The Ferrari Consulting and Research Group LLC

The Case for Tightly Integrating New Product Introduction and Supply Chain Management

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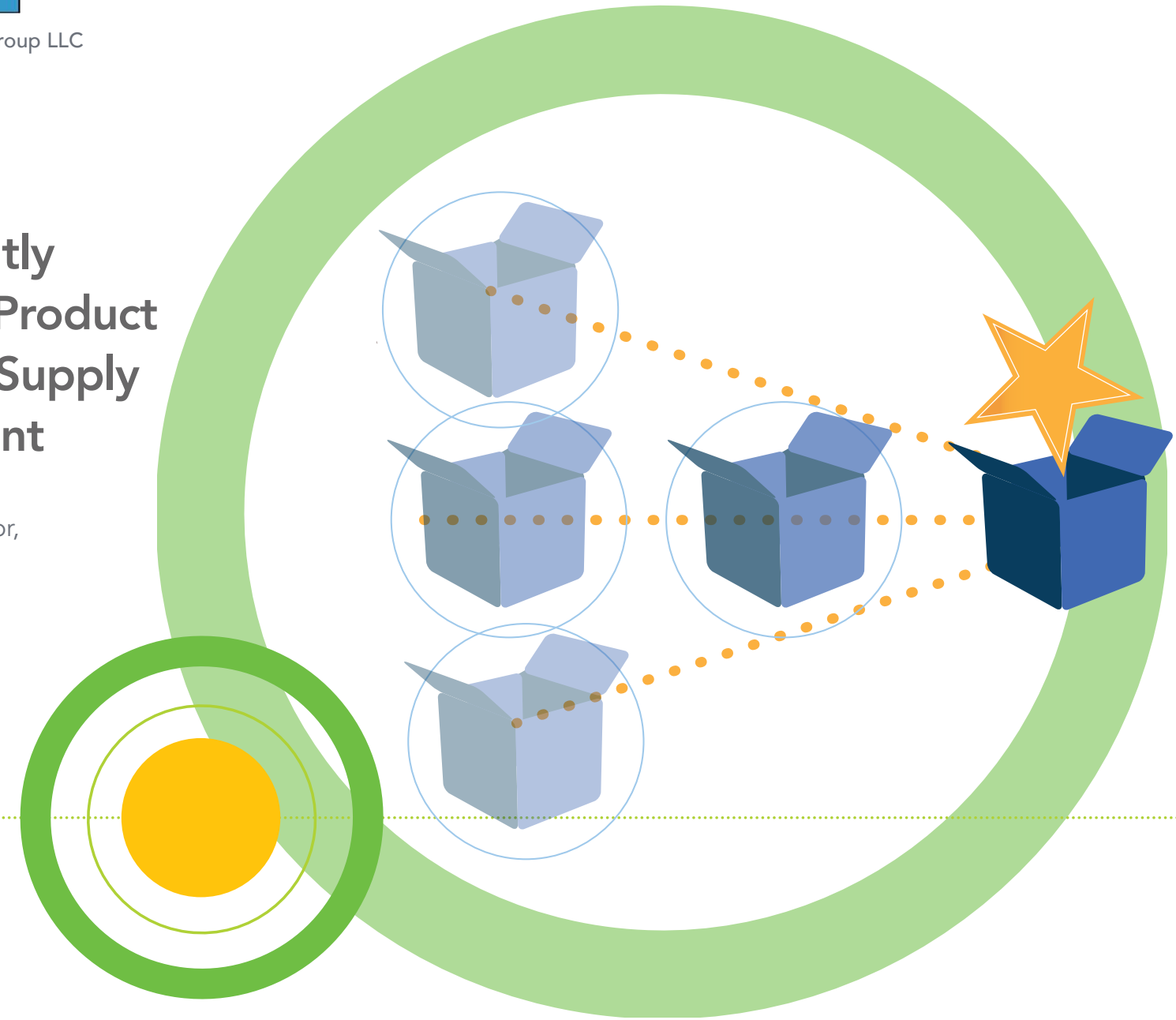
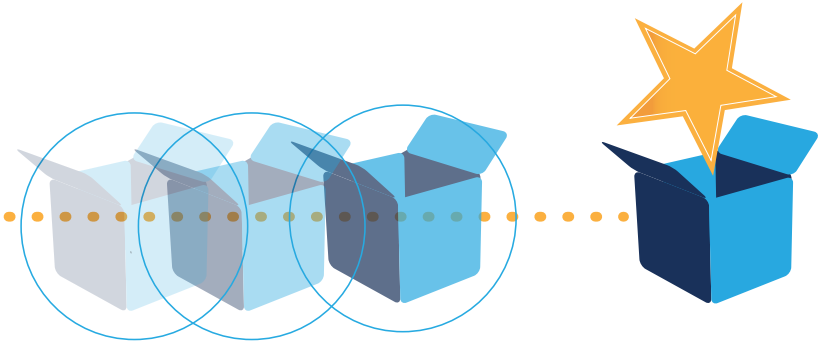


