CHAPTER

Chapter 2

PRINCIPLES OF NEW ECONOMY BUSINESSES

UNDERSTANDING THE UNDERLYING ECONOMICS OF THE NEW ECONOMY

Why do managers need to understand the economic factors that will be driving the economy of the future? What are these factors? How can firms and other organizations begin to rethink their strategies to accomodate these inevitabilities? These are some of the questions that will be dealt with in this chapter.

LEARNING OBJECTIVES FOR THIS CHAPTER

c ***CASE STUDY 1-1***

MICROSOFT

This chapter will discuss the underlying economic principles of 'Net'-enabled businesses and processes. Many of these have already been implied in the definitions of 'Net'-enablement above. Nevertheless, it is critical to understand these principles in order to see why e-Ventures represent an economic paradigm shift and why they ultimately succeed or not.

2 THE ECONOMIC PARADIGM SHIFT IN 'NET'-ENABLEMENT

This chapter will discuss the underlying economic principles of 'Net'-enabled businesses and processes. Many of these have already been implied in the definitions of 'Net'-enablement above. Nevertheless, it is critical to understand these principles in order to see why e-Ventures represent an economic paradigm shift and why they ultimately succeed or not.

Paradigm shifts occur when the very basis of doing business changes. For example, the industrial revolution brought about a paradigm shift when machines replaced human labor in the production process. In the information revolution that we have seen unfold over the last several decades, a particular hybrid of machines and human intelligence, i.e., computers, replaced humans in repetitive processing of information. As we have discussed earlier in Chapter 1, physical processes in the 'Net'-enablement revolution are being replaced by information shared via networks.

The 'Net'-enablement paradigm shift has resulted in two major changes to be discussed in this chapter. First, the cost of doing business has been lowered by orders of magnitude. By this we mean that it is frequently possible to dramatically lower the cost of carrying out a business process in the value chain, to less than 1% of what it cost previously, for instance. Cost savings of this magnitude are perhaps as incredible at this time as the ability of machines at the beginning of the industrial revolution to deliver, for a similar size and cost, 100+ times as much power as a human being. We know today that this machine-human ratio in machine tools has grown to orders of magnitude differences in the hundreds of thousands.

The NE revolution elevates orders of magnitude differences to the millions and billions. Not only are computers that much faster at processing digits than human beings, but they are capable of perfect accuracy, a statement which is not true of mechanical devices (machine tools) versus humans. Cost savings are not yet in this range, but they are cer-

tainly dramatic. The first signs of this are in the small staffs of the surviving and successful dot.coms and the large number of customers they are serving.

The second major change in economics is the complex interrelationships between organizations and their stakeholders. The simple model of the firm relating to suppliers and customers has completely broken down in the NE era. Firms now have intricate linkages to those supplying them with raw goods and those who are performing some parts of the value chain for them. They also hire assortments of intermediaries to assist in fulfilling the order and delivery processes. Competitors are not ruled out as possible partners in given enterprise initiatives. And customers are now viewed in the larger light of sometimes being customers, sometimes outsourcers, sometimes investors, and sometimes suppliers. In short, the modern virtual organizations is a patchwork quilt of core competencies that includes the ability to coordinate multiple partners in creating products and services, moving them to the customers and delivering after-sales support. A detailed discussion of virtual organizations and their economic power is found in Chapter 10.

What is the New Economy? The Old Economy is often identified with firms that focus on traditional sources of revenue, such as manufacturing and value-added services associated with physical goods. Heavily information–intensive, New Economy firms focus on information value-added services, ICT (information and communications technologies), or other high technology offerings. If there is a paradigm shift, then it must be occurring in the domain of the changes to intellectual creation and substitution of information for physical processes that we have talked about.

It is clear that the production and servicing of physical goods and machines will be with us for a long time. But even firms that are now locked into making money through physical assets can become more flexible by forming relationships with other firms that have certain physical processes as their core competency. UPS specializes in delivering packages the last logistical mile. The vast majority of firms are incapable of performing this service half as well or as cheaply as UPS. UPS is becoming a virtual warehouse for other firms and, again, unless a firm has a core competency in inventory management, New Economy firms will shed these physical assets and hire package delivery firms to handle these kinds of deliveries.

