

# This Is Not Your Father's Supply Chain

Ajit Kambil and Roger W. Dik

*In the last century, supply chains emerged from being a possibility to becoming a strategic capability. Today, supply chains are poised to enter a new era like one we have never seen before—one of greater complexity and unclear choices, where companies use supply chains to drive competitive benefits. In this new era, companies will dynamically assemble supply chains to adapt to changing business needs and selectively outsource capabilities to create real-time and real-scale supply chains.*

When you bought a bouquet of flowers for Valentine's Day, chances are the carnations came from Colombia, the tulips from Holland, and the roses from East Africa. The East African roses, for example, were probably jetted over to Amsterdam, where they were sent briefly to a nearby warehouse, electronically auctioned to a wholesaler, and then flown to New York for US distribution. In three days or less, today's advanced supply chains allow economic delivery of flowers to your local florist shop—before they wilt on the vine. That flower bouquet is but one illustration of how new transportation, communications, and supply chain innovations unleash tremendous, new value realization opportunities for buyers and sellers worldwide, transforming competition across industries and companies. This is certainly not your father's supply chain.

Whether in the eras of possibility, science, or integration, supply chains have always connected customers to products, and producers and suppliers. But they have now evolved to the point where they are changing business models and rewriting the rules of competition across industries (see Table 1). Those companies that mastered the eras—those that successfully adjusted to the new rules—found profit, growth, and survival. Those that didn't master the eras through adjustment confronted stagnation, decline, or demise.

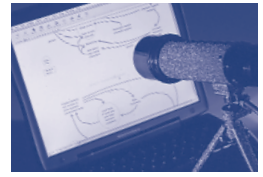
Today, all organizations confront a new era of value transformation—one where companies dynamically assemble best-of-breed supply chains to address increasingly fleeting market opportunities. This is a difficult era. Supply chain managers confront a number of more complex decisions: whether to insource or outsource, which new channels to adopt for customers and suppliers, and how to implement new technologies, platforms and practices—from B2B eMarkets to selective co-opetition—to enable "real-time supply chains." Those companies that learn the key lessons of past transformations, and carefully navigate the new possibilities and challenges, are likely to lead in the future.

## FROM THE PAST TO THE PRESENT

### **Creating the Era of Supply Chains as a Possibility: Linking Mass Distribution and Mass Production**

Beginning in the late 1800s, when Richard Sears and Alvah Roebuck founded Sears, Roebuck and Co., it became one of the most successful mail-order and then retail companies of the last century. Sears took advantage of the new possibilities in transportation enabled by railroads and communications. First, he utilized a reliable mail system—and then the telegraph and the telephone. These infrastructures enabled mass distribution of products for the first time, creating a profound opportunity—the separation of supply and demand in time and space. Through mail-order catalogs and new practices in warehousing and distribution, Sears was able to offer a new proposition to customers outside of the major cities: access to merchandise that was previously not available in the general country store.

Innovations in continuous process manufacturing further enabled high-volume outputs in diverse industries from chemicals to consumer goods. Economies of scale in mass production reduced unit costs and provided the mass merchandise to fill Sears' stores and warehouses. This allowed the company to offer greater value to the customer, making it one of fastest growing and most successful companies of the last century. Linking mass production and distribution provided a new formula for business success: the ability to leverage economies of scale efficiencies and high cash flows to lower cost of capital<sup>1</sup> and the capacity



to grow faster and outdistance smaller competitors.

As business historian Alfred Chandler notes, the innovations in distribution and production enabled the rise of the Modern Corporation. During this period, the large, vertically integrated corporation replaced many small owner-managed firms. The "invisible hand of markets" was replaced by the "visible hand of corporate managers" making major resource allocations decisions. Companies also evolved functional specialties—in marketing, accounting, operations, and divisional and multi-divisional structures to support new products and operations in different geographies. In the Dutch flower industry, for example, specialization enabled flower growers to focus on scaling their business. New auctions owned by grower cooperatives aggregated the supply of many farmers and aggregated the demand from many wholesale and retail buyers. Growers could focus on growing produce, and realized new savings and possibilities for expanded distribution.

Companies that mastered the possibilities of mass production and distribution in this era, such as DuPont, General Motors, Ford, Sears, and J.C. Penney, were among the most successful companies of the last century.

