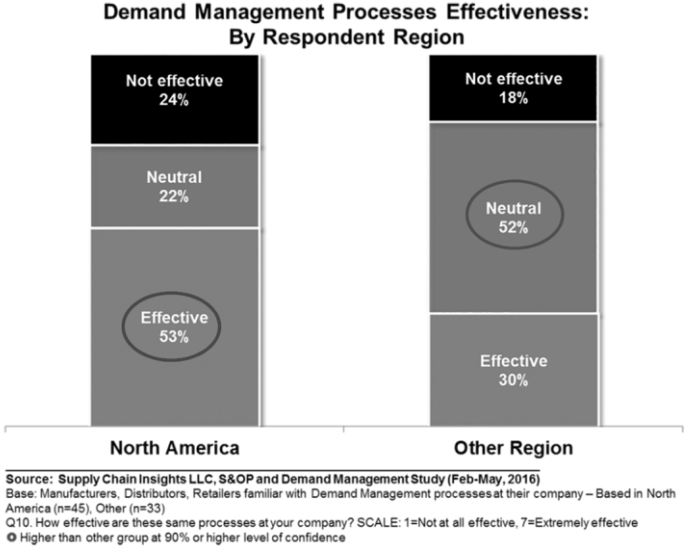
The action? Align. Ask data modelers using supply chain strategy tools to validate strategy and policy and refine the outcomes. Make them an important member of the team. the more that they feel involved, the greater the love.

Buy Technologies that Supply Chain Planners Will Love.

Over 65% of supply chain planning happens in Excel spreadsheets. One of the reasons? Usability. The second? The ability to model the supply chain in the technology. Models are not created equally.

Many times, it is the result of the purchase of supply chain planning technologies purchased based on IT standardization. The lack of usability and modeling capabilities drive dissatisfaction. Shown in Figure 3.3 is the current level of dissatisfaction.

Figure 3.3. Planning Technology Satisfaction

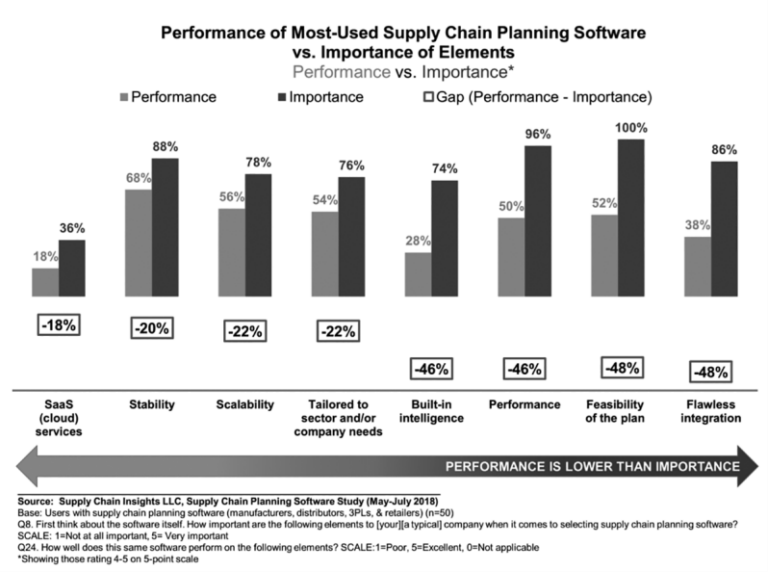


The gap is greater in emerging economies. User satisfaction is the same as the flip of a coin.

Next steps? Focus on buying planners technologies based on usability and modeling capabilities. Make sure that the planners have the right

technologies to do their jobs. As shown in Figure 3.4, the fit of technologies to do adequate modeling is a major gap.

Figure 3.4. Gaps in Planning Technologies



So, when Valentine's day rolls around, feel free to buy your planners lunch or host a celebration. Love in any form is a great thing; but to make a long-term impact, don't forget to address the tough issues that drive the low-level of planning satisfaction. I would start with these three.

Stories from Tom, Dick, and Harry

While companies like research, they love stories. The problem is no Company wants their story told, yet all want to know stories of other companies. I sign a Non-Disclosure (NDA) everywhere I go. For a gal that writes for an audience of over 400,000 readers, this poses a problem. How do I share the experiences of clients while preserving anonymity? The term *"every Tom, Dick, and Harry"* means *everyone and anyone*. Let's assume they are the quintessential supply chain guy. Here I will share stories using the Tom, Dick, and Harry pseudonyms.

Tom

Let's start with the story of Tom. I have known Tom for five years. His first call was on Sales & Operations Planning (S&OP), and his new inquiry was on S&OP. They sound eerily similar.

On the first call, he introduced me to his new boss, Jim. Tom wanted help to take his S&OP processes to a new level, but his boss was dismissive. Jim did not think that the organization needed help.

During this recent call, Tom shared the story of S&OP evolution with his three recent bosses. In short, progress on S&OP was a zig-zag pattern based on the differing beliefs of each manager. With current progress stalled, Tom questioned what to do. Here is a synopsis of our discussion.

Tom's questions:

Q. My organization does not value the role of demand planning. The group doing the work feels disenfranchised. How do I show value?

As I talked, we laughed. Tom's organization is not alone. Planning organizations around the world struggle for acceptance in the largely reactive supply chain world. Business leaders, uncertain of the value of planning, question the investment. The problem? Teams do not measure and communicate value propositions in business terms.

My advice to Tom? Show them the money. The how is simple: translate the improvement in FVA into value. To determine the opportunity, calculate safety stock requirements based on the naive forecast and the forecast. The secret is to dollarize the difference in safety stock needed to support replenishment based on forecasting improvements. When Tom and I connected later, he shared how effective this was.

Q. The organization focuses on operations. How do I drive value and encourage organizational alignment?

Tom's new boss, named Jim, is focused on improving manufacturing; yet, the most successful S&OP processes report to a profit center manager. Tom and I discussed how to elevate the discussion and gain the approval of the process at the P&L leadership level.

The first step? Focus on growth and customer fulfillment. When the P&L owner believes in S&OP, magic happens. Tom and I discussed how to drive this transition.

Later in the week, I connected with Jim's boss and gained some insights, *"Jim is failing to design 'a better path' forward. He claims to know the answer already, so there you have it. He will get improvement (so I'm not going to try and intervene), but they won't deliver excellence or drive excitement or competitive advantage. This is my dilemma."*

There are many stories of Toms and Jim's. Most of Jim's fail to question their prior experiences. They fail to question their paradigms and fail to drive organizational alignment to improve business value.

Dick

A week later, I got a call from Dick. He is actively driving an autonomous supply chain strategy for a major pharmaceutical company. As a part of the 7% of manufacturers attempting to use cognitive computing for demand planning, he shared insights, *"Lora, the magic is not in the new technology. I found that we, as an organization, are too focused on the outputs, and have forgotten the importance of the inputs. We have gone through a myriad of acquisitions, and in the process, we have forgotten the basics of demand planning. Our data is just bad."*

Dick continued, "*I have improved the demand plan by 21%, and it sounds good, but only a quarter of the improvement was due to the switch to more advanced*

technology. The majority of the error reduction came from attention to detail on inputs and alignment of the engines to drive better outputs. The improvement sounds good, but I know that the majority of the savings came from a focus on the basics, not from the new technology."

I laughed. Then sighed. Dick's story is too real. I see it every day. Often companies implement a demand planning technology and lack the knowledge to measure and drive improvement. As a result, on average, my clients degrade the forecast 16%. Imagine how devastating it is for a hard-working team to learn that the technology implemented is making the forecast worse, not better, and then to accept the fact that their well-intended efforts and hard work drove deleterious results.

Harry

Then there is the story of Harry. In my travels, I met two Harry's in the last month. Both have a similar goal: improve flow. The aspiration is to use channel data and build outside-in processes to minimize the bullwhip effect and improve replenishment.

Flow-based replenishment is a corollary to lean theory. The first question Harry asks is, *"What happened to flowcasting?"*

I start with a discussion of flow. It sounds a bit academic, and many roll their eyes, but mapping flow is essential to understanding the answer to Harry's question. Flowcasting defines replenishment as a pull from the market. In most supply chains, this is not possible.

Let me explain. Most supply chains are a combination of push and pull flows. Seasonal demand, by definition is a push signal to a distribution center. Also, demand shaping activities--price, promotion, new

product launch--redefine the demand signal making it more of a push-based process.

Based on the push and pull strategies order and replenishment strategies change. In a push-based supply chain, the focus of order management is compliance (order fulfillment). In contrast, in a pull-based supply chain, the focus of the order is to minimize waste by shortening the cycle time to market. In a pull-based replenishment system, the order is an output from the production schedule.

To illustrate the point, let me share a story. In the 1990's I worked for Clorox. My role was to start-up Vendor Managed Inventory (VMI) processes for Clorox to replenish Wal-Mart more effectively. I believed, at that time, that VMI could transform organizations. I believed by adopting VMI companies could become more outside-in. I was wrong. In my research of over sixty organizations in consumer manufacturing, no company accomplished this goal. Instead, demand, managed in isolation, is only a signal to order management.

Over the last two decades, as companies struggle to grow, there are more and more opportunities for pull-based processes, but push-based models are the prevalent signal in today's supply chains. While channel data is increasing in availability, channel demand seldom drives replenishment. As a consequence, the Harry's of the organization act as mavericks. They continually push to find a better way.

The answer? Plot the push-and-pull boundaries of the organization and design the decoupling points. When possible, maximize flow based on channel data, but understand that it is one of many options.

There are many Tom, Dick and Harry’s in the supply chain. It is my hope that they never give up.

Where There is Smoke, There is Fire

In 2006, I started a new job. As a new industry analyst at a Boston firm, AMR Research, I was researching and the future of supply chain planning. (Gartner now owns my prior Company and my research was deleted from the archives with the acquisition.)

On this memorable day, as I grabbed a coffee on my way to the SAP Waldorf offices, a heavily marked-up report titled *"When Is SAP APO Right for My Business?"* poked from my bag. It was the 30th revision. The published note published after 72 revisions.

As part of the research process, AMR Research gave technology providers the opportunity to conduct a factual review of the analysis before publication. The factual audit of the SAP APO report resulted in a trip to the German offices of SAP for a face-to-face meeting.

At the time, SAP APO commanded the #1 market share position in the evolving and over-hyped supply chain planning market. Endorsed by IT leaders, industry consultants, but questioned by business leaders, the APO

product was controversial. My report—critical analysis from a business leader's point-of-view—raised eyebrows. SAP pushed back on my analysis resulting in a request for a face-to-face review.

As I walked by the table with my coffee, Hans leaned nervously on the table while cradling a cigarette. It was early in the morning in Germany. The sun shone brightly through the window. The early morning rays cascaded through the rising cigarette smoke refracting the light like a prism.

Begrudgingly, he replied to me, *"Good morning."* Allergic to smoke, and with my head reeling from jet lag, I attempted pleasantries; but as I walked away, I knew that I failed to accomplish my goal. I left Hans alone at the table staring awkwardly at his cigarette before the meeting.

We both knew that our ten-hour meeting was going to be difficult. Hans was trying to avoid appearing defensive to a critical report. He was the leader of the SAP APO product team. It was an uneasy dance for both of us.

Two colleagues flew with me to Germany, but they were unable to attend the meeting. Kevin, hung-over from the previous night's beer tasting, called to say he would be late, and Bruce sent a note that the board requested his attendance at an all-day meeting. Ten minutes later, as I looked down the hall at Hans, ten SAP colleagues joined him at the table.

My review was destined to be Lora with eleven SAP product leaders. (As the picture flashed into view, I felt that it was a bit like David and Goliath having a discussion.) During that day, we reviewed the draft word-for-word and line-by-line. I doubt that any Ph.D. student ever had an equally arduous challenge in defending a dissertation.

The note published late that year. Today, there is no history of the report on a google search. So much

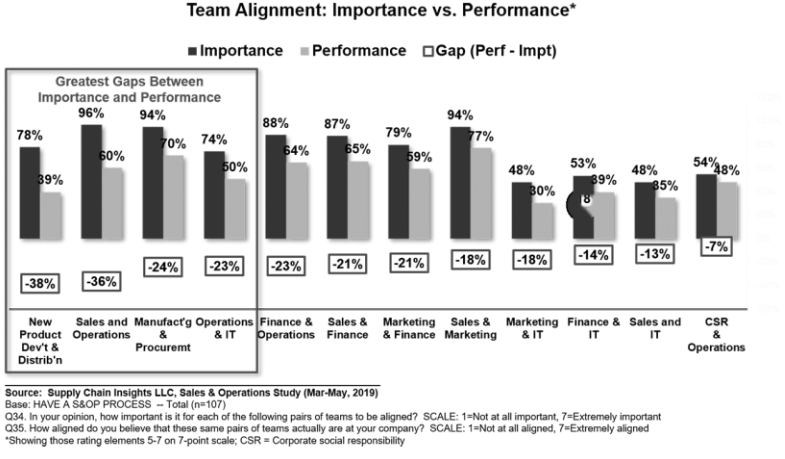
work, and angst, but it is now impossible to exhume the writing from anyone's files but mine.

The Discussion

The SAP team, proud of their development efforts on APO, shared reference call-after-call with me. The group tried hard to dissuade me from the positions taken in the report. Much to their frustration, I stood firm.

By-and-large the reference calls set-up by SAP were with manufacturing IT teams. I wondered at the time how the references on the calls were so different than the ones that I shared in the analysis. I now know through research that there is a large gap between alignment of operations and IT teams. The teams lack a common definition. While I was speaking to business leaders, SAP was primarily getting direction from IT teams. They were worlds apart.

Figure 3.5. Team Alignment



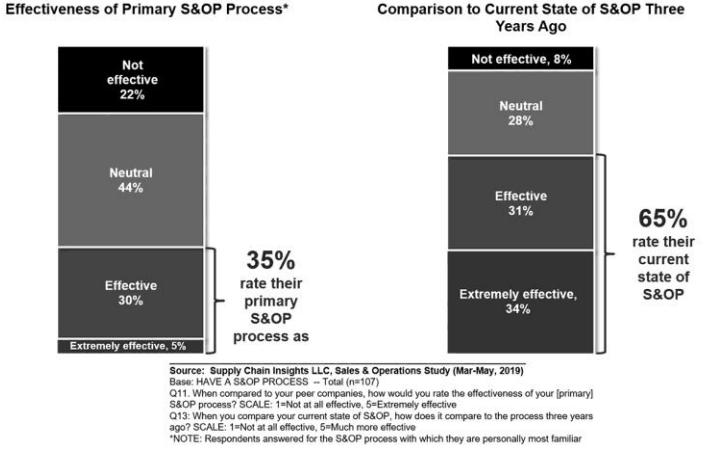
Source: Supply Chain Insights LLC, Sales & Operations Study (Mar-May, 2019)
Base: HAVE A S&OP PROCESS -- Total (n=107)
Q34. In your opinion, how important is it for each of the following pairs of teams to be aligned? SCALE: 1=Not at all important, 7=Extremely important
Q35. How aligned do you believe that these same pairs of teams actually are at your company? SCALE: 1=Not at all aligned, 7=Extremely aligned
*Showing those rating elements 5-7 on 7-point scale; CSR = Corporate social responsibility

A Perspective Fifteen Years Later

In the last fifteen years, I changed jobs, started a company, but continued working on research to understand supply chain planning. Hans was promoted several times and is still at SAP. The discussion fifteen years ago seems so long ago but is omnipresent in my memory. I sometimes wonder if anyone but me remembers the hot discussion in the stuffy conference room at SAP's offices.

Supply chains today are quite different. Post-recession, demand and supply volatility increased, inventories ballooned, and profits fell. As a result, supply chain planning grew in importance to help companies drive supply reliability in the face of uncertainty. However, as shown in Figure 3.6, organizational effectiveness in Sales and Operations planning processes declined over the past three years. (Sales and Operations planning is a tactical process (developing a monthly/weekly plan to align teams to maximize opportunity and mitigate risk)).

Figure 3.6. The Decline in Sales and Operations Planning Effectiveness



SAP APO was implemented by over 30% of supply chain teams at an average cost of 5M$. SAP achieved market share leadership but failed to deliver market-leading results. How so? From the research, I now know that manufacturing companies choosing SAP APO rate themselves as less effective in 2019 than their peer groups at a 90% confidence level. Shown in Table 3.1 are the research results from a recent study.

Table 3.1. Manufacturing Company Effectiveness in 2019 SAP APO Deployments Versus Overall Market

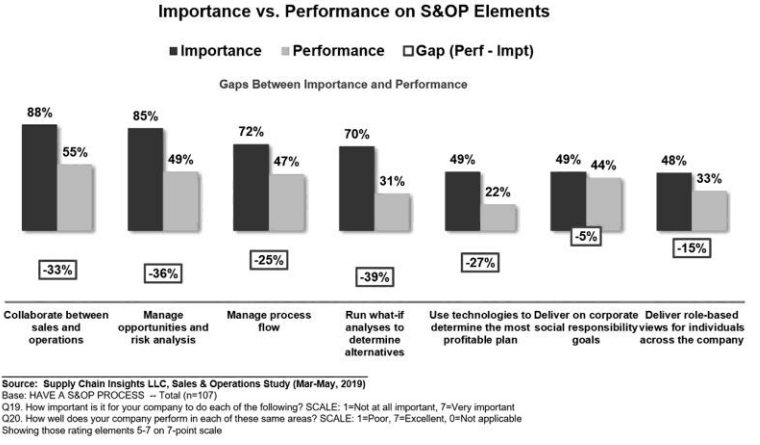
SAP APO vs. Other Process		
	SAP APO	Other
	A	B
Much more effective	13%	35% A
4	40%	31%
3	43%	30%
2	-	2%
Not at all effective	3%	2%
Average of Ratings	3.60	3.96 A

Source: Supply Chain Insights LLC, Sales & Operations Study ((Mar-May, 2019))
Base: HAVE A S&OP PROCESS -- Effective S&OP (n=30), Other (n=54)
Q13: When you compare your current state of S&OP, how does it compare to the process three years ago? SCALE: 1=Not at all effective, 5=Much more effective
AB Higher than other group at 90% or higher level of confidence

The So What?

A sticking point in discussion with SAP was the relative importance of "what-if analysis “and "industry-specific modeling to drive a feasible plan." The need for these capabilities grew in importance with the rise in supply chain volatility and an increase in supply chain complexity. SAP APO was stronger in integration than these critical capabilities. As a result, these gaps resulted in SAP APO supply chain planners rating themselves as less competent.

Figure 3.7. Gaps in S&OP Technology



Source: Supply Chain Insights LLC, Sales & Operations Study (Mar-May, 2019)
Base: HAVE A S&OP PROCESS -- Total (n=107)
Q19. How important is it for your company to do each of the following? SCALE: 1=Not at all important, 7=Very important
Q20. How well does your company perform in each of these same areas? SCALE: 1=Poor, 7=Excellent, 0=Not applicable
Showing those rating elements 5-7 on 7-point scale

Looking Back

` Taking a position and stating an opinion in a market as an analyst is difficult. The larger the technology provider, the more challenging this becomes. This one was very hard. The reason? Simple economics. Large consultants made more money on the implementation of SAP APO than other supply chain planning solutions.

Recommending APO to their clients was more lucrative…. As the market share of SAP APO increased, the report and the hard-fought battle to shed light on the "fit of the solution" slipped into oblivion. However, never forget when there is smoke, there is fire.

Looking Forward

There is good news for business leaders seeking supply chain planning solutions. The coalescence of cognitive computing, cloud solutions, and descriptive analytics is giving rise to a new set of solutions. The

market is at a tipping point which will make all solutions like SAP APO obsolete.

