

**ERAS OF ENTERPRISE GLOBALIZATION:  
FROM VERTICAL INTEGRATION  
TO VIRTUALIZATION & BEYOND**

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# 1. Introduction

*“There is a defect in the art of technology assessment: the lack of a sense of depth in time. It is understandable not only because most systems analysts are trained either in engineering or in the social sciences that normally take a flat contemporary view of phenomena, but also because the concrete problems set before systems analysts for solution look toward future action and discourage probing the genesis of things “*

Professor Lynn White Jr., “Technology Assessment From The Stance Of A Medieval Historian” 1973 (1)

The current mainstream and academic debates on globalization and enterprise reengineering have largely focused on the recent transition of enterprises to highly networked and outsourced entities. Certainly, the meteoric and highly visible rise of China and India as first low-cost then advanced manufacturing and service workshops has accelerated this enterprise transition. Information Technology-enabled extended enterprise supply chains; and an associated Third Party Logistics Industry capable of executing elaborate global business choreographies have also absorbed analysts’ attentions. These realities have framed the debate about the future of the corporation.

Yet we run the risk of “predicting the past” if we assume this trend can be merely extrapolated into the future. There are serious misjudgements possible if we base our analytical judgments on a static view of enterprise globalization. This paper will argue that we must step back from the particularly frenzied pace of this specific time period to recognize we are in the midst of a larger transition. We are currently moving into the third in a series of enterprise transformations within a century that have focused on new modes of globalization and new extensions of corporate value-generating capabilities.

The first era of enterprise globalization was the Era Of Vertical Integration. It was characterized by the spread and dominance of the vertically integrated enterprise as the best practice model of industrial organization. This model provided senior management with a high level of strategic control over the end to end value chain.

The second era of enterprise globalization has been the Era Of Viral Virtualization. We are currently experiencing the apex of this stage. Information technology and pervasive, viral outsourcing has enabled the pooling of assets and capabilities into multi-enterprise virtual networks well beyond the formal/ traditional boundaries of any single enterprise. This business model, while successful in driving cost-efficiencies and operational flexibility across global enterprises when executed selectively & in a balanced way, has also lead to a heightened Corporate Suite-level perception of eroded strategic command & control and loss of network coherence.

Today the next era, the Era Of Revitalized Command is already upon us. The emerging emphasis is on corporate risk management. A spectrum of enterprises are re-calibrating their globalization strategies & strengthening the core of their organizations as the risks of the over-extended enterprise, the over-outsourced enterprise have come into sharper focus. Executives today are struggling to internalize the lessons of the present era, an era characterized by the disruptions of Y2K, 9/11, SARS, the Asian Tsunami and Hurricane Katrina.

## II. Eras Of Enterprise Globalization

### A. The Era Of Vertical Integration

#### The Ford Motor Company's Vertically Integrated Supply Chain Leading The First Era Of Enterprise Globalization

The Ford Motor Company was perhaps the first and largest truly global industrial corporation and the way it organized its production & supply chain as a completely vertically integrated system in the early 1920s set the stage for many practices used by the modern corporation. Let us examine these first generation Multinational Enterprise globalization practices.

#### Manufacturing

Henry Ford built a Quadricycle in 1896 in his Bagley Avenue garage in Detroit. He added a chassis and created the Model T in 1908. He moved into volume production with assembly lines where parts were put together on sawhorses and workers towed chassis by hand along tracks at his first Highland Park Plant. By 1914, the Detroit Michigan manufacturing complex sat on 965 acres, including 205 and 1/2 acres under one roof. This plant produced the Model T the world over, including England, China, Japan and Indonesia. With over 54 miles of conveyer belts moving components and sub-assemblies along the assembly line, the Detroit manufacturing complex was the most modern and revolutionary of its time. It used a large scale, quality-management technique of manufacture called Mass Production to produce Model T Cars Its metrics of performance were the benchmarks of the day:

- 48 hours from iron ore to completed vehicle

- the innovation of the assembly line in 1914 resulted in a 550% productivity improvement to 7,000 cars a day in its Detroit manufacturing plant

- this productivity improvement enabled Ford to drop the Model T price from eight hundred dollars (U.S.) to 500 dollars and to increase wages from two dollars and forty cents a day to five dollars per day.(2)

#### Sourcing

The scope of Ford's Vertically Integrated Global Supply Network in the early 20<sup>th</sup> Century was remarkable. It drew raw material resources from all over the U.S. and overseas into its plants in the U.S., and into overseas branches in Yokohama, Japan, Cork, Ireland, Buenos Aires, Argentina and Copenhagen. Lumber camps in Michigan were established in 1917; coal mines in Kentucky and West Virginia were opened in 1920. A rubber plantation was established in 1927 on the Tapajos River in Brazil that included worker housing, schools, hospitals, testing labs, powerhouses, sawmills, railroad system and docks, airplane hangar and seaplanes, warehouses, telegraph and radio rooms and a cemetery

## Transport & Distribution

To ship raw materials and components to his plants and to distribute components and finished products, Ford bought up inter-modal assets and knitted together a seamless global transport system. The Detroit, Toledo & Ironton Railroad was purchased in 1920 for freight transport and the Lima Ohio Locomotive Works were acquired and operated for maintenance of railroads. Steamship lines were acquired in 1924 and launches of freighter vessels such as Henry Ford II and Benson Ford were executed. Ford also operated dry docks and loading/unloading facilities. The Ford airport was built in 1924 with internal roadster part package deliveries from the Dearborn plant to the Chicago Ford branch starting on April 13, 1925 and administrative airmail flights starting in February 1926.

By 1925, its Yokohama plant was assembling 10,000 Model Ts a year and distributing them around Japan. This branch plant template set the style for overseas expansion for many other Multinational Enterprises in successive decades to come.

Henry Ford was a visionary but the inflexibility and lack of agility of its Model T manufacturing and supply chain- you could only buy a black Model T for many years- led to a deterioration of its competitive position. So too did the rise of more agile and innovative competitors such as General Motors, led by Alfred Sloan, who pioneered new car model style and colour product introductions every year. Ford went from his garage to global corporate CEO to shutting the doors of his Model T manufacturing plant in 1927- all within 25 years.

But his R&D labs and Engineering Centers kept going and by 1932, he had a new product: the first V-8 engine. By 1948, Ford was fully global and operated branches in Argentina, Australia, Belgium, Holland, France, Portugal, South Africa, Spain, Sweden, Uruguay, Brazil, Chile, Mexico, Canada, China, Denmark and Egypt and the pattern of overseas expansion had been fully established.. ( Except otherwise noted, all facts cited were from Author's primary research conducted in 2006 with the Ford Production Collection 1916-1954, U.S. National Archives, College Park, Maryland)

## Transaction Economics: Driver Of The First Era Of Vertical Integration:

In her sweeping review of the evolution of the automobile industry, "Vertical Integration Trends & Supplier Strategy In The History Of The Automobile Industry", Susan Helper noted that Ford was driven to assume control over the end to end supply chain by the erratic performance and inconsistent quality of its suppliers who had grown up as suppliers to the bicycle industry.