## **Creating the Era of Supply Chains as a Science: Applying the Principles of Measurement and Analysis**

Beginning in the 1970s, Toyota, Honda, and Nissan began to grow market share in the US; and in the early 1980s, Canon could produce and sell copiers at below Xerox's cost of manufacture. By adopting innovations in manufacturing practices and a more scientific approach to quality, these upstarts changed the landscape of American industry. In some industries, like consumer electronics, new practices—combined with offshore manufacturing—led to the demise of American dominance in the industry. In others, like automobiles and computers, adopting new technologies and scientific practices to improve operations enabled major firms to survive and even thrive.

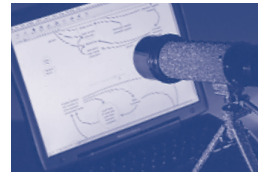
During this period of new computing capabilities, the application of scientific and data-driven practices dramatically improved supply chain performance and efficiency. For example, beginning in the 1970s, management information systems provided managers in different functions (e.g., procurement, production, and inventory management) with better decision support and optimization tools, as well as information on inventory and operations. Materials requirement planning (MRP) and manufacturing requirements planning (MRPII) systems emerged to enable better master production scheduling and optimization. Other innova-

tions like just-in-time (JIT) manufacturing provided new ways to improve efficiencies and reduce work in process inventories. With just-in-time, supplies were delivered to different manufacturing stations as required and not held in stock. This was not just a technique for reducing inventories, but also a tool for identifying problems in the manufacturing chain. If a problem occurred, the chain would stop, and the problem would have to be repaired before new inventory was delivered. MRP, JIT, and other practice innovations (see Table 1) initially allowed companies to gain new levels of functional efficiencies and reduce costs. Companies like Toyota and Honda leveraged new techniques to not only increase efficiency, but also dramatically improve quality—taking market share in the US for automotive vehicles.

In response to new international competition based on quality, shorter product life cycles and better designs, companies also sought cross-functional efficiencies. Managers recognized the need to better coordinate previously separate functions such as inbound logistics, purchasing, inventory management, forecasting, etc., and integrate them with marketing, finance, and product development functions to reduce time-to-market, improve quality, and reduce costs. In response, many management teams embraced total quality management (TQM), followed by the business process reengineering (BPR) movement in the next era.

The object of the TQM movement was to improve the quality of the product and service offered to the customer. This required managers in the supply chain to adopt three different mind-sets: customer orientation, process design, and continuous improvement. A customer orientation allowed companies to identify how customers perceive value and identify quality problems. The process design perspective allowed managers to find where quality problems arose and how to remedy them, and continuous improvement ensured that quality issues in the product or process were continuously examined and addressed by the firm. Thus, TQM motivated greater focus on process efficiencies and customer orientation.

Other practice innovations of the era include improved sourcing practices and supplier rationalization, vendor-managed inventory, and quick response systems. These practices also focused on improving the efficiency of processes and coordination between firms. The managerial focus of this era was to gain speed and other efficiencies through a more scientific approach to managing key processes and functions. Companies that overcame the challenges of adopting new practices and improving the manufacturing and supply chains, such as Xerox and Ford, were able to stem the tide of foreign compe-



tion and remain competitive. But functional excellence was not always enough to lead the competition.

## **Focusing on the Era of Supply Chain Integration: Improving the Extended Supply Chain**

---

In the mid-1980s, when Michael Dell invented a built-to-order and direct-to-customer model for manufacturing and distributing computers, he was not just competing on the basis of product design. Instead the "supply chain" became the basis of competitive advantage, allowing Dell to deliver lower costs, better service, and customization to customers and outgrow its competitors. Companies have always had supply chains. But the shift in managerial mind-sets to integrate previously disparate functions and processes, both within and across companies, occurred in the late 1980s and 1990s. The widely embraced business process reengineering movement emphasized the major redesign of business processes and integration across functional silos to achieve order of magnitude gains in efficiency. Electronic data interchange (EDI), vendor-managed inventory (VMI), and collaborative planning, forecasting, and replenishment (CPFR) practices extended the integration trend to supply chain partners. The advent of enterprise resource planning (ERP) systems and the World Wide Web further accelerated the trend to integration in the 1990s, creating a new era of intra-enterprise integration and new channel designs that reframed relations with suppliers and customers.