As the market shifts, let's hope that business users don't make the same mistake of trusting large consulting partners and technology providers. My advice? Test technology and ensure business results. And, in the process, trust but verify.

The selection of SAP for supply chain planning continues to be a hot topic in a tumultuous market.

Time for a Supply Chain Check-up?

July is my birthday month.

In the middle of busy travel, I made time for the annual physical. The reason? I know that early detection is the key to wellness. It is a familiar ritual. The nurse quickly assesses blood pressure, pulse, blood oxygen, height, and weight. Lab work testing follows vital sign analysis. Only when the tests are complete, can I have a meaningful conversation with the physician about my health. In my lifetime, the depth of lab testing plays a greater and greater role in the determination of health.

Importance of Supply Chain Diagnostics

In my work with manufacturing companies recently, I am thinking a lot about the need for diagnostic testing. While most consultants and technologists want to sell technology and are eager to slap in a new piece of software, my caution is to slow down and better understand root issues before having a technology

discussion. Here I share insights on how to get started using a four-step process.

When a company contacts me to help them with their supply chain, the pain is usually a gap in customer service. The symptom is clear, but the root issues are not clear. As I work with leadership teams to understand the "why", I experience circular discussions. They tend to have many pretty PowerPoint slide decks--full of acronyms, pretty pictures, and E2E commitments--but they lack a common definition of supply chain excellence. Ironically, I find organizations easily write big checks for technology implementations, but struggle to drive process improvement.

To complete a supply chain diagnostic, I take these four steps:

Step One. Analyze Past Results in Customer Service. To accomplish this goal, I ask a cross-functional group to audit the past year. We draw a timeline on a conference room wall and using customer shipment and compliance data, we plot the issues with customer service and product outages. As a group, we drill into root issues. I ask, "*Do you have data that could be used to alleviate the issue in the future?"* Or alternatively, *"Is there data that could be sourced to help?"*

I am working with a company with issues in delivering customer service. The company is a food and beverage company. When I asked for an analysis of the customer service data with a root cause analysis, it was not available. Six months later based on the work of four hard-working employees, we were able to get the analysis to start to roll up our sleeves. Most companies cannot get to data by a customer on orders shipped incomplete to understand root cause analysis.

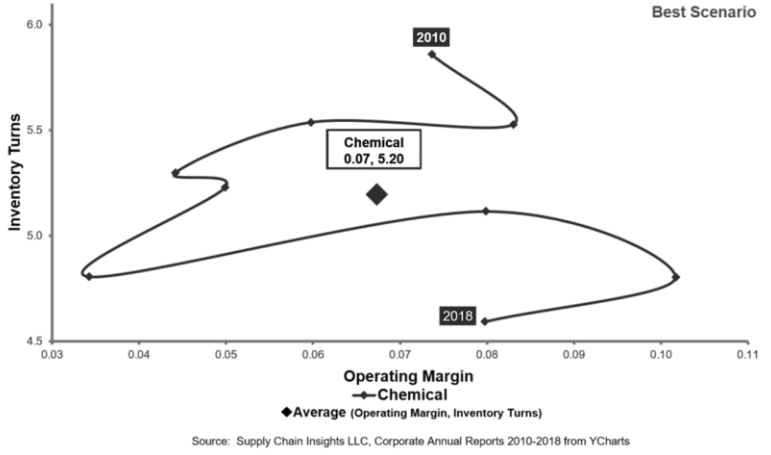
Many times, useful data exists in marketing or sales groups but is not shared with the supply chain team. The issue is either trust or awareness. I love getting the two together to explore all forms of unstructured data--weather, rating and review data, warranty claims, and email chatter. Normally, unstructured data is available but it is not considered because traditional supply chain processes only focus on the use of structured data.

Recently, I conducted a strategy session was with a major consumer products company selling cosmetics. The company wanted to launch a digital strategy, but the digital supply chain team had never connected with the firm's digital marketing team to understand how the two groups' efforts could be intertwined. The organization had a very strong digital team with great data, and the two groups were largely unaware of how they could work together. The result was an endless list of possibilities.

Step Two. Understand Industry Performance. Build an industry peer group and gain insights on major trends. Use the peer group analysis to establish realistic targets. Let's take an example. In Figure 3.8, we show the aggregate trend of the chemical industry in an orbit chart format showing year-over-year results at the intersection of two metrics operating margin and inventory turns.

In the period of 2010-2018, within the chemical industry, margins fluctuated, largely driven by the price of crude, but inventory turns plummeted. The average for the industry was 7% profit margin and 5.20 inventory turns. However, in looking at the more recent period, should a target of 5.20 for inventory turns to define best-in-class performance?

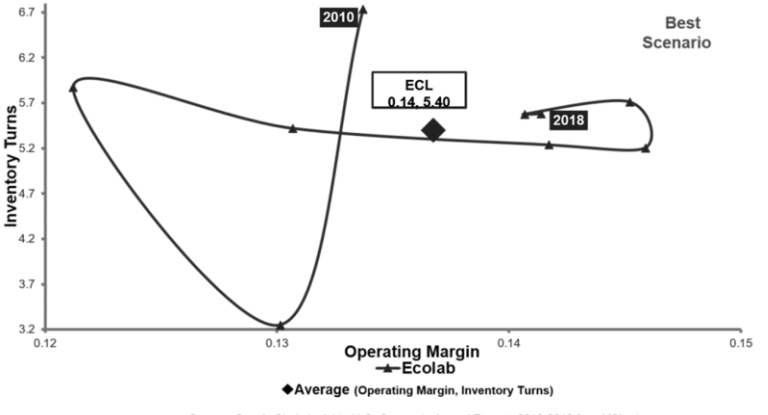
Figure 3.8. Orbit Chart for the Chemical Industry for the Period of 2010-2017 at the Intersection of Inventory Turns and Operating Margin



Source: Supply Chain Insights LLC, Corporate Annual Reports 2010-2018 from YCharts

Ecolab was able to overcome the downward trend. At first blush, the pattern in Figure 3.9., might not appear desirable, but the Company was able to outperform the peer group while driving performance improvements. 95% of companies fail to achieve this goal.

Figure 3.9. Orbit Chart for the Period of 2010-2018 for Ecolab



Source: Supply Chain Insights LLC, Corporate Annual Reports 2010-2018 from YCharts

Set targets based on the industry profile and a review of the industry peer group. Ask the group what is possible? What are reasonable targets based on this discovery?

I find companies will often set targets based on false beliefs or short-term goals. Let me give you an example. I laughed at a recent presentation of Mondelez trying to achieve the cash-to-cash performance of Dell. While feasible, the question is would this be desirable? The lengthening of payables by Mondelez will boomerang into rising costs, quality issues, and supplier viability concerns.

Step Three. Determine Forecastability and Forecast Value Added (FVA). I am often asked to benchmark demand. Executives will ask, "What is a good target for forecast error?" When I get this question, I laugh. I wish the answer was simple. It is not.

The answer is much like how long are a man's legs. Let me explain. Supply chains are not the same. To understand what is possible in forecasting start by determining forecastability. Profile volume segments by the coefficient of variation by demand flow. Customer service issues are normally in the medium-low volume product segments with a high coefficient of variation.

Use this data to understand demand predictability. If demand error is extremely high, traditional demand management techniques are of limited value.

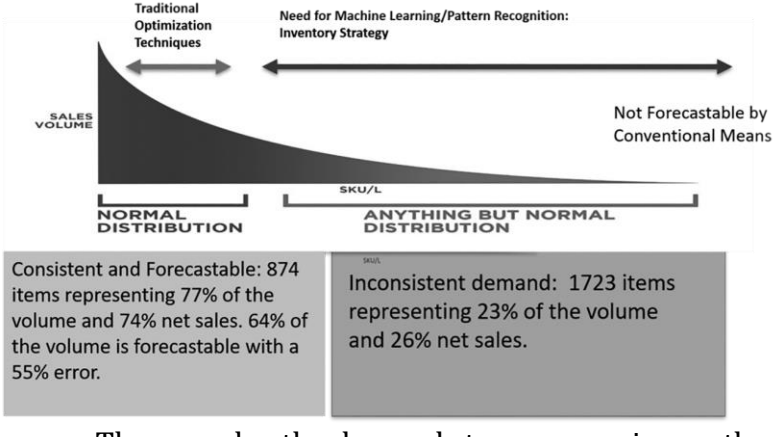
Divide the analysis into categories:

High volume, very predictable demand.
Medium volume products, predictable demand.
Medium volume, inconsistent demand.
Low volume, predictable demand.
Low volume inconsistent demand.
New product launch.
Declining volume.

Use this data to understand demand predictability. If demand error is extremely high, traditional demand management techniques are of limited value.

To tie the demand analysis to customer service, map products into categories and plot the long tail of the supply chain. Plot products by sales volume and order frequency. Shown in Figure 3.10 is a long tail analysis from a client.

Figure 3.10. Long Tail Analysis



Then overlay the demand stream mapping on the customer service analysis. Determine the root

issues of customer service. Traditional demand management techniques are the most suitable for predictable items.

For products in the tail, align demand classification techniques to the pattern. This requires testing of techniques like attribute-based forecasting, use of channel and weather data, and fine-tuning hierarchies through backcasting. (To backcast, take 2-3 years of history and try to predict the current period.) Sometimes, product variation is so high that demand modeling is not sufficient and inventory strategies are the focus. This includes postponement, platform rationalization, or the design of push/pull decoupling points.

Follow with the analysis of Forecast Value-Added (FVA). The goal of this analysis is to understand the value of the current demand planning process by the demand stream. In my client experiences of the last five years, I find that FVA is getting worse, not better. The reasons are many. My current clients have FVA analysis results of -33%, -14% and -9%. These are brand names with well-established supply chain planning teams. Before we started, the leadership team of each company did not know that there was an opportunity to improve the process. Why? What was the root issue? My guess?

Technology implemented without testing and fine-tuning the models. Measurement of demand accuracy incorrectly (comparison of units sold versus units forecasted monthly at a high level in the demand hierarchy). As a result, the Company teams have a false sense of achievement. As a result, the discussions were circular with a lot of finger-pointing.

Why go to this trouble? Supply chain excellence is all about detail. Companies have multiple supply chains. The answer is different for each based on the rhythms and cycles.

Step 4. Analyze Inventory: Muda Versus Buffers. Inventory is largely misunderstood. It is both waste and a critical buffer. Each company has a mix of both. The discussion is analogous to good and bad cholesterol with my physician. Buffer inventory is a shock absorber of demand and supply volatility while too much inventory is waste or Muda.

The key to supply chain excellence is focusing on the form and function of inventory and the design of inventory as a buffer in the supply chain while eliminating Muda. This requires analysis using network design and inventory optimization technologies.

Figure 3.2. Form and Function of Inventory

Form	Function
Supplier owned inventory: raw materials	In-transit Inventories: Inventory that is on trucks, barges and containers. The longer the trade-lanes and the slower the mode, the larger the requirements for in-transit inventory.
Company owned inventory: raw materials	Cycle Stock: In the planning of production, finished good production is cycled to ensure that the production lines are fully utilized. The average rotation between products on production lines in consumer packaged goods is three weeks.
Work in process inventory	Safety Stock: Inventory requirements to buffer demand and supply volatility.
Finished goods at the company warehouse	Seasonal Inventories: Inventories required to support seasonal builds.
Finished goods in the channel	Promoted Items: Inventories to support the promotional lift to support a promotion.

For each client with a negative FVA, there was a multi-million-dollar inventory opportunity. I find inventory management and the analysis of buffers is an

opportunity at most companies. This is one of the root issues leading to the swell of inventories in company warehouses as shown in Figure 5.

While 85% of companies have an Advanced Planning Solution, I seldom see one working well. In a conversation at a client with a solution deployed in 1995 and never fine-tuned, I asked, *"Would you have ever bought a car and ran it for over thirty years and never had an oil change or fine-tuned the engine?"* His answer was, "*Of course not..."* The issue was this was not his mental model.

The mistake is implementing advanced planning solutions as a technology without testing the output on implementation and never fine-tuning and testing the output over time. As a result, many companies unknowingly running systems that are making the forecasting number worse not better leading to increased costs, customer service issues, and higher inventory levels.

After testing in these four areas, companies should engage with technology providers. These insights help to drive the diagnosis.

What do you think? How do you assess the health of supply chain planning? I welcome your feedback.

Section 4

Case Studies

Case Studies

Here we share the case studies of supply chain excellence.

Clorox Successfully Implements Supply Chain Segmentation

I remember the first discussion with Mark and Dave. It seems like it was yesterday, but the work started in 2006. Mark is now a Director of Supply Chain Strategy at Clorox, and Dave is retired. Mark started in 2005 while Dave started with Clorox is 1968 and retired in 2018.

Supply chain segmentation—designing a fit for purpose supply chain—was the focus of the strategy day workshop. At the time, I was a Research Director at AMR Research (now Gartner). While it seems like yesterday, it was twelve years ago.

Figure 4.1. Clorox Company Business Overview

At that time, Clorox was moving from being a regional manufacturer of bleach products to manufacturing and selling a wider product portfolio globally. The Company was building the infrastructure to support a multi-national supply chain team. Today, the story is quite different. As shown in Figure 4.1, the company now has sales of 6B$, manufacturers 40+ brands in 24 countries and sells products in 100 countries.

Looking Back

In the spirit of transparency, I used to be a Clorox employee in the 1980s. At that time, the Company was 1/6th the size of today. Then, there were three primary product categories: Bleach/Home Cleaning Products (brands like Tilex, Clorox 2, and Soft Scrub), Hidden Valley Ranch Salad Dressings and Kingsford Charcoal. When I was moved into a warehouse management role to manage bleach and salad dressing in the same warehouse facility, I struggled with the marked

difference of the rhythms and cycles of products being managed out of the same warehouse facility. We spoke of this during the strategy day.

Dave pushed hard for clarity of terms. He searched for the difference between a responsive supply chain with short cycles and an agile supply chain that could adapt to yield the same cost, quality and customer service given the level of demand and supply variability. Unlike most supply chain leaders that I coached in this period, he understood that by definition an agile supply chain or a responsive supply chain would not be able to have the lowest cost per unit. A supply chain with the lowest cost per unit is efficient. Defining an effective supply chain required defining a supply chain strategy based on the business flows.

I am proud of Mark and Dave's work on supply chain segmentation. I share it here. Many times, the work that we did with clients in strategy days at AMR Research met a dreadfully boring dead end. This was not the case for the Clorox segmentation work. Clorox took the insights from the day and forged a strategy.

A Closer Look at Clorox

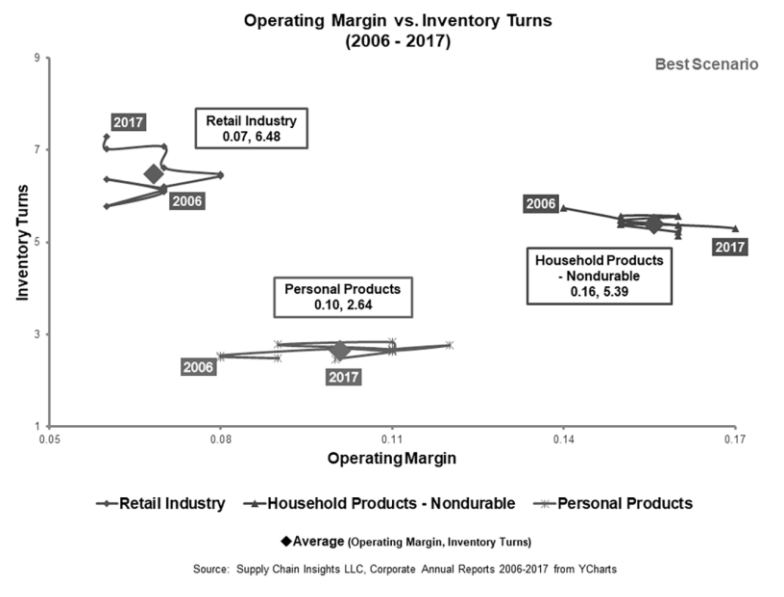
Over the course of the last decade (2006-2017), each vertical industry exhibited a well-defined pattern of performance. The margins for retail averaged 7%, while personal products were 10% and consumer products household goods were 16%.

While many in the industry believe that there was a significant improvement in data sharing and collaboration within this value chain over the past decade, this was not the case. Instead, each industry operated on its own effective frontier. While retail improved inventory, they lost ground on growth and operating margin. And, while household products gained

ground on margin, results for inventory turns worsened with the rise of item complexity. (The average company added 48% more items during this period.) Clorox, in this period of time, purchased significant business interests in the lower margin and inventory turns sector of personal products. This included products like the Burt's Bees line.

To understand this dynamic, reference the patterns of overall performance in Figure 4.2 for the period of 2006-2017 plotted as an orbit chart comparing inventory turns and operating margin averages for the sectors.

Figure 4.2. Orbit Chart Comparison of Personal Products, Household Companies and Broadline Retailers (Period of 2006-2017)



The addition of product portfolios in segments with a lower margin and turns affected the overall Clorox results, as the company drove a growth strategy.

However, based on the work of the supply chain strategy work by Dave and Mark, the company remained competitive against the peer set within household products.

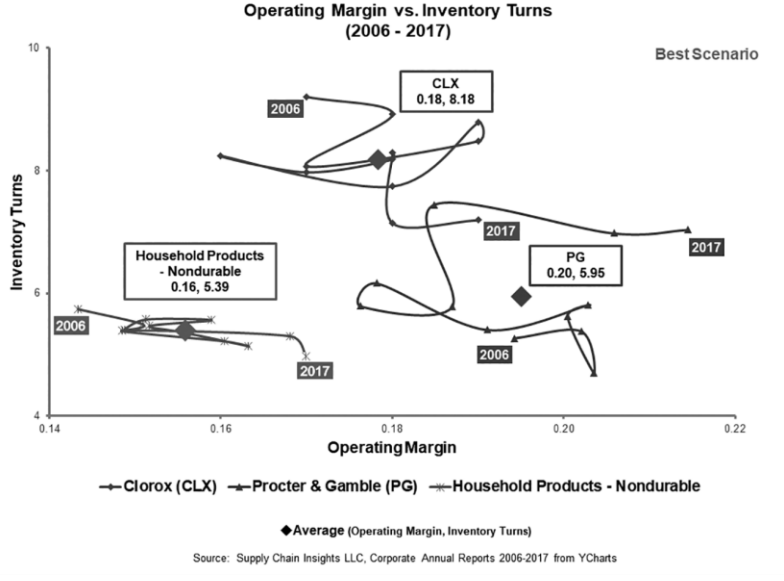
Table 4.1. Clorox Performance Compared to Competitors

Performance and Improvement (2010-2017): Household-Nondurables

Company	Growth	Operating Margin	Inventory Turns	Return on Invested Capital	Market Cap (000,000)	Price to Tangible Book Value	Supply Chain Index Rank
Church & Dwight Co	5.2%	0.19	7.1	14.0%	$9,201	-12.2	4
Clorox	1.2%	0.17	7.9	23.0%	$12,975	-8.6	11
Colgate-Palmolive	0.2%	0.22	5.2	30.9%	$55,003	-30.6	2
Energizer Holdings Inc	-3.2%	0.15	3.2	10.4%	$2,580	-9.2	1
Kimberly-Clark	-0.5%	0.14	6.2	18.7%	$36,683	-7.4	6
Newell Rubbermaid	17.7%	0.10	4.7	8.0%	$10,511	-4.9	5
Procter & Gamble	-2.0%	0.19	6.3	12.0%	$211,094	-14.1	10
Reckitt Benckiser Group "WINNER"	2.9%	0.24	5.1	24.1%	$59,262	-7.0	7
Spectrum Brands Holdings	11.0%	0.10	4.2	1.2%	$4,248	-1.6	7
Tupperware Brands	1.0%	0.14	2.8	13.7%	$3,277	-22.7	9
Unilever	1.3%	0.15	3.6	17.0%	$121,526	-13.7	2
Average	**1.7%**	**0.16**	**5.1**	**15.7%**	**$31,527**	**-12.0**	

Source: Supply Chain Insights 2018, Derived from YCharts; Showing average over time period; Supply Chain Index Rank = Based on average ranking within industry of Balance (Return on Invested Capital & Revenue Growth Vector Trajectory), Strength (Inventory Turns & Operating Margin Vector Trajectory) and Resiliency (Inventory Turns & Operating Margin Mean Distance; low score = better); Averages exclude outliers for purposes of Supply Chains to Admire calculations

Figure 4.4. Clorox Orbit Charts Versus Household Products Peer Group Along with Procter & Gamble for the Period of 2006-2017



Source: Supply Chain Insights LLC, Corporate Annual Reports 2006-2017 from YCharts

Q&A with Mark Hersh

I loved my dialogue with Mark to better understand his story. Here is the Q&A:

Q. What was the role of leadership in driving the segmentation project?

A. We could not have accomplished the goal without consistent and strong leadership. If you look at different businesses--water filtration, Burt's Bees, Probiotic Digestive Health—these were very different businesses than bleach. The degree of change was profound requiring personalization of the network to deliver results for the consumer. James Foster was the driving force behind the project. He is now retired but realized in 2006 that each business required a distinctly different network.