"At Ford during 1909-14, "the Company was not then averse to purchasing virtually all of its materials and parts from independent producers." The automaker shared its growing management expertise with suppliers: Ford purchased materials for its components makers, reorganized their manufacturing processes, supervised their larger policies, and, in some cases, aided them in financing production. *The Company became so dependent upon the production of its specialized suppliers that its own operations were frequently within thirty minutes of suspension because of tardy deliveries of parts or materials.* (italics mine) In a similar effort to assure supply, William C. Durant at General Motors persuaded parts makers such as Weston-Mott in Utica and Alfred Champion in Boston to move their operations close to

his in Flint. Smaller assemblers were even more tightly linked with their suppliers; their designs were so specialized that the bankruptcy of one firm often meant the bankruptcy of the other as well.” (3)

To overcome this dependence, Ford engineering a total supply chain vertical integration strategy designed to ensure continuous availability and the “uninterrupted supply of raw materials of high quality free from market changes” (source: Ford Motor Co Promotional Film, 1925, National Archive Ford Production Collection)

This Vertically Integrated Global Enterprise Reference Model was created by Ford largely in reaction to the economic phenomenon known as spiralling transaction costs. The concept of transaction costs was first defined in Coase’s 1937 analysis that there are ex-ante costs associated with searching for, locating, qualifying, contracting and monitoring external providers. As Alstyne (1997) notes transaction costs define the boundaries of the firm “at the point where the marginal cost savings from conducting operations within the firm equal the marginal costs of errors and rigidity. Hierarchies solve these (ex-ante) problems by vertical integration and owning the assets they use” (4)

Vertical integration became the dominant enterprise model for stability and control of the Multinational Enterprise’s system of industrial manufacturing. In the same way that Ford extended its reach in the early 1920s to Japan and set up a mirror-image branch plant with little in the way of indigenous customization, so other U.S. multinationals established cloned cells in other parts of the world right up through the 1980s. A classic example of this was in the U.S. pharmaceutical industry, where multinationals established industry outposts in the Commonwealth of Puerto Rico and Ireland. In the former case, by 1988 over 50% of the global profits of U.S. pharma companies came from Puerto Rican manufacturing subsidiaries who were assigned the patents to the most lucrative, blockbuster drugs by their parent companies. These subsidiaries distributed drugs worldwide from the island; the retained earnings from those sales were deposited in the Puerto Rican banking system, and then transferred to U.S. parent corporations after five years tax free under the umbrella of the U.S. Treasury’s Section 936 Tax Code. In the case of the latter, the Irish outpost became a launching point for pharmaceutical product introductions into the European Union. (5)

What shook this First Era Vertically Integrated Reference Model to its foundations was the rise of a new type of competitor from the East, a **Business Network Model** composed of multiple enterprises working closely together in a highly flexible and powerfully efficient manner. Backed by a powerful Kereitsu of inter-locked enterprises, Toyota emerged as the change agent and the template for a new Enterprise Globalization Reference Model. Its mode of operations presented a stark contrast to the Ford Way.

## **B. The Era Of Viral Virtualization**

*“The "Virtual Enterprise" is a new success model: Vertical integration is out. Today's markets require a broad fabric of alliances for effectively managing the entire value chain” (Electronic Business, 1992) (6)*

The Ford Model T Global Supply Chain was the original concept for the vertically integrated corporation that evolved in the first era of Enterprise Globalization. Its supply chain organized demand, production and supply management activities as inter-locked chain links that extended across the world. The organizational sub-units and assets that Ford networked were internally owned and operated. Certainly, its commitment to total chain ownership, from mines and lumber to network production facilities and dealerships around the world to its own fleet of ships and trucks seems antiquated today. Contrast Ford's approach with the Virtual Supply Chain Model today of companies like Sun Microsystems where 90% of the server computers it sells globally it never touches: an outsourced Sun supplier base receives Sun customer order signals directly and ships orders to the global customer base via outsourced third party logistics companies. (7)

This contrast between Supply Chain Models highlights the transition from the Vertically Integrated to Virtualized Supply Chain described in the next table;

### Characteristics Of Two Contrasting Eras Of Enterprise Globalization

1900-1980s	1900s-present
<p><b>-Vertical integration; end to end asset ownership.</b></p> <p><b>-To capture margins, shift upstream in value chain to higher corporate technical sophistication in products and services.</b></p> <p><b>-Key Challenge: overcoming inflexibility of owned assets/sunk costs in a rapidly changing market (The Model T Trap)</b></p>	<p><b>-Virtualization: IT-enabled end to end asset coordination</b></p> <p><b>-To capture margins, shift to speed in spotting niche opportunities; orchestrating external partnerships for products and services</b></p> <p><b>-Key Challenge: overcoming fragility and risk of Just In Time Systems in an increasingly volatile marketplace (The Fire At Core Supplier Trap)</b></p>

### Drivers of The Era Of Viral Virtualization:

#### 1. The Rapid Rise To Dominance Of Network Enterprise Structures

Whereas Ford and other vertically integrated companies sought to internalize value through increasing corporate asset ownership and through accumulating expertise in-house, Sun and other virtualized companies seek to capture value through a network of strategic alliances with other enterprises and are far more opportunistic in approach. This spirit of opportunism is captured well by Cassells (1996). To him, the modern network enterprise is "that specific form of enterprise whose system of means is constituted by the intersection of autonomous systems of goals" (1996, p. 171) (8) After examining business networks in Japan, Korea and China, he concluded that their networked organizations are more adaptable, better able to use information technology than counterpart corporations in the West and more suited to adopt some of the "flexible features of the spirit of informationalism". He defines this spirit as "a

culture of the ephemeral, a culture of each strategic decision, a patchwork of experiences and interests, rather than a charter of rights and obligations" (Cassells 1996, p. 199).

While Cassells emphasized the flexibility and opportunism of the networked model, particularly those arising in Asia, Van Alstne emphasized the unity of purpose and commonality of structure and process among enterprises participating in the network;

"Network organizations are defined by elements of structure, process, and purpose. Structurally, a network organization combines co-specialized, possibly intangible, assets under shared control. Joint ownership is essential but it must also produce an integration of assets, communication, and command in an efficient and flexible manner. Procedurally, a network organization constrains participating agents' actions via their roles and positions within the organization while allowing agents' influence to emerge or fade with the development or dissolution of ties to others. As decision-making members, agents intervene and extend their influence through association; they alter the resource landscape for themselves, their networks, and their competitors and in the process can change the structure of the network itself. Then, a network as an organization presupposes a unifying purpose and thus the need for a sense of identity useful in bounding and marshalling the resources, agents, and actions necessary for concluding the strategy and goals of purpose. Without common purpose, agents cannot discern either the efficacy or desirability of association or know whether actions are directed towards cooperative gains. These three design elements -- co-specialized assets, joint control, and collective purpose -- distinguish network organizations from centralized organizations, inflexible hierarchies, casual associations, haphazard societies, and mass markets." (Van Alstne (op cit))

As cited earlier, the emergence of Toyota as a fiercely competitive network model in the 1980s signalled a sea change in industrial organization. Unlike Fordist mass production techniques that focused on scale economies to produce commodity products for a homogenous mass market, Toyota focused on a model of flow production: this combined flexible automation and rapid design/product changeovers that could capture economies of scope and meet the fragmenting, diverse demands of a more sophisticated international consumer marketplace.

The feature set pioneered by Toyota included the following:

- Efficient cellular layouts with balanced material flow, whereby each cell produced an entire component, sub-assembly or finished product.
- Flexible automation for reduction in setup time, with changeover times as little as fifteen minutes between products.
- Kaizen or continuous improvement that engaged workers in the cell in constant inspection of product rather than end of the line inspection using sampling techniques.
- Multi-skilling of cell workers who are exposed to all facets of integrated production.
- Just In Time demand-based pull production rather than the supply push orientation of the Fordist model.
- Strategic and operational collaboration with suppliers, including fielding Toyota personnel to work on site at supplier facilities

Toyota's success was very influential. Its feature set quickly became the New Enterprise Globalization Reference Model and was widely imitated by U.S. enterprises seeking to maintain competitiveness in the face of the Japanese juggernaut.

Adoption of Toyota practices had big impacts on enterprise performance (particularly on accelerating cycle times for delivery of goods to the customer & on reducing inventory stocks) as shown in the results of a 1992 survey of U.S. companies that had adopted the Toyota Model.

