Building Market-driven Value Networks

Driving Differentiation in Supply Chain Processes Market-to-Market

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Contents

Research

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Disclosure

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Research Methodology

The information for this report is based on seven years of research, and work with over 300 companies, in building demand-driven value networks. The genesis of this report is the realization that being demand driven is not sufficient. Instead, companies need to connect market to market.

Executive Summary

Market-to-market pressures and volatility have never been higher, yet companies have not redesigned their supply chain processes to absorb the impacts and improve resiliency. We believe that it is time to change supply chain processes.

In this report, we share the concepts of the market-driven value chain. Today, it is largely aspirational, but we feel that the concepts will shape the supply chain of the future. The definition of a market-driven value chain is:

> *Market-driven value networks are adaptive supply chains that can quickly align organizations market-to-market to focus on the delivery of a value-based outcome. They sense and translate market changes (buy- and sell-side markets) bidirectionally with near real-time data latency to better optimize and align sell, deliver, make and sourcing operations to the goal. The focus is on horizontal process orchestration.*

This definition is in stark contrast to the supply chain definitions of the past; i.e., *the right product at the right place and at the right time*. In the journey to become market driven, the organization will face a number of change management issues. In this report, we tackle these directly. They are outlined in table 1:

Table 1 Change Management Issues with Becoming Market Driven

Change Management Issues with Becoming Market Driven		
From:		**To:**
Marketing driven		Market driven
Sell-in		Sell-through
Inside-out		Outside-in
Vertical Processes		Horizontal Processes
The Most Efficient Supply Chain		The Most Effective Supply Chain

We start the report by sharing why we think market-driven value networks matter. We do this by outlining current market drivers, detailing the progression of supply chain process evolution and listing the current gaps. We end with a recommendation of how to get started.

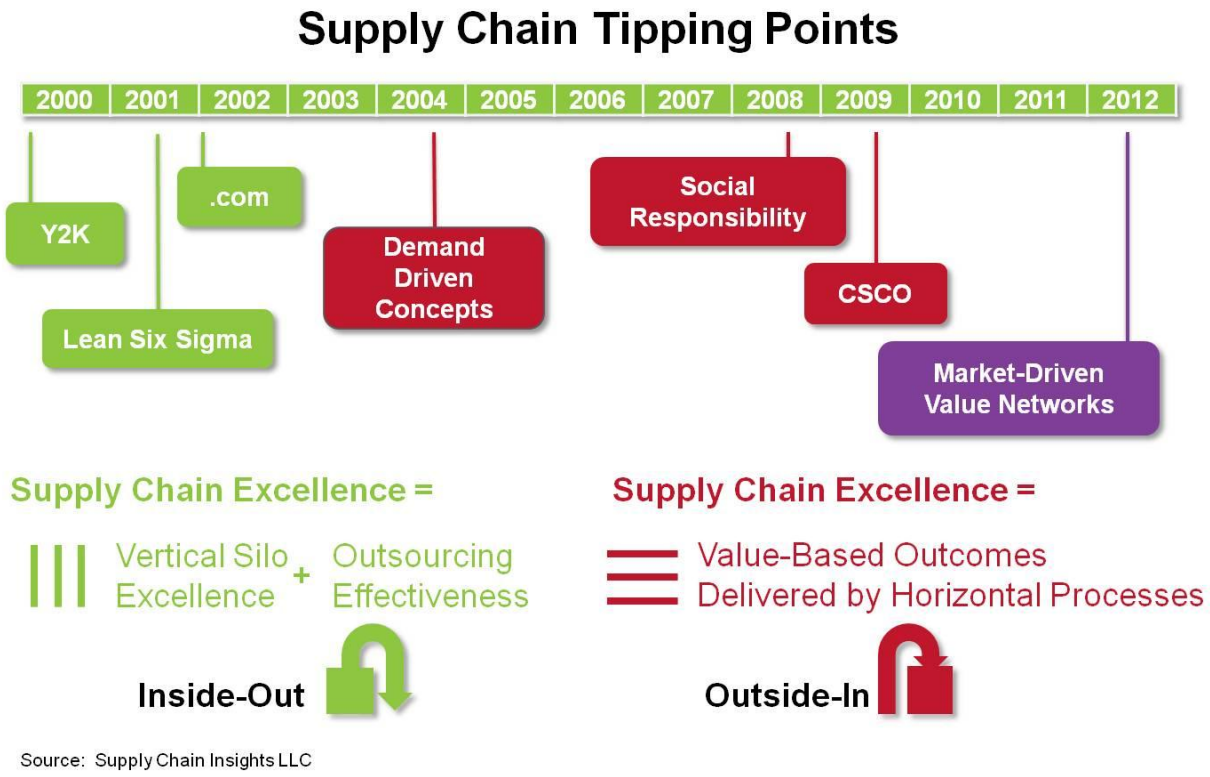
We realize that this is a journey, not a destination. It will take time and vision to actualize. We also understand that the journey for each company will look slightly different. The biggest obstacle in the path is change itself. Tackle it first and head-on. The first step is to build a guiding coalition. This report is designed to help you meet this goal.

What about Supply?

The year 2012 marks the third decade of supply chain process evolution. The first two decades were all about supply. Over the last decade, the shifts in supply chain processes have been dramatic. In 2004, it became all about demand when AMR Research defined the concept of the Demand-Driven Value Network. The definition of a Demand-Driven Value Network (DDVN) was a supply chain network that could sense and respond to demand with minimal latency. The primary concepts were demand sensing, demand shaping and driving an intelligent demand response.

In 2012, eight years later, there has been more talk than adoption. The concepts of becoming demand driven, while progressive, are not sufficient. One reason is that the concept has failed to address the changing world of supply and market-to-market volatility.

Fig. 1 Evolution of Market-driven Value Networks

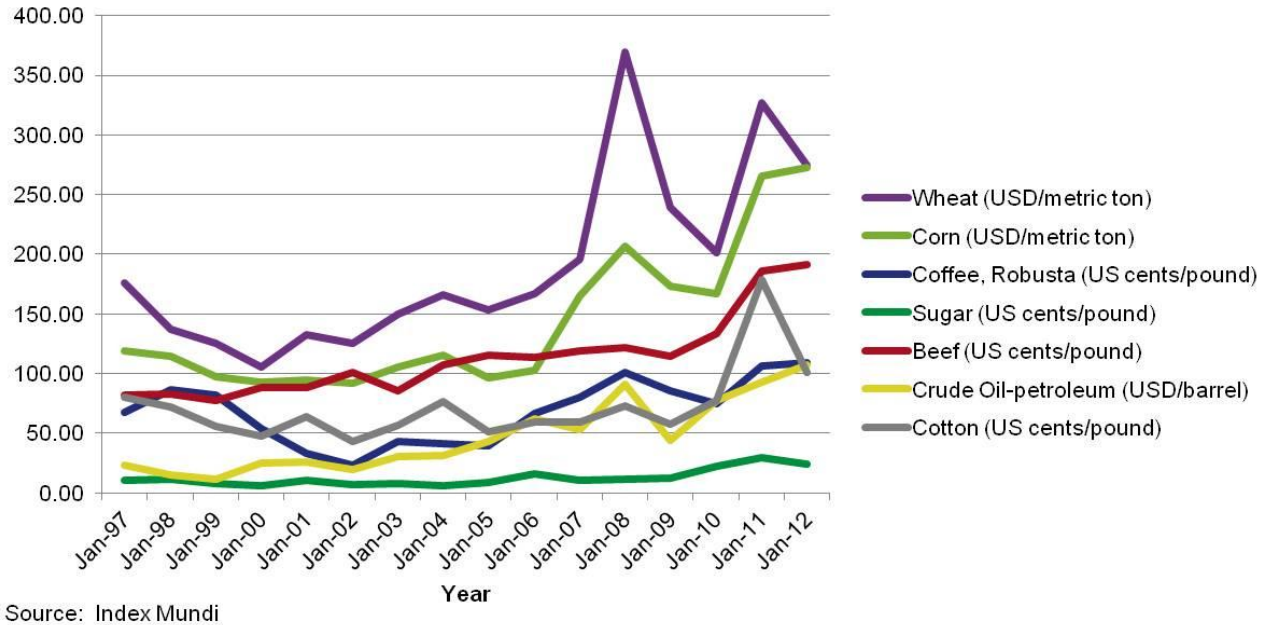


Source: Supply Chain Insights LLC

It cannot be JUST about demand. Today, materials are scarce and price volatility is the highest in three decades. Supply chain practices were defined in the early 1990s when crude oil was $10/barrel. They have changed little despite a 14X price increase and increased fluctuations. Likewise, no apparel supply chain was ready for cotton's doubling in price in 2011 followed by a 50% drop in 2012.

