

Chapter 4

INDUSTRY IMPACTS: INVENTING AND PROPELLING AN ENTIRE INDUSTRY

“Managing inventory in motion for delivery to the right place, at the right time and in the right condition is the value that is added by our freight transportation industry.”

- Robert Delaney

The express industry has exerted an enormous influence on the efficiency of the overall economy. This industry did not exist before FedEx. The delivery of packages and documents was carried out by a haphazard system of carriers, consisting of trucks, trains, and aircraft that were often operated by independent entities. Neither speed nor reliability were the hallmarks of this system. This all changed.

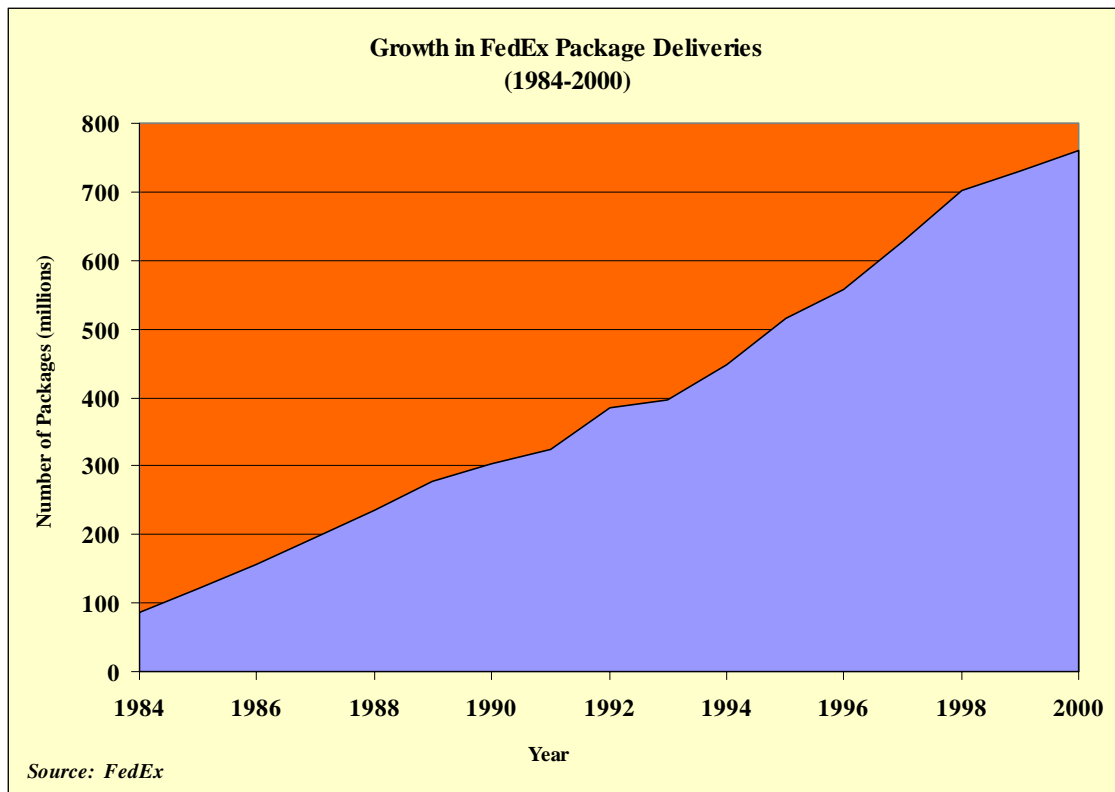
A. Remaking the System with a New Industry – Old Economy Impacts

Launching the Express Revolution

With its creation in 1973, FedEx invented the concept of overnight express package and freight delivery. Fred Smith’s vision was to merge the transportation and package delivery businesses, creatively blending resources in a way that had never been done before. The FedEx Express model is based on guaranteed time-definite delivery, with extremely high levels of speed, efficiency, and reliability. It is difficult to appreciate the enormity of the breakthrough of *guaranteed, time-definite, overnight delivery concepts* since they are now such an integral part of our business system. The introduction of these new cargo/logistics systems constituted a colossal achievement, and they triggered the fundamental transformation of the industry.

The FedEx integrated express service was a significant departure from the consolidated system operated by freight forwarders and airlines. An integrated express company performs its own pickup and delivery, operates its own fleets of aircraft and trucks, and ties the system together with advanced information and communication technologies. A

significant industry development since FedEx was founded was the rapid expansion of the integrated express companies in the United States, particularly in the 1980s. Adopting the same concept of offering integrated services, companies like UPS, Emery Worldwide and BAX Global all grew rapidly, to a large degree at the expense of the freight forwarders and the combination passenger/cargo airlines that had previously controlled the air freight market. Today, FedEx and other so-called integrated express carriers have gained a market share of approximately 62 percent based on revenue ton miles performed in the U.S. market.



The exact size of the express industry is often difficult to estimate because it depends on how the industry is defined. As a sub-segment of the air cargo industry, the air express market in the United States was estimated at around \$27 billion in 1998.⁴⁷ However, increasingly “express” service is not associated with a particular mode of transportation (i.e., by air), but with the speed at which packages are moved and with other characteristics, such as tracking ability or special handling – services typically only provided by an integrated express company. For example, an express package can now travel entirely by ground transportation.

⁴⁷ Air Cargo Management Group, *U.S. Domestic Air Freight and Express Industry Performance Analysis 1998/1999*, July 1999. Also see *U.S. Freight: Economy in Motion 1998*, U.S. Department of Transportation, Federal Highway Administration, May 1998.