**ADOPTING FLOW PRODUCTION: LEAD TIME AND INVENTORY RESULTS**

<b>LEAD TIME</b>	<b><u>% of Companies</u></b>
No Change	4%
Decreased up to 25%	38%
Decreased 25%-50%	30%
Decreased more than 50%	28%
<b>INVENTORY</b>	<b><u>% of Companies</u></b>
No Change	18%
Decreased up to 25%	30%
Decreased 25%-50%	33%
Decreased more than 50%	19%

(Source: Ingersoll Engineers' Study in "Making Manufacturing Cells Work" Edited by Lee R. Nyman, 1992)

By the late 1980s, competition from Japanese car makers had triggered a wave of U.S. auto industry restructuring, particularly of supplier relationships. This led Ford to a return to practices the company had abandoned and almost forgotten, buried deep in its own past. Helper talks about Ford's "revolutionary" approach to partnerships in the 1980s as having been rooted in an earlier cycle of industrial development at Ford.

"Dramatic changes are under way in U.S. automakers' relationships with their suppliers. Before these changes began in the 1980s, the automakers' dealings with outside suppliers had been characterized by short-term contracts (usually one-year), arms'-length relationships, and many (usually six to eight) suppliers per part. Since 1980, however, the automakers have been moving (albeit in fits and starts) toward a very different supplier relations system. In the new system, only a few suppliers provide each type of part, and information is interchanged extensively between buyer and supplier. Contracts with outside suppliers are increasing in length (three-to five-year contracts are now common), and the automakers are reducing their Commitment to their own components divisions, ending such practices as guaranteeing them business and in some cases divesting them completely."

"These changes seem surprising on several counts. First, the automakers' willingness to give up power over their outside suppliers in favor of long-term, often sole-source contracts appears to defy economic logic. Second, a reduction in vertical integration at a time when both the technology and the market

structure of the industry are in flux seems to contradict the predictions of organization theorists that vertical integration should rise with increasing uncertainty. Their reasoning is that vertical integration allows decisions to be made sequentially; as the state of nature is revealed, "internal adaptations can be made by fiat." In contrast, dealing with a financially independent supplier requires either a contract that provides in advance for every contingency or costly post-contract haggling. As uncertainty rises, so does the number of contingencies and therefore also the expense of contracting. Finally, the new supplier relations cannot be attributed to the discovery of some organizational form never before seen in the United States. In contrast to linear views of history, in which each change must represent a new, improved product, *the recent changes move the U.S. auto industry back to a supplier relations system seen earlier in the twentieth century, when relationships with outside suppliers were close and vertical integration was rare.*" (Helper, op cit pg. 781)

As Helper rightly points out, the rapid diffusion of strategic alliances in the auto industry during a time period of extreme market volatility raised transaction costs. This trend flew in the face of those transaction cost theorists who would have predicted behaviors of increasing vertical integration. However, unlike the static theorists, U.S. automakers understood in their bones they were witnessing a transition to a New Era and they had to radically change their behaviors just to keep up with the fierce new Japanese networked competitors.

Toyota has remained the benchmark up until today: between 2001 and 2006, its shares have outperformed the U.S. auto industry by 75%. Currently, the value of its outstanding stock is greater than that of Ford and General Motors combined. (Source: Wall Street Journal, Monday, May 22, 2006). But Toyota is hardly resting on its laurels. It's President, Batsakis Watanabe (the former head of the corporate purchasing division) was appointed to his present position in June, 2005 and he took the occasion of his appointment to re-affirm a continued corporate commitment for a "Value Innovation" Initiative. This Initiative seeks to integrate more closely with suppliers; and to streamline design to simplify platforms and reduce the number of sourced components.

## **2. Real Time Technology: Enabler Of The Networked Supply Chain**

Starting in the mid-1990s, the networked business model was accelerated and enhanced by: the development of the Web; the deployment of high speed high bandwidth telecommunications networks; and breakthrough integrated enterprise software suites. These developments led to increasingly real time collaboration across global extended enterprise ecosystems and a quickening of the pulse of end to end Supply Chain Management activities.

The Council For Supply Chain Management Professionals defines Supply Chain Management as "encompassing supply and demand management within and across companies and is an integrating function with primary responsibility for linking major functions and processes within and across companies into a cohesive and high-performing business model."

As a discipline, Supply chain management provides corporations with:

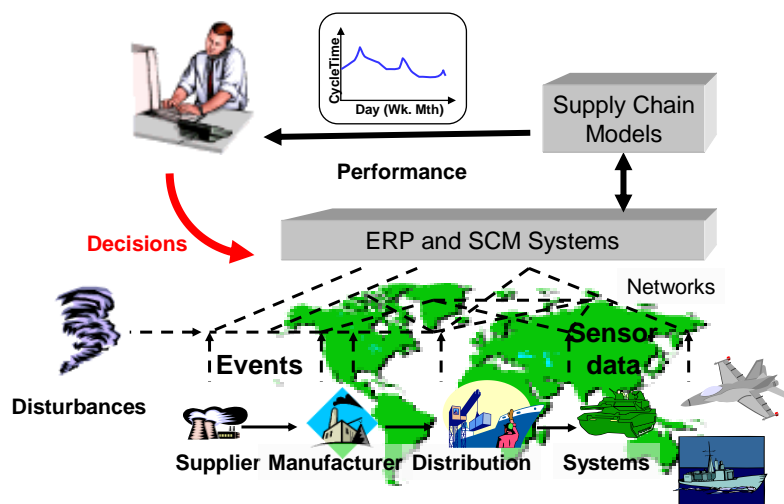
- *A holistic management concept* stretching from the point of demand all the way back to the source of supply.
- *A process architecture or super-structure* capable of efficiently absorbing assets and resources from a range of sources (both internal & external to the enterprise).

*-Methods to systematically evaluate the costs/ benefits and tradeoffs involved in outsourcing / insourcing decisions each step along the value chain.*

The Real Time Supply Chain is the result of highly streamlined physical and relationship networks. It is the apex of intensive organizational investment over many years in innovations such as cross-functional process integration, physical asset network streamlining, inter-enterprise collaborative demand planning & automatic vendor replenishment.

Today, the Real Time Supply Chain is built on the foundation of an integrated IT architecture that extends from sensors in the field of operations; to fused transactions and planning applications; to web portals that share critical cross-enterprise views among key actors. The IT architecture shown below enables information processing simultaneously among all partners- customers, distributors, manufacturers & suppliers.(9)

### The Real Time Supply Chain IT Architecture



Source: S.Boyson 2005

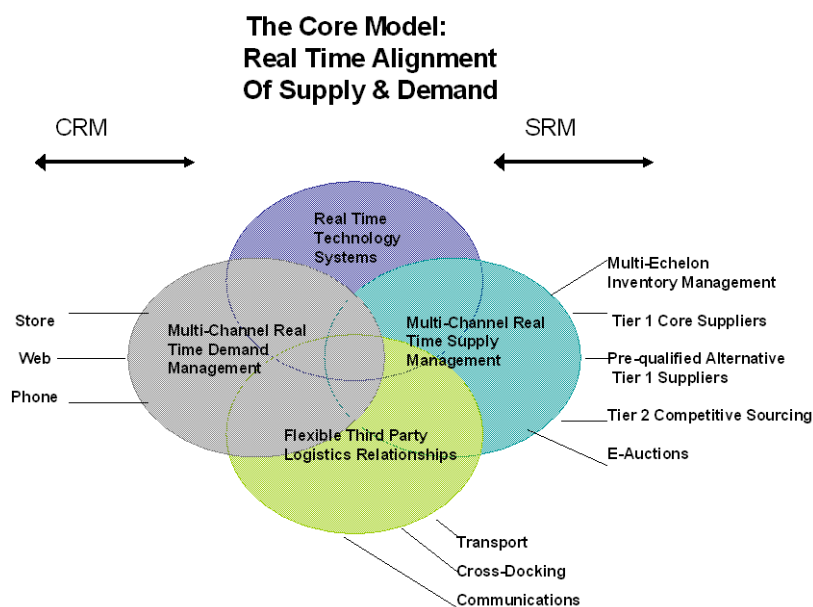
A single event- a customer order- triggers multiple actions at once across the entire global supply chain. This compresses time & costs and can result in orders-of-magnitude performance increases.