Supply has grown in importance for all. In 2011, 58% of the Fortune 100 companies list commodity price pressures as an issue or risk to earnings. In the words of one supply chain leader, "*It is like riding a roller coaster. While we used to operate in an environment where a few commodities would increase and offset each other in the cost structures, we now operate in an environment where every commodity seems to be increasing in both cost and volatility at the same time. It is the new norm."* Another supply chain leader commented in an interview that "*We are like a tube of toothpaste being squeezed at both ends."*

Fig. 2 Commodity Average Price



Source: Index Mundi

Today's world is a more complicated environment. The supply chain plays a higher profile role in the organization fraught with both more risk and opportunity. Government compliance and social expectations are higher. While they may have different names (e.g., Corporate Responsibility, Corporate Social Responsibility, Supply Chain Responsibility, Corporate Sustainability etc.), every Fortune 100 company today lists a policy on their website.

The management of supply is both more important and complex. Mismanagement is a sure bet to land a company on the front page of the **Wall Street Journal**. While **Apple** may be seen as a supply chain leader by some, the mishandling of supplier development programs at their outsourced **Foxconn** factory landed them on the front page of the Asian Wall Street Journal on May 27, 2010 with an article by Jason Dean *"Apple, H-P to Examine Asian Supplier After String of Deaths at Factory."* The name of Apple will be forever linked with suicide nets at the Foxconn factory. This problem hangs like a black cloud over the company.

Slowing of Growth. Supply Chain Matters More.

The importance of supply decisions is happening at a time when economic recovery questions linger like a bad hangover. Supply chain leaders remember the economic downturn of 2007-2009 like it was yesterday. They are carefully watching the Euro and the evolution of European monetary policy, and the rising wages in China and India. For all industries, the only constant is change:

- **Consumer Products.** In consumer industries, growth has slowed. It is now more aligned with Gross Domestic Product (GDP). Companies are feeling the pressures of commodity volatility and the shortage of supply chain talent.
- **Retail.** In retail, growth has also slowed. It is no longer double-digit. Mobile and social technology adoption has shifted power to the shopper. As power shifts, companies are trying to improve banner loyalty by rethinking store formats, cross-channel experiences and services. For many the overarching impact is a complete supply chain redesign.
- **Chemical Industry.** In the chemical industry, as commodity prices have increased, corporate growth has accelerated, but there is enormous pressure on margins. Industry consolidation and increasing governmental compliance has forever changed this supply chain.
- **High-Tech.** Only the High-Tech and electronics market, based on ongoing innovation, has weathered the course of time with double-digit growth. The focus is now on corporate social responsibility and building flexible supply chains that can morph with shifts in markets. The pace of innovation is high; and as a result, the High-Tech supply chain swings vicariously between markets.
- **Pharmaceuticals.** Big Pharma is quickly falling off a patent cliff. Innovation has slowed and many large pharmaceutical drug companies are facing a sharp drop in revenue from the loss of patent protection and the impact of cheaper, competing generic drugs. In 2012 alone, drugs which account for $63 billion in revenues are expected to lose patent protection. $33 billion in sales is forecast to be lost to generic competition and lower prices[1]. Eli Lilly, a supply chain leader, has 28 drugs coming off of patent protection this year. The company is forecasted to shrink from $20.8 billion sales in 2010 to $16.8 billion by 2016.

[1] Four Pharmaceutical Companies Facing Huge Patent Cliff Hurdles, Seeking Alpha, http://seekingalpha.com/article/322020-4-pharmaceutical-companies-facing-huge-patent-cliff-hurdles

Table 2 Year-over-Year Corporate Growth by Industry Sector

Industry Sector	Years				
	1990-1994	1995-1999	2000-2004	2005-2009	2010-2012
Retail	17.05%	42.46%	12.89%	8.76%	5.15%
Consumer Products	2.12%	.84%	3.91%	7.26%	2.32%
Food & Beverage	3.86%	2.97%	8.13%	2.59%	4.27%
Chemical	.4%	6.5%	13.8%	5.3%	13.8%
Pharmaceutical	8.1%	14.6%	6.3%	4.6%	15.7%
High-Tech & Electronics	27.3%	13.2%	11.0%	11.1%	24.0%

This added volatility needs to be absorbed in the chain. But how? Historically, supply chains had two buffers or shock absorbers: inventory and manufacturing. Manufacturing outsourcing has made many supply chains more vulnerable to these market shocks. Supply chains are now more fragile. With this outsourcing, many companies no longer have two shock absorbers, they have one. The primary shock absorber of most supply chains today is inventory.

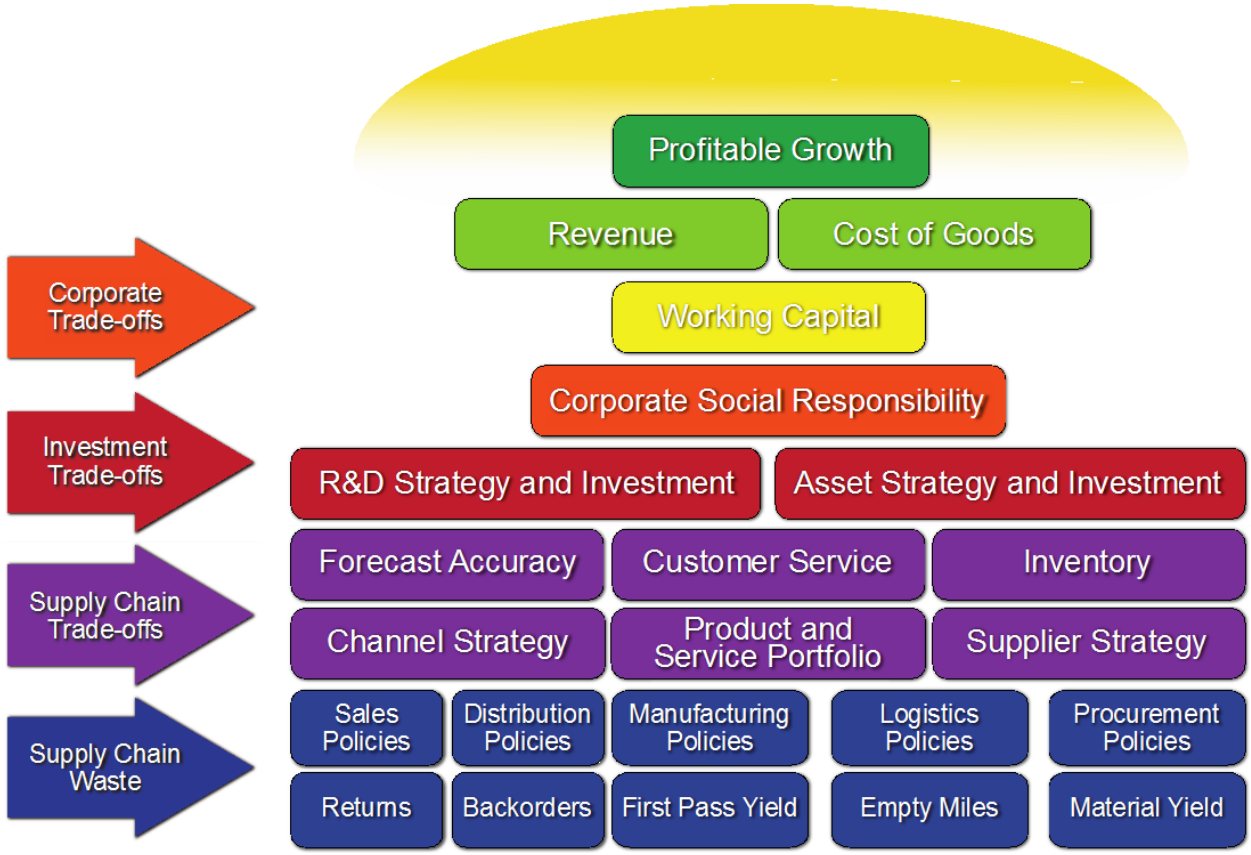
Through the deployment of Advanced Planning Systems (APS), inventory was right-sized. Companies were able to reduce ten days of Working Capital (on average) from their supply chains in the first two years of deployment. Effective inventory optimization analysis is able to improve the organization's ability to absorb market shocks, but year-over-year progress on working capital has stalled. Companies have squeezed what they can in inventory reduction.