Not every firm can or should become entirely networked, eliminating all its physical processes. Even if a machine for converting energy directly into products and services were to be widely available, we would still need machines to make the machines to make the machines, in an infinite regression. But where information can short-circuit material processes, it should.

2.1 Dramatic Reductions in Production and Exchange Costs

The most obvious economic difference between Old Economy traditional bricks and mortar business processes versus New Economy "clicks" or "clicks and bricks" business processes is the lower cost of doing business. The terminology here helps us to sort out one main difference. The overhead in running a warehouse or a retail business is directly tied

to the "bricks" that are required to shelter goods and personnel, and upon which one must maintain security, insurance, and so forth. Physical facilities are expensive as are the personnel needed to staff such facilities.

Now imagine an online storefront where sale goods are displayed on virtual shelves and questions about these goods are answered through an expert computer system. Theoretically, the store can be selling to hundreds and thousands of customers with computer systems that cost little more than a few dozen employees, at most. Assuming for the moment that the systems are "flexible," "robust," and "scaleable" (these terms will be explored later in the Chapter 4, "Basic Infrastructure"), customers can be served on a global basis 24 hours a day and 7 days a week (24 x 7). It is clear that the physical experience of shopping in stores is not equivalent to shopping at hp.com, for instance. Nevertheless, there are trade-offs that make the online experience as viable as a physical experience, and if these can be substitutes or better than substitutes in the customers' mind, then the costs of running a business are astonishingly lower for firms at their end of the exchange.

Besides the substitution of information for physical facilities, another way to lower production costs occur through the intensive substitution of information for physical processes. Let's take the example of the Dutch flower industry. The method of grading and inspecting flower lots is shown in Figure 2.1.

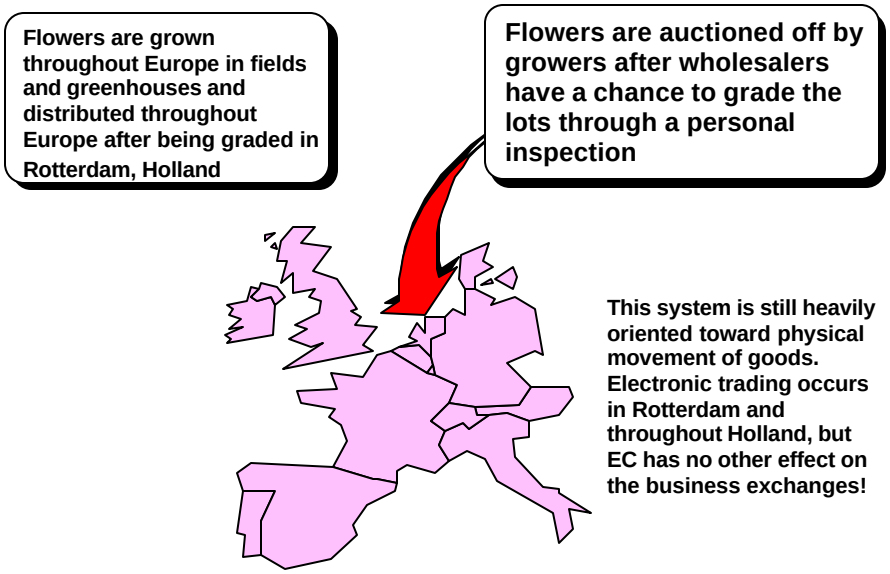

Figure 2.1. Economic Setting of the Dutch Flower Market

In this industry, flowers are flown from the locale of production (that is, where the flowers are grown) to the auction in Rotterdam, Holland. At this point, they are graded and priced for the market. Buyers can inspect the quality of the flowers and determine their bids for

certain lots. Once the flowers are purchased, they are flown to destinations for sale by retailers.

The physical elements of this process are shown in Figure 2.2. The process is labor- and capital-intensive in that people move from lot to lot and the investment is delayed until lots are purchased and delivered.