Wal-Mart's top 200 suppliers now have instant access to point of sales data from stores. They can respond in real time to replenish low inventory balances or fill stock-outs based on pre-agreed business rules. This has led to some fascinating supply alliances among competitors.

For example, Wal-Mart has facilitated a Virtual Consortium of fresh tomato suppliers led by Del Monte with participation from CH Robinson, Pikachi and others. Demand signals from Wal-Mart distribution centers are sent electronically to Del Monte and software compares needed quantities of tomatoes with available on hand inventory balances at Del Monte. If Del Monte does not have enough supply on hand, then automated business rules re-route the demand signal to the next tier of supplier in the Virtual Consortium and so on until sufficient supplies are secured and the demand signal is fulfilled (Source: author interviews, 2005).

The Real Time Supply Chain is a fundamental feature of the Viral Virtualization Era. It is an Enterprise Technology & Business Process Architecture that has arisen in response to coordination challenges stemming from a recent explosion of demand & supply channels. Customer demand signals today come not only from store purchases but also from phone/mail/website orders. To keep up with this disorderly rush of demand signals, there has been a simultaneous explosion of channels to and from an increasing collaborative and multi-tiered supplier network. This supply base now includes core or strategic suppliers, alternative/contingency suppliers, commodity/spot market suppliers and e-sourced/ virtual auction suppliers.

The Real Time Supply Chain coordinates and aligns these demand and supply channels. Its alignment activities have been supported by an advanced outsourcing industry comprised of third party supply chain service & technology providers. This highly complex and dynamic multi-channel supply chain is depicted below:



Source: S. Boyson (2006)

Imagine the adaptation required by a company such as Home Depot to this recent channel explosion. Traditionally, Home Depot's modus operandi has been to open retail stores across the United States and to focus on servicing the consumer base in the immediate geographic vicinity of the store. However, the first few hours it opened its web store, it received 8,000 hits to the site from customers as distant as Asia and Africa. This sudden explosion in demand has required a significant change in mindset on the part of Home Depot supply chain executives. It has not been easy. Channels to and from the customers persist in remaining

separate and apart. A refrigerator ordered online by a Home Depot customer in Rockville, Maryland will not be delivered from the Home Depot store which is only a mile away from the customer's home. Though this local store has available inventory and an installation technician on standby, the website customer order will be filled from a completely different warehouse & delivery system across the country.

This channel separation stands in contrast to best practices that create both multi-channel demand management repositories with single customer accounts spanning all channels, and multi-echelon virtualized inventory pools that span in-house and supplier inventories and optimize product sourcing & delivery. In fact, 85% of companies that have implemented a unified multi-channel demand management program have gained significant improvements: an average gain of 4.7 percentage points in gross profit margins (23.5 to 28.1%); a 24% gain in inventory turns (inventory holdings went from 39% of sales to 30%); and a 13 percentage point improvement in forecast accuracy. Similarly, it is typical for companies adopting a multi-echelon inventory solution to drive a 20-30% reduction in on-hand inventory while improving service level reliability. (10)

Some companies driven by competitive necessities have transitioned to best practice in the Virtualization Era exceptionally quickly: "We went from building 100% of our systems internally to building about 10% of our systems internally in a span of three years" Kurt Dowling, Vice President of Supplier Management, Sun Microsystems (Source; purchasing.com website, May 6, 2004).

In Sun's case, the impetus for this urgent, accelerated transformation was survival: it was confronting a marketplace for its products characterized by extreme volatility. The Dot.Com crash reduced demand for Sun's servers almost overnight, with a plunge in demand of almost 400% year to year. The company decided that it had to virtualize and outsource to survive. To maintain organizational coherence, Sun has increasingly relied on a shared online web portal to create real time channels among its network of customers and suppliers.

This is shown in the following table.

## Re-Engineering To A Real Time High Tech Electronics Supply Chain

<b>Sun Microsystems' SC Challenge:</b>	<b>Reengineering Goal:</b>	<b>Key Technology:</b>	<b>Key Business Practice:</b>
<p><b>React to year-to-year 400% spikes or plunges in demand for its servers</b></p>	<p><b>Create a Virtual Supply Chain that can adapt instantaneously to market volatility</b></p>	<p><b>Sun created a single worldwide ERP system linked to a huge data warehouse for knowledge management</b></p> <p><b>Created a 50,000 user web linking customers, suppliers, distributors, &amp; transporters.</b></p>	<p><b>Enable goods to flow directly from Sun's outsourced production agents to Sun's customers. 90% of what Sunt sells it never touches.</b></p> <p><b>Sun has reduced its planning cycle from 15 to 5 days and slashed inventory levels in half.</b></p>
<p>Source: S.Boyson 2005</p>			

In other companies, the impetus to move to the new model of networked organization and virtualization has been driven by longer term competitive needs. Proctor & Gamble, the world's largest consumer goods company, is seeking greater alignment with the promotional strategies of Wal Mart and its other chain customers. The current lack of alignment has been quite costly: its carries a company-wide just-in-case inventory of 65 days' worth of materials & product which ties up some \$3 billion daily in rapidly depreciating assets. P & G's new vision is to become a Consumer-Driven Supply Network with "no lost time, never-empty store shelves, & no stationary inventory." It wants to use actual consumer purchasing information to increasingly replace unreliable forecasting data and trigger "real-time, simultaneous movement of relevant demand data to all network partners- store, warehouse, retailer, manufacturer, and suppliers." (12)

This is shown in the table below.

## Reengineering To A Real Time Consumer Products Supply Chain

Proctor& Gamble's SC Challenge:	Reengineering Goal:	Key Technology:	Key Business Practice:
<p><b>10-15% average stock-out rates in retail stores</b></p>	<p><b>Become a consumer-driven supply network, with 72 hour product-to-consumer cycle</b></p>	<p><b>Developed online capabilities to give 80% of its suppliers visibility into its manufacturing process</b></p>	<p><b>50% of P&amp;G sales come from events or promotions by customer store chains. Two thirds of errors in corporate forecasts are caused by these events/ promotions</b>  <b>Collaborate with stores and suppliers to "sense and respond" to consumer demand.</b></p>

Source: S.Boyson 2005

Finally, let us consider again the case of Ford again. It has served as a sentinel example of how far and fast the virtualization trend has proceeded. Ford's steel supply chain has evolved from a closed, vertically integrated chain in the 1920s to an open multi-tier network comprised of Ford's in-house procurement group, steel producers, and large and small contract manufacturer stampers. There are now more than 1,200 participants across hundreds of companies in this network. Currently Ford procures millions of tons of steel and 2,600+ unique parts and components annually worth more than \$1 billion. Today, Ford partners with Newview to host a steel supplier portal through which the demands of the steel stamper supplier community are aggregated. Now, these stamper contract manufacturer suppliers of all sizes can obtain volume discounts through the portal and share product specification and quality control information with Ford in real time.