As companies struggle to compete in this environment, supply chain excellence becomes more critical. Demand and supply policies are equally important. The volatility in both sell-side and buy-side markets is driving the redefinition of supply chain processes to be 1) horizontal, 2) outside-in and 3) agile:

1) **Horizontal.** As companies realize that supply chains are complex systems with increasing business complexity, they want to make better trade-offs market-to-market. Three tactical supply chain processes—Revenue Management, Sales and Operations Planning, and Supplier Development—are focused on improving the trade-offs as shown in figure 3. While many supply chain discussions focus on the symptoms of poor supply chain performance (supply chain waste as defined by the bottom row in figure 3), leaders understand that it is a complex system of complex processes requiring planning

and alignment of policy and process. This alignment cannot happen through vertical process excellence of a laser focus only on source, make and deliver. Instead, it needs to be end-to-end, combining policy and process to drive horizontal process evolution.

Fig. 3 Supply Chain Horizontal Processes help to Guide Trade-offs in Corporate Decision Making Processes



2) **Outside-in.** Traditional supply chain processes are inside-out. They cannot sense, they can only respond. To sense market changes and adapt processes, companies need to design supply chains from the outside-in.

In the time period of 2000-2010, there were many market shifts, and companies found that without the ability to sense and adapt to market conditions, the reliable supply chain was not sufficient. Two examples demonstrate the importance of supply chain sensing. In 2000, **Cisco Systems** was caught in the downturn of the eCommerce bubble. As a result of not sensing demand changes, the company was forced to write off $2.25 billion in inventory in 2001. This taught the company an important lesson. As a result of the redefinition of supply chain processes to be more resilient, the company was able to sense and withstand the downturn of the Great Recession of 2008.

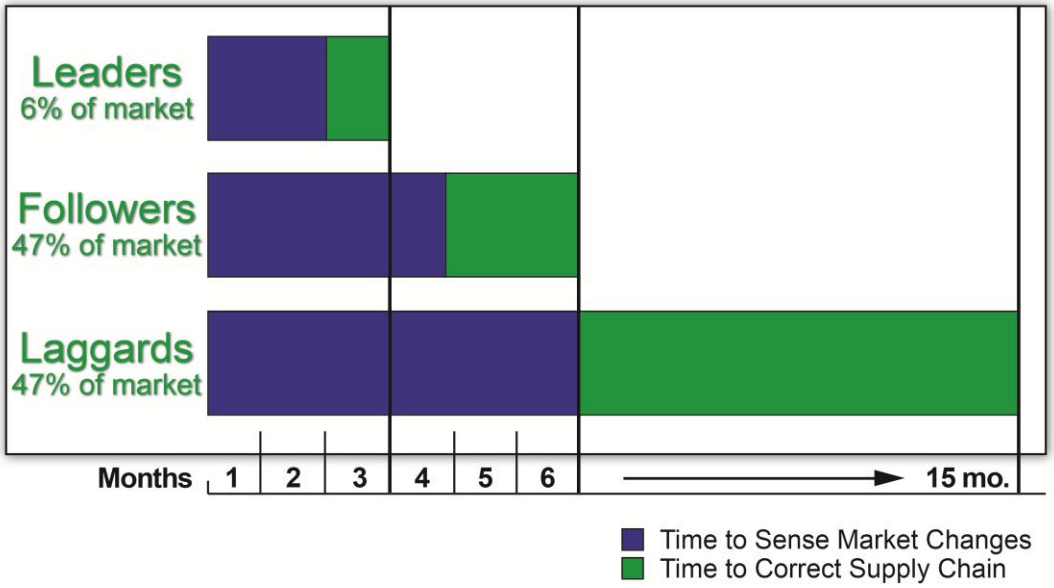
In contrast, eight years later, the leaders in the chemical supply chain learned a tough lesson. The magnitude of the economic downturn caught all by surprise. For example, **DuPont**, a supply chain leader, five steps back in the supply chain serving the automotive and construction industries, was forced to shut down 1/3 of their factories in 2008. As demand was translated across the long supply chain through conventional processes, the dominos started to fall. The business impact was pervasive with an employee restructuring program in both 2008 and 2009. The strength of the DuPont supply chain team was able to drive cash flow improvements and cost savings to stem the losses.

> ***In December 2008, DuPont announced plans to address rapidly deteriorating market conditions and strengthen the company's future competitiveness. Plans are focused on generating cash by better aligning cost, working capital and property, plant and equipment expenditures to the revised demand signals of the fourth quarter. These plans include a restructuring program with associated fourth quarter pre-tax charge of $535 million, with expected pre-tax savings of about $130 million for 2009, and about $250 million annual savings thereafter. The company also outlined 2009 plans to achieve a $1 billion in net working capital reduction and a 10 to 20 percent reduction in capital spending.***
>
> **DuPont 2009 Annual Report**

Shuttering factories in 2008 for DuPont was serious business. The company is known for excellence in process reliability. They own and operate factories with high process in some of the most challenging chemical environments. They are a supply chain leader. To ensure that this would not happen again, DuPont used the downtime in the factories to train employees on the principles of supply chain management. Their focus was on the redesign of the processes to sense and adapt more quickly to market changes. The principles of supply chain agility grew in importance. Today, they are actively building market-driven value networks.

Throughout the economic downturn, companies one by one gained a deeper understanding that the reliable supply chain was not sufficient. As a result, the demand-driven concepts gained greater adoption in the building of a resilient supply chain.

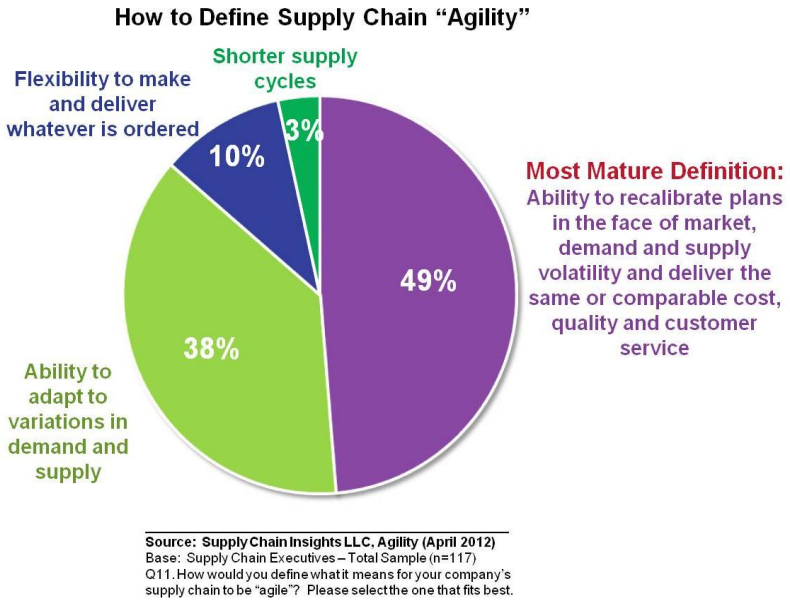
Fig. 4 Companies That Were Better at Supply Chain Sensing Adapted 5X Faster



3) **Agile.** Ask any supply chain leader if they want to be more agile, and they will all give a resounding *"Yes!"* But, if you ask them what they mean by "agile," you will get a range of responses. Why? There is no industry standard definition for supply chain agility.