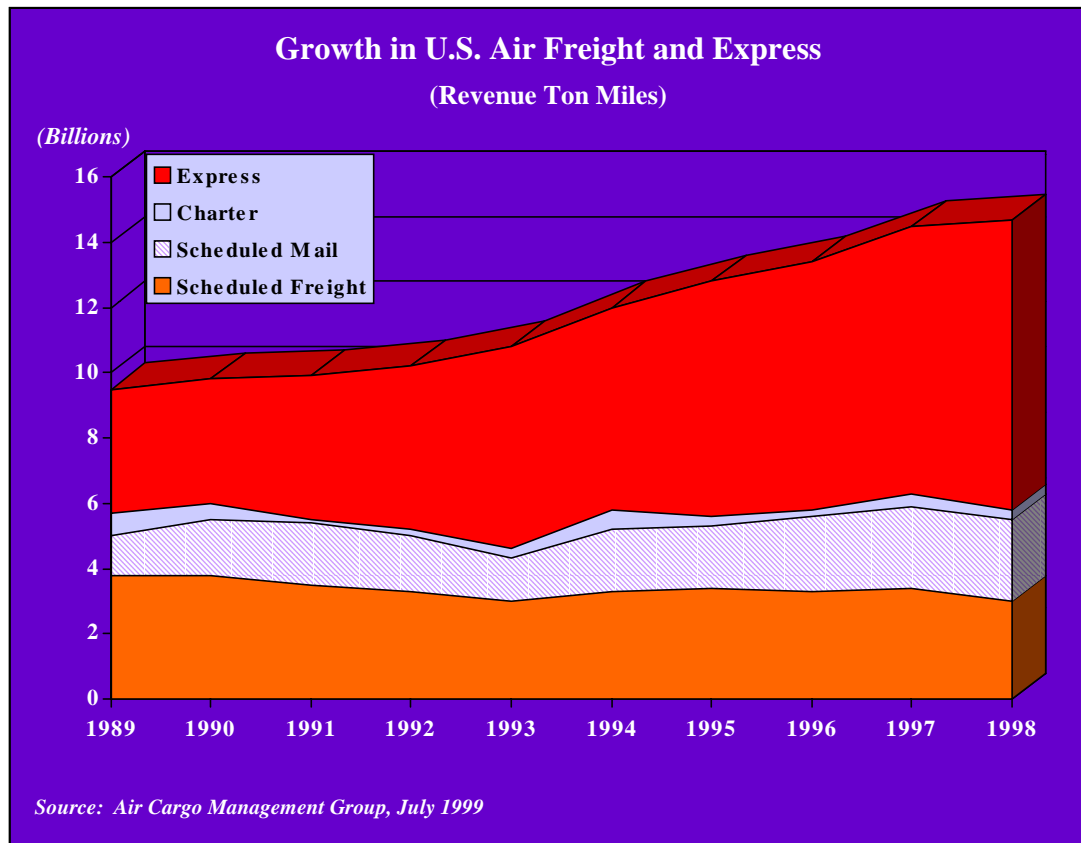
Thus, the express market is much larger when one takes into account the ground delivery segment and the integrated express company providing those services. It is estimated that the integrated express transportation sector has a combined annual revenue of around \$45 billion in the United States and employs more than 400,000 full time and part-time staff. FedEx is largely responsible for creating this sector.

FedEx has led the charge in the express revolution by developing and continually augmenting the commercial market called “express” for the transportation of packages and documents over the past three decades. As mentioned above, in addition to the speed of delivery, many other features have come to define the express market, most of which were first offered by FedEx Express:

- Time-definite service;
- The ability to track and trace package shipments;
- Money-back guarantees;
- Rapid/expedited movement through the system, including customs clearance;
- Airport-to-airport, door-to-door, and door-to-airport service delivery options; and
- Customized logistics services.

Express service is now the preferred mode of transportation for high-value, time-sensitive and perishable items. Small package express, although only a small portion of total U.S. freight by tonnage (0.2 percent), represents more than 9 percent of total freight by value.⁴⁸ Express has been, and will continue to be, the fastest growing segment in the air cargo industry. The U.S. air cargo industry has grown by more than 50 percent since 1989, with virtually all of that growth coming from the express segment.

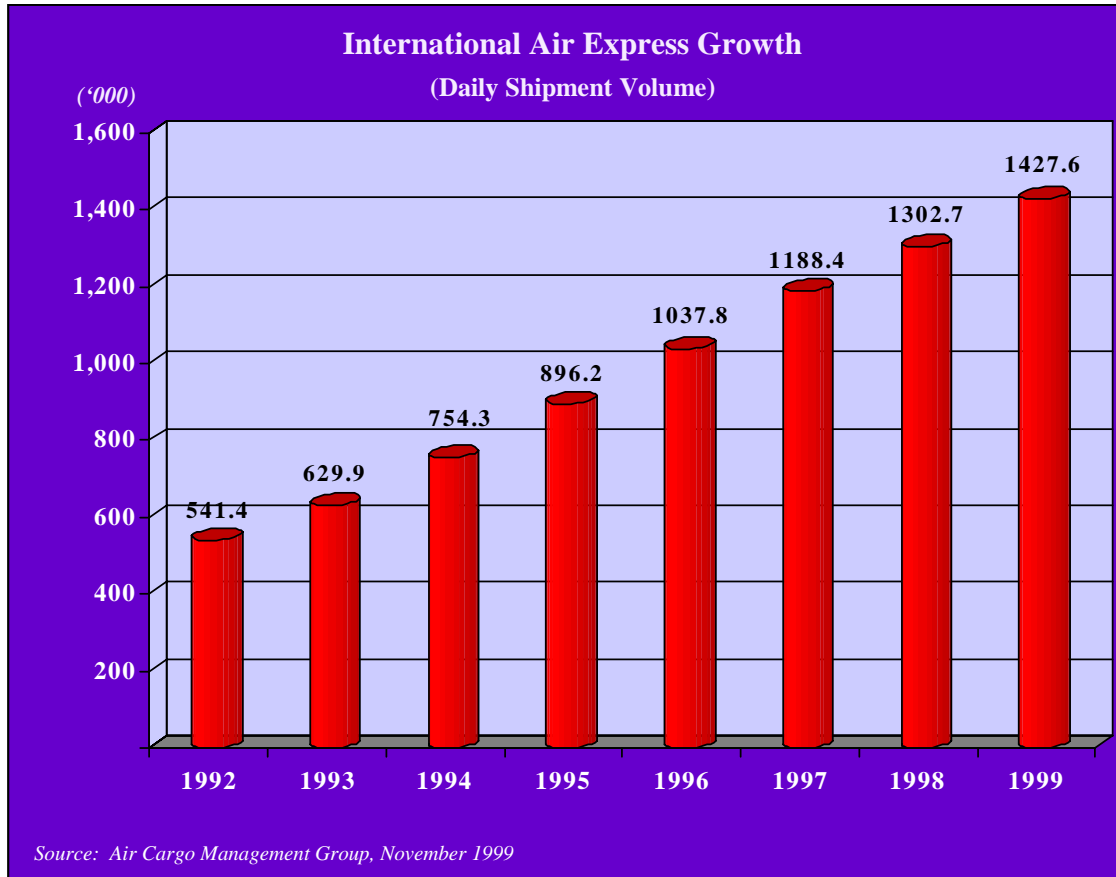
⁴⁸ U.S. Department of Transportation, Federal Highway Administration, *U.S. Freight: Economy in Motion 1998*, May 1998, p. 29.