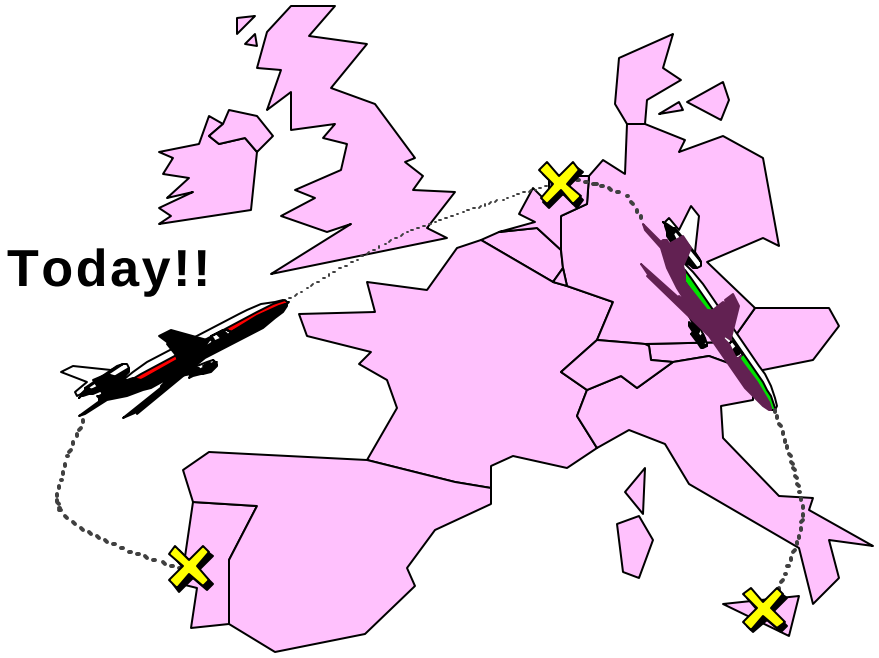

Figure 2.2. Current Movement of Goods in Dutch Flower Market

The Dutch Flower market is in the process of reengineering this cycle to eliminate the need for the physical inspection by buyers. A computerized auctioning system known as Buyer-at-a-Distance Auction (BADA) has been successful in permitting off-site grading and pictorial displays of flowers via network connections.[1] Coupled with ratings by trusted sources who are on-site, the BADA application gives inspectors enough information to bid on the lots remotely and to negotiate other terms online.

Figure 2.3 shows how the online system has cut out part of the physical chain by substituting information about flower lots for the in-person inspection. The Dutch Flower industry

[1] Van Heck and Ribbers, 1997

has profited from the experiment by facilitating broader participation as well as speed in the cycle.

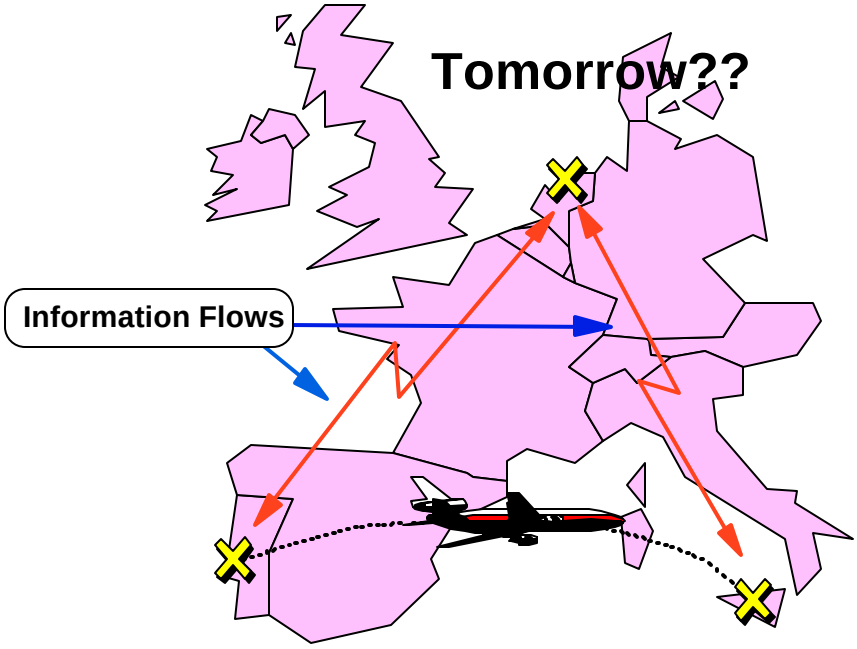

Figure 2.3. Future Movement of Goods in Dutch Flower Market?