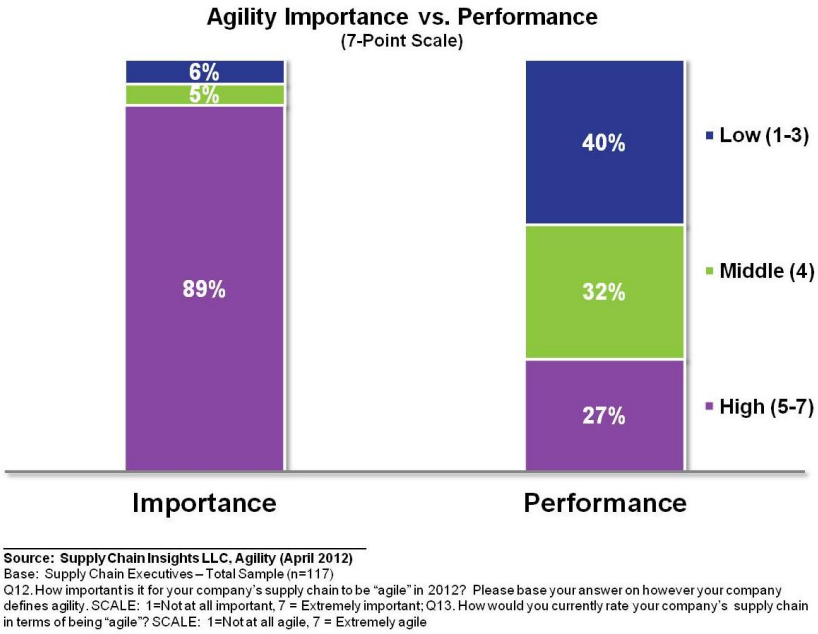
While everyone knows that it is about more than short cycle times, here we define supply chain agility in a Market-driven Value Network as the ability to deliver the same cost, quality and customer service given the market level of demand and supply volatility. In April 2012, we tested the definitions of agility in the market in a survey of 117 supply chain leaders. The results are shown in figure 5.

Fig. 5 Definitions of Supply Chain Agility



Companies want to orchestrate across buy- and sell-side markets bidirectionally: They want to maximize opportunity and mitigate risk through what-if analysis and scenario testing in business support. New forms of analytics and in-memory processing offer promise, but the underlying processes of supply chain planning must change for companies to take advantage of increased computing power. However, today, there is a gap between supply chain importance and the desired performance of the supply chain:

Fig. 6 Current Supply Chain Performance versus Importance of Agility



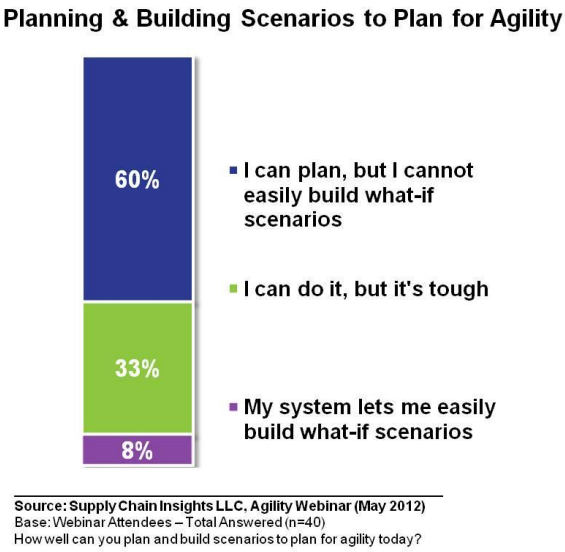
Source: Supply Chain Insights LLC. Agility (April 2012)
Base: Supply Chain Executives – Total Sample (n=117)
Q12. How important is it for your company's supply chain to be "agile" in 2012? Please base your answer on however your company defines agility. SCALE: 1=Not at all important, 7 = Extremely important; Q13. How would you currently rate your company's supply chain in terms of being "agile"? SCALE: 1=Not at all agile, 7 = Extremely agile

***Cargill Beef** is a market-driven leader. The Company uses price optimization tools to evaluate the market potential for beef. Before the company decides what to package for the market, they first evaluate the market potential for each cut of beef and then optimize how they harvest their inbound herds to maximize the opportunity and minimize the risk. There are 197 ways to cut up beef cattle. Since each breed of cow has a different potential or finite mix of products—steaks, ground beef, roast, etc.—Cargill uses the technology in Sales and Operations Planning to drive rancher insights to define which breeds are best for customer demand. This process of being adaptable to trade-offs from market-to-market based on the use of optimization technologies is termed demand.*

Despite the increased need for supply chain agility, business-user satisfaction with supply chain technologies is at an all-time low. Despite three decades of investment in supply chain planning, in a recent research survey of forty supply chain leaders, only 8% of companies surveyed felt

that they have the Business Intelligence (BI) capabilities to adequately analyze demand and supply trade-offs through what-if analysis in this new and challenging environment.

Fig. 7 Current Ability to Drive What-if Analysis to Drive Supply Chain Agility



Source: Supply Chain Insights LLC, Agility Webinar (May 2012)
Base: Webinar Attendees – Total Answered (n=40)
How well can you plan and build scenarios to plan for agility today?

In 2011, commodity pressures were pervasive, affecting companies across industries. Here are some excerpts from Annual Reports.

Fortune #5. General Motors

Automotive cost of sales increased by $11.6 billion (or 9.8%). Material, freight and manufacturing costs represented $1.7 billion. This was due to higher commodity prices and to support new vehicle launches. We are exposed to changes in prices of commodities primarily associated with various non-ferrous and precious metals for automotive components and energy used in the overall manufacturing process.

Fortune #9. Ford Motor Company

Full-year wholesale volume and revenue were higher than a year-ago period, but operating margin was down seven-tenths of a point; higher commodity costs reduced our margin by 1.8 points.

Fortune #21. Cardinal Health

Our Medical Segment revenue increased two percent to $8.9 billion with segment profit decreasing fourteen percent to $370 million, primarily driven by the negative impact of commodity price increases.

Fortune #27. Procter & Gamble

We are facing rapid and significant increases in commodity costs. Materials and energy costs were up more than $1.8 billion before tax for the fiscal year. We are taking a holistic approach to manage these cost increases.

Fortune #28. Archer Daniels Midland

Net sales and other operating income increased $19.0 billion or 31% to $80.7 billion. Net sales and other operating income increased $14.2 billion due to higher average selling prices, primarily related to higher underlying prices of commodities.

Fortune #35. Home Depot

Prices of certain commodity products, including lumber and other raw materials, are historically volatile and are subject to fluctuations arising from changes in domestic and international supply.

Fortune #48. United Technologies

While we expect to benefit in 2012 from cost reductions realized on the restructuring actions undertaken in prior years, we also expect an adverse impact on operating profits in 2012 from net commodity cost increases of approximately $50 million and incremental research and development investment of approximately $150 million.

Fortune # 50. Kraft Foods

During 2011, our aggregate commodity costs increased primarily as a result of higher costs of coffee, dairy, grains and oils, packaging materials, other raw materials, meat and nuts. Our commodity costs increased approximately $2.6 billion in 2011 and approximately $1.0 billion in 2010 compared to the prior year.

Fortune # 59. Coca-Cola

The company anticipates that the cost of underlying commodities will continue to face upward pressure in 2012. We currently expect the incremental impact of commodity costs primarily in juices and sweeteners to range between $350 million and $450 million on our full year 2012 consolidated results.