Q. How did you start the design processes?

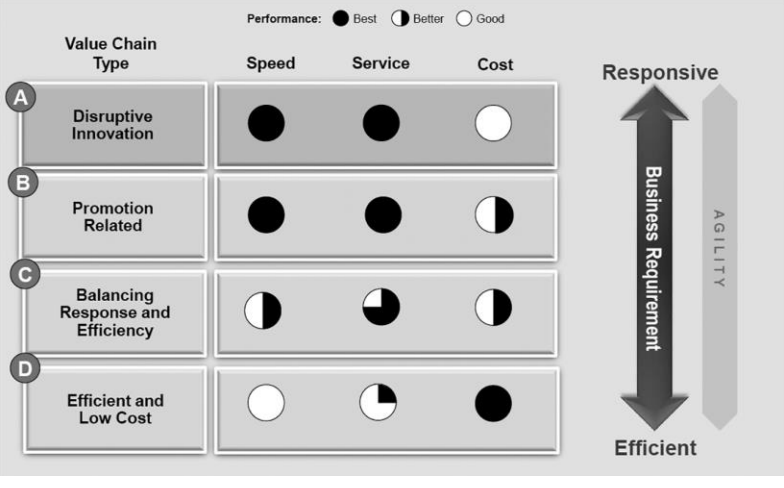
A. The goal was to design from the customer back. A lot of the new business/acquisitions were shipped directly to the customer versus moving through the Regional Distribution Network (RDC). In this time period, the bleach business had not changed a whole lot. It is still a low cost and highly efficient business. James knew that we needed a fit-for-purpose supply chain that matched the needs of the customer.

James sold the concept to CEO and senior leaders of the Company. His goal was to match supply chain capabilities with the needs of the market. General Managers needed product supply to be quicker and more responsive, and James wanted to deliver. If we were an efficient, low-cost supply chain like our days as a bleach supply chain, we're

not going to be able to support the business requirements.

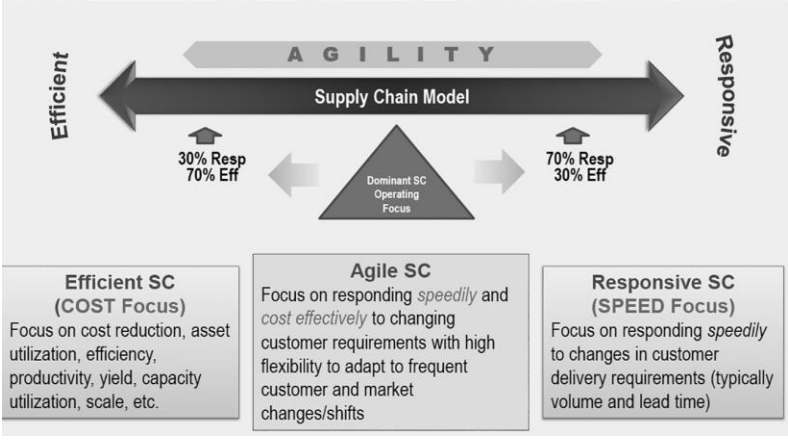
Leadership was essential. James's pitch was, *"If you focus on speed, the cost drivers will be good, but not the best."* What made the process powerful was that James forced the conversation. We used the diagram in Figure 4.5 to illustrate the trade-offs.

Figure 4.5. Map of Segmentation



The goal is to define capabilities. A very responsive supply chain is focused on customer service with a focus on new products. There is more capacity and the focus is on flexibility. In this segmentation process, it is also more important to collaborate with trading partners. Whereas, in an efficient supply chain, the focus is on the lowest cost and trading partner communication is not as essential.

Figure 4.6. Designing Supply Chain Segmentation

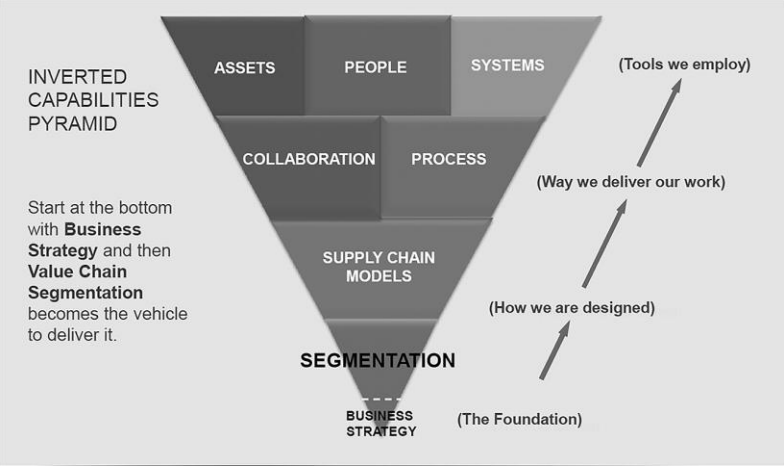


Q. How do you train and maintain the segmentation?

A. We start with strategy. Every year, we have an annual strategy planning process. At this meeting, business units and GMS share their plans. We focus on very clear objectives: how to win, how to play and how to configure. Within our organization, we translate the strategies to supply chain designs and requirements. Where there are gaps, we come up with the right designs. We do this each year. This is led by the Supply Chain Strategy. group composed of five people. We don't have special technologies. We focus on the method and the established template.

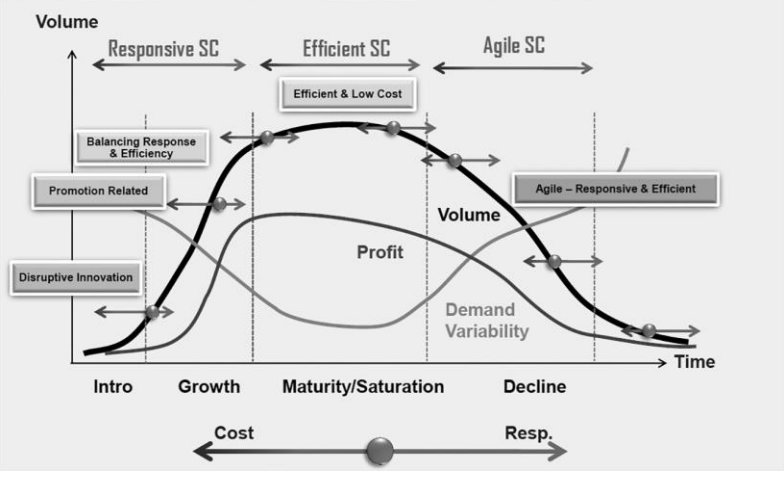
General managers are active throughout the process. Their hardest job is being clear on the longer-term view of the market. The focus is on the next five years. This is hard. This happens at the beginning.

Figure 4.7. The Process Starts with Strategy



Now segmentation is part of the culture. It is a routine and part of the planning process. If the product moves in the lifecycle, it is a signal to rethink the supply chain. This can be seen in Figure 4.8.

Figure 4.8. Shifts in Strategy Through the Product Lifecycle



Q. What role did this process play in Clorox's performance?

A. The process helped us to manage businesses that were different than the core.

Why is Clorox outperforming the industry on margin? Simple answer. Margin is clearly outlined in the strategic priorities. His strategy? Companies that are growing margin are creating dollars to drive growth. A focus on margin is applied across all of the functions.

Inventory turns went down due to the businesses that were less predictable. Businesses that we added are not as stable or predictable.

Q. What Do You Reward and Manage the Measurement System?

A. When it comes to measurement, we have not been as successful. We are still struggling to do this. We measure customer service the same way across all segments, but we have not differentiated metrics to match what is important.

Our Take

Clorox is one of few companies to initiate and maintain supply chain segmentation as a systemic program. It was initiated by a visionary leader and reinforced by GM training and review programs. Through this process, Clorox has been able to successfully manage the rhythms and cycles of multiple businesses while maximizing scale.

L’Oréal: A Case Study In Supply Chain Excellence

François-Régis Le Tourneau leads the efforts at L’Oréal for Standards & Prospective Process Improvement. L'Oréal is a Supply Chain to Admire winner for four consecutive years.

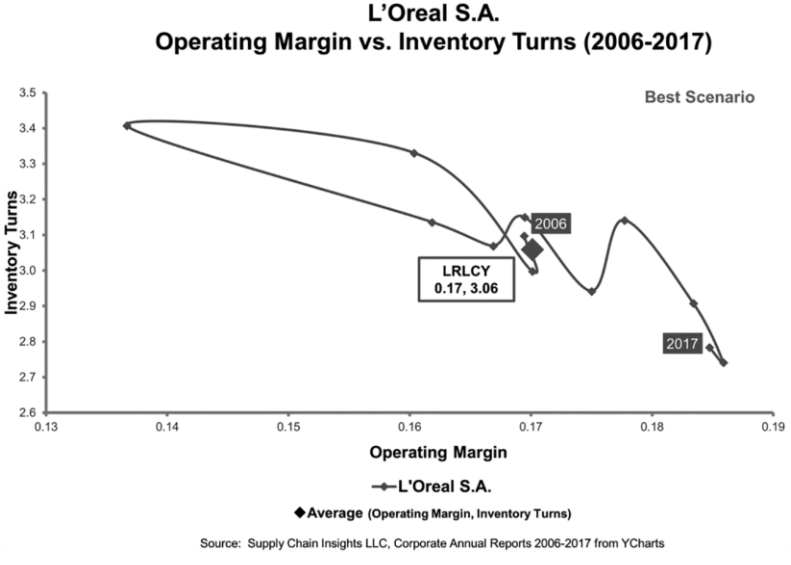
The award, based on beating the industry peer group on rate of improvement on the key metrics of growth, operating margin, inventory turns, and Return on Invested Capital (ROIC) while outperforming their peer group, is tough to achieve.

A Multi-Year Unbeatable Champion

Based in Paris, L'Oréal is a global personal care manufacturing company. It is the world's largest cosmetics company with annual sales estimated at over €26B. The Company has outperformed their peer group for the last decade making L’Oréal a multi-year Supply Chains to Admire award winner for the past four years.

To perform the analysis, we grouped L'Oréal into the Personal Products industry, which includes beauty, hair care, vitamins, etc. The orbit chart below illustrates L'Oréal's performance at the intersection of two metrics. Note that in the industry aggregate, in Figure 4.9 that the peer group actually went backward.

Figure 4.9. Orbit Chart for L'Oréal at the Intersection of Inventory Turns and Operating Margin



In Table 4.2 compare the performance of L'Oréal to its largest competitor, Estee Lauder. On average for the period of 2006-2016, L'Oréal had a 17% operating margin as compared to Estee Lauder's operating margin of 13%. Additionally, L'Oréal's inventory turns were slightly over 3.06 outpacing Estee's inventory turn value of 1.95. In this analysis, patterns matter. While both companies are driving improvement, L'Oréal is driving both improvements while outperforming the peer group. In contrast, Estee is driving improvement, but not outperforming the peer group.

Table 4.2. L'Oréal's Performance Compared to the Peer Group.

Performance and Improvement (2010-2017): Personal Products

Company	Growth	Operating Margin	Inventory Turns	Return on Invested Capital	Market Cap (000,000)	Price to Tangible Book Value	Supply Chain Index Rank
Avon Products	-6.6%	0.06	3.7	-6.9%	$5,335	49.5	12
Beiersdorf	0.2%	0.13	3.3	15.4%	$22,175	4.6	3
CCA Industries	-11.6%	-0.02	2.6	-12.3%	$26	2.1	17
Coty	14.3%	0.03	2.9	-0.1%	$10,053	-2.9	4
Estee Lauder	6.3%	0.14	1.8	20.5%	$28,277	15.2	4
Henkel AG & Company *WINNER*	2.4%	0.14	5.5	11.8%	$42,791	-3.5	8
Herbalife Ltd	9.0%	0.14	2.6	34.7%	$5,043	-6.9	10
Inter Parfums	5.7%	0.16	1.8	10.0%	$839	4.1	9
Kao Corporation	-0.6%	0.10	4.4	11.0%	$20,010	4.6	1
L'Oreal *WINNER*	2.6%	0.17	3.0	14.6%	$91,398	6.7	2
Natures Sunshine Products	0.1%	0.05	2.2	7.3%	$232	2.1	11
Nu Skin Enterprises	8.8%	0.14	2.1	21.2%	$3,267	6.3	12
Ocean Bio-Chem Inc.	5.8%	0.09	2.5	10.0%	$26	1.5	16
Oriflame Cosmetics SA	-3.5%	0.10	2.1	15.1%	$1,371	9.6	15
PZ Cussons PLC	-2.4%	0.11	3.3	9.7%	$1,901	14.2	7
Revlon Inc	10.1%	0.11	3.5	15.2%	$1,170	-0.9	12
Shiseido Co Ltd	4.8%	0.06	2.1	3.9%	$8,889	5.2	4
Average	**2.7%**	**0.10**	**2.9**	**10.6%**	**$9,463**	**3.9**	

Source: Supply Chain Insights 2018, Derived from YCharts; Showing average over time period; Supply Chain Index Rank = Based on average ranking within industry of Balance (Return on Invested Capital & Revenue Growth Vector Trajectory), Strength (Inventory Turns & Operating Margin Vector Trajectory) and Resiliency (Inventory Turns & Operating Margin Mean Distance; low score = better); Averages exclude outliers for purposes of Supply Chains to Admire calculations

This is an example of managing a balanced portfolio and of driving a supply chain revolution.

Driving Change: Adapting and Thriving

L'Oréal's global strategy embraces globalization with a keen focus on the customer. This case study is an excellent example of a customer-centric supply chain strategy.

The Company's strategy is to acquire brands developed on a local or regional scale and then bring them to a global scale in a short period of time. The focus is first on the customer with a global roll-out using an agile supply chain strategy to continually adapt to customer needs. (We define agility as the ability to deliver the same cost, quality and customer service given the level of demand and supply volatility.

Anticipating shifts in demand, the company's focus is increasingly digital. In China, for example, more

than 40% of the company's business through eCommerce.

The company experienced a 34% growth in global e-commerce in 2017 and is expecting the trend to continue. This is transforming the ways L'Oréal addresses the business. More than 38% of L'Oréal's advertising budget is now being spent on digital. This is how the company activates the markets and to ensure alignment, the supply chain team works closely with the digital marketing teams.

With a keen focus on the customer, L'Oréal senses and uses customer sentiment. The Company's senses consumer preferences to change and align its portfolio to deliver personalized products for purchase anytime and anywhere. This has pushed the company to hyper-connectivity with the final consumer.

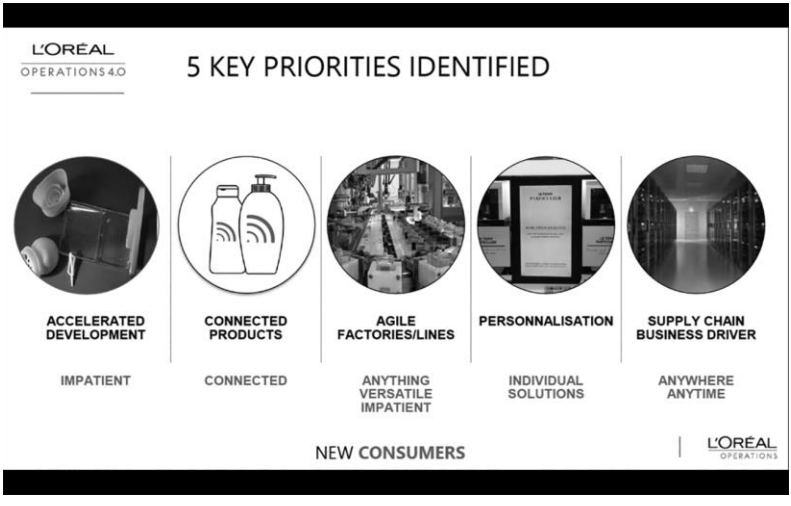
To meet the expectations of eco-friendly customers, the company has developed a method of assessing the environmental impact and the social contribution of each product they launch. If a conceptualized product does not exceed the results of an already launched similar product, it won't be launched. This approach has fundamentally shifted L'Oréal's response to the market.

Growing Pains

With eight distribution channels, L'Oréal believes they operate a complex global supply chain within the peer group of fast-moving consumer goods (FMCG). In their benchmarking, they believe that the closest company as measured by complexity is Nestlé. In just a few years the company went from a limited range of brands and SKUs to a highly complex business model. The Company currently produces seven billion products across 55 brands.

Operations complexity is intense. Some manufacturing sites are more focused on regional markets and on mass-market consumer products, others – mostly small branches in the US, France, and Japan - act on a global scale for the luxury segment. The company is continuously performing a balancing act in terms of luxury craft, complexity, and agility to produce a large number of SKUs made of over 1500 types of raw materials. We show their defined priorities in Figure 4.10.

Figure 4.10. Key Priorities in L'Oréal's Operations' Strategy



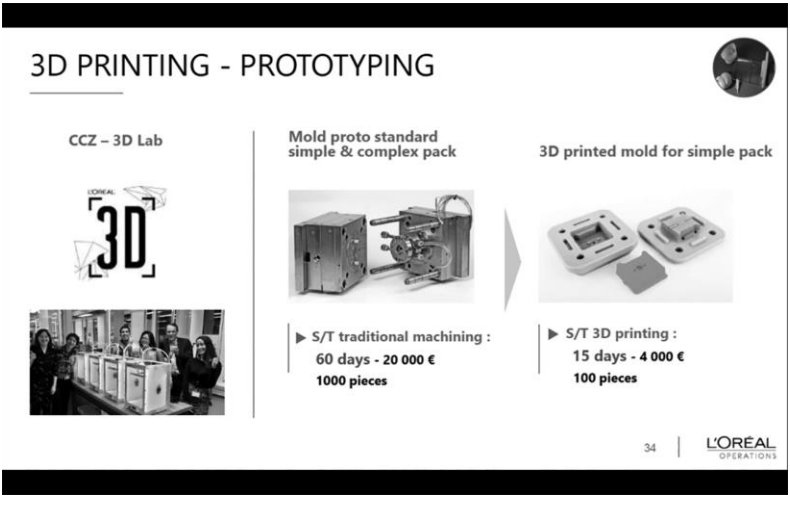
To respond to consumer shifts in preference, L'Oréal continually redesigns physical distribution and network optimization. This is active and ongoing. With smaller order sizes due to the focus on e-Commerce picking in detail is becoming more frequent. During the last decades, detail-picking orders mostly applied to luxury products in the hair salon channel. Now, picking the "each" is being extended to the entire catalog across the eight distribution channels.