Globally, although less than one percent of the volume of all cargo tonnage moves by air, it was estimated that air freight transportation accounted for as much as 40 percent of all goods shipped by value in 2000. According to estimates from the Colography Group, the global value of air-shipped goods approached \$2.2 trillion in 2000, increasing by almost 7 percent over 1999.⁴⁹ As in the United States, the express segment of the international air cargo market is also growing twice as fast as the broad market in terms of tonnage. According to ACMG estimates, 1.43 million express shipments are handled daily outside the United States. The express transportation industry is estimated to employ 155,000 in the European Union and 3,000 in Eastern Europe and Cyprus.⁵⁰

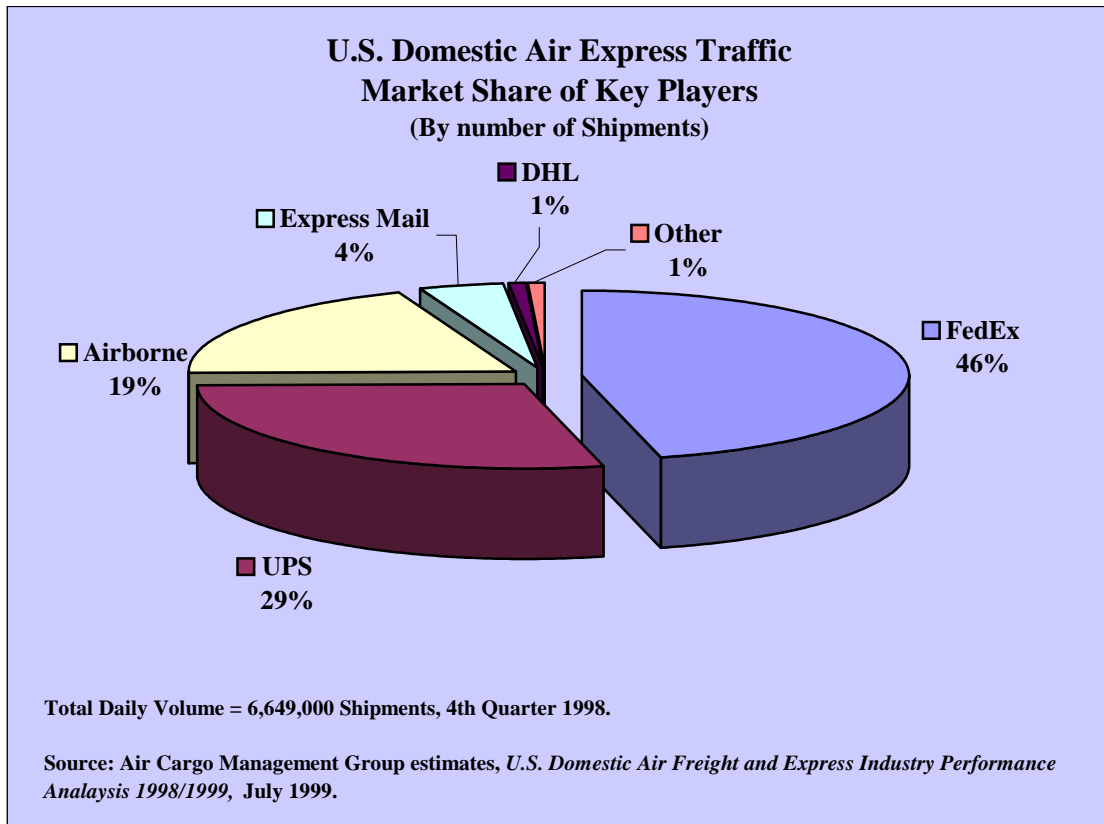
⁴⁹ "Recognizing the Importance of Air Freight," prepared for *Understanding Aviation Economics*, London, April 5, 2000, by Nancy S. Sparks, Managing Director, Regulatory and Government Affairs, Europe, the Middle East and Africa, FedEx Corporation.

⁵⁰ *The Importance and Impact of the Express Industry in Europe*, a Report for AEEC and EEC by Rigas Doganis and Associates, The Aviation and Travel Consultancy Ltd., York Consulting Ltd., October 1999.



With approximately 6.5 million shipments made each day, the United States still dominates the world market for express shipments. In the U.S. air express market, FedEx Express is the undisputed leader, with more than one-third of the market share by number of shipments, almost three times that of its closest export rival, DHL.⁵¹ FedEx's competitors, such as UPS, DHL, and the U.S. Postal Service, have replicated different components of the business model developed by FedEx Express. Imitation is, of course, the highest form of flattery. However, none of these competitors have reached FedEx's levels of efficiency and reliability. FedEx Express continues to be the predominant player in the express market, accounting for 46 percent of the daily shipment volumes in the United States.