How can information substitution continue to be used to drive economies in this industry? Figure 2.3 indicates a possible avenue that would carry the transformation on to a logical extension. If information can be substituted for onsite physical inspection, flowers can be flown directly from production to market, cutting out one expensive physical link in the value chain. The quality of imaging would be a key factor in whether these inspections can be conducted remotely. Alternatively, local trusted sources could rate the lots, and this information could be associated with each lot. As technology progresses, there is little left to the imagination if there comes a time when holographic images of the flowers can be beamed across the Internet and inspectors can evaluate their bids in any corner of the globe. Such dreams are now just that, dreams, but in the not-too-distant future, they will be realities.[2]

Given this scenario, where are the real monetary savings for such an organization? As transactions become more virtual, that is, taking place through the assistance of electronic networks, the economies of the Internet take over. Transactions over the Internet are measured in cents and pence, not in dollars and pounds. The transportation of bits is dramatically less costly than for atoms, as Negroponti points out in his book *From Atoms to Bits* (Negroponti, 1995).

[2] See the discussion of the transmission of holograms over Internet2 in Chapter 3, however.

Operating at Internet speed is another consideration. The time that it takes an inspector to view lots and enter bids over an online system is drastically lower than in a physical system. Moving a group of inspectors around a warehouse from flower lot to lot is physically demanding and time-consuming. Other buyers are also eager to "look over the goods" and there is time lost in waiting for a good view of the lots. The final part of the buying cycle is the entering of bids. Again, the physicality of this process limits the efficiency with which this can be carried out. Time is lost as the sellers sort the bids, and perhaps even enter them into a computer system for analysis and decision-making.

Physical transactions are orders of magnitude different from NE transactions in nearly all cases. If the firm's costs for completing the transaction drop by 99%, and the velocity of transactions is increased by some factor at the same time (meaning that the elapsed minutes to complete transactions is lowered), then the firm has the financial capacity to do at least 100 times as much business as previously. Figure 2.4 shows some of the dramatic cost savings compiled by Andersen Consulting (now Accenture) in the banking, securities, and travel industries.[3] Assuming that computer systems can replace manual activities, a technology infrastructure can affect productivity in numerous and varied ways (Malone et al., 1987).

Figure 2.4. Cost Savings from 'Net'-Enablement

The exchange of business information between parties, either between business and business or between business and consumer represents a cost, but this cost is broader in concept than the transaction costs which are the object of study in transaction cost theory.[4] Transaction cost theory will be discussed later in this chapter, but for the moment it is sufficient to indicate that transaction costs are the costs of moving from an internal provision

[3] Steve Freeman, Andersen Consulting, March 11, 2000, Atlanta Ritz Carlton

[4] Malone et al. (1987) perhaps mean "exchange" costs rather than "transaction costs" when they discuss the desirability of moving to online exchanges of information in order to lower costs. The issue here is not really a choice between an internal hierarchical provision and and external market provision, which is what "transaction costs" usually mean.

of a good or service to external provision in the marketplace. These include costs such as searching for a vendor/provider, negotiating a contract, monitoring the external provider, etc. Figure 2.5 illustrates how the Web could be used to replace some of these physical costs.