Defining the Strategy of Operations 4.0

François-Regis's focus is defining agility in operations through its Operations 4.0 strategy. This is a code word for operating model change in terms of manufacturing, supply chain, and global operation based on how fast and in what direction the business is changing and how the consumers are moving.

To define this strategy, the company started with consumer needs and then adopted manufacturing technologies through augmentation using virtual reality, simulation machine learning, 3D printing, etc. As the company transitioned from data scarcity to data abundance coupled with cheap data storage, the focus shifted from the ways to obtain data to the use of data to drive insights.

Figure 4.11. 3D-printing Revolutionizes L'Oréal's Prototyping



3D printing improves flexibility. The Company revolutionized product prototyping. The use of 3D-

printing enables smaller batches, lower manufacturing costs, and shorter lead times compared to traditional machining. The focus is on time-to-market to fuel growth strategies.

Consumers want fashion in their cosmetics. 3D-printing has enabled the company to produce products that they were unable to produce before. For example, product packaging seen below would not have been possible without 3D-printing.

The company is also able to test virtual products before moving to production decisions. This has led to accelerated development and has significantly cut costs. 3D-printing enabled a reduction in cycle time: the transition from the 60-day development cycle of first mock-ups with considerably high costs to a 15-day cycle at a fifth of the cost.

Testing for compatibility of the formula and the packaging before launching a new product is of our most important in the company's industry. For example, chemical interaction between aerosol cans and their product formula can lead to dangerous leakages. L'Oréal partnered with IBM to develop technical capabilities for identifying possible interactions based exclusively on artificial intelligence and machine learning. Since compatibility tests last up to 6 months, this technology has greatly reduced our time-to-market.

The Success Formula

In our studies of global supply chains, L'Oréal has the most effective global-regional-local governance model we have ever seen. The company empowers an entrepreneurial culture within regions. They ask each region to know their customers and empower the supply chain teams to collaborate with their commercial and digital marketing teams. It is one of the most effective regional/global governance models studied.

Might culture drive success? François-Regis certainly thinks so. “Our success is a question of proximity to our consumers,” – he insists. “*We operate our global business with our long-term strategic vision, but the day-to-day operations are kept local. Our supply chain and operations teams are customer-oriented entrepreneurs. We really focus on driving local supply chain initiatives. We empower employees to propose and to innovate.”* We think so as well. Everyone in the organization is very aware of consumers’ high expectations. In the end, it’s a drive for innovation to serve the customer.

Rockwell Automation: Supply Chain to Admire Award Winner

For the past five years, the team at Supply Chain Insights identified Supply Chains to Admire Award Winners by analyzing performance by peer group on the key metrics of growth, operating margin, inventory turns and Return on Invested Capital (ROIC). In 2018, Rockwell Automation won the Supply Chains to Admire Award.

To understand the journey, we interviewed Ernest Nicolas, head of the global supply chain at Rockwell to gain insights.

Rockwell Automation Supply Chains to Admire Award Winner

In Table 4.3, we share the results of Rockwell Automation's performance against their peer group in the diversified industry segment.

Table 4.3. Diversified Industry Performance for the Period of 2010-2017

Performance and Improvement (2010-2017): Diversified Industries

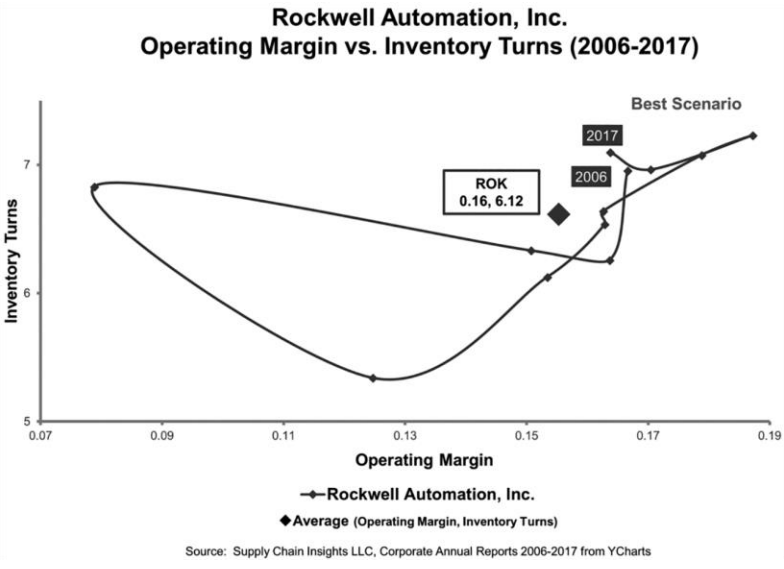
Company	Growth	Operating Margin	Inventory Turns	Return on Invested Capital	Market Cap (000,000)	Price to Tangible Book Value	Supply Chain Index Rank
ABB Ltd	1.3%	0.10	4.9	11.3%	$49,014	29.2	20
Actuant Corp	0.0%	0.08	4.8	2.0%	$1,777	24.5	26
AMETEK Inc	9.7%	0.22	5.1	11.5%	$11,052	-12.2	3
Avery Dennison Corporation	1.4%	0.08	8.8	10.4%	$5,349	-88.8	17
Dover Corp *WINNER*	4.4%	0.14	5.5	11.2%	$12,264	-4.4	13
Eaton	7.8%	0.11	6.0	8.8%	$26,782	-29.8	9
Emerson Electric	-2.5%	0.18	6.5	13.6%	$39,848	-3.1	18
Flowserve Corp	-1.9%	0.13	3.0	11.6%	$6,900	15.2	14
Fortive Corp	2.9%	0.20	6.1	15.3%	$21,844	-10.2	8
Generac Holdings	15.4%	0.17	2.9	10.8%	$2,510	-5.9	2
General Electric Co	-2.6%	0.16	4.6	1.6%	$232,606	-2.1	24
Hillenbrand Inc	13.2%	0.13	6.4	10.8%	$1,909	-10.7	16
Honeywell *WINNER	3.5%	0.14	6.4	13.4%	$70,654	-14.5	5
Hubbell Incorporated	5.7%	0.15	5.1	12.1%	$6,480	22.2	23
Ingersoll-Rand PLC	1.1%	0.10	6.9	8.2%	$16,167	-5.6	7
Legrand SA	3.1%	0.19	3.5	10.7%	$14,946	-10.1	4
MDU Resources Group Inc	0.9%	0.08	12.6	2.3%	$4,584	2.4	22
Morgan Advanced Materials	-1.2%	0.10	2.0	10.3%	$1,029	-5.9	20
MSC Industrial Direct Co Inc	8.9%	0.15	3.3	16.6%	$4,698	8.4	9
Parker Hannifin	2.4%	0.11	7.0	12.2%	$16,762	11.4	15
Regal Beloit Corp	8.5%	0.08	3.7	5.6%	$2,956	5.7	19
Rockwell Automation Inc *WINNER*	5.2%	0.16	6.1	22.4%	$14,981	17.3	11
Schneider Electric	3.7%	0.12	4.9	7.2%	$39,873	-49.4	25
Toshiba	-4.6%	0.02	5.7	-9.5%	$15,740	3.0	1
Trinity Industries Inc	8.5%	0.17	4.5	6.5%	$3,727	1.6	6
Valmont Industries Inc	6.5%	0.10	5.6	9.6%	$3,101	5.2	12
Average	**3.9%**	**0.13**	**5.2**	**10.2%**	**$13,512**	**-0.7**	

Source: Supply Chain Insights 2018, Derived from YCharts; Showing average over time period; Supply Chain Index Rank = Based on average ranking within industry of Balance (Return on Invested Capital & Revenue Growth Vector Trajectory), Strength (Inventory Turns & Operating Margin Vector Trajectory) and Resiliency (Inventory Turns & Operating Margin Mean Distance; low score = better); Averages exclude outliers for purposes of Supply Chains to Admire calculations

(The Supply Chain Index is a measurement of Supply Chain Improvement.)

In Figure 4.12, we include the orbit chart of performance metrics at the intersection of operating margin and inventory turns. Note the balanced results of Rockwell Automation against their peer group.

Figure 4.12. Orbit Chart for Rockwell Automation at the Intersection of Operating Margin and Inventory Turns for the Period of 2006-2017



Meet Ernest

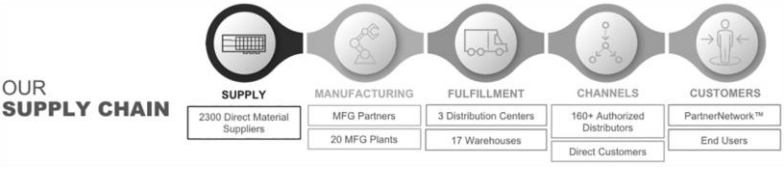
Ernest Nicolas joined Rockwell Automation in 2006. He is currently the vice president of the global supply chain. At Rockwell this includes all processes end-to-end except for manufacturing. In his role, Ernest owns strategic sourcing, materials planning, customer care, and logistics operations globally. He is a humble and quiet leader.

Rockwell Automation is the world's largest company dedicated to industrial automation and information. Headquartered in Milwaukee, Wisconsin, Rockwell Automation employs approximately 23,000 people serving customers in more than 80 countries. As a B2B company, procurement management is essential. The company has over 7,000 suppliers and provides industrial automation and information products to a variety of industries in over 80 countries. The company's sales totaled $6.3B in 2017.

Rockwell's finished products fall into three categories: components, control, and visualization platforms. Some products--pushbuttons, relays, and switches--turn very quickly with high volume sales. Configured products include panel views, industrial monitors and computers, and drivers turn more slowly.

At the core, Rockwell Automation produces logic controls. The company also offers engineered-to-order solutions, such as control centers and medium-voltage drives. From a manufacturing perspective, products vary significantly in complexity. Some items take very little processing time while others have quite an extended lead time. Solutions, for example, can take from 12 to 16 weeks to manufacture. In Figure 4.13, we show an image of the Rockwell Automation Supply Chain.

Figure 4.13. The Rockwell Automation Supply Chain



The company understands global manufacturers' problems because they are one. Like most industrial manufacturers, they manage a profoundly diverse portfolio of products. In this environment, complexity is both an opportunity and a challenge. Rockwell Automation has more than 400,000 items in its catalog. A typical order is about 200 SKUs, and an average product life cycle is 20 years.

Value creation and a value-driven approach are the pillars of the Rockwell Automation model. The company's current strategy is to bring a Connected Enterprise to life. This starts with defining value, and then combining processes, and simplifying the complex.

It's about understanding and delivering on the company's customer's requirements.

The Beginning of the Journey: Strategize, Centralize, and Re-footprint

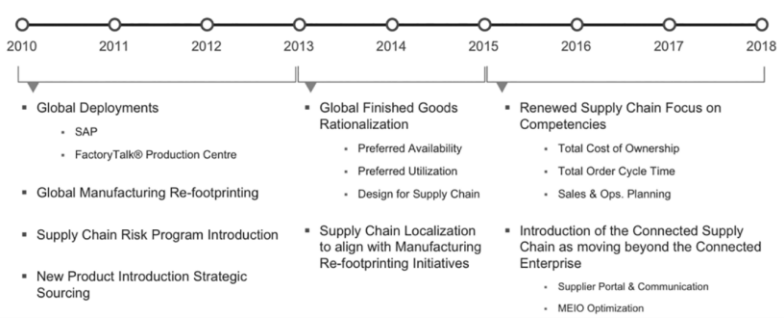
In 2008, Rockwell Automation prepared to embark on something intentional: the redesign of manufacturing operations and the supply chain. At the time, the company started internal discussions on re-foot printing the organization and deploying SAP across manufacturing centers. The plan included the centralization of operations and services.

At Rockwell Automation, the vision of the Connected Enterprise is the convergence of informational technology (IT) and operational technologies (OT). The idea is to connect the shop floor to the executive suite. Within Rockwell, Ernest's team goal was to connect upstream and downstream processes. The focus was a faster time to market, the lower total cost of ownership, improve asset utilization, and reduce risk.

The project included the centralization of SAP ERP and the augmentation with other software. The Factory Top Production Center (FTPC) is the essential core of the Rockwell Automation supply chain.

To continue driving change, Rockwell Automation also invested in design thinking. The team created a portfolio of global supply chain personas of essential roles. Supply chain personas guided the global manufacturing re-foot printing efforts and landed the company at the very top of the Supply Chains to Admire ranking.

Figure 4.14. Rockwell's Automation Journey



Historically, the Rockwell Automation supply chain organization included materials planning and engineering of new products but did not include strategic sourcing. to change this, the company chose to take engineers out of design function and trained them on the fundamentals of supply chain and strategic sourcing. The company also taught them to understand the basics of negotiation and risk management. The goal was to generate scale while ensuring that they leveraged their preferred suppliers, and taking some of the products' cost upfront. That was a significant shift in Rockwell Automation's previous approach to a supply chain.

Step Two: Rationalize, Localize

In 2013, the company drove scale for finished goods. They started to preferred metric availability and preferred utilization through sales to better understand order tracking along with the analysis of customers' orders were using preferred products. Rockwell Automation provided incentives sales to help motivate their sales team.

The company also started to localize order fulfillment. Looking back, one strategic move Ernest

regarded as questionable is the company "localizing to localize" without questioning whether it was the best fit for sourcing. However, localized sourcing shortened lead times and improve responsiveness.

Bringing It All Together: The Connected Supply Chain

In 2015, the company began focusing on total cost of ownership, order cycle time, and sales and operations planning.

The total cost of ownership is an analysis of the total costs of the buying decision. The company had to ensure they were balancing everything appropriately, not only considering just purchase price variance or cost down but all the elements of the source-plan-make-deliver cycle. (In the case of Rockwell Automation, it's plan-source-make-deliver because of the structure of the organization.) Ultimately, the company made sure they were taking into consideration all the various elements and the impact they will have on different functions of the process supply chain.

An analysis of total order cycle time was about going back to the cash and thinking about ways to reduce the time. This methodology was especially crucial for Rockwell Automation global customers, whose impact was notable since it didn't have the benefit of their distribution network. The company focused on sales and operations planning comprising one supply chain. They also focused on lowering the walls of the silos: getting logistics, sourcing, supply chain planning to work on being globally inclusive. The company embraced cross-functional thinking, became much more end-to-end, and leveraged its cross-functional talent. All of these steps led to the final push: the introduction of the connected supply chain.

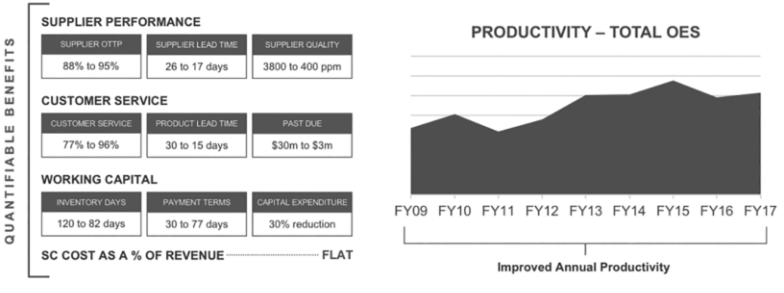
The next step was modernization. At this point Rockwell Automation was ready to redesign supply chain hordes, to fundamentally change its business process, and to leverage technology.

The Result: Show Me the Money

Ernest started the journey with some realistic expectations: a sustainable return, a reduction in cost, and improved supplier performance. The figure below lays out important metrics: supplier performance has surpassed the expectations in all three dimensions. Customer service also exceeded its targets.

As Rockwell Automation learned and understood their capacity and segmented their data, they saw significant improvement in on-time fulfillment rates, product lead time drops by 50%, and past due orders (ten-fold improvement).

Figure 4.15. Quantifiable Results of Rockwell's Automation Journey



As shown in Figure 4.15, annual productivity numbers climbed steadily since 2011.

What Is Next?

The company has achieved clearer visibility into plant operations by leveraging its own products. They are using real-time data to make more profitable decisions faster. The team has standardized processes across all the facilities. As a result, best practices are more accurately identified and proliferated using consolidated analytics. The company is now focusing on cognitive sourcing, demand-driven procurement, and enhancing visibility. The next step is expanding the supply chain to improve the visibility of upstream and downstream, which will bring the connected enterprise to a new level: The Connected Supply Chain.

Our Take

Rockwell Automation is a case study of a company working a long-term plan focused on improving flows for the customer. The focus on design-thinking and supply chain personas grounded the process to ensure the delivery of results.

Demand-Driven Processes Drive Value for Shell

Nick Lynch is the Global Excellence Manager at Shell Lubricants, a division of Shell Global. Located in the United Kingdom (UK), he has more than twelve years of experience in progressive roles driving demand-driven projects for their global supply chain. Nick is a master of influence skills and building cross-functional and horizontal processes.

At the 2018 Supply Chain Insights Global Summit, Nick shared his story on driving demand-based improvements. In this post, we share our take on his journey.

Incrementalism Is Not Sufficient

Nick strongly believes that it is insufficient to drive supply chain improvement through incrementalism. His take? It is just not enough to do a software upgrade or slowly push continuous improvement projects. He has personally experienced the results from this type of incrementality and believes that the most significant success happens by challenging existing paradigms. Nick does this well.

The start? He began the journey by implementing demand sensing from Terra Technology (now E2Open) eight years ago. The implementation of a Demand-Driven Materials Requirements Planning (DDMRP) using Orchestr8 followed in 2017. Nick thinks that the demand-driven journey can exploit a combination of demand sensing, demand translation, and demand orchestration. The Terra Technology implementation is an example of demand sensing while the DDMRP implementation is an example of demand translation of the probability of demand into materials requirements.

Nick also believes that changing an organization paradigm to move from a supply-centric mindset to accept a demand-driven vision is a significant change management issue. To our knowledge, Shell is the only company globally to have used both demand sensing and DDMRP capabilities.

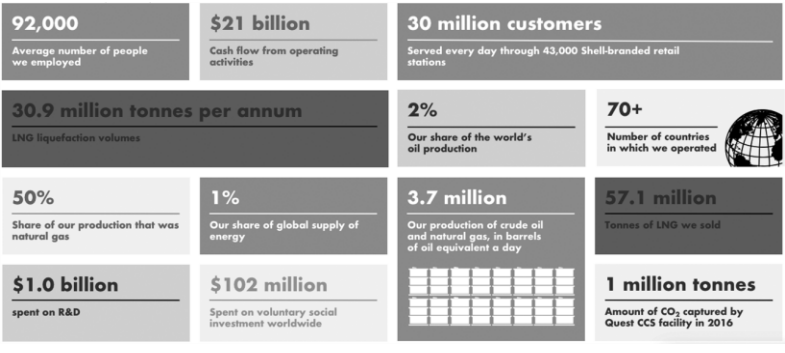
Understanding the Lubricant Supply Chain

To understand Nick's opportunities and challenges, let's start with some company numbers to give the reader perspective. Shell is the sixth-largest company in the world and the largest global provider of lubricants. While the lubricant business is a small sector

within the vertically integrated conglomerate of Shell, it is crucial for growth and margin.

There are 92,000 employees within Shell and 3,000 work in the lubricants business. The lubricant business supply chain acts similarly to a mix-and-pack consumer products supply chain.

Figure 4.16. Overview of Shell



The lubricants are oils and greases to reduce friction and prevent moving machine parts from grinding. Ubiquitous, motor engines, machines in a factory, or a turbine on a wind farm run easily based on lubrication from companies like Shell.