Introduction



In many industry environments today, business as usual isn't sustainable. New dimensions of competitiveness—the speed and accuracy of information and decision-making—are driving supply chain transformation.

Highly outsourced supply chain networks provide cost and agility advantages, but they also add to the complexity that must be overcome. Supply chains strive to be more customer and business event-driven, but today, that implies far different business process and decision-making competencies. Five significant forces are driving change:

- Customers expect companies to innovate in compressed time frames
- Customers expect higher-quality product experiences
- Customer and business support needs are constantly shifting
- Supply chain processes and IT technologies are converging
- Technology innovation and systems continue to converge

The new product introduction (NPI) process plays a critical role in how companies respond to and leverage these changing market forces for competitive advantage. Innovative supply chain leaders will leverage their supply chain network for broader and more timely visibility; business process applications integration; and better informed, more proactive decision-making.

The business-to-business (B2B) business network has become the new opportunity for fostering stronger business process relationships with suppliers and integrating new product management and introduction (NPI) with product design, collaborative manufacturing design, change management, and supply chain

fulfillment. Consider that various industry supply chains have become highly outsourced in both product design and production. This requires that product engineering, process engineering, suppliers, operations, and other partners receive timely updates on product changes and process needs along with more responsive integration of information related to product plans, schedules, and master data information.

Technology supporting the extended supply chain network started with a focus on supplier-facing processes such as sourcing, manufacturing collaboration, service contract management, e-procurement, and electronic invoicing. These processes further evolved to incorporate customer-facing, B2B and business-to-consumer (B2C), and channel fulfillment processes as well as business and trading partner network relationships.

In turn, there continues to be industry supply chain shifts that include changed priorities. Growth and profitability stem from new products and capitalizing on untapped markets. More technology-empowered customers and consumers demand added services, more timely information, and shorter product time-to-market cycles. Many supply chain organizations find themselves drowning in data but lacking timely insights. Driving this is the fact that information is managed externally and is thus beyond the capabilities and reach of existing enterprise resource planning (ERP) or legacy systems to manage.

The new opportunity is to incorporate supplier- and customer-facing information flows with layered applications, analytics, and information integration associated with product design, manufacturing design, and management-facing processes that can extend across the supply chain business network. This can foster more timely integration and updates of product design and test information among suppliers and contract manufacturers.

"Airbus and Boeing have bulging order books, with a combined backlog of 10,000 aircraft worth nearly $1 trillion at list prices ... the two planemaking giants now watch the firms that provide the components far more closely—including sending inspectors to their factories. They share more information with them and press them to invest in new capacity." [1]

"Good, in parts", The Economist, *October 4, 2014*

Outsourced Supply Chains Need Product Management, Quality Conformance, and Supply Chain Linkage

Industry supply chains such as semiconductor, high-tech and consumer electronics; automotive; and medical devices have already experienced the challenges of a significantly outsourced supply chain with information disconnects.

For instance, major product recalls are symptomatic of information disconnects across the multiple tiers of the outsourced supply chain. The implications and stakes to substandard product quality are enormous. As an example, consider recent events occurring at General Motors and across the broader U.S. automotive industry.

With consumer electronics such as smartphones, electronic tablets, and laptop computers, product life cycles are far shorter. NPI cycles occur far more quickly and increasingly involve concurrent introduction across multiple countries and geographies. Apple and Samsung now introduce new products simultaneously in multiple global regions.

In the commercial aerospace industry, original equipment manufacturers (OEMs) such as Airbus and Boeing have outsourced major component design and manufacturing to key global suppliers, challenging them to new ways of communication and collaboration.