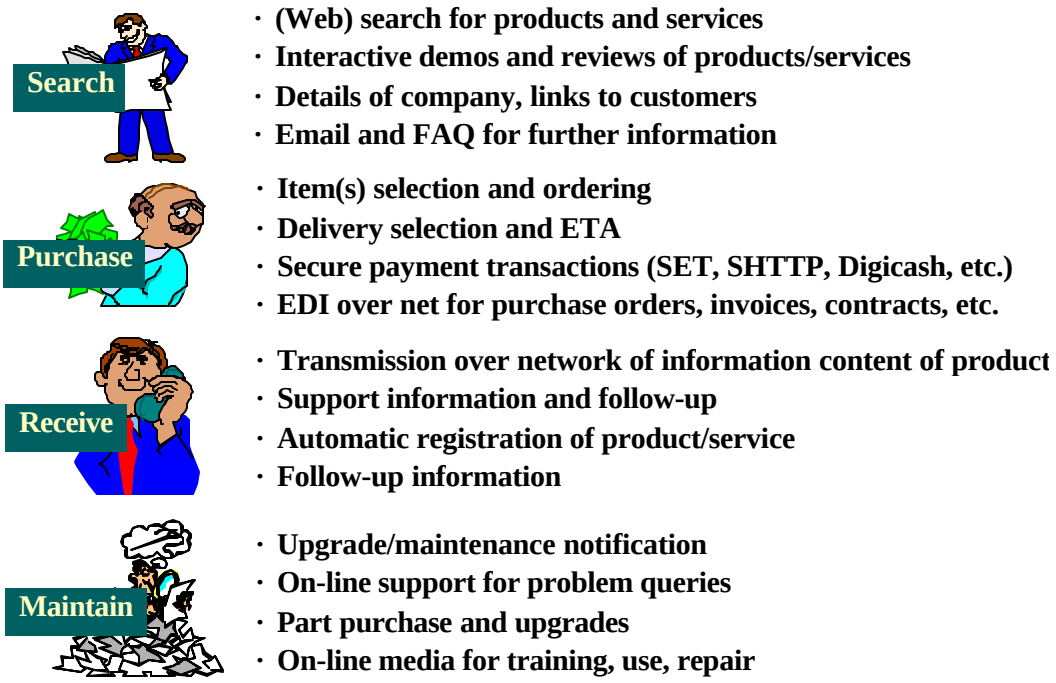

Figure 2.5. Web Reductions of Transaction Costs in a Purchase[5]

Business exchanges also have a value chain. Lowering the costs of a business exchange are outlined in Malone et al. (1987). Networks give managers access to information about products and services that are expensive to acquire in a more physical world. These transaction costs are dramatically lowered in a world of electronic connections between firms and other firms and between firms and customers (Malone et al., 1987). Another part of the exchange that lowers the cost, theoretically, is the time-saving for the parties.

The range of exchange costs includes transaction costs, but both have a distinct impact on e-commerce. Exchange costs are part of the fulfillment process, as shown in Figure 2.5. They accompany production costs and are certainly part of the overall costs of goods or services sold in the accounting sense.

[5] This graphic is courtesy of Dr. Richard Welke, Director of the e-Commerce Institute, Georgia State University

2.2 Manipulation and Global Dissemination of Symbols

New economy businesses manipulate symbols rather than physical objects. And these businesses are able to disseminate these symbols throughout their cyber domain for further manipulation.

Substituting information for physical processes is different from this manipulation. In the case of the Dutch Flower example, flowers can be flown from Spain to England because information has replaced physical inspections and approvals. But the representation of these flowers, down to the minutest level of detail, means that we have abandoned physical counting systems and replaced them with symbols that can be manipulated for further managerial decision-making.

Let's take the example of flowers again to illustrate this principle and the differences between doing business in the new economy and doing it traditionally. Flowers may be physically transported, as lots, from greenhouses and fields in Spain to Rotterdam, and then onto England. Taking advantage of the substitution effect, new economy businesses can avoid the physical transference to Rotterdam. As we discussed in the last section, this saves the time and expense of a complete leg of the journey of the flowers from supplier to retailer.

But suppose the flowers are on a fast boat to England from Spain when a last minute rush order has negotiated a premium price for particular lots of the shipment bound for England. The fast boat on the following day would still be timely enough for the majority of lots in the shipment, but not all.

The substitution of information for physical processes has allowed a direct movement of goods from producer to consumer (retailer, at least). But it does not inherently allow for the further manipulation of the physical objects, flowers, to dynamically reprogram the order en-route.

The only physical way to accommodate the rush order customer would be to physically match each arriving order with a physically sorted and calculated list of lots or sub-lots which were not time-critical. In short, the lot of flowers retain a physicality that does not permit the process to manipulate them readily.

If the lots were represented by symbols rather than by their own physical existence, a new economy business could manipulate the symbols and dispense instructions for sorting and handling to the landing dock yard, or, if there were sorting devices available, aboard the ship itself.

Figure 2.6 illustrates how sub-lots that matched the requirements of the rush order could be segregated from physical flower lots to maximize the value for all current customers.