Shell's goal is to provide a variety of products to enable usage in multiple applications. The company sells products globally through both B2B and B2C channels. The Company also has franchised aftermarket services in automotive repair shops, retail outlets, and everything in between. Shell's current shift to the global supply chain is impacting North America, Latin America, Europe, Middle East, Asia, Russia, and China. The variety of products coupled with channel proliferation results in complexity in the global supply chain.

A Brief History of Shell's IT Investments

Shell operates as a single instance of SAP Enterprise Resource Planning (ERP). Completed in 2012, the ERP project forced the company to standardize organizational design, roles, and metrics. However, the value of a single integrated ERP system with the embedded functionality and modules did not materialize was never achieved.

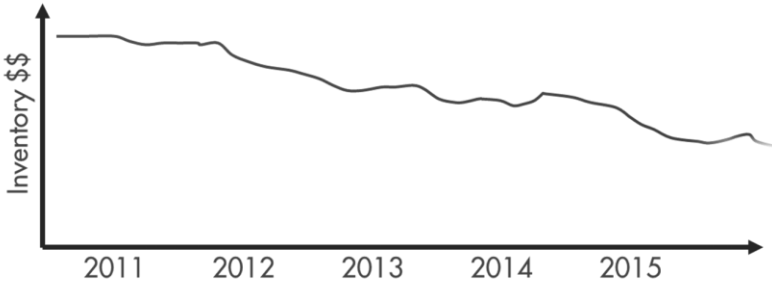
The reason? While the company leadership expected everyone to follow one process, it did not happen. The Company implemented SAP Advanced Planner and Optimizer (APO) including the standard functionality of Demand Planning (DP), Supply Network Planning (SNP), and Production Planning and Detailed Scheduling (PPDS), yet many planners also used Excel. What can often look like compliance in APO (SAP Supply Chain Planning) were calculated in Excel and pasted into the SAP system.

The Demand-Driven Journey Begins

In 2010-2011 Shell partnered with Terra Technology to roll-out demand sensing as a bolt-on to SAP ERP. The implementation was very successful. They saw a steady drop in inventory and reduced working capital by about 50% between 2011 and 2015.

The project enabled improvements in Sales and Operations Planning. To drive adoption of S&OP, Nicknamed the process Integrated Business Value (IBV). He knew Integrated Business Planning (IBP) tools were out there, but he couldn't sell IBP within the organization.

Figure 4.17. Impact of Demand Sensing on Inventory Levels



As soon as his sales and finance managers heard the word "Planning," they switched off resisting change. Nick and his collaborators decided to call it IBV since everyone in the organization could align on value. By emphasizing value instead of planning, he was able to move the conversations forward. By leveraging demand sensing and the Multi-tier Inventory Optimization (MEIO) platform-- using machine learning and some cognitive technologies--from Terra Technology on top of SAP APO, Shell successfully launched an analytics platform initiative to improve the demand signal and reduce safety stock.

Over this period of 2013-2014, Shell made good progress on inventory but faced unprecedented supply price volatility. When the price of oil dropped from $120 per barrel in 2012 to the staggering $29 per barrel in 2015, everyone in the oil and gas industry felt the impact.

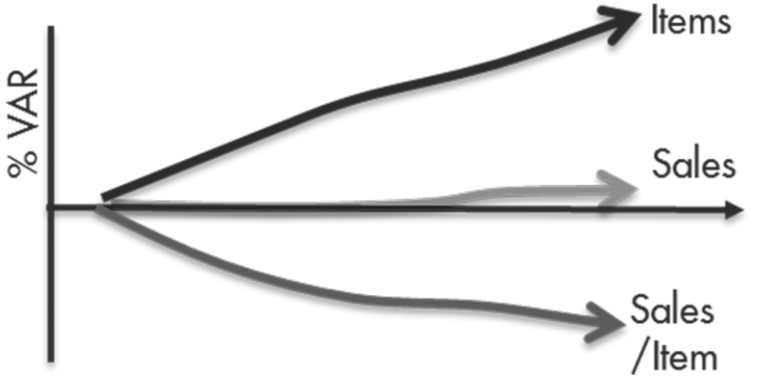
It intensified the company's focus on performance: business benefits, cost platforms, value delivery, and balancing upstream spending, such as digging wells and searching for oil reserves, with money-making downstream activities. In the new business environment, the nine-digit numbers of financial improvements in 2011-2015 from implementing IBV

were now not sufficient. The first project was well done, but not enough.

Planting the Seeds for Change

Reducing inventory to the lower levels within lubricants drove a subsequent increase in risk. As the number of items sold grew, they became increasingly more difficult to forecast. A chart from the Terra Technology annual study on demand depicts this relationship. Shown in Figure 4.18, it is a clear depiction of the implications of complexity.

Figure 4.18. Trade-offs in the Supply Chain



Shell experienced service level hits, resulting in firefighting. Trying to find ways to soften the impacts, Nick took a closer look at the product portfolio. The block chart below tracks the relationship between the stable, forecastable product, the variable product, and the unpredictable product.

When Nick analyzed Shell's sales volume, excess stock, the number of SKUs sold grew, and the revenue over a long enough period, he saw a disturbing picture: the areas for growth in the company's business were the

hardest to forecast. Nick recognized that he was running out of levers to drive improvement. The regions running the business were finding it harder and harder to stay on the projects. He needed to find new solutions. This quest led to the consideration of the adoption of Demand-Driven MRP.

Traditional MRP and the Shift to Adopt DDMRP

Most ERP platforms include traditional transactional-based MRP logic. By definition, in traditional MRP, the forecast is input into supply planning and integrated into MRP. When MRP runs, the forecast translates into supply chain requirements. In the process, the initial forecast number first becomes a finished product requirement, then a stock movement one, a production one, and finally a materials requirement – all based on the initial forecast.

The problem is that demand is not an absolute number. Instead, it is a set of probabilities. As demand error increases, a focus on inventory buffers and push/pull decoupling methods increases in importance. Previously, Shell was only looking at safety stock levels and the not form and function of inventory. The adoption of DDMRP enabled the building of buffer inventories to reduce the 'nervousness' of the system.

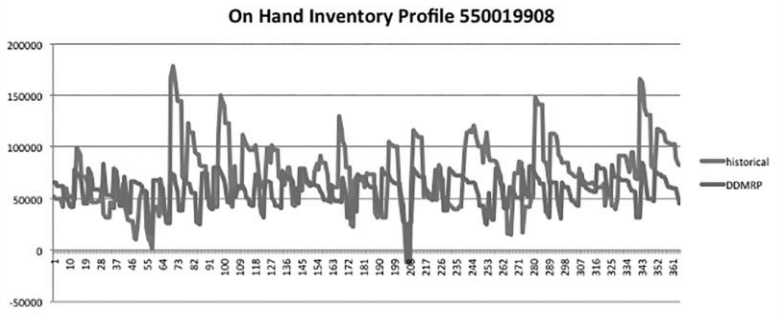
In early 2015, Nick gathered the three senior regional planning managers to discuss the concept of demand-driven planning. Their regional business and personal successes depended on success in improving working capital and costs. Initiatives were stuck. The low hanging fruit was gone.

To prove the concept, in 2016 Shell collaborated with SmartChain, a consultancy experienced at implementing DDMRP. Nick worked with them to

provide intensive education of stakeholders, planning managers, general managers, process experts, and SAP specialists on the concept of DDMRP. To prove the concept, Nick decided to run a simulation and tested the North America market.

Shown in Figure 4.19 are the results of the simulation. The red line of DDMRP was a substantial improvement to traditional MRP output shown as the blue line.

Figure 4.19. North America Simulation Output



DDMRP logic uses order flow sensing to build buffer strategies and as a result, results in better results with less system nervousness. As a result, the system still experiences variations, but with less volatility and noise. The blue historical profiles demonstrate the effect of the bullwhip and system nervousness.

First Results

The simulation in North America projected a 35% drop in finished product working capital. The simulation showed a 10-15% reduction in additive (active-ingredient) inventory requirements to support production.

To gain organizational support to drive change, Nick ran two more simulations: one in Hong Kong and a grease plant in Belgium. This was to show the power of

DDMRP with regional differences. Hong Kong has a lot of city transport, lengthy lead times, containerized products, and is much more fragmented when compared to the North American market. The two simulations were different flows, but both demonstrated similar benefits – about 15%-reduction in finished goods in Hong Kong and a 20%-reduction in finished products in Belgium.

To move forward, Nick needed a technology solution to drive the results. SAP was not in the game at this point, and there was no way Nick would move forward with MS Excel solutions. Requirements included Software as a Service (SAAS), be globally scalable, and be accredited and certified by the Demand Driven Institute to ensure it performed to that documented standard. Shell selected Orchestr8 as its strategic partner to convert the simulations they had completed into a reality in the supply chain. The project was a two-digit investment for a three-digit payback, a quite lucrative one. Change management was a challenge.

Benefits

By early 2017, after six months of back-and-forth peer reviews, senior VP and EVP signed the investment proposal. The pitch was all business-case driven. Nick didn't use buzzwords such as digital or cloud supply chain, but sold the project saying "Would you like saving X hundred million dollars in your supply chain?" The simulation results--the ability to see the results--made the conversation real. Talking numbers worked.

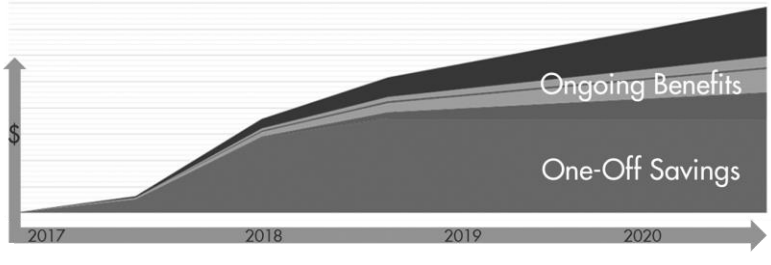
Nick formed a tight-knit implementation group with business users, and technologists used the backbone of SAP ERP to source master data and transactional flows from SAP and into Orchestr8. The planners would then drive all replenishment planning (for make, move or buy) directly in Orchestr8. The pilot went live in October 2017

in Spain, Italy, and Turkey and included the inbound materials planning managed by the planning service center in Krakow, Poland.

To mitigate transition risks and validate target results, the project team tested live numbers in parallel to the real platform. This way, they could be confident that going live wasn't going to crash the business. The results accelerated global adoption.

Some benefits of switching to DDMRP are obvious, such as the immediate impact on working capital and inventory levels. Others become apparent over time. Change in logistics cost or production cost based on implementation, for example, accumulates with time. The chart in Figure 8 demonstrates the full benefits.

Figure 4.20. Project Benefits Over Time



Benefits that are not as easy to quantify, but are of immense importance, include noise and waste reduction, supply chain stability, increased capacity. Country by country, people in planning roles are often more stressed and work extended hours, because of the necessity to continually put out fires as supply chains become more complex and difficult to forecast: the lead times are shorter, while the normal inventory safety levels are lower. With noise out of the system – firefighting, urgent orders, stock out alerts, expediting expenses –a very tangible difference gained in the planners' and logistics' productivity.

Another result is a noticeable climb in service levels. Shell was no longer loading up their production facility and all of the material purchases that were going to come in based on that, with all the products that might sell based on the questionable forecast. By loading the production capability with orders that were taking place based on real demand instead of orders based on guesswork, Shell freed up production capacity and increased agility. The waste reduction came from lowering excess stock levels and, consequently, reducing stock write-offs.

Current State:

With the company's global and regional programs in place, Shell actively deployed the platform in the Americas, Europe, and Asia. By the time the company got to Egyptian implementation, they had enough successful deployments on their hands that they mustered up the courage to skip the implantation of SAP APO. Shell went from no ERP system straight to the full DDMRP deployment, thus cutting the implementation time by about six months.

The company went live in the Philippines in July 2018 and France in September 2018, with North America and Russia following in October 2018, thus working their way around the global supply chain network. Because it's a single global instance of SAP transactional backbone single-cloud instance of planning solution, the implementation methodology is identical for every location.

The regions are responsible for deployment. The Shell Global Supply Chain Team equips regions with the methodology, the step-by-step process, and a consultant team.

Case Study Key Takeaways:

Incrementality is not enough. Nick, with twenty years of experience, had to change his personal paradigm of supply chain excellence and that of his organization to drive business results.

Sell Projects by Speaking the Language of Business. Nick is a master at influence management. He sold the project by speaking the language of the business. Instead of drop-parachuting into a department or a leadership team and giving them tech-speak and acronyms, Nick sold the benefit of a demand-driven journey.
Drive Change Management Through Education.

Ask for Help. 80% of the work in this effort outsourced --process design and configuration. Nick formed a broad cross-functional coalition and empowered the group to drive change. Partnering was critical to success.

Our Take

Nick is at the forefront of defining and driving demand-based capabilities at Shell. By building a convincing, numbers-based business case, and backing it with real-life data, Nick was able to persuade a large, and conservative company to invest in demand-driven transformation. His secret to successful implementation was building cross-functional, horizontal processes and actively investing in change management.

Thanks to Nick's leadership, Shell is currently the only company that has combined demand sensing with DDMRP capabilities on a global scale.

Section 5

What Drives Value?

What Drives Value?

Supply chain leaders traditionally focused on managing costs. Today, there is a shift from cost management to value. However, this raises a question, *"What is value?"* Here we attempt to answer this question.

Triple-A Supply Chains

It was not my goal; but by accident, it became a mission.

As we prepared for the 2018 Supply Chain Insights Global Summit, we combed through over 9000 quantitative responses on supply chain management from business leaders to understand what drives supply chain excellence. In the process, we proved Hau Lee's theorem in the Famous Harvard Business Review Article, Triple-A Supply Chains[1].

"...it isn't by becoming ***more efficient*** that the supply chains of Wal-Mart, Dell, and Amazon have given those companies an edge over their competitors. According to my research, top-performing supply chains possess three very different qualities. First, great supply chains are agile. They react speedily to sudden changes in demand or supply. Second, they adapt over time as market structures and strategies evolve. Third, they align the interests of all the firms in the supply network so that companies optimize the chain's performance when they maximize their interests. Only supply chains that are agile, adaptable, and aligned provide companies with a sustainable competitive advantage."

Hau Lee, October 2014
Harvard Business Review

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[1] The Triple-A Supply Chain, Hau Lee, https://hbr.org/2004/10/the-triple-a-supply-chain, 8/25/2019

When presenting the results, I get the question, "*how to improve performance."* When I got this response, I focus on the “how".

Let's Start with Definitions:
One of the difficulties in the supply chain is the lack of common definitions. To help the reader, let's start with the definitions used in our research:

> **Efficiency.** Delivering products at the lowest possible cost.
> **Agility.** A supply chain that produces products at the same cost, quality and customer service given the level of demand and supply volatility.
> **Responsive.** Delivery in the shortest cycle time. Note that this is not the same as agile, adaptive or aligned.
> **Adaptive:** The time to sense and respond to market changes.
> **Alignment:** We assess alignment by asking companies to rate their organization. It is an easy test. We ask how important is alignment between function and divisions?

Then assess the gap. We are assessing both importance and performance. The focus is to understand how companies gain agreement on future direction.

A supply chain cannot be agile, responsive and efficient at the same time. It requires a choice.
Most companies want to be agile, but they drive an efficiency agenda. By definition, an efficient supply chain is not adaptive, agile or aligned.

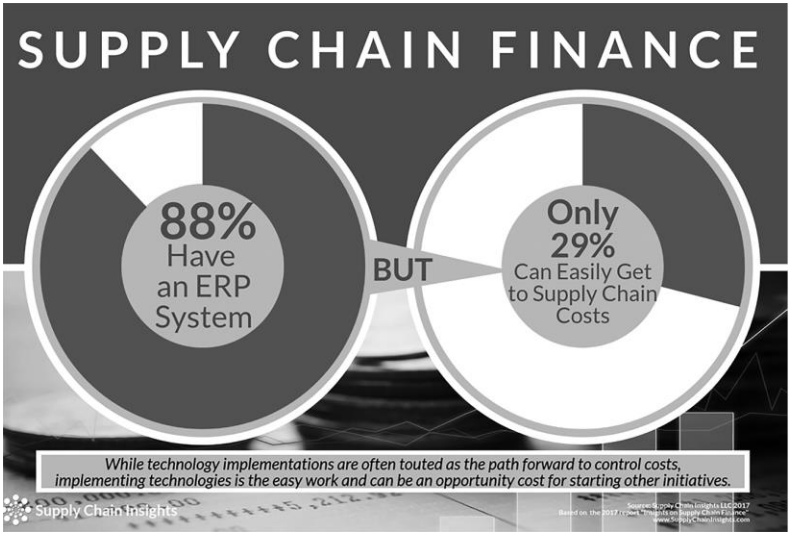
Our data also shows that it underperforms the peer group. For a financial team, this will seem illogical. Leaders must explain that the supply chain strategy needs to be about more than cost mitigation.

In the future, with the evolution of cognitive computing, processes will adapt. Today, they cannot.

The starting point? The pre-requisites are leadership and a clear strategy. Many, mistakenly, try to start with technology.

Let me give you an example. Recently, I was presenting to a supply chain team in Europe. The technology group wanted to implement SAP IBP, and the business leaders were resistant. The team lacked alignment between commercial and operational teams. The gap was large. It could not be closed through technology. So, I asked, "*Why would you want to automate a process when the groups are not aligned?"* We continued, *"Wouldn't it be better to drive alignment through use of the current S&OP technologies and implementing a cost-to-serve approach?"* I am not sure that I convinced the group, but I got them to think.

Figure 5.1: Managing Supply Chain Costs



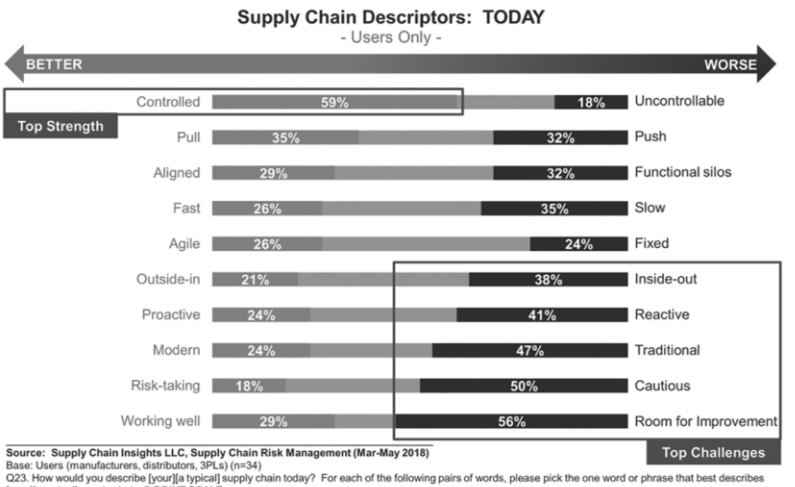
Reactive, knee-jerk decisions often stem from transactional mindsets focused on cost. Companies that are better at planning are more agile and adaptive. Cost decisions are the most effective when set in motion in the tactical and strategic planning horizons. (The time horizons past the order duration and crossing the planning horizon.)

In planning, the management of cost is easier said than done. Why? Only 29% of companies can easily view total supply chain costs. Despite having robust ERP and APS solutions, most Companies can only access costs within a function or region. This is largely due to how companies implemented technologies and not with the systems themselves. Using these limited views of costs will drive the supply chain out of balance. As shown in Figure 5.1, achieving and obtaining total cost information to drive decision-making is difficult for most companies.