### 3. Rise Of The Global Outsourcing Industry

The growth of outsourcing has been inextricably linked to the emergence & maturation of the Real Time Supply Chain as the apex multi-enterprise business model of the 2<sup>nd</sup> Era.. This

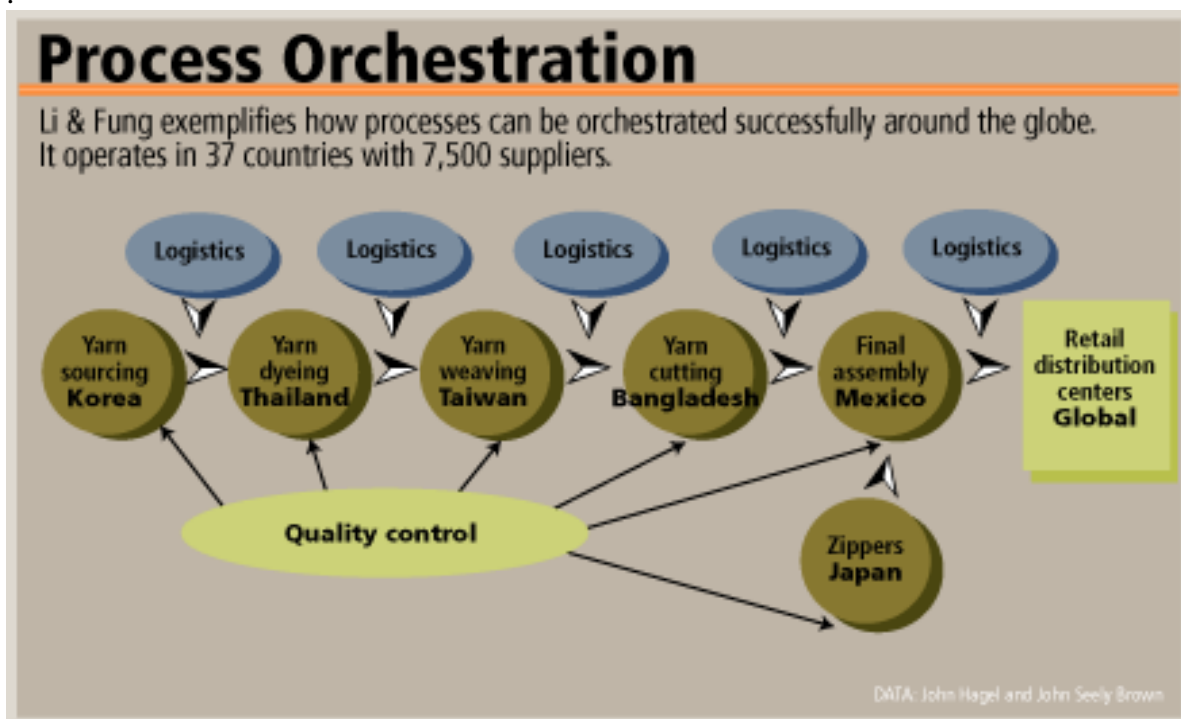
Model has become established (in Carlotta Perez' resonant phrase) as "a new commonsense among managers".

### **Supply Chain Re-Engineering In The 1990s Created The Corporate Foundation For Massive Global Outsourcing**

In our earlier work, "Logistics & the Extended Enterprise", we tracked the organizational innovations, the best practices of Multinational Enterprises in the 1990s that were the foundational developments of today's supply chains. (12)

Virtualization and the Global Outsourcing that accompanied it are part of a larger strategy of supply chain-wide optimization enabled by extensive 1990s corporate reengineering initiatives that set up headquarter supply chain planning & management hubs to:

- Consolidate inbound (procurement) and outbound (distribution) flows to gain scale-economies in transportation & purchasing.
- Orchestrate business eco-systems, extended enterprise relationships that spanned 1,000s of component suppliers and customers.
- Interact with and strategically control increasingly capable Third Party Logistics Providers for segmented or whole outsourcing of global logistics chains.
- Interact with & strategically control other types of globalization intermediaries, such as production agents (e.g. Li & Fung described below). These intermediaries have insider knowledge of labour/regulatory regime cost-differentials across opening economies in Asia, Latin America and Eastern Europe. They provide product design guidance, quality assurance of suppliers and oversee production for MNC clients.



Source: Sealy Brown, *"The Only Sustainable Edge: Why Business Strategy Depends On Productive Friction and Dynamic Specialization"* Harvard Business School Press, April 2005

As a premier production outsourcing agent, Li & Fung organized a far flung network of external contractors and sub-contractors shown above. It is an example of a loosely linked outsourced and "virtualized" global supply chain that emerged to prominence in the 1990s.. It had advantages in lowering overall production cost structures and increasing supply chain flexibility for apparel industry producers. It enabled producers to literally turn over their logistics and supply chains and focus on higher value competencies such as channel marketing and design.

The mid-1990s also saw the emergence of daring new end to end transport logistics outsourcing providers, such as Menlo Logistics who assumed complete coordination of the entire global supply chain of National Semi-Conductor. Menlo conducted "milk runs" to the entire supply base of National Semiconductor around the world, picking up components, delivering them to factories, and then picking up and delivering finished goods to distribution centers worldwide.

It is useful to recall the degree of scepticism that prevailed about outsourcing's relevance in the mid 1990s. Many questioned the gains generated from outsourcing. However, during this same time period, the Supply Chain Management Center at the University of Maryland conducted a survey of 500 corporate logistics managers experienced in outsourcing (including 114 Fortune 500 companies). We found that savings from outsourcing appeared to be significantly greater and more sustained from a strategic approach to supply chain outsourcing than from outsourcing individual functions only. Survey respondents indicated that the first

year savings from total supply chain outsourcing averaged 21.3 % with additional annual average savings of 15.1 % in years 2,3, and 4; versus 10.54% first year savings and 9.44% average savings in years 2,3,and 4 for outsourcing the freight payment/ auditing function, the best cost savings performance for an individual function. These results accurately anticipated the business acceleration of outsourcing and its rapidly broadening scope that unfolded with such startling speed over the ensuing decade.

### **The Pace Of Outsourcing Intensified During The Millennial Change**

The pronouncements and breathless headlines signaling the massive global outbreak of outsourcing have been omnipresent in the trade press, as the following examples show;

"Subcontracting as many non-core activities as possible is a central element of the new economy. *We live in an age of outsourcing*. Firms seem to be subcontracting an ever expanding set of activities, ranging from product design to assembly, from research and development to marketing, distribution and after-sales service. Some firms have gone so far as to become "virtual" manufacturers, owning designs for many products but making almost nothing themselves.( Source: *Financial Times*, 31 July 2001, p. 10.)

"The pace is picking up across such industries as retailing, consumer goods, software, electronics, autos and medical devices. In many realms, the time it takes to bring a product to market has been cut in half during the past three or four years.. At Nissan Motor Company, the development of new cars used to take 21 months. Now the company is shifting to a 10 and a half month process. In the cell phone business, Nokia, Motorola and others used to take 12-18 months to develop basic models. Today: 6-9 months. Of course, speed has always been important in business ever since the California Gold Rush. What's changed in recent years is that a slew of new techniques make it possible to get things done much faster. *Start with global outsourcing. A vast network of suppliers around the world stands ready to do anything from manufacturing products to drawing up legal contracts. This helps companies create supply chains that are faster, more flexible and more efficient than ever before*" (Business week, "Speed Demons", March 27, 2006, p.70)

"*This is about how to redesign the supply chain,*" Girsh Paranjpe, president of Wipro Ltd., told The Wall Street Journal. Wipro is one of India's biggest outsourcing companies and recently picked up some additional American business as part of a \$7.5 billion computer services contract with General Motors. He is right; the outsourcing boom is simply evidence that the global supply chain is changing, evolving and becoming much more efficient (Hollon, John, *Outsourcing: Get over it* , Workforce Management, 1092-8332, March 13, 2006, Vol. 85, Issue 5)

More serious survey research also found that the pace of outsourcing had seemed to intensify during the Millennial Change. Direct findings have included: Sixty five per cent (65%) of corporate respondents in a 2005 Deloitte Survey have outsourced manufacturing, 60% have outsourced engineering services; and 60% have outsourced distribution/logistics functions. (13). In a 2005 LTD Management Group survey, 42% of 197 corporate respondents were outsourcing half or more of their supply chains.