Across major OEM-branded automotive supply chains, where upwards of 30 to 40 percent of product content is now digital and consumer-focused electronics, unprecedented occurrences of product recalls have occurred involving millions of vehicles negatively having an impact on bottom-line results. Automakers now have only a five-day window to report a pattern of incidents involving vehicle safety issues.

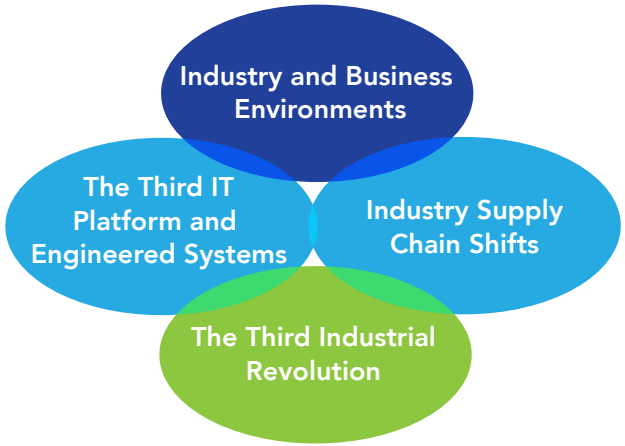
"The cost of recalls can put a financial strain on automakers. GM estimates that its recalls will take $2 billion off its bottom line this year."

"GM's U.S. Recalls Outpace World Sales", Washington Post News Service, *June 23, 2014*

As for medical devices, an October 2013 McKinsey quality study noted: "In the past ten years, there was an average of one major quality event per year that resulted in a 13 percent stock price drop across the industry." McKinsey further noted in this study that: "Costs of a single non-routine quality event, like a major recall, have been as high as $600 million in medical device companies."

Industry analyst firm Gartner has cited the increasing importance of developing product and process centers of excellence (CoE) to ensure global-based consistencies and information transparency.

Mega Trend Convergence



Planning and NPI can no longer afford to be sequential processes but rather a continuous sales and operations planning (S&OP) process that can factor near real-time planning and execution information reflecting ongoing events or exceptions to plan.

A Combination of Converging Forces Profoundly Impacts Future Supply Chain Process Capabilities

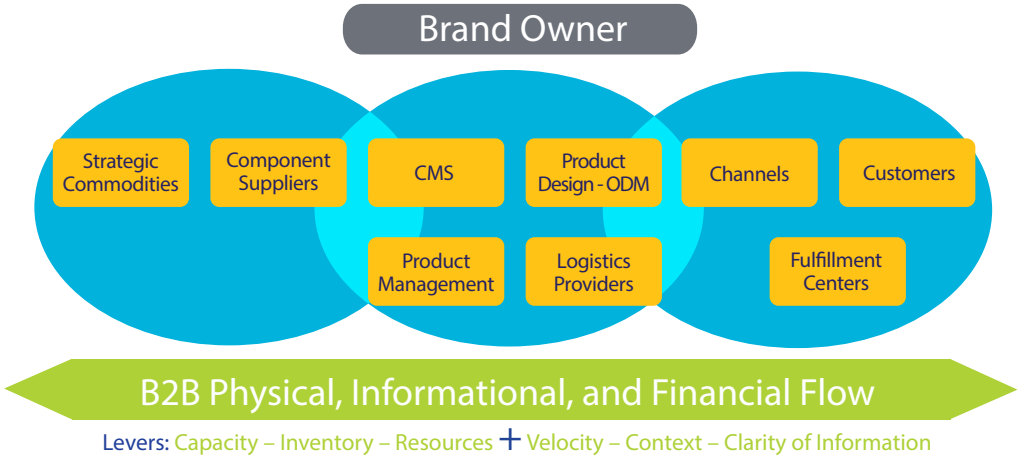
Industry environments are experiencing dramatic increases in the clock speed of business. Many industries describe a "new normal" of management that requires faster and more proactive decision-making. While current infrastructure, business processes, and information systems may work, they are cumbersome, and require manual workarounds. This raises questions as to whether they can accommodate the need for increased speed in information and decision-making.