Driving Change

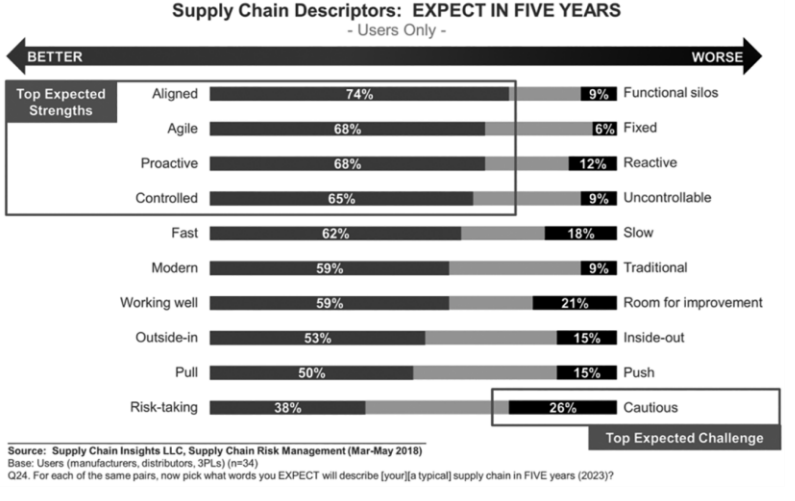
While companies desire agility, today's supply chains are largely reactive. Contrast the current state in Figure 5.2 to the desired state in Figure 5.3. Today, only thirty percent of business leaders feel that supply chains are working well. The focus of today's processes is controlled, inside-out and largely reactive.

Figure 5.2. Current State of Supply Chains Through the Lens of Business Leaders



In the future, the desired state is a supply chain that is aligned, agile and proactive. For most, this requires a supply chain redesign.

Figure 5.3. Desired Future State of Supply Chains



How do I Drive Greater Change Against the Goals?

To change course, learn from history, to unlearn to rethink outcomes. In Table 5.1, from our research, I share ten tactics to consider.

Table 5.1: Ten Tactics to Consider

	Alignment	Agility	Adaptability
1. Balanced Scorecard	X		
2. Customer-Centric Supply Chain	X		
3. Effective Center of Excellence	X	X	X
4. Maturity in Analytics	X	X	X
5. Network Design Effectiveness		X	X
6. S&OP Maturity	X	X	X
7. Supplier Development		X	X
8. Supply Chain Planning		X	
9. Supply Chain Visibility		X	X
10. Use of Channel Data/Building Outside-in Processes	X	X	X

To take action focus on these ten processes:

Balanced Scorecard. Reward teams for cross-functional metrics. We like the metrics of growth, on-time, and in-full orders, operating margin, inventory turns, and Return on Invested Capital (ROIC). Select seven-to-nine metrics and hold all functions equally accountable. Focus functional metrics to improving reliability.

Customer-Centric Supply Chain. Understand what your customers value and deliver. Do this through assessment, top-to-top meetings, and ongoing feedback. Tie policy to action. Don't make the mistake of only valuing net-promoter scores.

Cost-to-Serve Analysis. In the supply chain, many organize the response by function. What

seems like a low-cost option in one function is not always the lowest total cost alternative.

Maturity in S&OP. Seems like everyone in the supply chain has an opinion on S&OP. Many renaming it and white-washing the basics. The best S&OP processes balance the "S" and the "OP". The focus is on the **ampersand.** Aligned across the organization, the process focus is on executing the supply chain strategy.

Maturity in Analytics. The advancements in analytics--open-source, cloud, internet-of-things (IOT), and cognitive computing--are very promising. It requires the building of an analytics framework.

Network Design Analysis. Supply chain excellence starts with design. Buffer strategies. Push/pull decoupling points. The design of transportation and supplier networks. It is about conscious choice in aligning assets and building cross-functional processes. In our data when the network design tools are used within a function, and only for that function, there is a negative correlation to value. When it is used holistically across make, source and deliver to design a network, there is a positive correlation to price to tangible book. Successful network design strategies are holistic crossing the boundaries of source, make and deliver.

Supply Chain Center of Excellence. Thirty percent of supply chain leaders have a Supply Chain Center of Excellence but only 50% are successful. However, when the center of excellence is driving thought leadership against a strategy there is a statistically significant relationship between alignment and total costs.

Supplier Development. The management of supplier relationships is dependent on successful

supplier development processes. Companies that outsource procurement and focus on transactional supplier management are less agile and struggle to be adaptable.

Supply Chain Planning. The most advanced companies are good at supply chain planning. They use the technologies, have less dependency on excel spreadsheets and understand the need for "what-if analysis." The focus is on the important not urgent.

Supply Chain Visibility. Supply chain visibility means different things to different people, but in our research, it is the ability to understand the state of transactions between first and second-tier trading partners and the sharing of planning data.

Celebrating Supply Chains to Admire™ Award Winners

I watch news channels on mute. The reason? I hate political pundit debates. When the nonsensical banter reaches a crescendo, I shake my head and ask myself the question of *"Why?"* I wonder why people are listening. Fondly I remember the days of Walter Cronkite and Dan Rather with eye-witness accounts and on-the-ground reporting. Phenomenal photography brought the stories to life. In my lifetime, the 24-hour news cycle eroded the essence of TV news.

News is the first write of history. I feel that topic of supply chain management is analogous to the downward cycle of the news channels. There are many pundits and too few facts. (I shake my head and watch the twitter and LinkedIn streams. I see many opinions, but seldom find factual information.)

Writing the News. What Drives Supply Chain Excellence?

I analyze supply chain management. In the research, I'm trying to understand the impact of choices—technology, process innovation, and leadership--on balance sheet performance. No one pays me for my ink. The research is independent and data-driven. For the past six years, I have analyzed public reporting and triangulated the results in quantitative research.

What have I found? I think that history will write many stories. There is the story of aggressive sales teams over-hyping the promise of technology to drive balance sheet improvement. There is no correlation between technology selection and balance sheet performance.

History will also include case studies of mergers and acquisitions. No company in the past decade achieved the promised economy of scale. Most degraded value. Financial re-engineering--outsourcing, elongation of payables, chasing the lower costs of labor--made companies less resilient. Best performing companies have three characteristics:

> **Business Model Innovation.** Smaller, more agile companies outperform the larger and well-known brands in the retail, beverage, food, and pharmaceutical industry sectors. Companies with traditional definitions of marketing and sales struggle to beat the competition. The more significant the gap between commercial and operations teams, the lower the performance.
> **Consistent and Enlightened Leadership.** A clear definition of purpose and alignment of business processes to corporate strategy is an apparent characteristic of companies that outperform. Maturity in horizontal process development--

Sales and Operations Planning (S&OP) and new product launch—also drives value.

Building Outside-in Processes. The broader the definition of end-to-end strategy and the alignment of supply chain processes drives value. When the process focus is from the channel to the supplier's supplier there is greater value. In contrast, the focus on functional silo excellence and transactional processing reduces value.

Discovery

Over the last month, I have been working on the 2019 Supply Chains to Admire™ analysis. The study of improvement and performance for the 535 companies in 26 industries took two months. (The source data for the analysis comes from Ycharts.)

While social media is full of opinions on supply chain excellence and techniques to drive balance sheet improvement, I find most of this commentary noise. The dialogue lacks a standard definition for supply chain excellence and most of the posts are self-serving. This adds to the confusion.

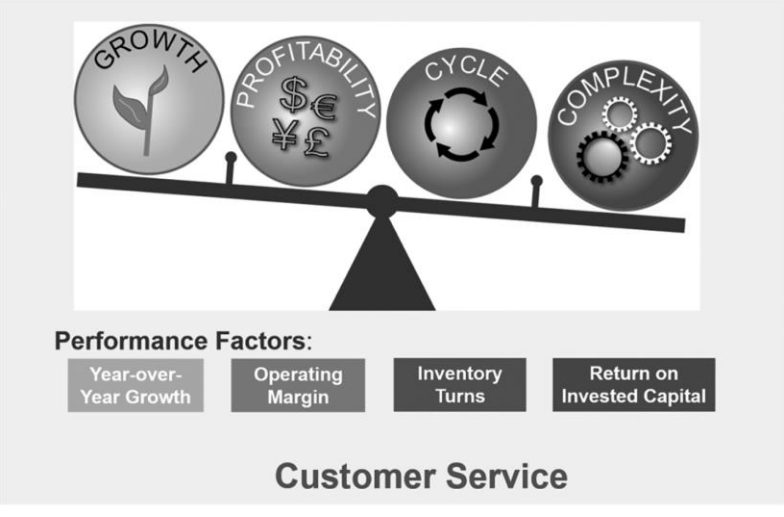
Summary

Leadership teams want easy answers. They want to know, *"What drives supply chain improvement? Where should they invest?"* It is not an easy journey. The starting point is the definition of the supply chain. The narrower the description, the more difficult it is to drive balance sheet improvement.

Let's explore why. The supply chain is a complex nonlinear system. Each company operates on its Effective Frontier™. It is not as simple as trading-off inventory, cost, and customer service. There are many trade-offs:

asset strategies, product complexity, growth plans, demand flows, and price volatility. In the Supply Chains to Admire™ analysis, the focus is to understand the relative performance of a company within a peer group of growth, operating margin, inventory turns, and Return on Invested Capital (ROIC). (We selected these metrics based on correlation work with Arizona State University in 2012. The portfolio shown in Figure 5.4 has the highest correlation to market capitalization.)

Figure 5.4. Building a Balanced Scorecard to Focus on Value



The long-term view of eight years in the analysis allows the tracking of year-over-year patterns through orbit charts. The Supply Chains to Admire is a study of pattern recognition: performance and improvement at each of the balanced scorecard intersections.

Celebrating Success

Please join me in celebrating the success of 23 companies. The winners drove long-term value (measured by market capitalization) while outperforming on the portfolio of metrics shown in Figure 5.4. They also drove improvement faster than their peer group. The top-performing supply chains include Apple, Ahold, AbbVie, Broadcom, BorgWarner, Capri Holdings (previously Michael Kors), Continental AG, Dollar General, Eastman Chemical, Ecolab, Herman Miller, Intuitive Surgical, Lululemon, Leggett & Platt, Lockheed Martin, L'Oréal, Monster Beverages, Paccar, Packaging Corporation of America (PCA), Ross Stores, Sleep Number, TJX, and Ubiquiti Networks.

Some are winners for multiple years. L'Oréal places as a top performer for four consecutive years. Apple, Broadcom, Dollar General, TJX and Ubiquiti Networks earn placement in the Winner's Circle for three successive years. Capri Holdings (previously Michael Kors), Eastman Chemical, Monster Beverages, Herman Miller, Leggett & Platt, and PCA are also award winners for multiple years. Shown in Figure 5.5 are the logos of the winners.

Figure 5.5. Supply Chains to Admire 2019 Top-Performing Supply Chains

Comparison to the Gartner Top 25

The Supply Chains to Admire analysis is six-years-old. When I present the results, one of the first questions asked is, "*How does this compare to the Gartner Top 25?*" There is no industry definition of supply chain excellence, nor is there a perfect measurement system. The Supply Chains to Admire analysis is a data-driven discovery by the peer group. Shown in Figure 5.6 is the comparison of the two approaches. Only Apple and L'Oréal make both the Gartner Top 25 and the Supply Chains to Admire lists.

Figure 5.6. Comparison of the Supply Chains to Admire and the Gartner Top 25 Methodologies

Comparison	Gartner Top 25	Supply Chains to Admire™
Focus	Fortune Global 500 and Forbes 2000 lists 12$B minimum annual revenue.	All public companies by analyzed by industry peer groups. 515 companies by 26 peer groups. No revenue minimum.
Analysis	2016-2018	2010-2018
Calculation	**50% Opinion:** (Equally split between analyst and peer voting) **50% Quantitative Analysis:** • Revenue Growth (3-year weighted average). • Inventory Turns (one-year average). • Return on Assets (ROA). Three-year weighted average. • Corporate social responsibility (3rd party index).	**Improvement:** Top 2/3 ranking on the Supply Chain Index. **Performance:** At or above the industry mean for: • Year-over-year revenue growth. • Operating margin. • Inventory turns. • Return on Invested Capital (ROIC). **Value:** At or above the mean for Price-to-Tangible Book or Market Capitalization. Index Calculations: https://www.slideshare.net/loracecere/sci-summit-2014-math-behind-sc-index?qid=27326733-0325-4ee7-aacd-e2827bd216de&v=&b=&from_search=11
History	15th Year	6th Year

The list in the Supply Chains to Admire report does not reflect public opinion. There is a popular belief that brand owners like Boeing, Colgate, Intel, Nike, P&G, Schneider Electric or Unilever define supply chain excellence. Most of these companies market their supply chain capabilities by speaking or sharing case studies. When I was at Gartner, the presentations by PepsiCo to capture our hearts and minds on their prowess was over the top. (It included a beverage cabinet with our favorite beverage.)

I have a lot of respect for each of these companies and have worked side-by-side with their teams. However, the data does not support public opinion. Each company scores below the peer group on the metrics in Figure 5.3 and/or is struggling to drive improvement. The Supply Chains to Admire analysis is data-driven analysis. We score each company on the creation of value (comparison of price-to-tangible book or market capitalization to peer group), rate of improvement (a vector analysis of the orbit charts) and performance

(scores above the mean in each factor with consideration for outliers).

Driving Long-Term Results

Based on observation, I know that it takes three-to-four years to drive balance sheet improvement. On the journey, companies typically make three mistakes: starting with technology, a focus on performance within functional silos, and the lack of alignment of measurement systems to strategy. When companies focus on siloed excellence, they throw the supply chain out of balance.

Long-term balance sheet improvement requires a focus on a balanced scorecard and the alignment of sell, deliver, make, and source to drive value. It is not easy, and most pundits over-simplify the journey. Fads drape the historical landscape. Tactics come and go, but when deployed within a function in the absence of a balanced scorecard, they reduce value. Functional excellence, when taken to an extreme sub-optimizes the supply chain.

Why Does It Matter?

My friends ask me why I sat hunched over my PC for a month calculating these results. The answer is simple. I want to help. My goal is to break through the noise to change the current dynamics. Isn't it sad that only twenty-three companies made the list? Let's face it. We don't have the best practices. Supply chain processes are emerging and they are important. I firmly believe that supply chain leadership builds economies and can save the planet.

I want teams to think harder. Here is why:

Automation. If we are going to automate supply chain planning don't, we need a clear goal? Automation against the wrong goals drives us faster down the wrong path.

Target Setting. The companies I work with struggle to set metrics targets. They are not clear on what is a reasonable target or the performance of their peer group. My goal is to help drive alignment.

Debate Stirs Better Results. I know that the analysis is not perfect. (However, in the toes of my shoes, I am firmly convinced that it is a better methodology than the Gartner Top 25.) My goal is to provoke thought and open debate. My goal is to force leaders to think harder. 95% of companies are not improving results. I want to drive change.

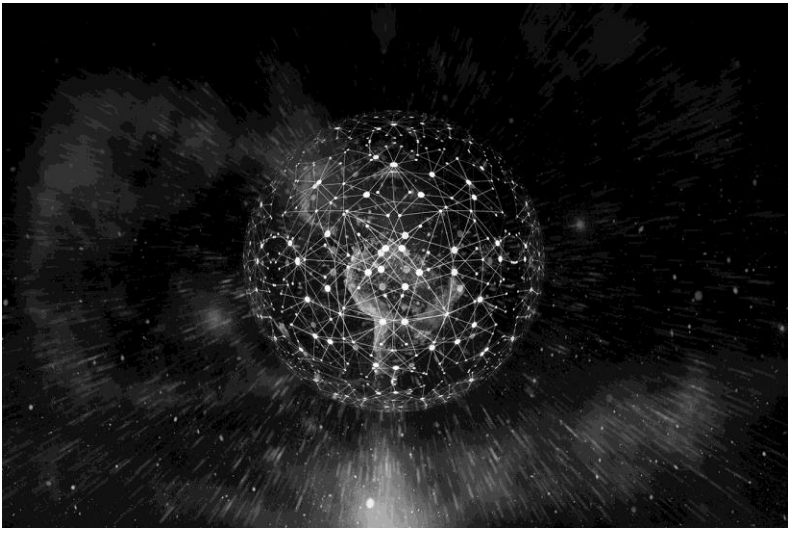
My goal is to build a guiding coalition to drive change. Together, as supply chain leaders, we need to ask better questions and push for new answers.

Section 6

Building Value Networks

Building Value Networks

Over the last three decades, we have aspired to build value networks. Instead, companies created enterprise architectures and inside-out processes. Today, the building of value networks remains an opportunity.



If Only I Could See

My phone rang. Consultants, technologists, and ex-analysts called to challenge my position in my last post focused on control towers.

I love debates. As I discussed my views of "visibility" and "control" with my many callers, I discovered that I was not clear in my post. (Sigh. This is

not my favorite topic, but there is confusion in the market. The focus of this post is to drive clarity.)

Starting with the Basics

The confusion starts when a supply chain leader states the need for improved visibility without a clear definition. Well-seasoned supply chain leaders understand that visibility is a capability, not an IT taxonomy. The design of capabilities needs to align with the goal. As shown in Figure 6.1, there are many variants of visibility.

What does an IT taxonomy mean? A taxonomy is a well-defined class of applications. Examples include Enterprise Resource Planning (ERP), Warehouse Management (WMS_ or Advanced Planning (APS). When you say ERP, the term communicates. In contrast, visibility does not. The IT taxonomy for visibility is supply chain analytics.

When I was a Gartner analyst, technology providers would provoke me to write a Magic Quadrant on visibility solutions, I would laugh. In 2004-2006, Greg Aimi (now a Gartner analyst) and I worked on a common definition of visibility for over a year. When we started the discussions, we both thought that we were clear. When we ended the discussions, we agreed that visibility is supply chain capability not a well-defined technology classification. Hopefully, by the end of the article you will also agree.

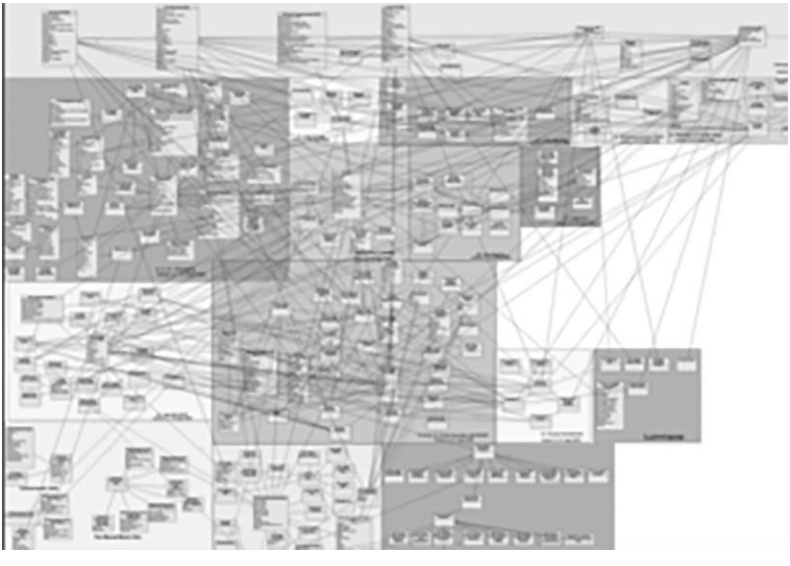
The term control tower, by definition, is similar. Control is a capability, not an IT taxonomy. As you implement supply chain analytics and use control theory with well-defined reference data with clear bands for control, process improvement ensues.

Why Focus Today on Visibility?

Supply chains are complex. Current architectures are inadequate. Process gaps are larger in companies greater than 5B$ in annual revenues. Figure 6.1 is a picture of a client's processes.

This team was working on quality improvements and found that the flows crossed 117 disconnected documents in access, excel, and google analytics. These sources while functional are difficult to connect. The team was seeking analytics to monitor process compliance. (This is a form of visibility.) In my experience, typically, only 1/3 of data needed for visibility is transactional data. As a result, ERP contribution to visibility projects is smaller than most realize.