The Internet enables innovative business models that connect customer needs more effectively with manufacturing and distribution models. For example, Dell's direct-to-customer business model permits it to receive orders online, transfer information to component suppliers and manufacturing plants where the product is assembled, and provide status information to customers. Data from its website permits real-time demand forecasting, and the use of dynamic pricing and merchandizing to change customer offers, get the best margins, and stabilize supply chains. These demand and supplier management capabilities have given Dell cost advantages and market leadership in the personal computer industry. Similarly, Cisco saves tremendous costs and is able to provide better customer services through its Internet channels; and Wal-Mart's online Retail-Link program allows it to inform its 10,000 suppliers about product sales, promotions, returns, and inventory adjustments at its 3,100 domestic stores. By minimizing warehousing, and having suppliers directly place products on Wal-Mart shelves in response to changing cus-

tom purchase patterns, Wal-Mart is able to realize cost savings that it can pass on to customers.

In this era, businesses also have made extensive investments in B2B electronic markets. While many organizations initially turned to electronic markets to drive competition among suppliers for lower prices, they soon realized the true value of these platforms was to gain enhanced benefits from cooperation. The focus shifted away from independent exchanges to consortia exchanges that provided shared industry platforms for coordination, and private exchanges to enable specialized coordination across the supply chain. Private exchange platforms increasingly allow companies to manage the ordering and fulfillment process, the payment and settlement process, joint design, and forecasting processes with preferred buyers or sellers.

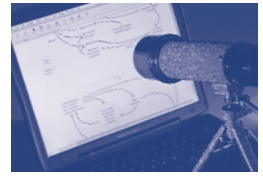
During this time, the mind-set of the supply chain manager has shifted from optimizing processes in the firm, to using the supply chain to redefine the value delivered to customers and value realized from suppliers. This requires a focus on business models and channel innovations leveraging extended supply chains. Wal-Mart, Dell, Cisco, and others that have mastered these imperatives dominate their respective industries.

## **Supply Chain Transformation: Preparing For The New Era**

---

When BMW wanted to develop and produce the X3 Sports Activity Vehicle, it did not do it all in-house. After engineers from BMW developed a detailed product concept, they forwarded it to Magna Steyr for engineering development and complete manufacturing. This model of increased outsourcing promises a new supply chain era—one that radically transforms value creation and delivery through a new model of supply chain design driven by real-time information integration and corporate unbundling.

Today, like BMW, companies are poised to enter a new era of supply chain transformation, where assumptions of how to design the supply chain—and doing most supply chain functions in-house—will have to be reconsidered. This is an era of complex choices where supply chains are strategic and central to a firm's competitive advantage. It's an era where increasing product and service complexity will require more complex, real-time and real-scale supply chains—ones that are increasingly responsive to customer needs, pricing, and profit opportunities in real time. Supply chains in this new era will have to



be adaptive, scaling quickly up or down to meet varied customer demands. Increasingly, these supply chains will leverage a new service-provider industry to provide specialized supply chain services, from third-party logistics to contract-manufacturing services. Consider contract-manufacturing services: From high technology electronics to automotive industries, companies are shedding their manufacturing plants and fixed assets, and outsourcing the manufacturing of critical parts and whole systems to third parties. By aggregating demand across all their buyers, contract manufacturers such as Flextronics in electronics can deliver lower costs and greater manufacturing efficiencies to its clients like Xerox. But today this corporate unbundling can be made more effective through real-time information integration across the supply chain.

Businesses in the first three eras focused on acquiring supply chain capabilities within the organization and integrating them to other functions. As supply chains become central to business strategy, managers will have to simultaneously improve supply chain performance across an entire network of suppliers and distribution channels to compete effectively. As they seek excellence in executing supply chain activities, they will have to rethink what supply chain activities and competencies they will house within the firm and what they will outsource. We expect that a number of supply chain activities—from indirect to direct procurement, logistics, spare parts services, and other functions—will be outsourced, as third-party providers specialize, accumulate better know-how, and develop scale efficiencies in critical supply chain functions. Outsourcing can also create greater competitive flexibility. By outsourcing, companies reduce the level of fixed cost investments they make in physical capital and human capital. If market and product offerings change, shifting to different outsourcers may be a more flexible option than changing the fixed assets, plants, and union contracts of the firm. Outsourcing can thus provide a new level of nimbleness to compete.