What would be required for such a process to collect data, repurpose the order, and vet the change order? Flowers would have to be sorted into sub-lots, which, based on historical

change options, would be marked with meaningful symbols for future manipulation. Bar codes have been a traditional physical way of marking such products. Inexpensive, barely discernible chips, however, have the ability to be read from any position and angle by unobtrusive scanners.[6]

Modularization is the key to this dynamic rearrangement of shipments and orders. But modularization is only possible to the extent that the data is captured, manipulable, and communicable to the parts of the network that need it.

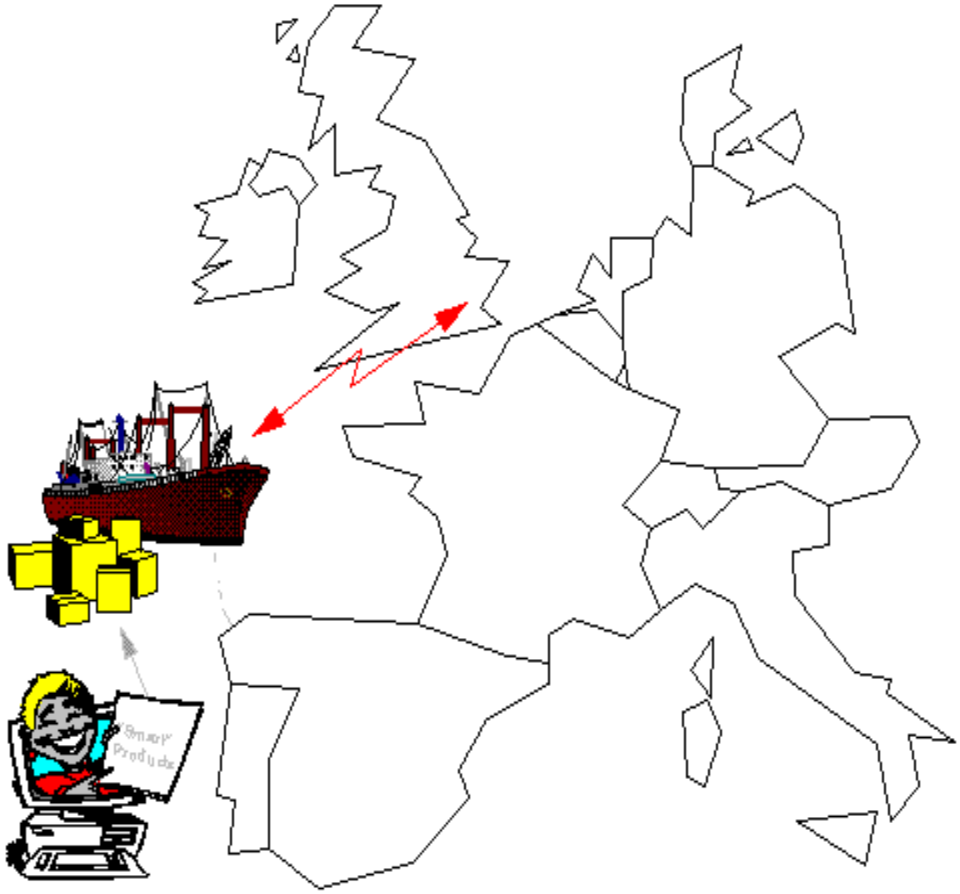

Figure 2.6. Ship at Sea with Sub-Lots being Dynamically Reprocessed

[6] Chip readers or scanners are capable of picking up identifying numbers from chips embedded in the shoelaces of runners in races, from the windshields of cars whizzing down the highway, and from other obscure and buried locales. They represent the next logical and new economy extension of bar codes, which still depend on physical representations, the physical lines that are inscribed on the bar. If these lines become physically marred or removed, the code is unreadable. Chips are clearly still physical, but they are closer to the symbols themselves. They embed digits directly, rather than analogues of those digits, as in bar codes.

The creation of symbols as stand-ins for physical goods has been a long term process which has evolved over the century and more. Figure 2.7 shows the growth of information work in the US during the 100 years from 1890-1980. It is clear that information as the inputs and outputs that knowledge workers deal with has been at the expense of workers with physical processes, such as manufacturing jobs and farm jobs. Technology uses information to carry out physical processes with orders of magnitude improvements in efficiency, and this has resulted in a dramatic shift in where human labor can be most effectively employed.