Figure 6.1. Getting to Insights Is Not Easy



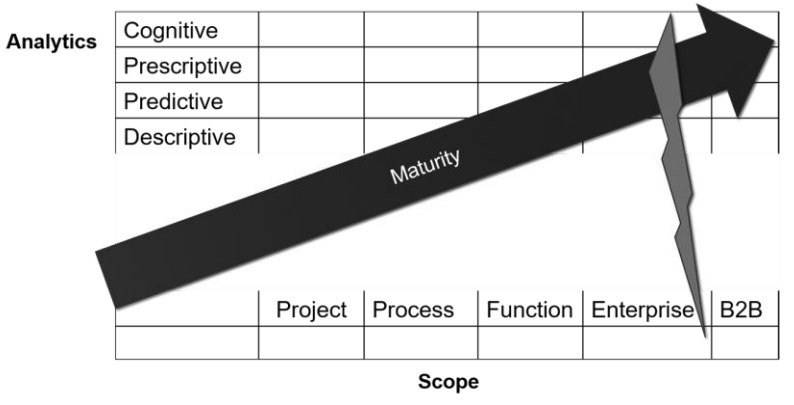
Improved visibility allows teams to see information and take action. When done well, a visibility

project improves outcomes and collaboration. The caution is that the word "visibility" is overused, and there are many solution options.

The market is over-hyped and often companies are not clear in their selection criteria.
Technologies cross a spectrum from project-based to cross-functional enterprise visibility. Most deployments focus on functional excellence–manufacturing, transportation, customer service or procurement. Very few companies focus on improving capabilities within the four walls of the enterprise.

As companies develop mature enterprise visibility capabilities, the focus shifts from integration to data portability between trading partners. I show the spectrum of visibility options in Figure 6.2.

Figure 6.2. Visibility Maturity Model



Supply chain analytics capabilities run a spectrum based on insights. Advancement in analytics improves outcomes. It all starts with the definition and the use of the data.

Descriptive analytics gives business users status. Technologies like Microsoft Power BI, QlikView, Spotfire and Tableau are forms of descriptive

analytics. As companies implement descriptive analytics, they realize that the data needs context to drive meaning. Most companies forget context and data enrichment. This helps with the so what? And, the relative importance of the outcomes. In building descriptive analytics, always ask yourself, "What is context?" Focus on helping others see the relative importance of elements like shipping status, trading relationship (customer or supplier importance) or information on the product.

Predictive analytics yields exceptions and alerts, but also lacks insight on relative importance. Deployments of advanced planning systems are a form of predictive analytics. Most companies struggle with the mountain of exceptions. The energy to sort through them to understand the best next steps is a daily grind for planners.

In contrast, **prescriptive analytics** yields not only the exceptions and the alerts, but also gives recommendations on what steps to take.

Cognitive analytics–the most advanced analytics–senses, responds and drives actions. It is a step towards the autonomous supply chain. Only 7% of companies are testing these more advanced technologies.

In summary, when it comes to visibility, there are many options. Very few companies move past predictive analytics to drive insights. Similarly, most companies are stuck with a focus on functional visibility capabilities.

Driving value on enterprise analytics requires the combining of structured and unstructured data which leads us down the big data path using data lakes and schema on read. Ironically, the fixed schema of ERP data sets is a barrier to combining structured and unstructured

data. In this shift, the legacy SAP Business Warehouse (BW) implementation is especially problematic.

Moving Past Enterprise Visibility to Network Visibility

Companies are so consumed with enterprise visibility that very few companies focus beyond the four walls of the enterprise. Instead, they dabble at the edges.

Many implement portals which are detrimental to improving visibility. Why? A portal lacks a system of record; and as changes happen on the portal, there is no tracking of changes.

As companies move on their journey to build B2B network capabilities, they quickly learn five things: Easier said than done. There are no solutions that connect their source, make and deliver in many-to-many architectures. Instead, there are industry-specific solutions that are one-to-one and one-to-many.

These solutions are proprietary and closed. There is no open disclosure of the process definitions (defined by B2B canonicals). Consolidation and investment capital strategies are problematic. Across the B2B technology market, there is less focus and investment in B2B solutions.

Organizational talent. Manufacturing organizations struggle to find talent and bandwidth to drive B2B visibility. The resources focused on B2B connectivity (usually located in IT) have little exposure to the deployments in customer sales and procurement teams. As a result, there are usually many misaligned project initiatives.

Traditionally, deployments focused on indirect procurement. The solutions for direct procurement and indirect procurement have little in common.

The shift from data integration to process portability. While IT projects within the organization focus on data integration, B2B projects need a focus on data portability. This is such a large subject that I explain in a subsequent paragraph.

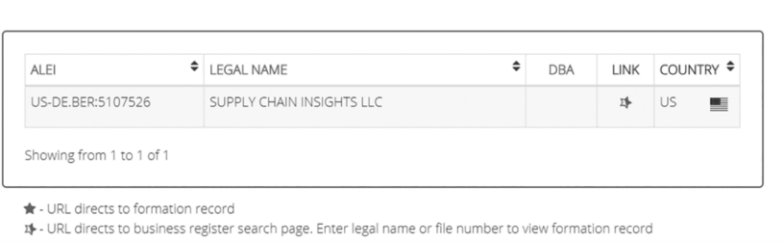
What Is Data Portability?

Portability focuses on the synchronization and harmonization of data from one company to another. Recently, the evolution of ISO-8000 standards enables the transport of company, item and location data. While in banking there are clear account and bank routing definitions, prior to the release of the ISO-8000 ALEI standards in 2017, there were no equivalents in supply chain management.

Today, every company uses its own definition for company, location, and item information. Supplier onboarding for Supply Chain Operating Networks lacks rigor. As a result, the mapping is difficult. Let's take an example, what is the right master data designation for P&G? Is it Procter & Gamble? Procter and Gamble? or P&G?

Using the ISO 8000 standards, the mapping follows their legal authoritative identifiers termed ALEI. The ALEI for P&G is US-OH BER:792698. Likewise, if you want to send a wire to Supply Chain Insights, the legal authoritative identity is US-DE.BER:5107526. Like a social security number, these authoritative identifiers, are unique based on governmental registrations.

Figure 6.3. Use of the ALEI Search for Supply Chain Insights



ALEI	LEGAL NAME	DBA	LINK	COUNTRY
US-DE.BER:5107526	SUPPLY CHAIN INSIGHTS LLC			US

Showing from 1 to 1 of 1

★ - URL directs to formation record
- URL directs to business register search page. Enter legal name or file number to view formation record

Embrace Disparate Data

Streaming data and unstructured text mining improve the depth of visibility outcomes. The use of disparate data sources enriches insights. As companies embrace new forms of data, there is a move to open-source analytics and schema-on-read architectures. This requires new skill sets and a willingness to challenge today's architectures.

In this evolution, there is ongoing tension between data scientists and ERP system architects focused on relational database technologies. They are usually worlds apart. NoSQL technologies are 1/5 the cost of relational database technologies but most today are science projects and not used in mainstream processes. Open source analytics offers great promise for visibility projects.

Summary

As visibility projects mature, the discussions transform from speaking generic mumbo jumbo to clear and concise definitions. This is harder than it seems. The technology landscape is difficult but easier than organizational implications.

The journey for supply chain visibility is an evolution based on increasing capabilities to see and take action. In summary, when you hear a discussion on visibility, raise your hand and ask for clarity. Getting clear on terms with a focus on improving capabilities will help to drive success.

I hope that this post helps. I welcome your thoughts.

How Are You Managing Risk?

Global growth is slowing to levels of GDP. average growth for consumer nondurables is 1.7%. This is a far cry from the pre-recessionary growth rate of 6%.

Public stock markets reward growth. As the rate of year-over-year revenues slows, companies attempt to grow through tactics. In consumer good supply chains, this includes new product launch, price incentives, and trade promotion management. In the digital world, traditional broad-brush marketing programs become less effective. Yet, they are still widely deployed. The residual effects drive higher demand error and increased complexity.

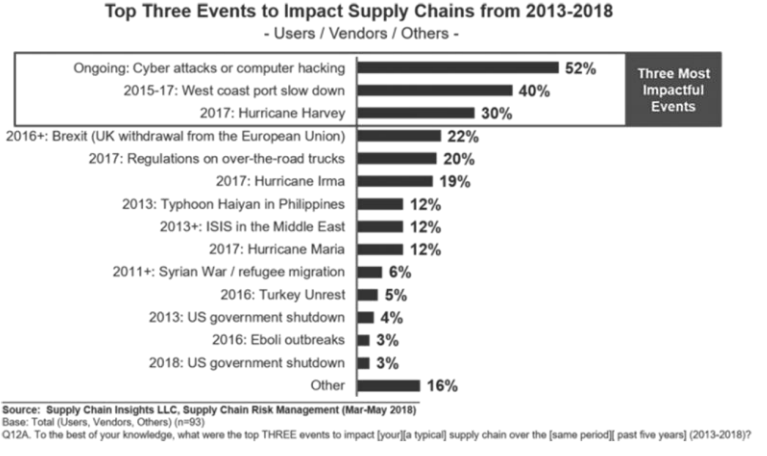
Demand shaping—trade spend, promotions and rebates—adds to risk.

What Is Risk?

We define risk management processes as the *"proactive identification and assessment of potential risks to the supply chain – as well as the development of strategies to avoid these risks."* It can include uncertainty, disruption or volatility.

While most leaders, early to the subject, think of risk as mitigation of events, this view is too narrow. In Figure 1 we share the most disruptive events from the period of 2013-2018), event mitigation is the easy part of risk management. The tougher issues lie with the management of complexity and volatility.

Figure 6.4. Top Events Leading to a Supply Chain Disruption



The increase in risk due to cyber hacking is a change versus prior studies, with cyber threats increasing in the supply chain.

What Are the Risk Drivers?

While technologists and consultants hawk wares for supply chain visibility, the larger issues are in

demand volatility and operations complexity. Poorly implemented demand planning solutions creating Forecast Value Added (FVA) issues and increasing demand error by 2-30%. The saddest part is that most of these customers were unaware of the issue.

With consumer goods companies increasing item complexity on the item master by 30-40%, this is a never-ending cycle. While companies believe that item complexity is tied to driving a growth agenda, in many categories, it added brand confusion, not personalization.

Figure 6.5. Risk Drivers

How Do You Mitigate Risk?

Consultants and technologists are selling risk management solutions; however, the answer is a focus on supply chain basics. Designing the supply chain with a focus on the form and function of inventory, flexibility, supplier score-carding processes along with monitoring, business continuity planning, and "What-if" analysis.

Unfortunately, most companies are not good at these basics. Only 1/3 have supplier development programs, and 12% design/modify the supply chain with a focus on form & function of inventory.

Let's learn from the story of Baxter International and the production of small IV bags in Puerto Rico. The product was sole-sourced from Puerto Rico in a heavily regulated industry. So, when Hurricane Maria decimated the island, and power became an issue, Baxter could not manufacture at any of the three locations in Puerto Rico. The design of the supply chain did not allow for alternative production sites. Designing the supply chain for alternate sourcing is critical. Baxter failed to design for business continuity.

In addition, item complexity is a silent killer of supply chain performance. It increases volatility, operational complexity, and supplier risk. Unfortunately, less than 5% of companies actively manage item complexity.

Figure 6.6. Most Important Techniques for Risk Mitigation

Source: Supply Chain Insights LLC, Supply Chain Risk Management (Mar-May 2018)
Base: Users (manufacturers, retailers, distributors, & 3PLs) (n=XX)
Q19. What are the 3 most important techniques [your][all] company [currently uses][SHOULD use] for supply chain risk management? Please select up to three.

Summary

To wrap up, before I turn out the light and get some badly needed sleep, while most companies believe that risk management centers on event management or a shiny new tool, this does not address the issues. Instead, risk management is about getting good at the basics with a focus on business continuity. This includes the design of inventory buffers, alternate sourcing, common platforms, management of item complexity, better management of demand, effective supplier development programs and "what-if" analysis.

So, the next time that you see a presentation on delivering an integrated end-to-end supply chain, ask, *"How are you managing the risk?"*

Section 7

Lora Being Lora

Lora Being Lora

Blogs are about life. In this section, Lora lets her personality shine. This is Lora uncorked.

Welcome to the New Year!

Congratulations. You made it through 2018. It has been a while since I penned a blog post on New Year's predictions, but today as I sit and drink my hot chocolate, I feel the itch to write.

The bears are starting to chase the bulls from the field. Fourth-quarter public market results coupled with tax and tariff uncertainty define a shifting market. Bear markets drive heightened interest in supply chain management. The impact may surprise us. Today, we have younger leaders driving keyboard clicks.

Teams in these seats did not experience the down market in 2007 or the start of the market run in 2009.

The teams are new. These supply chain groups are more global and diverse. They bring fresh thinking and what I believe is a healthy questioning of the status quo. The traditional processes, rooted in historical relationships with large system integrators and technologies will crumble, as companies push for answers on value. The response to the shifts to the market coupled with technology capabilities may drive a step-change in process capabilities.

Gradually companies realize that the supply chain is an enabling capability, not a function. The evolution of supply chain excellence challenges traditional mental models.

Companies cannot save their way to supply chain excellence with cost-cutting and inventory management — the requirement is customer back capabilities. Unfortunately, the rusted nuts and bolts of the supply chain only turn in place.

Teams want to drive digital processes. There is a goal to improve agility and become more customer-centric, but a disconnect with current technology architectures.

In 2019, here are eight trends that I will be tracking:

Trend 1. The ERP Battle Is Over. Will We Ever See Value? What happens next? In the past decade, ERP technology providers consolidated. The goal? While not explicit, the driver was to develop market share. The reality? The ERP battle is over. SAP won the fight, but ERP failed to make the desired mark on driving value in supply chain management.

Slowly, as we enter into the bear market, the focus is shifting away from ERP-centric architectures. The story will continue into 2020 as ERP vendors claw their way to market relevance. The question is one of value. Costs are high while the benefits are not clear.

Trend 2. The Battle for Analytics Is Waging. The winners are unknown. The potential for process capability improvement is great. Descriptive analytics is mainstream. Prescriptive and cognitive computing markets are at a tipping point for early adopters. Machine learning will redefine master data management. Best-of-breed technologies will pave the path for early adopters. These new analytic architectures will fit in between workforce productivity applications and alphabet soup legacy solutions like APS, SRM, CRM, and ERP.

Trend 3. Planning Systems to Be Held Accountable for Driving Value. Three decades of implementation results are history. The value is not clear. Business leaders are questioning the value of planning labor. Technologists will be under the gun to build planning value dashboards. The question is "Does supply chain planning pass the litmus test?"

Trend 4. Shifting Technology Taxonomies. Technology capabilities are redefining the rule sets of the supply chains. These solutions have different names. Examples include allocation, available-to-Promise, and transportation routing. However, supply chains don't play by hard-coded rules. In 2019, the combination of machine learning, Robotic Process Automation (RPA), cognitive computing and cloud-based deployments will coalesce to create a new software category for sense and respond rules management. Innovation from best-of-breed technologies drives this change. Traditional advanced planning technologies will scramble to keep up.

Trend 5. Digital Manufacturing Success. In the next two years, companies will make the most progress in the area of digital manufacturing. The combination of

technologies for track and trace, 3D printing, robotics, and wearables improves flexibility in operations. Company digital initiatives will have the most success in production operations.

Trend 6. Outside-in Transportation. Telematics and outside-in data redefine transportation. When companies find out that there is no place for outside-in data--telematics, GPS and status documents-- in today's transportation solutions, this will become abundantly clear as more-and-more people attempt to try to stuff new forms of data into traditional solutions. There will be growing tension between inside-out and outside-in transportation solutions resulting in a redefinition of supply chain execution making today's transportation solutions legacy.

Trend 7. Good Clouds Gathering Over the Supply Chain. Cloud-based deployments of applications transform the relationship between technology providers and business leaders. In this transformation, traditional application consultants lose power. Indian system integrators will suffer the biggest impact as the value proposition of cloud-based deployments grows there will be fewer religious arguments over good and bad clouds. Instead, business leaders will put applications in all clouds to work. The focus will be on business leaders.

Trend 8. Building Network Capabilities. With the growth of outsourced business relationships, business network architectures grow in importance. Between 2019 and 2020, a trading score will evolve that will rate trading partners on electronic capabilities. This ranking system (analogous to a credit score in your personal life) will give preferential treatment to companies with superior electronic B2B capabilities. ISO-8000 standards

for B2B master data for company, location, and item will grow in importance.

Winners and Losers

The winners include small biotech companies and medical device companies investing in hospital manufacturing capabilities. Also, small and nimble consumer goods companies gain power over larger and less flexible consumer products companies. Best-of-breed companies driving innovation in blockchain, cognitive computing, and transportation real-time data will start to redefine technology taxonomies and will gain market share.

The losers include companies with big and inflexible manufacturing models and traditional retailers. (This includes JC Penney, K-Mart, and Sears.) Traditional supply chain planning companies will lose market share to best-of-breed companies, and large system integrators will fight over table scraps in the post-ERP era.

These are my thoughts. I hope that this is a good year for you.

Where Would We Be Without Bu@#$h8t?

It is 1:00 AM in Antwerp. I cannot sleep. As I stare at the keyboard sitting on my desk, my view is the train station draped in darkness. The quiet streets await the coming of the soft snow. It seldom snows in Belgium: the city sits in anticipation.

I hate jet lag. There is nothing worse than trying to sleep when you cannot, and you know that you should. So instead of wearing out the sheets, I thought that I would

do some blogging. Maybe as I type, my body will crave sleep.

This week in my travels I posed a question to myself. *"Where would the supply chain technology industry be without all of the bulls#&t?"* Based on my research, it is clear to me that buyer frustration with supply chain technology is increasing. Progress on the key performance metrics of cost, customer service, inventory, and Return on Invested Capital (ROIC) is going backward; not forwards, for most companies. The lack of progress is troubling. Only one in three business leaders feel that their supply chain performs well.

As I stare at my keyboard, I wonder what would have happened if the dialogue on supply chain improvement, over the last decade, was more data-driven with less vendor hype.

Let me share some stories. In this blog, I will focus on the current market confusion. Specifically, I will focus on the lack of clear market definitions of the terms control tower, cognitive computing, and concurrent planning.

Control Tower

Last week, a major strategy consultant asked a question about control towers. The dialogue quickly became circular. Here is my memory of the discussion:
"Hi, I am Lora. How can I help you?", I said.
The raspy voice on the other end of the phone stated, *"Can you share your experience on the implementation of control towers. What is the best practice?"*

I laughed, and said quietly, *"What are you trying to control?"* (For me the discussion of a control tower is an industry rabbit hole. What do I mean? It is a concept that sounds good, but due to lack of definition never goes anywhere.)

Frustrated, the consultant's voice rose an octave. *"What do you mean? Aren't Descartes, GT Nexus, JDA, Fourkites, Kinaxis or OM Partners control towers? Which is better?"*

Softly, I asked, "*What is your goal? What is your client trying to measure and gain control of? Each of these solutions is quite different."* (I find that companies state that they want a control tower, but are not clear on what they are trying to control. Each technology provider also drapes its solution in ambiguous, generic descriptions. As a result, the discussions become circular.)

I then shared, *"I see many companies attempting to implement control tower projects without a goal in mind. Yesterday, I was at a client that proudly showed sexy screens. Yet, they were viewing day-old information. How helpful is that? The data was out of sync with their needs. When I asked the client the value of the project, they were not sure that there was one. Their control tower approach, due to data latency, had not improved operations. It fell short of expectations."*

Pausing, I reiterated, "*I would start the discussion with the Chief Operating Officer. The most important question to ask is what is the goal. How will the client measure success? Then determine is the project targeted to improve visibility, control and improve an outcome or drive continuous improvement. Each objective has a different project requirement."*

The consultant, now, **very** frustrated, stated, **"Isn't the goal clear?"** The voice was now two octaves higher. The demeaning tone quickly made me feel like the dumbest analyst in the world. I swallowed and shook off my emotions.