Indirect evidence also appears to support the claim of a recent broad acceleration in supply chain outsourcing. Witness the market-driven expansion of the supply chain IT outsourcing provider industry. In June 2005, as part of a "flurry" of recent activity by IT outsourcers, IBM added a new Supply Chain Outsourcing Unit to its Business Process Transformation Division, bringing together its already existing 8,500 supply chain consultants with another 15,000 IBM employees who have worked on building IBM's own internal outsourcing arm. In July 2005, Bob Moffat (the Senior VP of IBM's Integrated Supply Chain Group) was asked by the CEO to re-organize the global services supply chain in the same way he did the

physical supply chain He has been charged with “tightening the services supply chain”. To get the right people to the right place at the right time, he has launched the Professional Marketplace, a database of skills, location and availability of 250,000 IBM services, software, sales and distribution personnel worldwide. This will avoid sending overqualified people to customer sites & ensure that lower cost employees in Brazil, India are well utilized to lower IBM’s service cost structure.

These were only the latest in a series of strategic moves by the world’s largest IT Outsourcer into supply chain management, going back to Moffat’s appointment as Senior Supply Chain VP for IBM in 2002. His Group has grown to oversee some \$40 billion of annual spending, everything from raw material sourcing to logistics and customer support; and his span of control covers 19,000 people and 33,000 suppliers. He has reengineered the supply chain away from traditional functional silos to a more horizontal structure and reported \$7 billion in productivity gains in 2003. (14)

Smaller IT-oriented supply chain outsourcing players are also seeking to expand their markets. India-based start-up Aegis InterWorld has been using software and services technology purchased from InterWorld Holdings to form a platform for Internet-based order and workflow management. Launched in the summer of 2005, Aegis has already begun working with customers that include Verizon Wireless, Okidata, and clothing retailers Ann Taylor and Joseph A. Bank, said CEO Mark Skoda. Aegis will help give customers “the ability to design and carry out business process improvements in real time, bringing cost savings of 15 to 30 percent over existing processes” (CEO Skoda). Aegis is aiming its outsourcing services at all sizes of enterprises in sectors that include high tech, retail, and auto manufacturing. Services range from supply chain application hosting to inbound call centers, transportation management, sourcing, purchase order processing, order delivery and transportation management. Aegis’ activities are attempting to capitalize on some early wins by Multinational Enterprises. The Standish Group found that customers saved 49 percent by outsourcing their supply chain applications management. For example, Kvaerner Pulping Inc., a division of Kvaerner Group, reduced its inventory by almost \$1 million and shaved a massive 31 percent off the company's annual IT budget by outsourcing its supply chain management software (15)

In fact, it seems the entire Third Party Logistics Industry that enables supply chain outsourcing is booming all over the world. In Japan, the 3PL business has been growing rapidly, driven by deregulation in the logistics industry, fiercer competition among service suppliers and the trend among shippers to outsource logistics for higher cost efficiency. Japan’s third-party market will increase from about 1 trillion yen in 2003 to 1.8 trillion yen in 2013, according to Yano Research Institute Ltd. Between 2003 and 2005, India's 3rd-Party Logistics (3PL) market expanded from \$10 billion and to an estimated \$16 billion by 2005. A 2005 Study by the Nankai Logistics Institute identified over 30,000 Third Party Logistics Companies in Tienjin, China’s second largest port city. FedEx, the world's largest express transportation company, is creating an entire China Direct Strategy, with its express hub in Shenzhen in south China's Guangdong Province providing customers across south China with next-day delivery to cities across North America. This means in some cases multinational manufacturers can ship direct from factories to consumers’ doors and eliminate tiers of warehouses and associated inventory carrying costs. (16)

Thus, direct and indirect evidence would appear to support the conclusion that the frenzied pace of corporate supply chain outsourcing might continue unabated. However, such evidence could be misleading. Signals are emerging of a sea change underway in enterprise globalization strategies and business models.

## **C. The Era Of Revitalized Command**

We are once again entering a new Era, where corporations are altering their strategies and changing their practice mix. Dell and Ford, sentinel examples of best supply chain practices in the previous Era, have moved to drastically pull back decision making and critical systems from outsourcing providers. They are trying to re-calibrate and re-vitalize their supply chains to remain competitive. In both cases, the companies have moved to dramatically strengthen strategic management command & control over key design, engineering and manufacturing activities and have launched initiatives for in-sourcing and localization of assets.

### **The Surge Of Insourcing Across Multiple Industries:**

#### **1. The Auto Industry: Ford's Insourcing Strategy**

“After 28 car recall campaigns in 2001, David Thursfield, Ford president-International Operations and Global Purchasing, admitted Ford may have been asking for too much. Caught up in the industry-wide trend toward outsourcing, Ford may have relied too heavily on suppliers for engineering, he said. To rectify the problem, Ford would reclaim some engineering responsibility. Ford then consolidated from 2000 to 200 suppliers and retook, insourced engineering and manufacturing from such mega-suppliers as Lear Corporation and Johnson Controls. *“This is the biggest extreme we’ve ever seen”* says one brake supplier, “Ford went from sourcing only brake components in the 1980s to sourcing complete systems in the late 1990s. And in the just the past few months, the pendulum is swinging totally in the other direction.” “It has been humbling for the company that pioneered mass production of the automobile to admit nearly 100 years later that it took its eye off the ball, that it sacrificed engineering prowess in what ironically was an attempt to make itself more efficient. This is the dark side of outsourcing, for it demonstrates that OEMs run the risk of becoming subservient to the technical capabilities — or liabilities of outsourcing agents.”

(Source: Ward's World, “InSourcing Ford's Quality Control”, May 1, 2003)

Ford is now examining a full spectrum of candidate systems for insourcing; seats, engine cooling, heating, ventilation, air conditioning, brakes, tires, wheels and electric systems calibration. Ford believes it will regain control as well as new efficiencies by re-applying its inherent system knowledge to more activities in production. Ford is seeking to re-assert its fundamental advantage in systems design and integration, which Hobday defines as a core capability of the modern corporation, albeit one that has been de-emphasized in the rush to outsourcing. (17)

In August, 2003, Ward's Supplier Survey confirmed Ford's dramatic turnaround strategy, with 26% of supplier respondents reporting Ford was the most aggressive Auto Maker in bringing design and systems work back in-house. But dissatisfaction with outsourcing is pervasive in the auto industry as a whole & extends beyond Ford. More than 38% of OEM respondents in the same Ward's survey said their companies brought work in-house that they previously outsourced because a supplier was unable to meet performance targets. Fully 70% of OEM respondents said some of their suppliers still shipped too much defective product. An

even higher number (77%) agreed that very few suppliers actually have full-service capability, despite claiming to have such capability (18)

## **2. The Electronics Industry's Insourcing Strategy**

At the 2005 International Electronics Forum, Synopsys Inc. Chairman & CEO Aart de Geus explicitly stated what had been on the minds of executive-level participants: "We are at one of those switching moments again ...when the wheels are coming off the electronics industry's 20 year long disaggregation train." (19)

At the conference, both Sony Corp. and Matsushita Electric Industrial Co. revealed ambitious plans to vertically integrate again their semiconductor businesses. Sony announced plans to double the proportion of its own internally developed chips that are embedded in its systems from 20 percent of the total chip content in value terms to 40 percent over the next three to four years. This is an important development given that Sony annually accounts for purchases of \$8 billion worth of chips, or 4 percent of the worldwide semiconductor market. Similarly, Matsushita announced the roll out of an internally designed "scalable silicon architecture" named the Integrated Platform. This platform will be incorporated in Panasonic products such as digital televisions, cameras, DVD recorders, MP3 players and cell phones. In both companies, the apparent goal is to develop differentiated products that can separate them from low cost commodity chip producers in Asia. Matsushita executives called their new strategy a "back to customization" movement that would enable them to move up the value chain from the commoditization sinkhole of the PC/ Wintel platform.

At a more fundamental level than even fears of commoditization, there is a pervasive perceived erosion of strategic management command & control among managers in the Electronics Industry. In a survey of 121 key electronic brand owners by the Electronics Supply Chain Association, conducted in December, 2005, 69% of respondents claimed that they now have less control over critical supply chain processes such as order promising, risk analysis and management, inventory management and forecasting. The extent of outsourcing was identified as a major factor in loss of perceived control (20). It is within this context, that a return to more active orchestration of supply chain systems and greater internalization of design, engineering and logistics management appears to be a bid to re-exert strategic command & control over the factors of competition.