Fortune # 65. Sears Holdings

K-Mart's gross margin rate was 22.7% in 2011 and 24.6% in 2010. The decline of 190 basis points was mainly due to higher commodity costs and markdowns.

Fortune # 87. Plains All American Pipeline

Crude oil, low pressure gas, refined products and natural gas commodity prices have historically been very volatile. For example, over the last 24 years, NYMEX West Texas Intermediate crude oil benchmark prices have ranged from a low of approximately $10 per barrel during 1986 to a high of over $147 per barrel during 2008. During 2011, crude oil prices traded within a range of $75 to $115 per barrel.

Fortune # 96. Tyson Foods

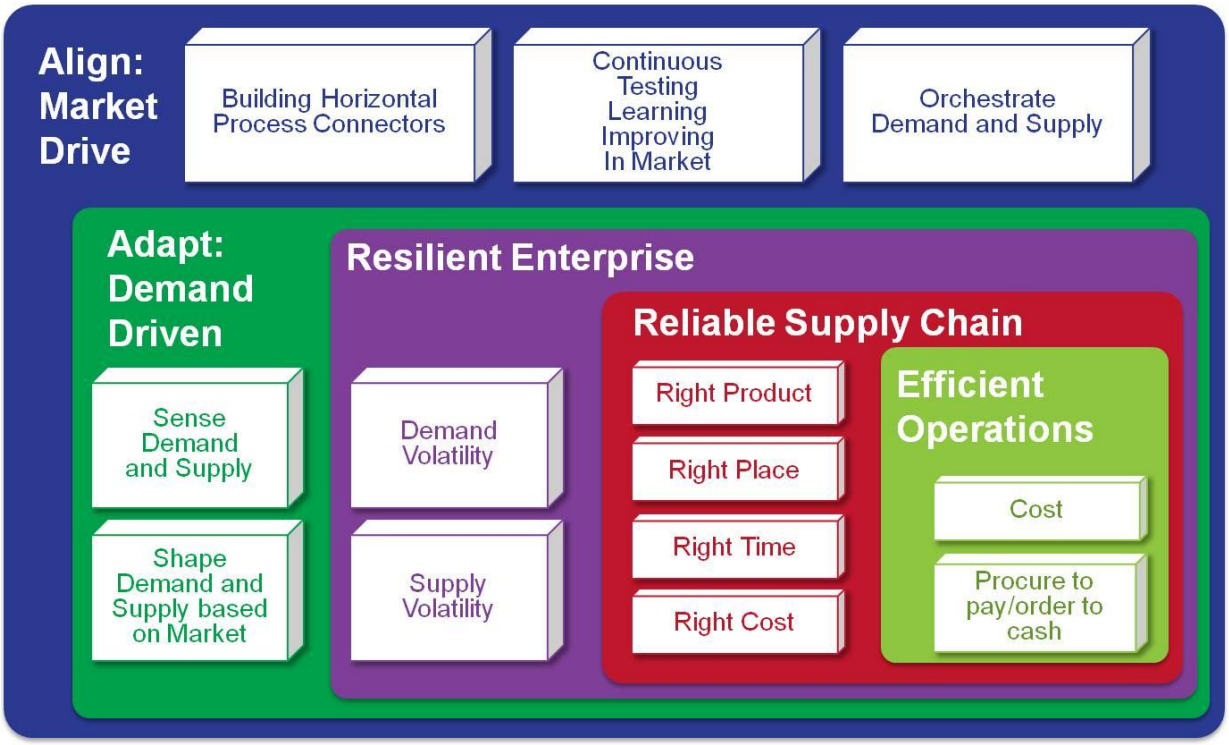
Increase due to net losses of $78 million in fiscal 2010, as compared to net gains of $191 million in fiscal year 2009, from our commodity risk management activities related to forward futures contracts for live cattle and hogs and exclude the impact from related physical purchase transactions which impact current and future period operating results.

Time to Build a Market-driven Value Network?

Today's supply chain is strong in the middle. The ends are fragile. The pressures of both buy- and sell-side markets are increasing. The origins of supply chain excellence are rooted in vertical process excellence of manufacturing, logistics and sourcing. The development of supply chain processes that can extend from the customer's customer to the supplier's supplier are evolving.

There are five phases in the evolution. These are portrayed in figure 8.

Fig. 8 The Five Stage Evolution Model of Supply Chain Processes



Source: Supply Chain Insights LLC

1) The First Supply Chain Process Definition: The Efficient Supply Chain. In the beginning, supply chain excellence was defined as the lowest manufactured cost. The belief was that supply chain excellence could be achieved by *"sweating assets."* This set of beliefs formed the foundation for the efficient supply chain. Through the evolution of supply chain processes, costs were reduced, inventory levels lowered and waste eliminated; but, each company reached a point where they could no longer just cut costs without trading off customer service.

Early supply chain pioneers fought hard battles with finance teams that did not understand the concepts. IT projects were implemented with overinflated commitments that were not grounded in reality. In the early days, the principles of supply chain trade-offs and the effective frontier were difficult to conceive. The singular focus on costs resulted in failures in customer service. These failures in customer service drove organizations to define supply chain excellence as a reliable supply chain to focus on closing multiple gaps:

- **A Shift in the Goal of Continuous Improvement Programs.** In this period, there was a belief that savings from operations could self-fund growth. At first, it worked. However, as the company reached their effective frontier of trade-offs, these

continuous improvement programs became largely shell games of trade-offs between functions. Net new savings and true impact on the bottom line became more and more difficult to achieve.

- **Recognition of Multiple Supply Chains.** As companies matured, they also realized that they had not one, but multiple supply chains. Each supply chain has unique rhythms and cycles requiring design from the outside-in (from the market back).
- **Need to Build Supply Chain Talent.** There was a need for a supply chain organization that could span the organization to build a guiding coalition: leaders that could credibly drive the discussion on trade-offs. This led to the building of the supply chain organization and the need to hire and train the second generation of supply chain professionals. There is now a supply chain organization in over 80% of North American manufacturing and distribution corporations.

2) The Second Stage of Supply Chain Process Evolution: The Evolution of the Reliable Supply Chain. The lack of reliability to deliver customer service was the Achilles heel of the efficient supply chain. The shortages in shipments, and the decrease in customer satisfaction, gave rise to the concepts of the reliable supply chain. With this shift, the focus changed to how companies can balance costs with reliability in customer service and working capital management. The goal of this supply chain was the right product at the right place at the right time at the right cost. In this process evolution, companies focused on improving the decision support systems to increase the potential, or the effective frontier, of the supply chain. This included the implementation of deep analytics for inventory optimization and factory scheduling.

In this process, the companies had to rethink their processes and close some major gaps:

- **Rethinking the Goal.** There was a general belief that the best supply chain is a tightly integrated supply chain. As companies worked on the implementation of processes to become more reliable, they found tight integration was not always beneficial. Planning grew in importance and there was a need to focus on *"what-if analysis"* and simulation to test for reliability. Each planner needed their own workbench to test the feasibility of solutions and these solutions required a different technology configuration.
- **Redefining Forecasting.** While many companies in their quest for efficiency embarked on a one number forecasting program, they quickly found that this was too simplistic. Instead, they found that they needed a common plan (not one number) with role-based views for sales, marketing, and manufacturing based on assumptions and market drivers. The visualization of a common plan by role with agreed upon assumptions increased supply chain reliability.

- **Need for a Supply Chain Strategy.** As companies worked on the definition of supply chain excellence, it became clear that there was a layer of definition needed between business strategy and supply chain planning. This spawned work on supply chain strategy documents to drive alignment and clarify cross-functional direction. Without this clarity, functions within the organization aligned on functional goals which were a barrier to building a reliable supply chain system. Today, only 5% of companies feel comfortable with their level of supply chain strategy.