⁵¹ Colography Group, *20 Years of U.S. Air Cargo Deregulation*, November 10, 1997.



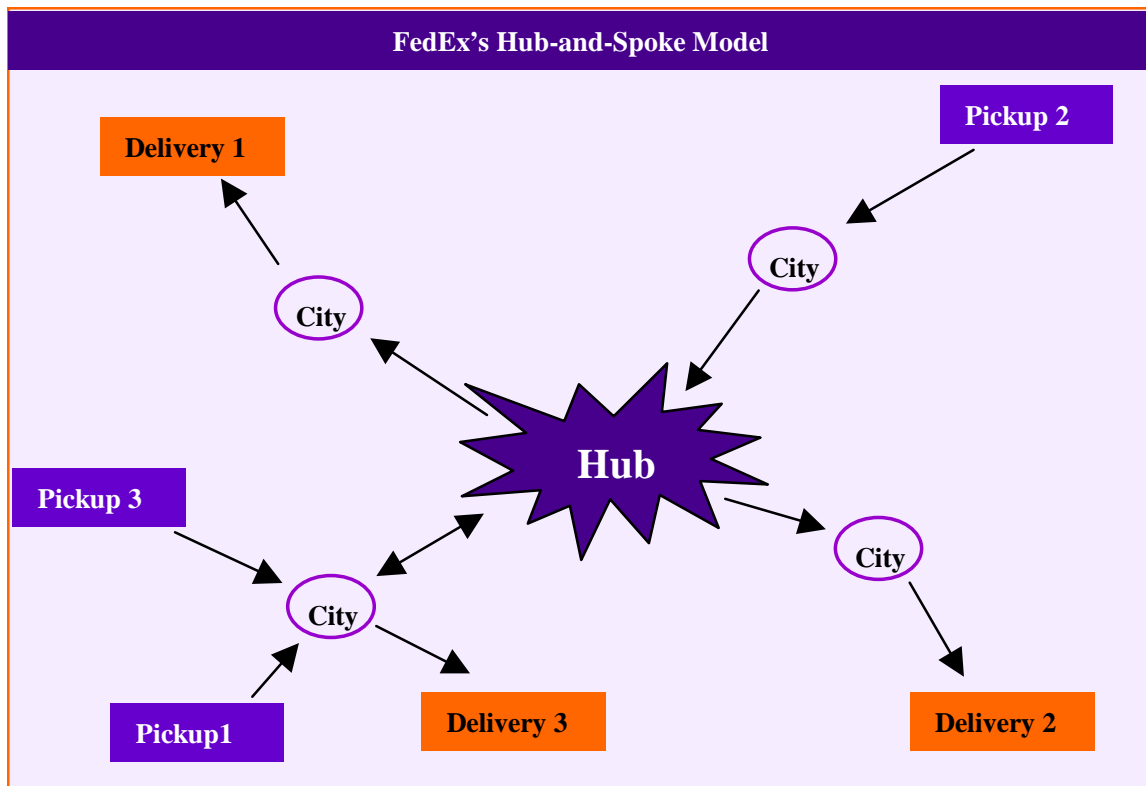
Creating a New Logistics Framework – The Hub-and-Spoke Model

Fred Smith created the concept of the hub-and-spoke network as an indispensable operational strategy for his new air-cargo delivery business. The birth of FedEx was also the birth of this now dominant model of efficient, successful air cargo and air passenger operation. Smith concluded that Federal Express could streamline operations and improve efficiency by using a hub-and-spoke approach.

Under the hub-and-spoke system, packages could be collected at various pick-up points, routed to a central distribution point for sorting, and rerouted and loaded onto planes to reach their final destination. Prior to this time, airline companies relied on linear networks and grid networks to move their cargo or passengers.

The hub-and-spoke network was later adopted by FedEx's air cargo competitors such as UPS, DHL, and Airborne Express. The same hub-and-spoke concept was also adopted by nearly all the major commercial passenger carriers in the United States, including American Airlines, United, Delta, US Airways, Continental, and Northwest.

Hub-and-spoke networks play a crucial role in today's transport of passengers and cargo around the globe and have stimulated the air cargo and passenger markets enormously. Under this system, flows of smaller arriving flights are precisely timed to connect seamlessly with larger, transfer-forward departing flights. Flights depart from different airports – the spokes of the network – and arrive at the hub at approximately the same time. This system maximizes the number of attainable connections for incoming cargo. Cargo flies in from various regions, is consolidated at the hub, and then undergoes a reversed process to reach its final destination.



A hub includes not only an airport and its terminals, but also extensive logistics networks associated with concentrated and consolidated traffic and on-ground sorting. Hubs act as switching centers, consolidating intermediate cargo flows between multiple origins and multiple destinations, as well as contributing origin and destination traffic of their own.

The hub-and-spoke logistics system has had a revolutionary economic impact upon the air cargo and passenger airlines industries, for reasons that stem from the particular characteristics of these industries. To begin with, the air cargo and air passenger industries involve high fixed costs that come with the purchase of very expensive aircraft. In addition, new entrants need to install computer reservations systems, pick-up and

tracking systems, and need to absorb advertising, training and administrative organizational costs upfront. However, once established, operating costs are relatively low and stable compared to the linear approach.⁵²

The second important characteristic of transportation industries is the presence of economies of scale. Economies of scale refer to a production situation in which increasing output results in decreasing costs per unit of output. In the passenger airline industry, with the tremendous sunk costs of aircraft, the number of passengers can be increased with very low additional or *marginal costs* associated with each additional passenger. Therefore, as passenger throughput rises, the average cost per head falls. This results in increasing *economies of scale*.