### **Dell's Strategic Localization Initiative**

Logisticstoday.com recently named Dell as one of the ten best supply chains in the world. In fact, this was only the latest in a string of such honors for Dell. The company is often cited as a sentinel example of a company gaining competitive leadership by exploiting the trend to global outsourcing. The extent of its global outsourced network is shown below:

Dell Global Supplier Network ( based on Kramer and Dedrick (2002), Dell web site, and Logisticstoday.com)

components and materials	suppliers	supply location
PCBs	SCI, Celestica	Asia, Scotland, and Eastern Europe
Drives	Seagate, Maxtor, Western Digital	Asia, mainly Singapore
Printers	Lexmark (used to be HP)	Europe (Barcelona)
Monitors	Phillips, Nokia, Samsung, Sony, Acer	Europe and Asia
Box builds	Hon Hai/Foxteq	Asia and Eastern Europe
Chassis and case	Hon Hai/Foxteq	Asia and Ireland
Sheet metal and plastics	Trend Tec, APW	Europe
services	service provider	service location
Inbound logistics	Suppliers' hubs must be within 30-minutes travel of Dell production facilities	Ireland, Eastern Europe, Middle East and Africa
Outbound logistics	Eagle Global, FedEx, UPS	Strategically located nto serve regional markets
Call centers	Dell-run but moving abroad	Round Rock, Nashville, USA; Bangalore, India; Limerick, Ireland.
System integration	EDS	Globally
Information Technology	Agile Software, Ariba, GT Nexus, i2 Technologies, Oracle, V3 Systems, PartMiner	Globally
Services and field repair	IBM, Unisys, Wang, and BancTec	Globally
Consulting	Arthur Anderson and Gen 3	Globally

Yet the Dell model has been so tightly managed & the company has had such a strong hold over its outsourced supplier network that the company averages 91.25 inventory turns a year; keeps only 4 days of inventory on hand in its own plants; and has 9 days of inventory on hand in its aligned 3<sup>rd</sup> party managed warehouses. Dell also uses its leverage over external suppliers to throw off huge amounts of cash. Dell gets payment immediately from customers over its order management web site; then delays payment to suppliers and enforces advantageous terms of trade through 60 day payment schedules, Dell has created a four billion dollar float for itself from the accumulated interest.

Herein lies the paradox: though often touted as a virtual and fully outsourced company, Dell has held strict control over its outsourced network to survive & succeed. Given this outsourcing prowess, it was indeed jarring to hear Dell CEO Kevin Rollins declare:

***“Our model requires that we own the value chain (which includes manufacturing and parts procurement). We can’t outsource. The issue has become one of logistics. The cost of moving a personal computer around has become more expensive than the cost of labor”***  
(22)

As if to emphasize the point, Ro Parra, Dell’ Senior Vice President For Manufacturing similarly noted that there is only eleven dollars (U.S.) of labor inputs in each Dell personal computer, too small a cost to justify wholesale outsourcing to China. (23).

To support a pullback strategy from international outsourcing, Dell has invested heavily in next generation local market capability. On October 6, 2005, only eight months after the ground was broken in a vacant lot, Dell opened a one hundred million dollar 750,000 square foot manufacturing facility in Winston Salem North Carolina capable of producing a computer every 5 seconds for the North American market. These computers will be distributed online and marketed through its own newly announced network of retail stores in the U.S..

These radical moves are being made to address a serious deterioration in its stock value. *Between July, 2005 and June, 2006, Dell shares in the stock market have lost almost 42% of their value* (21)

Dell is crossing a Rubicon into a Third Era of Enterprise Globalization: The Era of Revitalized Command and is placing greater emphasis on strategic localization and multi-channel ownership.

### **3. The IT Services Industry's Insourcing Strategy:**

As in the Auto and Electronics Industries, there is ample evidence of a significant pullback in IT Service outsourcing investments by Multinational Enterprises since 2003:

- Bank Of America canceled its IT services outsourcing contract with TSYS and moved back management in-house.

- Sainsbury (UK) ended its outsourcing contract with Accenture to take back/insource IT management.

- Cable and Wireless terminated its IT management contract with IBM, as did JP Morgan Chase, whose outsourcing agreement with IBM was worth five billion dollars (U.S).

- Prudential has shifted a substantial piece of its computer services management back in-house.

- Deloitte Consulting reports many firms are now favoring in-house management of IT services rather than outsourcing.

- A National Outsourcing Association (NOA).survey indicates that only a small percentage of insourcing has resulted from poor outsourcing experiences, while the majority are resulting from positive, proactive *deliberate company policies*. (24)

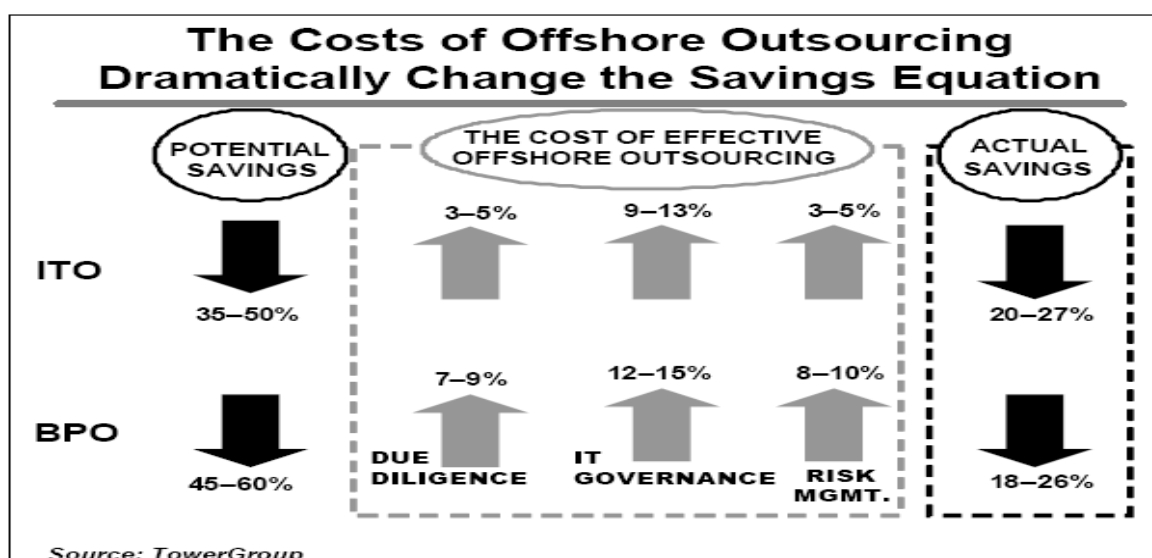
Unlike NOA's survey results, CIO Insight's 2004 survey of 604 Chief Information Officers reported nearly half of respondents cited experiencing problems from IT outsourcing. Out of the 302 responses, the most cited problems are listed below:

**Problems With Outsourcing IT Services:  
% of CIO Respondents Reporting Type Of Problem**

	Quality	65.1%
	Missed deadlines	42.9
	Higher-than-expected costs	38.5
	Didn't understand our business/market	36.2
	Not enough value	30.9
	Staff resistance	17.3
	Security concerns	15.0
	Lack of executive support	4.7

Source: CIO Insight (2004)

Focusing in on the costs and ROI of IT outsourcing, we can state that cost savings & financial ROI from Outsourcing have been disappointing for many companies. This disappointment may stem from an inadequate calculation of the total cost factors involved in offshoring IT support, particularly costs associated with due diligence, risk management and governance. These cost elements can halve the projected savings from offshore outsourcing, as shown below:



This survey of recent developments in auto, electronics and IT services industry supply chains shows an emerging but pronounced tendency toward re-internalization of assets and capabilities previously outsourced. The drivers appear to vary across industry: from pressures to maintain system quality in the auto industry; to imperatives to retain higher value integrated system design advantages and/or logistics network advantages in the electronics industry; to needs to rein in IT costs in the business services industry.