This era will also be characterized by new technologies such as economic radio frequency IDs and software that provides greater visibility into information across the supply chain. Organizations will have to learn how to use the new technologies and devise information-leverage strategies to optimize their supply chain performance across many different businesses and processes.

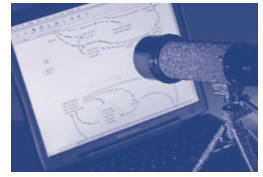
The emerging era of value transformation poses both a major opportunity and challenge for managers. Low-performing competitors will take advantage of better services and new infrastructures to improve their supply chain capabilities and

challenge industry leaders. Leaders will then seek to maintain competitive advantage through better product differentiation and better integration of their demand and supply chains by using new technologies or managing contract services more efficiently. The challenge for supply chain managers will be to navigate the changes required to realize new opportunities. This will require new skills at "co-opetition" and the management of complex outsourcing and cross-industry collaborations. Managers will have to decide what information should be shared in real time, and with whom, across the supply chain. Making supply chains efficient in the new era will also drive hard choices about what activities a company should keep in-house and what activities to transition to external service providers. This in turn will require skills in journey management to transform and create new supply chain structures. In short, managers will have to adopt a new mindset to designing supply chains. Instead of building best-of-breed capabilities internally for all functions, they will dynamically leverage the best capabilities available in the marketplace to assemble supply chains adaptive to changing market conditions.

## CONCLUSIONS

Supply chains have changed dramatically over the last three decades—enabling the previously impossible to become routine. However, we are poised for an even more remarkable transformation—where managers will have to rethink the assumptions that drove the design of their current supply chains. As supply chains become more strategic, managers will face complex choices about integrating emerging contract services and new technologies into their value chains.

In every new era, new leaders have emerged who understood the possibilities of the era, and adapted their business models accordingly. But as each progressive era of supply chain innovation indicates, the time horizon of market leadership declines (from over half a century for Sears, to a few years for IBM, which popularized the personal computer). In the emerging era, we expect competitive advantage to go to the nimble—those that master how to frequently assemble and adapt their supply chains to changing customer needs and new supply chain opportunities.

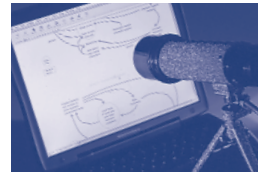


## Note:

1. Vipul Agrawal and Morris Cohen, "Survey-Mastering Management: All Change in the Second Supply Chain Revolution," *Financial Times*, 2 October 2000.

*Ajit Kambil* is a senior research fellow and associate partner at the Accenture Institute for Strategic Change. His new book, *Making Markets: How Firms Can Design and Profit from Online Auctions and Exchanges*, will be published by Harvard Business School Press in June 2002. Ajit can be reached at [ajit.kambil@accenture.com](mailto:ajit.kambil@accenture.com).

*Roger W. Dik* is a Boston-based partner in the Accenture Supply Chain Management Service Line. He leads the company's Supply Chain Value Transformation practice area, which is focused on major large-scale, supply-chain-driven strategic initiatives that strengthen a company's competitive position. Roger can be reached at [roger.w.dik@accenture.com](mailto:roger.w.dik@accenture.com).