Similarly, in the air cargo industry, the number of packages delivered can be greatly increased with relatively low increases in marginal costs. One of the obvious reasons for such economies of scale is that the use of larger aircraft will result in declining average costs per package.

However, there is a trade-off between increasing the size of aircraft (i.e., capacity) and increasing the frequency of flights. For example, while obtaining a high seat capacity greatly reduces the average costs per head for passenger airlines, it is not possible to achieve a high level of capacity on every route and with sufficient frequency of flights as customers demand. This is where the hub-and-spoke model enters the picture.

In addition to being characterized by *economies of scale*, the air cargo and air passenger industries are characterized by *economies of flow*. *Economies of flow* refer to situations in which average costs fall as a result of increases in the number of types of different “products” offered. In the air cargo and air passenger case, the number of different products is the number of different destinations that are offered to customers. FedEx was extremely innovative in recognizing that, through the creation of a hub-and-spoke network, the number of destinations serviced by FedEx could be greatly increased, while at the same time reducing average costs.

According to Alfred Kahn, former head of the Civil Aeronautics Board and the “father” of airline deregulation in the United States, the hub-and-spoke system has created tremendous efficiencies, economies of scale and more flight options for passengers or packages.⁵³

⁵² Heling Shi, *Case Study: The Collapse of the Compass Airline – Is the Australian Airline Industry Contestable?*, 1992.

⁵³ Alfred E. Kahn, “The Competitive Consequences of Hub Dominance: A Case Study,” *Review of Industrial Organization*, vol. 8, 1993, p. 381-405.

The Logic of Hub-and-Spoke

The logic behind the hub-and-spoke model can be described as follows. Suppose there are 10 airplanes servicing 10 cities, five on the east coast and five on the west coast. Each plane can make a single, point-to-point flight, connecting one city on each coast with a city on the opposite coast. However, by introducing a hub-and-spoke network, the same 10 planes can service 70 cities, making one stop in a hub. This is a seven-fold increase in the number of destinations serviced by the same 10 planes. Each city now has five destinations on the opposite coast rather than one. Since there are 10 cities, there are 50 routes created by a hub-and-spoke network. Moreover, each city is also connected to the other cities on its own coast. This creates 20 routes – 10 new routes among the spokes on each coast.

Under the hub-and-spoke system, a package originating in a city on the west coast now has the option of being flown to any of the five cities on the east coast or any of the four other cities on the west coast, while the air cargo company has not had to purchase any new planes. Average costs per package fall because of the increased traffic density on hub-to-spoke flights and because of the creation of new routes with new passengers without having to incur wholly commensurate, additional costs.

Source: Alfred E. Kahn, "The Competitive Consequences of Hub Dominance: A Case Study," *Review of Industrial Organization*, vol. 8, 1993, p. 381-405.

The economic impact of the hub-and-spoke model on air cargo and air passenger industries is evidenced by the fact that, following deregulation of the air transportation industry in 1978, the model was adopted by nearly all major airlines and air cargo carriers. According to the U.S. Department of Transportation, "Among other things, the major carriers' development of hub-and-spoke networks has brought most domestic air travelers more extensive service, more frequent service, and lower fares."⁵⁴ Similarly, in the air cargo industry, FedEx Express, utilizing a hub-and-spoke network, made its service available to 99 percent of the U.S. population by the end of the 1980s.

In addition to the vast extension of air cargo services, the frequency of deliveries also increased. Delivery options became more time-specific, and came to include FedEx Priority Overnight[®] (next business morning), FedEx 2Day[®] (second business day), FedEx First Overnight[®] (earliest next business morning delivery), Saturday Delivery, and FedEx international services, among others.

Although it is now such a commonly used transportation model that it is taken for granted, it is significant that the hub-and-spoke model has resulted in the availability to "spoke" customers of one-stop service to anywhere in the world. In the case of the air cargo industry, businesses and individuals located around the globe can ship packages overnight to nearly any country, city, or region in the world.

⁵⁴ U.S. Department of Transportation, Office of the Secretary, *Request for Comments on DOT Enforcement Policy Regarding Unfair Exclusionary Conduct in the Air Transportation Industry*, 1998, [Docket No. OST-98-3713].

The use of hub-and-spoke networks has afforded airlines and air cargo carriers substantial cost reductions. This has allowed them both to expand their service significantly in terms of geographic coverage and to increase the frequency of this service. An unexpected by-product of the hub-and-spoke network has been the relocation of computer, electronic, health industry and biotech companies to hub cities. Close proximity to hubs affords such companies a competitive edge in their time-sensitive response to purchases or orders for repairs.

Pushing Out the Industry Standards Envelope

FedEx has consistently set the standards in the express industry that it founded, both in the range of delivery options and in the level of customer service offered to all clients. By applying its “People→Service→Profit” model and its technology and logistics innovations to its own business, FedEx has been instrumental in setting customer and market expectations of what constitutes an “express” service. Prior to FedEx, customers were resigned to the possibility that their packages might not arrive on time, that they might be damaged or lost along the way, and that there was no way to track where the packages were. Customers were never before offered a money-back guarantee based on their satisfaction.

Raising Customer Expectations. FedEx changed those expectations. It offered the first express service. It was the first company to offer a range of express delivery options: 8 a.m. delivery, afternoon delivery, Saturday delivery, money-back guarantees, etc. In addition, FedEx pioneered additional services, such as shipment tracking and customs clearance for international shipments, and has now expanded its service menu to include integrated logistics, inventory control systems, scheduling and routing, and warehousing.

FedEx sets high standards for customer service and reliability, standards that have been emulated by many of its competitors. As a result, customers have come to expect much more from an express service, such as close to 100 percent on-time delivery for a time-definite service, tracking ability and money-back guarantees. In addition, customers expect a high level of customer service from their express service providers, including knowledgeable and helpful customer service representatives plus courteous, competent and professional couriers at the door.