### **Risk Management & Business Continuity Planning: Cross-Industry Drivers Of The Insourcing Trend In A Post-9/11 World**

We have identified Real Time Supply Chains as key mechanisms of enterprise globalization, building webs of interaction with customers, suppliers and producers across multiple borders. A recent body of work has focused on the effects of supply chain disruption on the Multinational Enterprise. Professors Vinod Singhal, College of Management, Georgia Institute of Technology and Kevin Hendricks at the Richard Ivey School of Business, The University of Western Ontario, conducted an event study that presented evidence of the economic consequences of firm-level supply chain disruptions. This study monitored some 800 disruptions at publicly traded firms and the findings showed that firms suffering from supply chain disruptions experienced 33% to 40% lower stock returns relative to their benchmarks over a three-year time period that starts one year before and ends two years after the disruption announcement date. Also, disruptions negatively affected profitability. There was a 107 % average decline in operating income; a 114% decline in return on sales; a 93% decline in return on assets; and a 7 % slower sales growth. (25)

Against this backdrop of severe financial implications associated with supply chain disruption, attempts have been made to define more effective strategies and practices for managing global supply chain risk. Sweden's Lund University has established a Supply Chain Risk Management Forum to better differentiate among types and severity of enterprise-level operational risks. Multinational Enterprises such as Wal-Mart and FedEx have created Global Situation Rooms led by Directors Of Business Continuity to track and respond to emerging threats.

There is a fierce debate currently underway about which type of global organizational form is superior in buffering against risks of disruption. There are those, such as Sealy Brown (2005) who argue that networked virtualized enterprises are far more resilient than classically vertically integrated companies. They point to the way in which Li & Fung, as a flexible network organization, was able to dynamically shift production from its contracted supply base in Asia to Latin America when the SARS epidemic hit, thereby avoiding the disruption that caused 63 billion dollars (U.S) of business loss in Asia.

Critics such as Barry Lynn take the opposite stance:

**“Some supply chain experts argue that today’s lean and flexible production systems are actually safer than the vertically integrated, company-delimited production organization. But, as time goes on, such systems become more and more likely to witness collapse. The hyper-specialized production system that is emerging is, if we are honest, the natural outcome of what happens when globalization and outsourcing are combined with an entire lack of regulations by government.”**

He points out that a 1999 earthquake in Taiwan shut down two semiconductor companies in the same industrial park and crippled global electronics production; and that an explosion in a single Japanese chemical plant disrupted one half of global capacity to produce a resin needed to make memory chips, doubled the price of memory chips and added \$100 to average cost of a laptop. (26)

In a 2005 survey of 180 global enterprises, 80% reported supply disruptions in the past 24 months. Most expected risks to increase. This study found that best practice companies are taking a variety of measures to counter-act risks including the adoption of balanced sourcing methods (27). Such portfolio risk management activities will invariably lead Multinational Enterprises to reduce over-dependency on a few outside service & product suppliers; and will act as a constraint on the scope and intensity of future outsourcing. We are starting to receive the emerging signals of this trend.

As corporations look out on the horizon, they see storm clouds of environmental, political and demographic risk. Companies are re-thinking their strategies and operations to take into account these factors. Though Friedman's popular monograph about globalization may be right and our new world is flat, nevertheless the ground that corporations must traverse is hard & a strong wind is blowing.. (28)

### III. Conclusions:

We have defined a series of three major transitions this past century in the organizational structure of the globalizing Multinational Enterprise. In the first Era, the Enterprise kept strictly to its vertically integrated form and sought end to end asset ownership. Its globalization style was that of a resource predator, and its expansion overseas was a vehicle for sourcing industrial raw material & low cost labor from "sweatshop countries". In the second Era, virtualization opened up the structure of the Multinational Enterprise and enabled it to serve more as an alliance partner and as a bridge to the global marketplace for nascent national outsourcing providers of all kinds. Multinational Enterprise outsourcing investments in this period have accelerated the overall growth of the "technical workshop countries" e.g. China and India who have provided increasingly advanced manufacturing and services support.

As we go forward into a Third Era of globalization- the Era Of Revitalized Command- we are witnessing yet another metamorphosis in Enterprise Strategy & Structure. The Enterprise is becoming more risk-averse, less likely to over-extend itself through alliances and with an emerging bias toward more direct absorption and control over assets in its network. This bias is clearly demonstrated in the recent intensification in outward U.S. *cross-border merger and acquisition activity* as a preferred method of investment. It has surged from US \$16 billion in 2002 to US \$29 billion in 2003 to nearly US \$31 billion in 2004. (29)

Thus at the same time Multinational Enterprise organizational structures appear to be becoming more inwardly-oriented and less open, the rapid overall increase in foreign direct investment signals a great expansive confidence by these Enterprises in global markets. Certainly, there is a contradiction at the heart of this phenomenon. The Multinational Enterprise will continue to struggle to balance its tendency toward efficiency & control with its tendency toward flexibility & speed of response. It will work at cross-purposes for a long time to come.

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## Appendix: Milestones In Ford's Evolution Across Three Eras Of Enterprise Globalization

### Ford Motor: A Century of Global Supply Chain Expansion

(this chart was compiled based on Ford Motor company website and annual reports)

1903	Ford Motor Co. founded and the first Ford Model A produced Ford cars exported to Britain and Japan
1904	Opened operations in Ontario, Canada and made its first foreign-made cars
1908	Opened sales branch in Paris
1911	Opened assembly plant in Manchester, England
1913	Signed contracts to sell Model T in China, Indonesia and other Southeast Asian countries
1916	Opened an assembly plant in Buenos Aires, Argentina
1917	Rouge plant under construction in Dearborn, Michigan, allowing the complete production of vehicle from raw materials processing to final assembly
1920	Ford bought DTI railroad to control transport of materials and supplies to its Rouge plant in Dearborn.
1923	Ford bought thousands acres of forestland for supplying lumber for Model T.
1925	Ford Japan formed to implement assembly line in Asia, assembling about 10,000 vehicles a year with imported components till 1930s. Operations ceased due to WWII but started in mid-1970s.
1926	Established assembly plant in Berlin, Germany. Ford Australia founded.
1928	Ford Motor Company Ltd. formed to better manage western European activities due to growing production and sales across the continent and Britain.
1967	Ford Europe formed to coordinate car and truck manufacturing and sales in Europe and Africa.
1970	Asia-Pacific Auto Operations formed in Melbourne, Australia
1971	formed North American Automotive Operations to consolidate operations in U.S., Canada and Mexico.
1974	Ford Latin America formed in Mexico City.
1975	Ford Mideast and Africa Inc. formed in Dearborn, Michigan.
1979	Ford made 25% equity investment in Mazda of Japan.
1986	Ford acquired 10% interest in Kia Motor of Korea. Ford of Korea formed to control 90% of all Kia shares in 1996.
1987	75% equity investment in Aston Martin Lagonda and bought Hertz -Rent A Car. Ford bought the remaining 25% of shares in 1994.
1989	Ford acquired Jaguar of Britain.
1993	Established first formal dealerships in China.
1994	Ford China Operations formed for manufacturing and assembly. Ford vehicle assembly began in India.
1996	Sales and marketing office opened in Moscow to serve dealers in Russia. Launched the New Global Mid-size Family Car which Ford started to design in 1988.
1999	Launched Ford IKON, specifically designed for the India market. Ford acquired Swedish Volvo passenger cars for \$6.45 billion.
2000	Ford purchased Land Rove from BMW.
2001	Started to form joint ventures with Chinese car makers and established Global Procurement Center in China.
2005	Announce initiative to cut half of the number of suppliers for 20 high-impact components systems, representing about 50% of Ford annual production purchases globally.