Recent C-suite survey data from the IBM Global Institute and PwC, among other sources, reinforce that senior executives expect the barriers within the supply chain, including suppliers and partners, to become more open. The MIT 2020 Initiative equates the "new normal" of business to required future supply chain capabilities that are predicated on "uncertainty as a certain factor." Velocity, context, and clarity of information serve as augmented levers to capacity, inventory, and resources. Multi-enterprise management and governance of master data are the fuel for consistent semantics and more informed supply chain decision-making across a business network of trading partners and their disparate information systems.

The Third IT Platform, initially defined by IDC, cites cloud, mobile, and big-data analytics as powering the bulk of tomorrow's IT business applications. The Third Industrial Revolution was initially outlined by *The Economist* in 2012, reflecting a new era of digitally enabled manufacturing (Internet of Things, next-generation robotics), each with profound implications for how information moves across physical and digital networks.

Planning and NPI can no longer afford to be sequential processes. Rather, they must become key processes within a continuous S&OP process that can factor periodic optimization planning, sales and operations execution (S&OE), and response planning, all based on near real-time execution information reflecting ongoing events or exceptions to plans.

Today's Complex Value Chain Networks



Industry Supply Chain Challenges

- Complex, global-based value chains with large outsourcing profiles—particularly in high-tech, aerospace, and automotive industry settings—that require a network-wide, unified view of information beyond just point-to-point data transfer, traditionally managed via electronic data interchange (EDI).
- Seamless, more timely ownership transfer between product management and various outsourced production providers, including design specifications and manufacturing/testing instructions with workflow approval for original and design/manufacturing changes.
- A need to move beyond traditional sequential processes toward continuous Plan-Sense-Adapt-Synchronize-based business process capabilities.
- A data model that can scale and support consistent taxonomies and semantics across the extended supply chain network. This requires multi-enterprise master data management (MDM) for governance of master data assets across processes and planning, shared among network trading partners.
- Augmented, cloud-based applications that can extend beyond the enterprise capabilities of existing ERP or legacy systems.

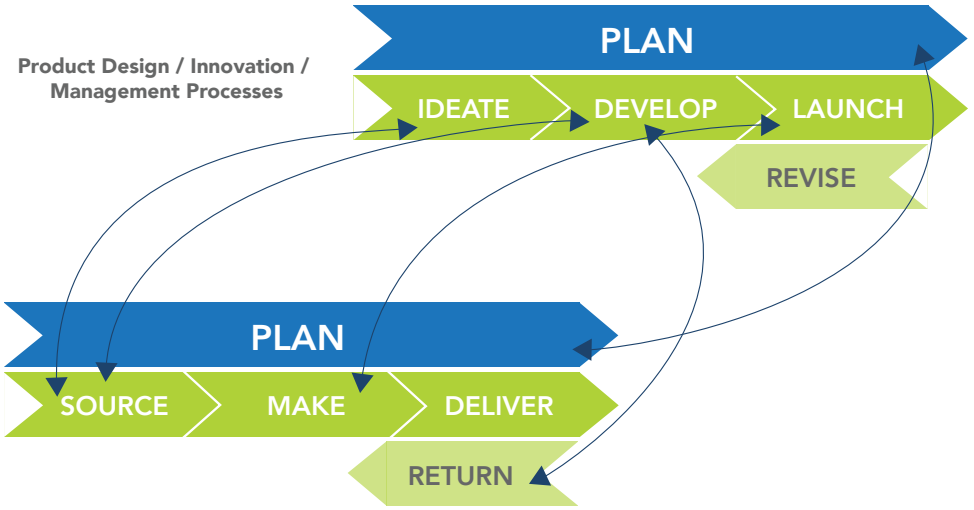
Other Considerations and Needs

In addition to the traditional levers of capacity, inventory, and resources, the added levers of velocity, context, and clarity of information are fast becoming supported across B2B business networks.

The consequent, dramatic, clock-speed acceleration of newer products requires faster response cycles to customer needs and market opportunities. However, the ability to manage continuous changes is often hampered by the need to update multiple systems manually, or provide audit trails as to how design changes were developed, released, and implemented.

In addition to planning, procurement, and supply chain execution, information regarding products, product management, new product introduction, and product retirement processes that bridge the needs of the critical design to manufacturing step can augment business intelligence and more informed decision-making and accelerate time to market.