Today, FedEx still sets industry standards and reigns in the express industry as the company providing the highest quality service and maintaining the highest brand prestige. According to a survey of shippers published by Salomon Smith Barney in 2000, FedEx is ranked the highest

by business customers in terms of Customer Satisfaction, Service Quality, and IT/Tracking Capability. FedEx also received the highest overall ranking among express companies.

Ranking of Express Companies by Business Customers*					
Customer Satisfaction		Service Quality		Product Breadth	
FedEx	1.8	FedEx	1.6	UPS	1.7
UPS	2.3	UPS	2.0	FedEx	2.1
Airborne	2.7	Airborne	2.8	Airborne	2.6
DHL	2.9	USPS	3.1	DHL	3.1
USPS	3.4	DHL	3.1	USPS	3.4
Pricing/Rates		IT/Tracking Capability		Average Score	
UPS	2.0	FedEx	1.6	FedEx	1.9
USPS	2.3	UPS	1.8	UPS	2.0
Airborne	2.5	Airborne	2.8	Airborne	2.7
FedEx	2.7	DHL	3.0	DHL	3.0
DHL	3.1	USPS	3.6	USPS	3.1

* Companies were ranked on a scale of one to four, with one being the highest score.
Source: Annual Shipper Survey conducted by Salomon Smith Barney, *Air Freight/Trucking/Railroads*, April 5, 2000, p. 23.

Implementing Centralized Logistics Networks

One area in which FedEx has pushed the industry toward high standards is in the level of logistical efficiency and customer friendliness. As mentioned earlier, integrated express companies, led by FedEx Express, have greatly expanded at the expense of combination carriers and freight forwarders, first in the United States and recently in international markets. Offering faster transit times and a higher degree of reliability, FedEx has raised the level of high quality, time-definite service. By integrating the pickup and delivery components with the air linehaul system, and by mastering information systems needed to support booking, tracking, tracing and billing of shipments, FedEx has clearly raised the bar in industry efficiency. Integrators now hold a 62 percent market share (based on revenue ton miles) in the United States, up from just 6.5 percent in 1980.

For many years, freight forwarders and combination carriers had not made much progress in improving logistical efficiencies, especially in the handling of international door-to-door, express delivery. The fragmented operation of “à la carte” services provided by forwarders and airlines clearly was no match for FedEx and other integrators in terms of operational efficiency. While the use of high-tech equipment has enabled goods to be transported long distances at a high speed, redundant processes and lack of coordination, which often result in longer delivery times and uncertainty, have become increasingly unacceptable to

customers, especially when they compare them to the services offered by FedEx and other integrators.

According to a study commissioned by Unisys, the delivery time from shipper to consignee for a typical international shipment averaged more than six days in 1996, with no improvements made during the previous 25 years. The main impediments to achieving rapid delivery for international packages were long dwell times in forwarder or airline cargo warehouses, on both the outgoing (export) and incoming (import) ends of the delivery process, due to insufficient coordination. The study found that 50 percent of all shipments sat in a warehouse for three days, and 27 percent remained at the destination air terminal for more than five days before being picked up by the forwarder.⁵⁵ The Unisys study, which also provided a detailed timeline of the movement of international air shipment, showed the following contrast of efficiencies between integrators versus the combined teams of airlines and freight forwarders.

Comparing Airline/Freight Forwarder Team and Integrated Express Companies			
Operation in Moving an International Shipment	Airline/Freight Forwarder Team	Integrated Express Companies	Comments
Number of steps moving a package door to door	40	11	Only 2 steps performed by the airline/freight forwarder team added value.
Number of times information is keyed in, on average	4	1	Airline/forwarder delivery cycle is longer.
Number of times documents are moved or sorted	10	4	Airline/forwarder delivery cycle is more error-prone.
Number of times packages are stored or retrieved	8	None	Integrators save in time and warehousing expenses.
Number of quality checks made in the delivery cycle	None	6	Integrators provide higher quality service overall.
Source: Air Cargo Management Group, <i>International Air Freight And Express Industry Performance Analysis 1998/1999</i> , November 1999, p. 31.			

This finding, coupled with demands from shippers that all industry players raise the standard of their service to the level already offered by FedEx and increasingly by other integrated express companies, has forced airlines and freight forwarders to seek more integration and better coordination in order to deliver better services. The Cargo 2000 working group, which

⁵⁵ Air Cargo Management Group, *International Air Freight And Express Industry Performance Analysis 1998/1999*, November 1999.

consists of 36 international airlines and freight forwarders, is the most organized industry response to the competitive pressures exerted by FedEx and other integrated express companies. Recognizing that express companies have raised shippers' expectations for a reliable, 48-72 hours turnaround time for delivering international shipments, Cargo 2000 has set a goal of developing for its members operating procedures that will reduce the number of steps to about 20, allowing the delivery of goods within 72 hours with a 95 percent confidence level. The consortium is now working to provide a range of guaranteed door-to-door services, time-definite delivery, global coverage, and more competitive pricing.

Whether the airline/freight forwarding teams will increase their efficiency and customer service to the level attained by FedEx and other integrators remains to be seen. However, industry players that are currently not vertically integrated will clearly be forced by the market to create and adopt a more centralized logistics network to establish more seamless information exchange in order to provide more accurate package tracking, better customer service and more efficient delivery.

B. Propelling the Industry into the Future – New Economy Impacts

Elevating the Use of Information Technology

Technology has been a powerful enabler of innovation and progress within the logistics industry. A hallmark of the FedEx business strategy over the years has been the innovative use of technology in order to serve customers more effectively. By continuously applying new technologies to its business, and eventually offering these technologies to its customers, FedEx has often leapfrogged past the rest of the industry.