3) The Third Stage of Supply Chain Process Evolution: Building the Resilient Supply Chain. Like the story of the three little pigs, supply chain leaders wanted to build supply chains that could withstand the winds of demand volatility or the pressure of supply disruption. These supply chains were built to sense outside-in and change the supply chain response based on market conditions. Supply chain leaders that built resilient supply chains decreased the latency—or time to sense—demand and supply changes. Based on a qualitative survey of sixty Fortune 500 companies in the Great Recession, we find that companies that were better at demand sensing aligned their supply chains five times faster.

In this stage, supply chain leaders defined process excellence by minimizing data latency from both buy- and sell-side markets to drive a near real-time response. In the process, supply chains became networks. In the adaptive or demand-driven supply chain, companies increased sensing capabilities and infused the processes of source, make and deliver into the discussions with both buy- and sell-side trading partners. These top-to-top meetings and relationships became more data driven. The metrics changed. Procurement discussions focused on total landed cost not just purchase cost and suppliers were incented to contribute through innovation networks and alignment to Corporate Social Responsibility (CSR) programs. Scorecards and performance management processes evolved. The focus evolved to concentrate on building win-win partnerships through supplier development programs.

To build supply chain sensing capabilities in the downstream channel, the processes needed to be turned outside-in. Demand planning processes changed from focusing on predicting *what to ship in factories* to predicting *what would be sold in the channel.* For many companies, this made the investment that they had made in the “integrated supply chain” and multi-year Enterprise Resource Planning (ERP programs) obsolete. It was no longer sufficient to be tightly integrated to order and shipment processes. Instead, the company needed to define the process of demand translation: the translation of market demands to supply operations with minimal latency. These processes were built on channel data not corporate history. Demand

architectures needed to be built to sense and then translate the meaning of channel or downstream data.

Supply chain leaders realized that sensing without changing the response was insufficient. They needed to be more adaptive. They needed internal processes that could flex and adapt with market changes. As companies experienced high levels of demand and supply volatility, they realized that they needed to embed mechanisms into the processes to ensure profitability. As a result, they invested in the processes of revenue management and demand shaping to deliver the Adaptive Supply Chain.

> ***My supply chain planners used to work for NASA. They are scary smart. They say market sensing in Supply Chain Management is tougher than what they did at NASA.***
>
> **Supply Chain Leader, North American Manufacturing Company**

4) The Fourth Stage of Supply Chain Process Evolution: Demand Driven. Building the Adaptive Supply Chain. In the adaptive supply chain, the processes first sense and then shape demand based on revenue management practices. This is sometimes termed *"a demand-driven supply chain."* Demand shaping includes the active processes of new product launch, price management, trade promotion management, marketing and advertising, and incenting sales against revenue management processes. They design processes to build processes outside-in to evaluate what "really matters to customers." Companies that mature in this capability usually are also mature in the processes of analyzing customer profitability through cost-to-serve analysis and looking at product profitability to determine the right product portfolio. They actively manage complexity.

Common misconceptions of market-driven value networks:

1. Market-driven is the same as marketing-driven
2. Orders and shipments represent "true" market demand
3. Supply chain latency is not an issue
4. Tight integration of the supply chain drives supply chain excellence
5. The most effective supply chain is the most efficient

This stage of development requires tight integration of the research and development efforts (R&D) to the supply chain processes. Since 60%-80% of the costs of a product are defined in new product launch, and many supply chain networks are defined at the time of launch, in the maturation of these processes companies need to carefully define the coupling of cross-functional, horizontal processes. This includes the integration of the

processes of Sales and Operations Planning (S&OP) with R&D Stage Gate Planning, and Corporate Social Responsibility (CSR) with Supplier Development programs. This is even more critical in heavily regulated industries like pharmaceutical, agro sciences, and aerospace and defense. If these companies do not get it right on the product launch, they have a very difficult time amending the process later.

> ***We introduce fifteen to twenty mobile phones a year. This can only happen if there is cross-functional alignment.***
>
> **Chief Financial Officer, High-Tech Manufacturer in Europe**

One of the toughest change management issues is the role of *"sales"* in driving a profitable demand response. Since most sales organizations are incented on volume, not profitability, there is a strong resistance to shape demand unless the incentives are aligned to focus on selling a profitable unit. This is a change management issue worth fighting. As the adaptive supply chain evolves, leaders find that one of the largest impacts is improved customer service and the reduction of the cost of sales as a percentage of revenue. Customer satisfaction improves and the dialogue is now focused more on what the customer values versus internal self-serving metrics.

> ***Today when it comes to improving sales, a dollar spent on improving the supply chain of our customers is worth three spent in trade promotion management.***
>
> ***Vice President of Supply Chain, Consumer Products***

With maturity, the networks within the supply chain coalesce. Demand, supply and innovation networks begin to overlap. Companies learn that a customer is not just a customer, and that a supplier is not just a supplier. A customer may also be a supplier and a supplier may also be a strong source of ideas though contributions in open innovation networks. A supplier and/or a customer may also be a provider of logistics services.

Supply chain design and the architecture of supply chain strategy increases in importance. This changed from an ad hoc or annual process to be an integral part of the monthly S&OP process. Companies also learn that forecasting is more important than ever, but that the focus needs to change. It is no longer about the accuracy and tight integration of numbers; but instead, it is a focus on sensing market drivers, aligning on assumptions, and planning the network based on the predicted level of demand volatility.

The change in demand forecasting processes is a major change management hurdle for the traditional supply chain. The shift from a focus on history to a focus on market drivers, or to align on demand assumptions versus debating numbers, is a cultural redefinition.

Today, this stage of maturity is largely aspirational for most companies, and not well understood. Less than 1% of the Fortune 500 Companies are actively building this type of capability. They include companies like **Dow Chemical, Intel, Kimberly-Clark, LG Electronics, Procter & Gamble, Seagate** and **Samsung**.

5) The Fifth Stage of Supply Chain Process Evolution: Market-driven. Align the Supply Chain Market-to-Market. The market-driven supply chain is a future state aspiration for the supply chain leader. The concepts are based on building advanced processes to listen, test and learn. This will happen through the application of Big Data concepts (reference Supply Chain Insights' Big Data Report) and new forms of predictive analytics.

> ***Market-driven value networks are adaptive supply chains that can quickly align organizations market-to-market to focus on the delivery of a value-based outcome. They sense and translate market changes (buy- and sell-side markets) bidirectionally with near real-time data latency to better optimize and align sell, deliver, make and sourcing operations to the goal. The focus is on horizontal process orchestration.***

The design of market-driven supply chains is dependent on an end-to-end vision. It is contingent on the effective building of value networks, strong horizontal processes, the redesign of supply chain processes and a retraining of the organization.

It should not be confused with a marketing-driven supply chain. In the marketing-driven supply chain, the focus is on an internal signal, not a market signal. Marketing-driven is very different than market-driven. A marketing-driven supply chain does not adapt horizontally market-to-market (buy-side to sell-side markets). In contrast, the market-driven supply chain stretches horizontally across the extended supply chain from market-to-market.

Change in Supply Chain Planning

I believe that we should be discussing how to connect the customer's customer to the supplier's supplier. I believe that we should not be marketing driven, but market driven. I believe that the vertical processes of sales, marketing, logistics, manufacturing and procurement need to cede and give way to the building of outside-in horizontal processes. The traditional views are too

limiting. We have built inflexible inside-out processes that need to transition to outside-in processes to improve sensing and drive an intelligent response. We need to start with the ends of the supply chain (commercial and procurement teams) and work back.

Traditional Supply Chain Planning

It is a different world. The traditional views shown in figure 9 are just too limiting. This is the traditional Advanced Planning System platform that is implemented in over 85% of manufacturers with more than 1 billion in annual revenues.