Addressing the Product Information Alignment Disconnect



Source: DCOR 1.0, Framework, APICS Supply Chain Council

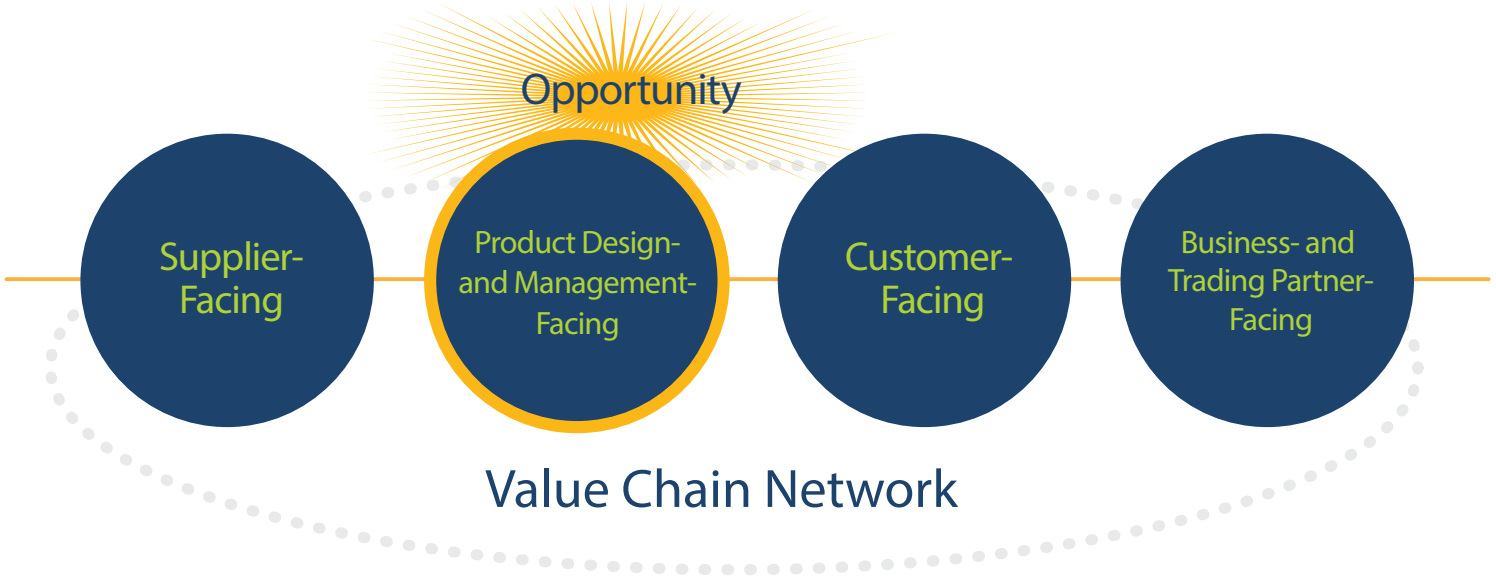
Across various industry supply chain settings, teams have acquired important learnings in addressing the information disconnect among product design/innovation/management processes and the "supply chain value chain network". There is a significant gap in communication of design, manufacturing, and testing information between engineering and manufacturing, resulting in product delays and quality problems that drive up costs and hurt customer satisfaction. Current systems also lack capabilities to reuse manufacturing intellectual property (IP) to reduce costs and decrease NPI cycle times.

Harnessing the narrow window of a product's maximum revenue and profitability value must further be achieved across concurrent and frequent NPI cycles.

Enabling NPI Process Integration With Newer Cloud-Based Technology

- Provide seamless ownership transfer among product design and value chain manufacturing providers with higher levels of integration to transcend the multitude of existing systems, processes, taxonomies, and semantics.
- Accurate, timely, and reliable two-way information flow synchronization concerning products.
- Transcend existing legacy, ERP, or product life cycle management (PLM) systems as constraints to sharing timely new product
  information across the extended supply chain network.
- Support multi-enterprise MDM for holistic governance of assets across organizations, systems, and processes.
- Manage continuous change while updating multiple systems simultaneously to avoid being out of sync with information related to product testing, yields, quality factors, and early warning warranty claims data.
- Define audit trails as to how design changes were developed, released, and implemented.
- More simplified and streamlined data management to avoid product design and management teams drowning in efforts to maintain data versus designing product improvements.