Numerous examples of FedEx's integration, use and sharing of new information technologies are noted in Appendix B. FedEx was years ahead of its competition in adopting barcoding technologies to increase efficiency, reduce errors, and improve customer service. Often upgraded, FedEx's comprehensive management information system (COSMOS[®]), which keeps track of all packages handled by the company, remains the most advanced, sophisticated and busiest such system in the industry. In addition, FedEx was the first express company to install terminals in vehicles to guide couriers to their next pickup through a digital assisted dispatch system (DADS[®]).

FedEx Express was also the first express delivery company to share the benefits of its technology with key customers by giving them stand-alone terminals (FedEx PowerShip[®]) that link customers directly to the COSMOS[®] system to place shipping orders, print air bills, track packages,

etc. This was indeed one of the earliest “e-commerce” applications in the business world, fully a decade before e-commerce became a powerful and transforming phenomenon.

Another major information technology milestone in the industry was the launch of FedEx’s website, www.fedex.com, in 1994. FedEx was the first company to utilize the Internet to share real-time package tracking, order fulfillment and other valuable supply chain data with its customers. According to *Business Week* magazine, the site was pivotal. “In the brief annals of doing business on the Internet, Federal Express Corp.’s customer Website has become a legendary success story.”⁵⁶ Jim Barksdale, a former CEO at Netscape and previously FedEx CIO and COO, noted, “It was the first outward and visible demonstration of a practical, productive use of the Internet by a real business for a real business purpose.”⁵⁷

More importantly, successful innovations and adaptation of technologies by FedEx have spurred industry-wide adoption of information technology in all aspects of transportation logistics. For example, barcode technology, whose benefits were demonstrated by FedEx, has been widely adopted by integrated transportation companies. Express delivery companies in the United States, and increasingly overseas competitors, are routinely scanning packages to improve efficiency, minimize errors and enhance information flows to the customers.

Even non-integrated players, such as airlines and freight forwarders, are beginning to adopt barcode technologies to provide better information management, coordination, and package tracking. According to the Cargo 2000 Group, “Barcode labeling and barcode scanning to the individual piece level by airlines and forwarders is now considered an essential process to enable time-definite delivery and visibility through the distribution chain.” In addition to barcode labeling and scanning, the industry consortium is also focusing on improving information flow between different parties in the logistics chain through electronic messaging and other EDI protocols.

FedEx continues to lead the industry in the level of its internal IT investment to improve productivity. Seeking continued information technology innovations to add value to customers, FedEx invests about \$1.5 billion a year, or over seven percent of its revenue, in its information and telecommunications systems. Nationwide, the air transportation industry only invests about 6 percent of its revenues in technology, while the motor freight, transportation and warehousing industry invests even less, at about 1.5 percent.

⁵⁶ *Business Week*, February 26, 1996.

⁵⁷ D. Joachim, “FedEx Delivers on CEO’s IT Vision,” *Internet Week Online*, October 25, 1999.

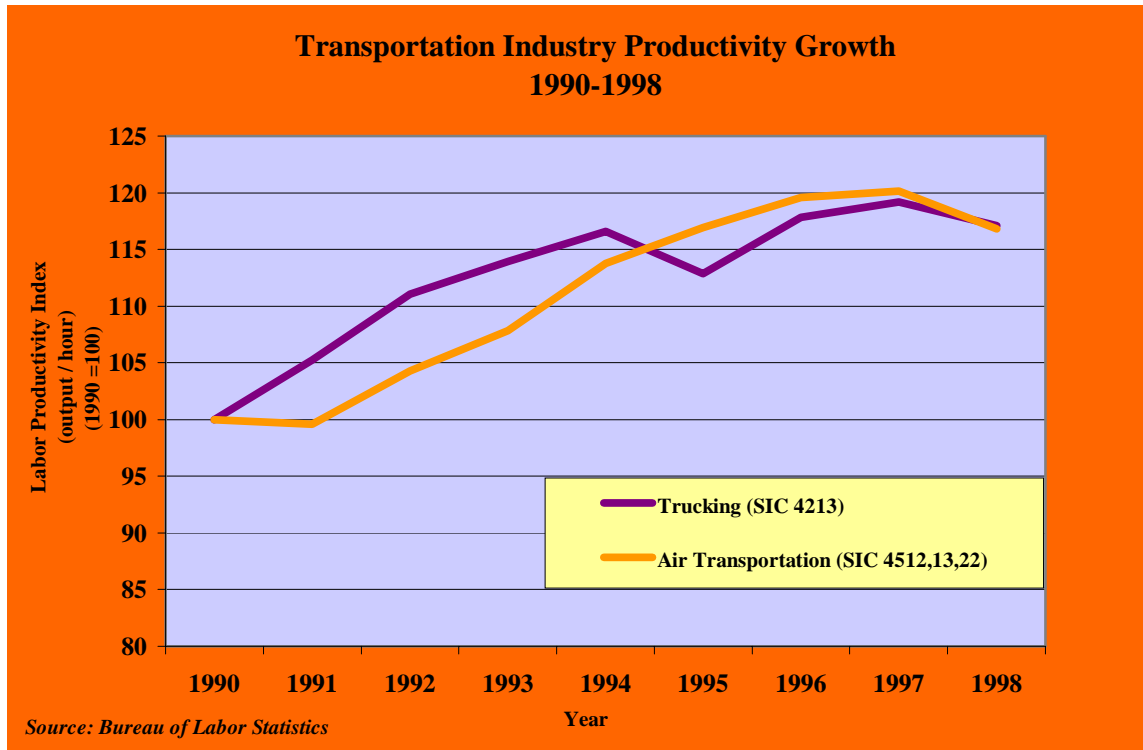
Industry Investment in Technology Inputs		
(\$ millions)		
Composition of Inputs to Industry	Motor Freight Transportation & Warehousing	Air Transportation
Computer & office equipment	4.7	3.7
Audio & video equipment	6.6	1.4
Electronic components & accessories	0.0	187.8
Aircraft & parts	0.0	3,372.5
Scientific & controlling instruments	29.4	23.8
Ophthalmic & photographic equipment	76.4	19.9
Communications services, excluding radio & TV	2,489.8	1,235.9
Computer/data processing services	484.6	2,451.1
Total High-Tech Spending	\$3,091.5	\$7,296.1
% of Industry Output	1.45%	6.17%

Source: Bureau of Economic Analysis, Input-Output Tables, 1996 Transportation Satellite Accounts.