Fig. 9 Traditional Supply Chain Planning Processes

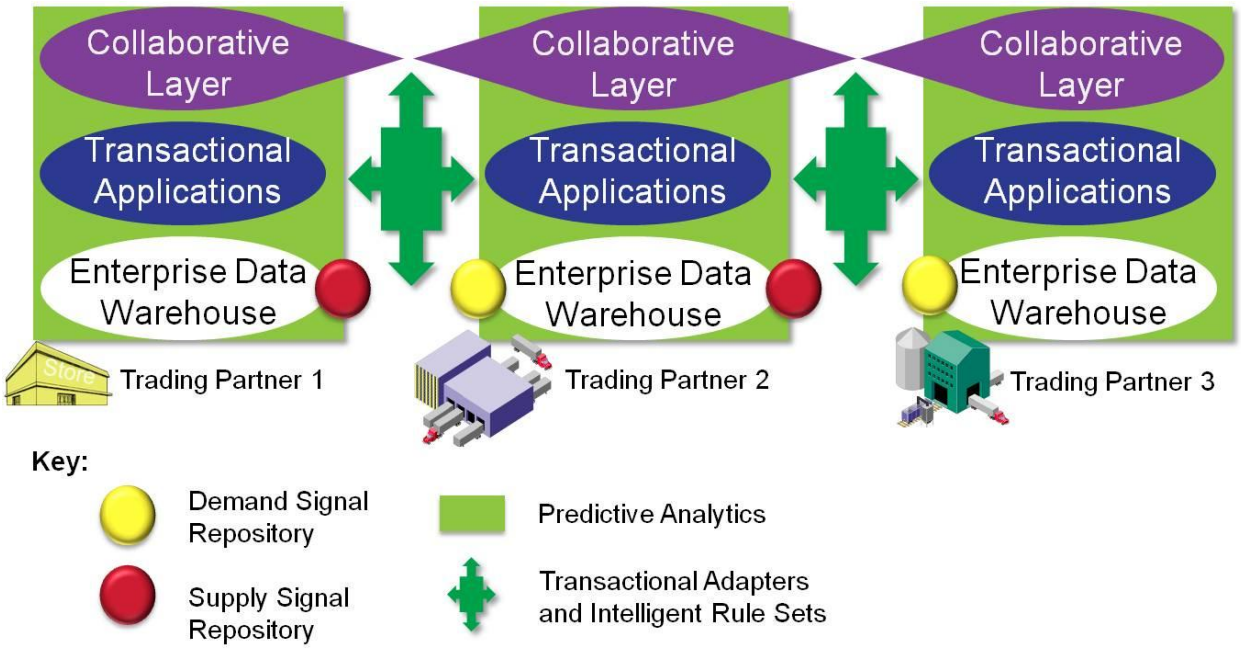
Sell	Deliver		Make	Source	Service
Strategic: Multi-year views in viewed in aggregate					
Sales and Operations Planning: Focus within months within the tactical horizon on actionable timelines for decisions on revenue management, operational planning, sourcing strategies, and new product launch					
CRM: Operational planning for sales deals (weekly views for 4-6 weeks)	**Demand Planning:** Forecasts for Periods of 12-18 months.	**Distribution Planning:** for customer service (weekly views for 12-18 months	**Supply Planning:** Constraint-based planning with manufacturing (weekly views for 12-18 months)	**Material Requirements Planning:** for sourcing(weekly views for 12-18 months)	**Service Planning:** for service (weekly views for 4-6 weeks)
Sales Operations: Executional planning (Daily views within the week)	**Demand Sensing:** Sensing market demands in the period of 0-6 weeks.	**Deployment Planning:** (Short-term planning for 0-6 weeks with daily views)	**Manufacturing Scheduling:** (Daily views within the week for 0-6 weeks)	**Supply Sensing:** Sensing supplier shifts. (Daily views within the week) for the period of 0-6 weeks.	**Service Deployment:** (Daily views within the week)
Market Execution	**Warehouse Management & Transportation Planning**		**Manufacturing Execution**	**Procurement Execution**	**Service Execution Planning and Dispatch**

These traditional supply chain frameworks had a strong focus on vertical processes. Supply chain execution (SCE) was defined only as order-to-cash systems: transportation, warehouse management, and order fulfillment. Demand planning was defined tactically, but lacked an operational component. Demand sensing definitions evolved in the past five years to fill this void to replace rules-based consumption with short-term forecasting processes, but it is not sufficient. Customer Relationship Management (CRM) has never lived up to its believed potential. The ends of the supply chain—sales and procurement—are weak links, and a barrier to forging the end-to-end supply chain. We will never build strong value networks with the current definitions of enterprise applications.

Market-driven Value Networks

The processes for market-driven value networks need to start outside-in. They need to be constructed from the customer back to the supply chain within the enterprise. The focus needs to be on value-based outcomes.

Fig. 10 Building the Extended Market-driven Value Network



Source: Supply Chain Insights LLC

Long term, the architectures will have a collaborative layer, a transactional layer and will be enriched and supported by a new Business Intelligence (BI) architecture. Microsoft's recent announcement to acquire **Yammer** for $1.2B is a testimonial to the need for a social layer in enterprise applications. **Jive's** market evaluation is also high with a high probability of acquisition by an enterprise application vendor. Along with building the social layer, companies will also realize they need to build an inter-enterprise system of record. **Demandtec** (recently acquired by **IBM)** is an example of the evolution of the inter-enterprise system of record.

The purple areas in the drawing are new forms of analytics that are evolving to help organizations better sense and respond to market shifts. As these new forms of predictive analytics evolve, we forecast that current transactional systems (often termed ERP, CRM and SRM) will become legacy applications.

Business differentiation in Market-driven Value Networks will occur through new forms of predictive analytics and pattern recognition that will happen within the new suites of emerging

applications by vendors that paint outside the lines. Look for them in the areas of sentiment analysis, natural language processing, text mining, advanced pattern recognition, rules-based ontologies, and advanced optimization techniques. The supply chain leader will get new sets of *"black boxes"* that will combine these techniques for the supply chain.

Fig. 11 Emerging Supply Chain Planning Framework

Sell	Deliver	Make	Source	Service
Strategic Network Design				
Revenue Management	Sales & Operations Planning		Supplier Development	
Demand Translation & Demand Orchestration				
Contact Management Price and Promotion Management	Demand Planning	Distribution Requirements Planning	Tactical Supply Planning	Procurement Contract Management Material Requirements Planning	Contract Management and Warranty Planning Service Parts and Labor Planning
Market Execution	Demand Execution and Forecast Value Added Analysis	Deployment Planning Transportation Planning	Production Planning	Materials Management	Service Execution
Demand Sensing and Demand Execution		Supply Sensing and Supply Execution			
Available-to-Promise (ATP) Functionality					
Demand Visibility Channel Partner Network Collaboration	Order Management	Warehouse Management Transportation Execution	Digital Manufacturing Manufacturing Execution	Supply Visibility Supplier Network Collaboration	Warranty Execution

There are eight shifts in the drawing above that are a major departure from the traditional view portrayed earlier.

1) Shift from Vertical to Horizontal Processes. While there has been a resurgence in Sales and Operations Planning (S&OP), there is also slow momentum growing for revenue management and supplier development programs. There is slow realization that CRM and SRM architectures are not sufficient to drive compliance and orchestrate reliable networks. As a result, companies are beginning to invest in three, not one, horizontal processes (definitions listed below): revenue management, S&OP, and Supplier Development.

2) Demand Translation and Demand Orchestration. With the increasing volatility of commodity markets, companies need to quickly translate demand implications of channel strategies and orchestrate them bidirectionally market-to-market through demand orchestration. In demand orchestration, advanced analytics are used to rationalize customer, product and material strategies to predict shifts in commodity markets against market potential. An early example of this type of functionality is **Signal Demand** in the process industries. The work by **Cargill Beef** and **Fonterra** are case studies to follow closely.

3) Management of the Supply Chain Planning Market-to-Market from Contract-to-Contract. Contract management has not played heavily in supply chain planning. With the slowing growth and increased market volatility, this is changing. In the future, I believe that text mining and natural language processing will be used to translate contract terms to demand orchestration processes. Early work in this area is seen in contract compliance by **Enterra Solutions'** work at **Conair** and **Newell Rubbermaid**.