**Table 1: The Evolution of the Modern Supply Chain**

POSSIBILITY	SCIENCE	INTEGRATION	TRANSFORMATION
<p><i>Strategic Business Focus</i></p> <ul style="list-style-type: none"> <li>• Geographic Expansion,</li> <li>• Economies of scale for:                             <ul style="list-style-type: none"> <li>– Cost advantages</li> <li>– Lower cost of capital</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Reengineering business functions to reduce product costs</li> <li>• Improving product quality to compete globally</li> <li>• Product differentiation through innovation, and product design to compete effectively</li> </ul>	<ul style="list-style-type: none"> <li>• Generating corporate growth by:                             <ul style="list-style-type: none"> <li>– Creating new markets</li> <li>– Product, service or business model innovation</li> <li>– Corporate venturing</li> <li>– Acquisitions</li> </ul> </li> <li>• eEnabling business models                             <ul style="list-style-type: none"> <li>– Direct-to-customer</li> <li>– Online customer interface</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Generating growth and better returns on tangible and intangible assets</li> <li>• Increasing speed-to-value</li> <li>• Mastering operations and making supply chains a source of competitive advantage</li> <li>• Partnering, including co-opetition, to expand or reach markets more quickly</li> <li>• Increasing profit and revenue mix derived from services in contrast to products</li> <li>• Unbundling the corporation to change the asset mix</li> </ul>
<p><i>Supply Chain Focus</i></p> <ul style="list-style-type: none"> <li>• Linking mass production capabilities to mass distribution</li> </ul>	<ul style="list-style-type: none"> <li>• Optimizing business processes</li> <li>• Developing functional excellence</li> </ul>	<ul style="list-style-type: none"> <li>• Enterprise applications integration</li> <li>• Building and optimizing the extended supply chain                             <ul style="list-style-type: none"> <li>– Inter-organizational process integration</li> <li>– Linking supply and demand chains</li> </ul> </li> <li>• Supporting new business models such as built-to-order and direct-to-customer</li> </ul>	<ul style="list-style-type: none"> <li>• Improving performance and execution excellence across all supply chain partners</li> <li>• Creating flexible supply chains to adapt to changing business needs</li> <li>• Integrating inter-organizational processes</li> <li>• Improving the skill base of supply chain personnel</li> <li>• Leveraging supply chain service providers to rapidly acquire skills and capabilities</li> </ul>
<p><i>Supply Chain Practice Innovations</i></p> <ul style="list-style-type: none"> <li>• Rudimentary systems for:                             <ul style="list-style-type: none"> <li>– scheduling</li> <li>– forecasting</li> <li>– warehousing</li> <li>– inventory control</li> </ul> </li> <li>• Trailer on flat cars</li> <li>• Multimodal carriers</li> </ul>	<ul style="list-style-type: none"> <li>• Materials resource planning (MRP) and scheduling optimization</li> <li>• Just-in-time manufacturing</li> <li>• Third-party logistics</li> <li>• Total quality management (TQM)</li> <li>• Business process reengineering (BPR)</li> <li>• Vendor managed inventory (VMI)</li> <li>• Quick response</li> </ul>	<ul style="list-style-type: none"> <li>• B2B electronic markets</li> <li>• Collaborative product and forecasting replenishment (CPFR)</li> <li>• eSourcing</li> <li>• eProcurement</li> <li>• Reverse auctions</li> <li>• Dynamic pricing</li> <li>• Postponement</li> <li>• Fourth-party logistics</li> </ul>	<ul style="list-style-type: none"> <li>• Outsourcing a wide range of supply chain activities</li> <li>• Collaborative product commerce</li> <li>• eLearning</li> <li>• Improving service management through:                             <ul style="list-style-type: none"> <li>– Designing products for serviceability</li> <li>– Leveraging software and third- and fourth-party logistics for parts distribution and product returns management</li> <li>– Better knowledge management and support for repair personnel</li> </ul> </li> </ul>
<p><i>Technology Enablers</i></p> <ul style="list-style-type: none"> <li>• Telephony</li> <li>• Electric power</li> <li>• Railroads</li> <li>• Continuous production technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Mainframe to microcomputers:                             <ul style="list-style-type: none"> <li>– Shifting from batch processing to real-time scheduling and operations</li> <li>– Decision support systems</li> </ul> </li> <li>• Data networks enabling EDI</li> </ul>	<ul style="list-style-type: none"> <li>• Enterprise resource planning (ERP) systems</li> <li>• Internet and WorldWideWeb technologies</li> <li>• Specialized supply chain software e.g., eMarket, auctions, procurement, sourcing, and CPFR systems</li> </ul>	<ul style="list-style-type: none"> <li>• Software for:                             <ul style="list-style-type: none"> <li>– Cross-enterprise collaboration and process integration</li> <li>– Pricing optimization, service management, forecasting and collaborative design</li> <li>– eLearning infrastructures and tools</li> </ul> </li> <li>• Radio frequency identity (RFID) tags to track supply chain items</li> <li>• Wireless communications</li> </ul>