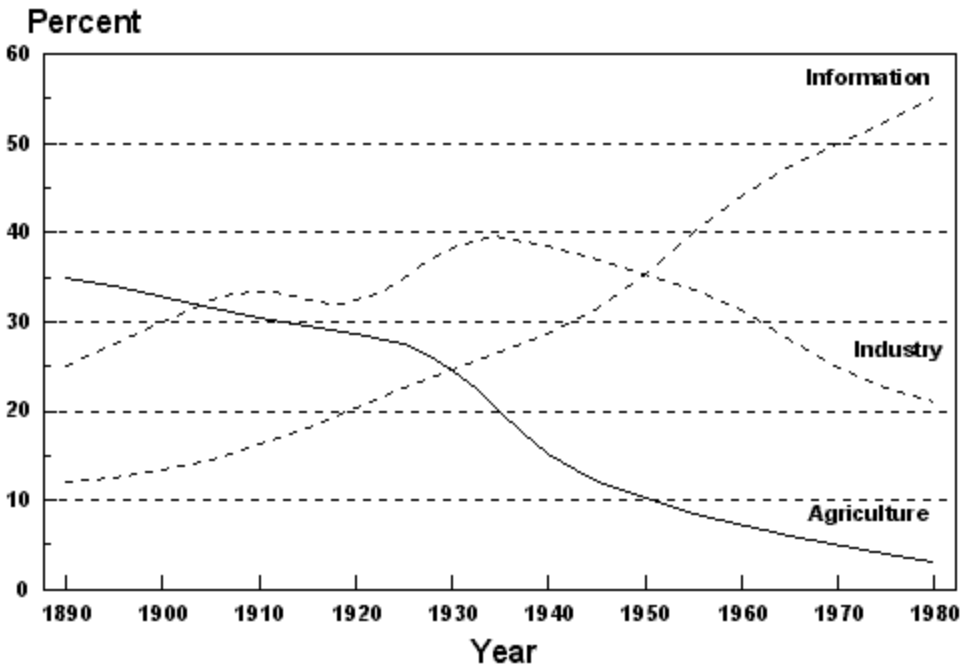

Figure 2.7 Distribution of Knowledge Eokers in the United States, 1890-1980

To understand the long time consequences and meaning of such changes, one only has to think of the difference between the railroad spike nailing abilities of John Henry and the machine in the traditional American ballad. In the ballad, John Henry wins the contest with the machine, but then dies of exhaustion. A modern computer-controlled machine for spike driving would be programmed to treat all aspects of the task with precision and speed and each spike would be pounded with the exact amount of pressure needed to hold the rail in place, and it would be able to manage its inventory of spikes and spike coating besides so that there would be no delays in materiel required to do the work. Finally, there would be no contest with a human opponent. The computer-controlled machine would be hundreds or thousands of times as efficient becuase of its ability to treat the parameters of the job as symbols and to use this information to carry out the task perfectly again and again.

3 MOVING TO THE MARKET FOR SUPPLIERS, COMPLEMENTORS, AND SUPPLEMENTORS AND INCURRING NEW TRANSACTION COSTS

Theorists contrast the decision of firms to build or manufacture themselves versus purchasing these goods from others. The terminology that is often used to characterize this decision is "Build versus Buy." In the New Economy, this decision is much more complex in that it also includes services. The terminology in this case contrasts internal provision of a service ("in-house provision") against external provision ("outsourcing.") What is the decision-making process in the New Economy that leads firms to build versus buy, and insource rather than outsource?

The form this debate took in the 1990's was the so-called transaction cost theory. More restricted in scope than the transaction costs described in Malone, et al. (1987), transaction costs for New Economy businesses are the extra costs associated with moving to the marketplace to acquire goods and services. If a firm decides to purchase externally, there are processes and procedures that must be followed to ensure that the firm has done its "due diligence." A sampling of "transaction" costs are shown in Table 1.