4) Completion of the Demand Management Footprint. Traditional demand planning was defined as a tactical planning process with no tie to market execution. As demand sensing capabilities are replacing rules-based consumption, there is the evolution of a demand execution footprint complete with forecast value-added analysis (FVA) to evaluate continuous improvement programs in demand management. Look for new footprints in this area from **SAS** and **Terra Technology**.

5) Building of Demand and Supply Sensing Capabilities. The use of unstructured and structured data to sense demand and supply capabilities will first evolve through Big Data Services and then be integrated with enterprise data repositories. **Bazaarvoice's** listening service for ratings and reviews and **Dun & Bradstreet's** listening for supplier performance are early examples of this type of service.

6) New Capabilities for Demand and Supply Execution. Long term, both demand and supply execution, and functionality for demand and supply networks, will be constructed from the outside-in. This is where the average company will first encounter Big Data concepts as they try to fuse streaming data, geolocation and mobile data, and large transactional data sets. **Kinaxis'** work in in-memory processing of supply data is an early form of this functionality.

7) Closed Loop Processes for Demand and Supply. Large scale parallel processing and advanced optimization and new predictive analytics techniques will allow companies to sense, respond and evaluate. This will evolve to listen, test and learn strategies for both demand and supply over the course of the next five years.

8) Building of Supply and Demand Networks. The traditional programs for Vendor Managed Inventory (VMI) and Supplier Managed Inventory (SMI) systems have been implemented, but never tightly integrated because the enterprise data models were inside-out, not outside-in. As the enterprise architectures are redefined, VMI and SMI will become tightly integrated and enriched with unstructured data like quality, return, warranty and social data. This will redefine demand and supply visibility.

To make this new supply chain planning suite a reality within the enterprise, we predict that the new world will be based on analytics. Demand Signal Repositories (DSR), Supply Signal Repositories (SSR) and Enterprise Data Warehouses (EDW). There will be a shift from transactional systems to Business Intelligence (BI) architectures. BI will mean much more than rows and columns and reporting. The views in figures 10 and 11 are aspirational; it is not today's reality and not available from any technology provider.

Getting Started

It is a journey, not a destination. As you think about the supply chain strategy for your company, evaluate how these concepts fit by doing the following:

- **Step # 1. Map processes outside-in.** Go back through two years of operational results. Map market shifts and your time for response. What would have been the value to your company if you could have sensed these shifts quicker? List all of the opportunities and make a grid of how you could apply these new concepts. Then make a drawing of how your organization could redesign their supply chain processes from the channel back using market data to sense, shape and orchestrate demand. Identify which processes could be adjusted in your Market-driven Value Network based on a greater understanding of the market. This would include sourcing strategies, bill of materials and the management of alternate materials, manufacturing strategies, distribution and network design options and demand shaping programs. Identify which changes could have been made within the last two years to improve profitability and/or drive revenue.

- **Step #2. Build strong horizontal processes.** Evaluate the organizational maturity of your company in each of the three primary horizontal process areas of revenue management, Sales & Operations Planning (S&OP) (reference Supply Chain Insights Report on Market-driven S&OP) and Supplier Development.

Develop a gap analysis and evaluate how closing these gaps could address the opportunities outlined in the mapping of outside-in processes in step #1.

- **Step #3. Learn to listen.** Make a list of all of the opportunities that your organization has to listen to customers of your product. This list could include ratings and reviews, social data, warranty and return information, customer service logs, distributor feedback, eCommerce comments or quality data. Evaluate how well your organization uses this data and map the potential use of this data to the opportunities in step #1.

- **Step #4. Redefine supply chain planning. Orchestrate demand.** Using the frameworks in this report, evaluate your current investments in supply chain planning to the future vision. Invest in demand sensing, revenue optimization and demand orchestration capabilities. Build strong what-if analysis within the current planning technologies to improve agility.

- **Step #5. Build value networks.** Using figure 10, evaluate how well your organization builds and rewards supply chain relationships. Over the last three decades companies have talked collaboration, but have actually pushed costs and working capital burdens backwards into the supply chain, increasing total costs. Own your value network by:
    1) **Identifying where strong relationships are needed.** Map current performance against importance for key supply chain relationships. Identify the areas of greatest gaps.
    2) **Evaluating how to reward these relationships.** While most channel relationships are rewarded on sell-in not sell-through based on volume, and most supplier relationships are rewarded on lowest purchased cost, neither of these measurements builds strong value networks. Evaluate how to change the incentives to improve informational latency, decrease waste and improve value.
    3) **Putting your money where your mouth is.** Walk the walk and talk the talk. Identify value-based outcomes and orchestrate Kaizen events to drive change in key relationships focused on the new goals.

Why Does it Matter?

Growth is slowing. Economic volatility is increasing; yet the definitions of supply chain practices have not changed in the past three decades. Supply chain leaders identify the gaps as the need for greater agility, flexibility and resiliency in the face of market volatility; however, they do not know what to do about it. The concepts in this report are based on seven years of studying the evolution of demand-driven value networks and the advancement of supply chain technologies. They are offered as a solution for leaders who understand that they need to drive a change.

Appendix

Research used in this report is based on the analysis of twenty-five years of financial balance sheet data, current Annual Reports of Fortune 100 companies, and quantitative data from four different Supply Chain Insights research studies conducted in the period of February 2012 to July 2012. Demographics for each study are listed at the bottom of each figure.

Building a Market-driven Value Network… Terms to Know:

As a supply chain leader, achieving market-driven differentiation requires the learning of a new language or nomenclature. Here we provide definitions of commonly used terms in this report. They will help the supply chain leader become conversant, but not an expert, in reading about Market-driven Value Networks:

- **Demand Orchestration**: The process of making trade-offs market-to-market based on the right balance of demand risk and opportunity.
- **Demand Sensing**: Shortening the time to sense "true" market data to understand "true" market shifts in the demand response. This is in contrast to the use of order-to-shipment data that can have 1-3 weeks latency in translating "true" market demand.
- **Demand Shaping**: The use of techniques to stimulate demand. This includes new product launch, price and revenue management, assortment, merchandising, placement, sales incentives and marketing programs.
- **Demand Shifting**: The shifting of demand from one period to another through advanced shipments, and moving more products into the channel without stimulating base demand.
- **Demand Translation**: The translation of demand outside-in from the market to each role within the organization. Recognizing that the requirements for distribution, manufacturing and procurement are different.
- **Revenue Management**: The process of stimulating demand through demand shaping efforts and carefully managing payment capture to ensure that the changes in payment terms do not result in deductions. Evaluation of the effectiveness of demand shaping programs through sales analytics.
- **Supplier Development**: The process of supplier selection, training, onboarding and adherence to supplier policies. Supplier development programs have increased in importance to accelerate innovation, improve supply and ensure compliance to corporate social responsibility initiatives.
- **Supply Sensing**: The use of unstructured and structured data to sense supplier failure and pending supply shortages.

About Supply Chain Insights LLC

Supply Chain Insights LLC (SCI) is a research and advisory firm focused on helping supply chain teams improve value-based outcomes. The offerings include research-based Advisory Services, a Dedicated Supply Chain Community and Web-based Training. Formed in February 2012, the company helps technology providers and users of technologies gain first mover advantage.

About Lora Cecere

Lora Cecere (twitter ID @lcecere) is the Founder of Supply Chain Insights LLC and the author of popular enterprise software blog Supply Chain Shaman currently read by 4500 supply chain professionals. Her book, **Bricks Matter**, publishes in the fall of 2012.

With over eight years as a research analyst with **Altimeter Group, AMR Research, Gartner Group** and now as a Founder of Supply Chain Insights, Lora understands supply chain. She has written over 600 articles on demand-driven value networks and has worked with over 600 companies on their supply chain strategy. Lora is a frequent speaker at over 50 conferences a year on the evolution of supply chain processes and technologies. Her research is designed for the early adopter seeking first mover advantage.