Opportunity: Leveraging the End-to-End Supply Chain and Business Network



This author's recommendation is that opportunity can be garnered by a broader perspective of investing in a cloud-based, end-to-end business network capability that bridges the gaps in existing PLM and ERP support systems.

Consider how industry supply chains have evolved in information integration and business process capabilities that bring together end-to-end value chain networks:

- Supplier-facing and connected supplier networks.
- Customer-facing, including B2B/B2C online commerce, channel partners, and customer service.
- Business and trading partner connections, including design partners, distributors, customer fulfillment, other outsourced services, and global trade partners.

Bridge the Gap in PLM and ERP Systems

Consider brand owner capabilities that incorporate product design and product management-facing business process and NPI needs within an end-to-end business and value chain network.

- Fostering a unified view of:
  - Supplier-Facing
  - Customer-Facing
  - Complex Business-Facing and Trading Partner-Facing
  - Product Design-Facing and Manufacturing-Facing

  processes across a supply chain business network platform saving massive amounts of unproductive time in NPI cycles while providing accurate, more timely, and reliable two-way information flows about product information.
- A network-wide information framework supporting applications that span collaborative planning, execution, and NPI needs, enabling extended supply chain orchestration.
- An ability to support a hub-and-spoke, federated data model that spans key process areas.
- Cloud-based, layered applications that bridge the gap in PLM and ERP systems and overcome information silos across outsourced production, product planning, and information update needs.

Prepare Your Organization

External Forces

- Constant change is a given in today's industry supply chain business environments, and uncertainty is the constant of our time. As a brand owner, more and more critical information may extend beyond the capabilities of existing systems.
- Consider that speed of information and more informed decision-making are the new determinants for industry competitiveness.
- Predominantly outsourced supply and value chains require deeper levels of end-to-end visibility, including synchronization of product management and NPI process management.
- Business, technology, and supply chain process convergence will open new opportunities for industry competiveness and innovation. Leverage them in a holistic business network framework approach.

Consider Investments in Augmented Internal Capabilities

- Influence your organization to invest in higher levels of end-to-end business network visibility and more predictive capabilities.
- In addition to the levers of capacity, inventory, and resources, consider the new levers of velocity, context, and clarity of information that will support more timely decision-making.
- Context product design and management processes as dependent on the end-to-end product value chain network, as well as engineering and product design management.
- Orchestrate the business network to better manage product transitions, market opportunities, higher levels of collaboration, and more-informed decision-making.
- The level of process changes affecting industry supply chains implies significant impact-to-skill requirements. Prepare yourself and your organization for these requirements and ensure organizations have a talent management strategy.
- Select a business network technology provider that is responsive to your business and process needs, and can scale with value chain data and informational business growth.

Summary and Takeaway Messages

- Constantly shifting customer and business needs are prompting business leaders to seek externally based product innovation, increased supply chain responsiveness, and reduced barriers for collaboration across supply and value chain networks.
- Shifting industry supply chains that are now highly outsourced, in turn, require more network-wide information synchronization and federated data models to support more timely and more informed decision-making.
- Supply chain business networks are the new opportunity for fostering more proactive and timely NPI process and information integration capabilities across the outsourced supply chain.
- Continued technology convergence involving in-memory analytics, engineered systems, and plug-and-play hardware coupled with advances in cloud-based services and big data analytics are providing additional opportunities for integrating broader and deeper levels of information across the supply chain business network.
- End-to-end cloud-based networks are the new opportunity for moving toward abilities for integrating product management, NPI, and federated data management with value chain fulfillment.

Resources and Additional Information

Watch videocast

"Increasing Importance for Tightly Integrating Product Design and Supply Chain Management"

Learn more about Manufacturing Collaboration and NPI

About the Author

Bob Ferrari is the Managing Director of The Ferrari Consulting and Research Group LLC, a supply chain consulting and research firm providing insight and strategic assistance in supply chain business processes and information technology applications and infrastructure. Bob is a highly recognized thought leader in supply chain and B2B management and is the Founder and Executive Editor of the Supply Chain Matters Blog.

His background includes over 30 years of experience across multiple dimensions of supply chain functional and information systems management. Previous industry analyst research leadership roles include AMR Research (Gartner) and IDC.

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Supply Chain Matters Blog: www.theferrarigroup.com/supply-chain-matters