This level of investment not only puts FedEx ahead of all its logistics industry competitors, but also places it “in the very top tier of purchasers of information and technology services and capital goods in the country.”⁵⁸

Today, FedEx Corporation employs more than 6,100 high-tech professionals to support, operate, and continuously improve its information systems and architecture. The demonstration effects of FedEx’s use of IT and its impact on industry efficiency and productivity have been enormous. As a result of these IT investments, transportation industries have made steady and significant productivity gains. During the early- to mid-1990s, air transportation productivity grew at an average annual rate of about 3.2 percent, while annual productivity growth in the trucking sector averaged 2.5 percent.

⁵⁸ Transcript of remarks by FedEx Chairman, President, and C.E.O. Fred W. Smith, Patterson Transportation Lecture, Northwestern University, April 5, 2000.



These improvements not only have had a positive effect on the transportation sector, but, more importantly, have exerted dramatic spillover effects in the productivity of the overall economy. The efficient transportation of goods and the mastering of information on inventories-in-motion have helped businesses manage their supply chains better and achieve productivity and profit growth. Spillover impacts in the overall economy are detailed in Chapter 5.

Sharpening Visibility Through Real-Time Shipment Monitoring

Fred Smith posits that information about a package in transit is just as important to the customer as the package itself. Smith was the first in the industry to recognize that providing shipment information on a real-time basis was imperative to businesses in their management of inventory and work flow. The introduction of the SuperTracker[®] in 1986 empowered and engaged each FedEx courier and package sorter as an information gatherer in realtime, utilizing barcode technology. Now, each FedEx Express shipment, depending on whether it is bound for domestic or foreign destinations, is scanned between 12 and 20 times, and the information is instantaneously transmitted to FedEx COSMOS[®] system, retrievable by customers through the company's website.

This innovative system has since become synonymous with logistics and inventory control throughout the world. The impact of this value-adding service extends far beyond the transportation/logistics industry. FedEx's

leadership has raised the expectations of the shipping public, which now expects not only speed and reliability from their express service providers, but also “visibility” of the packages in transit. Real-time shipment monitoring means inventory visibility, better inventory management, and lower operating costs for businesses in this competitive marketplace. In the growing e-commerce world, both in the B2B and B2C segments, real-time shipment monitoring also translates into better customer service and higher accountability.

Creating New Services to Encompass the Entire Supply Chain

Over the past decade, the express and air cargo industry has made a dramatic shift, from initially offering an isolated set of services to becoming a vital component of the overall logistics and supply chain management system. In today’s business environment, where speed-to-market is a competitive imperative, the movement of inventory is no longer viewed by businesses as a compartmentalized process. Rather, the sourcing of inputs, parts and components and the delivery of the final product are all viewed as a continuous value-adding chain. By applying advanced information systems that integrate information on inventory-in-motion into its customers’ supply chains, FedEx led its peers in crossing over from the express/transportation sector into the logistics and supply chain management industry.

Third Party Logistics (3PL) is now a large and growing market. The U.S.-based 3PL market was estimated at about \$50 billion in 2000, expanding at an annual rate of 15-16 percent.⁵⁹ Over the past decade, a number of large U.S. firms have revamped their logistics strategies in order to integrate vendor and customer information and logistics systems into their own systems. Integrated logistics management allows firms to coordinate operations related to purchasing, transportation, inventory and warehousing – thus yielding significant cost savings, and also increasing service and performance levels. Increasingly, businesses are looking to logistics and supply chain management companies to outsource functions that are not part of their core competencies. In the case of e-commerce, firms are often seeking total solutions for supply chain management and customer fulfillment.

According to a recent survey conducted among logistics executives in a broad range of manufacturing sectors, customers of 3PL services are looking to suppliers to add value by providing information technology services. Eighty percent of respondents stated that the integration of transportation and distribution systems was important to their overall strategies. Not surprisingly, e-commerce and other technology

⁵⁹ Cass Information Systems and ProLogis, “Logistics and the Internet: In the Frantic Search for Space, It Is Still About Relationships,” *11th Annual State of Logistics Report*, June 5, 2000.

applications will shape the demand in the near future for 3PL services. “The growth and development of e-commerce and information-technology-based capabilities... is clearly identified as a leading concern for both users and providers for 3PL services,” says C. John Langley Jr., of the University of Tennessee, one of the study’s authors.⁶⁰

FedEx has been a pioneer in assisting companies with supply chain management. In 1999, FedEx and SAP announced an alliance to develop and market the first “one-stop solution” suite of supply chain services, including supply chain planning, management and order execution. The suite of services allows customers to outsource all or part of their supply chain functions to a single provider. FedEx customers can tap into an entire network of supply chain management solutions through the Internet. The solutions allow customers to streamline processes, reduce costs, improve cycle time and increase revenue, by leveraging state-of-the-art Internet-based technology solutions.

Integrated supply chain management offers businesses significant benefits, including lower inventory and intermediary costs; an increase in supply chain efficiency; and simplicity and transparency in order placement, delivery, and management of suppliers and customers. It also gives producers the opportunity to stay focused on their core competencies.⁶¹ These benefits directly contribute to making businesses more competitive.

⁶⁰ “Survey Shows Companies Want More From 3PLs,” *Logistics Management and Distribution Report*, January 1, 2001.

⁶¹ C.K. Prahalad and G. Hamel, “The Core Competence of the Corporation,” *Harvard Business Review*, May-June 1990.