"No," I continued. *"There is no industry standard definition for a control tower. Let's take some examples. While telematics providers all use the term 'control tower', real-time visibility of truck status needs to be connected/compared to a planning system of record. This*

can take many forms. It can be compared to the estimated time of delivery in transportation planning, or to customer booking data to compare on-time delivery, but the reference data varies by transportation mode. The system needs to be built with the goal in mind." (Each mode of transport has different comparison reference data.)

"Enterprise solutions are complex," I continued. *"Within the company, the average company has seven ERP systems, five telematics solutions, and five Advanced Planning Solutions (APS). Forty percent of shipments move through 3PLs. The use of third parties introduces data latency issues. To track data and drive 'control', the data needs to be synchronized and compared against reference data with the goal in mind."*

"Why then do all of the vendor's websites list control tower functionality?", asked the consultant.

My answer? Over-hyped marketing. The term control tower is over-hyped; and as a result, lacks meaning. The answer is not simple. I know of no success in control towers that are not dependent on a data lake for data harmonization and synchronization. I also do not know a team that has successfully implemented a solution across make, source and delivery processes without clearly defined goals and process workflows. While the term control tower sounds good on a vendor's website, the reality is quite different. As a result, most control tower projects sound good but go nowhere.

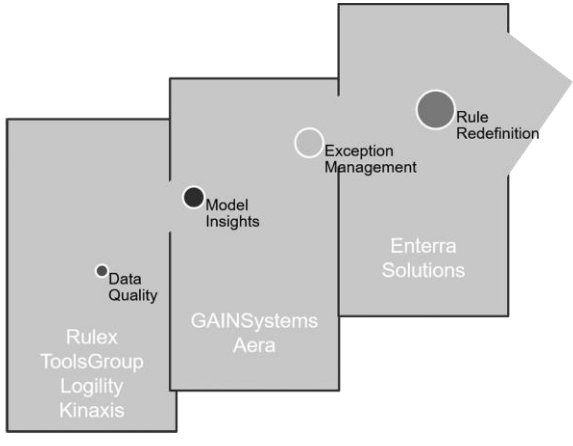
Advanced Analytics

In a similar vein, I discussed the evolution of machine learning and cognitive computing with a client last week. It seems that all of the software technology presentations are now dripping with promises of cognitive computing. However, what I find, is a lack of definition. Most technology providers are using yesterday's definitions of

planning using machine learning to clean data through pattern recognition. They are painting inside the box versus thinking outside of the box.

The market is awash with terms. We are in a spin cycle of digital innovation. My questions for the technologists were, "How do you define cognitive?" With hearing this question, most will answer with silence. Only Enterra answers the question with the definition of a semantic inference engine. Instead, most of the solutions are aligning data using machine learning or improving planning models through better use of math. Few are driving innovation to drive autonomous supply chain planning through better management of exceptions (not just showing the exceptions, but giving suggested action), or implementing learning engines to sense, learn and act to improve the rule-sets of the supply chain. This would include rules like inventory matching, customer policy, Available-To-Promise (ATP) or allocation. ...or a learning engine on top of software bots to improve directed workflow.

Figure 7.1. The Application of Advanced Analytics to Supply Chain Management



Concurrent Planning

There are three definitions in the industry for concurrent planning. This includes:

-**In-Memory Modeling.** The use of an in-memory model to drive visibility of plan changes with minimal latency for large planning teams. For example, when companies use an in-memory model, when planner A makes a change in the plan it is seen by planners B-Z without a delay.
-**Planning Simplification.** Collapsing the planning horizons of strategic, tactical, operational and executional horizon planning. The focus of this discussion is to streamline planning; however, I find this discussion worrisome. In most organizations, there is a need for each of these distinct workflows at a process level. However, this discussion is spun as an irrational message into the market with much hype.
-Semantic Reasoning. The use of an ontology to sense, learn and act across time horizons and improve data flows. This includes consumption logic across time horizons.

These are very different definitions. What to do? The answer is easy. When you hear the term, stop the speaker and ask for a definition. This may seem uncomfortable, but it is difficult to have a discussion without clarity.

The sun is rising. I need to run to my meeting. In my jet-lagged state, I will make it through my day and into seat 13E back to the states tomorrow. I hope that this blog post helps to debunk market hype. I would love for us to move past marketing spin cycles to drive real results, but this is difficult in today's market.

I welcome your thoughts. Until next time...

Seven Reasons I Got Supply Chain 2020 Wrong

2020 is four months away. When I founded my company, Supply Chain Insights my initial focus was Supply Chain 2020 predictions.

Over the last decade, I was laser-focused on the trends. What did I learn? My predictions were too aggressive. Technology advancements were fast and furious, but the business process shifts were slow.

Much to my dismay, few business leaders challenged the status quo. Instead, it clung on organizations like a wet plastic bag in a wind storm. Hard

to shake off and perpetuated by system integrators, progress over the decade was slow with many companies moving backward not forward on balance sheet results. Facing negative market headwinds, they were unable to drive progress.

My Insights

As an independent analyst, I triangulate the market and observe shifts in buying patterns and the acceptance of new technologies.

Why did I get it wrong? Here I share seven observations that prevented faster progress:

1. **Only Software Companies Should Deliver Software.** Software development is a unique business model. The focus is on product roadmaps and future development. Consultants, Third-party Logistics (3PL) providers, and Freight Forwarders are great at the delivery of services but are not successful in the delivery of software. The difference in focus is a barrier.
2. **The Riskiest Purchases Are Not Obvious.** Co-Development is the most successful with small and nimble software companies. I know of no company successful in co-development with Infor, Oracle or SAP.
3. **Building Value Networks is Slow.** Why? We are having the wrong discussions. The focus needs to be on portability, not integration. Portals are dead-end streets. The business models of Supply Chain Operating Networks are a barrier to building a network of networks. The answer is not clear.
4. **Effective Is not Always Efficient.** The supply chain needs to be designed to drive outcomes.

Efficient supply chains —the lowest cost per unit—is only possible when there is high volume, very predictable demand. Agile supply chains—where companies have the same cost, quality and customer service based on the level of demand and supply variability—are very different designs. As demand volatility increases, more and more companies need to focus on supply chain segmentation. Most companies manage supply chain design with the mistaken belief that they have one supply chain

5. **Success Starts with Clear Definitions.** I find most companies having the wrong discussions. The reason? The lack of clear definitions. Terms like customer-centric supply chains, end-to-end transformation, digital innovation, Industry 4.0 and supply chain excellence are bandied about, but teams are not aligned on definitions. The terms sound good, but without clarity, it is difficult to move forward.
6. **Software Acquisitions Only Benefit the Initial Software Owners.** More and more technology companies pursued acquisitions strategies—mergers, acquisitions, and public offerings—it is clear that the only people that win are the shareholders of the companies being acquired. This type of exit strategy should be a cause of alarm for business users. The focus on exit strategies versus lasting customer value sets the industry back at least five years.
7. **Software Partnerships Seldom Drive Value.** While most have great fanfare, software partnerships seldom drive value and should be viewed by business leaders as a non-event. They are largely a waste of time.

I hope that this helps. I think that these seven traps are the reason why we have not made more progress in the last decade. Technology advancements are outstripping our ability to adopt new approaches and drive value.

Looking Forward

I welcome your thoughts. Let's hope that we can cast off these behaviors to drive higher levels of value in the next decade. I sense a tipping point coming in this upcoming decade.

My Advice for Young Women in Supply Chain

April was intense. I relaxed at home by quilting and watching movies. A great boon of the digital era is home entertainment.

The day before I attended the INFORMS conference in Austin, I watched the Ruth Bader Ginsberg documentary movie, On the Basis of Sex. The opening of the film showcases row-after-row of well-dressed men walking the halls of Harvard. The movement is rhythmic and hypnotic. The appearance of a few female faces at the end of the clip is jarring. The imagery sparked memories.

The scenes of Ruth at Harvard reminded me of my days in the engineering school at the University of Tennessee. In 1974, there were two women in my class, and there were no women's bathrooms near the lecture room. (They were near the office area which was down two flights of stairs and a ten-minute walk from my desk.)

The atmosphere was anything but welcoming. In the movie, the image of the professor asking a question and then calling on the men struck home. In fact, when I struggled on a test, the professor would hold up the test in front of the class and remark that *"this is why women shouldn't be in engineering school"* before slamming it on my desk. I graduated in the top 10% of my chemical engineering class, but it was a struggle. The experience was not pleasant. Years later, reoccurring dreams would wake me from my sleep. The nightmare? I had not finished my senior project and had to return to complete a class.

Give Back

The hall at the INFORMS conference--an event focused on analytics--was reminiscent of the movie. As I walked to my speaking event, the rows of men walking the halls, reminded me of the opening of *On the Basis of Sex*. I was speaking at the WORMS (Women in Operations Research and Management Science) reception. Approximately sixty women of differing ages gathered to hear me speak. There were few women in the halls of the convention.

My story of becoming an unlikely entrepreneur took about 45 minutes. In the presentation, I shared stories of Ashley, Bob, and Maxine. My goal? Be open. Successful people help people on their journey.

Embrace Ashley. When I was a teenager, physical activity in schools was limited. Home economics filled the slot of physical education classes. There was no organized sports program. Fitness, for me, is a constant struggle. At the age of 53, I was diagnosed with osteopenia (degradation of bone density in the spine). Ashley, my first trainer, cajoled us to get serious about

fitness. My body was stiff and out-of-shape. After a week of squats, I could not walk. He laughed and encouraged me. In the process, I learned the names of muscles that I did not know existed. Through hard work, I reversed osteopenia without drugs. My advice to the audience? Stay in shape. Find an Ashley to help you.

Meet Bob. I put myself through school. My last student work assignment was a co-op position for Procter & Gamble. I loved the work as much as I hated some of my classes in engineering school. The plant manager of the P&G Jackson plant wrote me letters of encouragement throughout my time at the University of Tennessee. When the professor held up my final with a red "D" in front of the class, Bob encouraged me to rise above the fray and go forward by going forward. His advice? Not to dwell on the negative, but to focus forward.

What did I tell the audience at WORMS? Be a "Bob" for others. While many people search for a mentor to help for one's own career, my advice is to give back to others. When you give, others give back. I would never have finished engineering school without Bob. My quest for excellence in open content research stems from this belief.

Give Thanks for Maxine. My mother was the smartest woman I ever met. She made a perfect score on the GMAT in both the verbal and math sections, but was humble and never bragged. Being the daughter of a brilliant mother was intimidating.

When I was thirty, mom told me about Maxine. It was an unplanned pregnancy. My mother told me if abortion was legal that I would have been aborted. In the process, she hung her head and reflected on her personal struggle between emotions to have a child and her intellectual debate to terminate the pregnancy. At the

time, my mother was a teacher and schools would not allow staff to work while pregnant. My family struggled financially and mom worried about providing for my two brothers with the loss of work for a year.

Unsure what to do, mom consulted with Maxine, her best friend. Maxine listened quietly and provided a sounding board. She did not tell my mother what to do.

Mom vented on the unfortunate situation. Maxine did not judge. Together, they worked on a plan to help mom subsidize her income with the loss of work.

Through Mom's reflection I learned three important lessons. The first was the stark difference of opportunities for women in the workplace over three generations. (For this, I give thanks.) The second was the need for a good friend to be a sounding board for tough decisions, and the third was the gift of life. My suggestion for the audience? Be like Maxine.

Relax

I am lucky to be able to do what I do at the age of sixty-five. Three themes arose from questions from the audience:

> **Start a Company?** At the end of the speaking engagement, a 28-year-old woman stopped me and asked for advice on starting a company. She worked for Amazon. I asked her, "*Why do you want to start a company? What can you uniquely offer that the market will find valuable?"* I asked with a full understanding of the work and heartache of founding a small business.
>
> She struggled with the answer. Her response? As an employee in Silicon Valley, she felt that starting a company is an important rite of

passage. I asked her to shift focus from starting a company to being successful in running a company. To drive success, you need to have your feet firmly grounded in management principles and your reach based on a differentiated offering.

Success takes time, passion, and a differentiated offering. I am constantly amazed by the number of people that want to start a company only to check a box. My advice? Take your time. Start a company when you are ready. Don't pressure yourself. At the right time, do it for yourself as opposed to having a start-up on your resume.

Career Path? I am also amazed by the number of young professionals finitely plotting their future career paths. My issue? The workplace is constantly changing, and positions evolve. When I hear someone trying to push a fixed career path, I ask the person to relax and be open to the outcome.

"*The student graduating in 2019 will have nine careers in the course of their lifetimes. 50% of the occupations known today will be obsolete in ten years.*[2]" So why, do young professionals feel compelled to push themselves into fixed career paths when what we know today will be obsolete?

Choosing Work. Recently, I was teaching at a local university, and a young student in the back of the room approached me. She was wringing her hands. Hesitantly, and without looking me in the

[2] Cecere, Investment in Talent Improves Costs, https://www.forbes.com/sites/loracecere/2017/09/23/investments-in-talent-improve-costs/#76eae53d7350, 8/15/2019

eye, she asked, *"My Company is trying to fast track me into a managerial career path. I really don't want to manage people. How do I make a decision? What do I tell them?"*

I asked, "How old are you?"

"Twenty-three," she replied.

I smiled and asked her to take a deep breath. (My thought to myself? Why was a young student feeling such intense career pressure?) I replied, *"Life is too short to do what you don't want to do. Focus on opening doors in your career based on what you like to do."*

We talked in-depth about networking with people she admired to identify the characteristics of the jobs that appealed to her. This story seemed to resonate with the audience.

Adapt

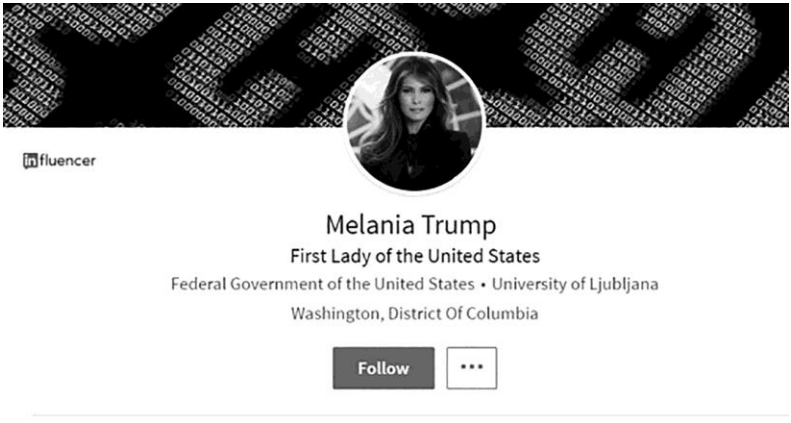
At the end of this session, a woman in the back of the room asked the question of *"How had I adapted my presence, and speaking style, to fit into a man's world?"* My answer prompted a heated debate. I stated, *"I learned to get rid of the chip on my shoulder."*

The Lora that graduated from Engineering school never felt good enough. She felt the need to outwork all the men. Inside, I was angry. It showed. Through mentoring, I now focus on channeling discomfort into humor. Laughter is a great equalizer.

This reply prompted anger in the room and replies that I was selling out. As the group pushed back, I remembered the section of the Ruth Ginsberg movie where she was preparing for a landmark case. Originally her answers, while well-researched, sounded cold

pedantic. Her coaching panel asked her to redirect and use humor. This segment of the movie resonated. I think it is an excellent answer to the question that I was asked.

Maybe by the time I retire, the halls of conferences that I attend will not be rows-after-rows of men. I look forward to having to stand in a long line for the women's restroom. Meanwhile, my advice? Find people like Ashley, Bob, and Maxine to help. Focus on what you enjoy and be open to the outcome.



How I Became Melania Trump

Oh my! …a tough couple of days. I have been fighting a hacker in Nigeria that took control of my LinkedIn profile page.

I was hacked, and when he found out that I was fighting back for account control, he changed the name on the LinkedIn profile to Melania Trump. So, for three days, my LinkedIn Profile had the picture of the First Lady of the United States, and all of my LinkedIn communications carried the name of Melania Trump. You may be asking as I did, what the &%$^K?

Here is how it happened, and my key insights:

> **Thursday.** I get a message on LinkedIn from a person to share a document. I click on the link. The link goes to a form asking for my password (the link looks like Dropbox file sharing). I entered my password. (MY MISTAKE. Never, never, ever enter your password on a form document even

though it looks like a file-sharing request.) I had my guard down on LinkedIn and I should not have given out my password.

Thursday Afternoon. My password is changed by the hacker and the primary email is changed on my LinkedIn and my Gmail accounts. (My Gmail contact information is connected to many accounts.) Contacts in my network are sent a request for password information. Multiple parties contact me to share that I have been hacked.

Alarmed, I try to get into LinkedIn to make changes, but I cannot access the account. I try to send a note to LinkedIn through their help desk, but I could not. You must be an active member of LinkedIn to access the help desk.

Friday Morning. I establish a new account to make contact with the help desk at LinkedIn. The help desk sends me a link to share government ID documentation to verify my identity to my Gmail account. I attempt to send this information, but the hacker blocks it and closes the case with LinkedIn. I try in desperation to find a contact at LinkedIn to call. (Not possible. All of the communication at LinkedIn is completed through case files. Don't waste your time trying to find a live person.)

Sunday Morning. I again try to upload authentication. I am not successful. My Gmail hacker blocks the attempt. Late Sunday night, my identity is changed to be Melania Trump. (Oh MY!) Monday Morning. I attempt to set-up LinkedIn accounts to open new case files using my

Facebook login. I file multiple cases. This confuses the help desk.

Monday Afternoon. I ask my contacts to report the issue.

Tuesday Night. I am contacted by LinkedIn to rectify the situation.

What did I learn?

Avoid the Issue. The obvious answer? Never respond to a request for a password. Regaining your identity on LinkedIn is almost impossible. If you see that your friends and contacts have been hacked, CHANGE YOUR PASSWORD. Protect yourself. A hack into LinkedIn can be dangerous.

It is Ugly. The LinkedIn system makes it easy to lock out the account owner. When the hacker changes the password and the email, the only way to take back account control is through a manual case file system that takes 24-48 hours for a response. A hacker can do a lot of damage in this period of time.

Anyone There? There is no substitute for a live helpline. If you own a platform or a system, make sure that your users can access a live person. Management of an issue like this through a case file system leaves a lot of room for issues. The hacker in the 24-48-hour delay for resolution caused havoc.

Melania? I have over 13,000 direct connections and 230,000 followers. Yet, only five people contacted me to let me know that there was an

issue when my name changed from Lora Cecere to Melania Trump. <Really? Yes, really. Only five people let me know. I had no idea that my new name was Melania Trump.> < The name change threw me; I had no idea that I needed to search for a new name. > So, if you see something strange, report it to LinkedIn and let your friends know. Realize that your friend can easily be blocked to get into their LinkedIn account by a smart hacker.

Manually Record Case Files. In resolving this type of case, record your LinkedIn URL (on your information profile) and record each case number manually. The hacker will be working feverishly to delete the cases as soon as they are created. Without the ability to communicate case numbers, the resolution will take longer.

Yes, I am back. The real Lora Cecere now has ownership of the Lora Cecere LinkedIn account. Over the past four days, I did not get a ride Airforce One or any perks of being First Lady, but I did learn a lot about hacking. It is a VERY painful experience. I hope it is one that you can avoid.