Table 1: Sample Transaction Costs

Transactions Costs	Description
Search	Costs to find firm able and willing to sell desired goods and services
Decision-Making	Costs to determine relevant bidders
Negotiating	Costs to determine mutually agreed upon deliverables and pricing
Bonding	Costs to insure against failure to deliver or sub-performance levels
Legal	Costs to investigate and formulate contracts
Monitoring	Costs to monitor ongoing outcome performance

Transaction cost theory argues that the firms will choose to "move to the market" when it is less expensive to achieve its goals by purchasing from the marketplace than it is by provisioning internally. The following simple formula represents this concept:

Internal production costs[7] > Transaction costs + External price of goods/services[8]

[7] Termed a "hierarchy" in transaction cost theory for the typical firm structure that is capable of producing goods and services internally.

[8] See Ang and Straub [, 1998 #37] for an empirical analysis of this tradeoff in information systems decisions.

Old Economy firms are just as subject as New Economy firms to the theoretical pressures to build or buy as expressed in transaction cost theory. If the move to electronic markets to fulfil firm needs is less expensive (and especially if it is *much* less expensive), then both Old and New Economy firms could decide to cease provisioning themselves.[9] For the moment it is only important that we recognize that transaction costs are necessarily higher when a firm buys from the marketplace.

3.1 Transaction Costs versus Business Exchange Costs

For these reasons, transaction costs are certainly relevant to New Economy firms, but business exchange costs are even more germane. The cost of business exchanges can be much lower using networks like the Internet since the physical costs of carrying out the searching, negotiating, etc. that are part of the transaction are expensive (See Table 2.2). New economy firms will go to the Internet to save these physical costs, especially in the B2B or business-to-business setting, as we shall see in Chapter 3.

Table 2.2 Physical versus 'Net' Business Exchange Costs

Physical Business Exchange Costs	Description
Transaction costs	Physical costs to find bidders, negotiation, guarantees, writing contracts, and monitoring
Invoicing	Costs to handle a physical bill
Payment	Physical costs to pay
Movement of goods/services	Physical movement of goods/services

'Net Business Exchange Costs	Description
Transaction costs	Internet costs to find bidders, negotiation, guarantees, writing contracts, and monitoring
Invoicing	Costs to handle an electronic bill
Payment	Internet costs to pay
Movement of goods/services	Digital movement of goods/services

Let us consider the case of two firms in the auto body repair business, one operating according to Old Economy principles (Call-Around Auto Body) and one according to New Economy principles (Surf-the-Net Body Shop.com). The physically-oriented body shop Call-Around Auto Body will make phone calls to locate auto parts necessary to make repairs. Because there are a limited number of suppliers that can be reached given the margins expected from a single repair, a full search can never be undertaken. Theoretically, therefore, a sub-optimal price[10] for supplies results from such labor-intensive searches as well as the higher personnel costs from the search process. Finally, the physical movement of the parts from the suppliers to the firm and the physical invoicing and payment processes also raise the overall business exchange costs.

[9] Chapter 10 discusses these issues in greater depth.

[10] These limitations on search costs are known as "bounded rationality" and were first discussed in Herbert Simon's work. See Simon (1965); Simon (1957); Simon (1956).

Surf-the-Net Body Shop.com not only advertises its service over the Web, but it also uses the Web to find the suppliers and parts it needs. Price adjustments, if any, are negotiated online. This New Economy firm has much lower overall exchange costs. Its transaction costs are lower and it finds optimal prices for its parts.[11] Furthermore, it uses the Internet to complete the exchange by electronically handling the bill and paying the charges. If Surf-the-Net Body Shop.com were also in a business that involved intellectual property, that is, if it sold digital goods or services, it could also choose to deliver these online. Companies like software manufacturers frequently offer the option for delivery of the software over the Internet. Consulting firms like Ernst & Young are also offering their services online.[12]

Therefore, even though transaction costs are higher when one goes to the marketplace, this is true for both EC firms and those that are more physically based. The major difference in economics between the two types of firms is the much higher business exchange costs of the traditional firm. The formula below expresses this relationship.

EC business exchange costs < Physical business exchange costs

4 THREE PRINCIPLES OF E-COMMERCE TIED TO THESE EMERGING ECONOMIC REALITIES

There are three principles of digital business that drive the New Economy. They are:

Principle #1: Substitution of Less Expensive, More Effective Information-Driven Processes for Physically-Driven Processes
Principle #2: Use of Open Systems Architectures and Standards
Principle #3: Enhancing Products and Services with Information

A brief description of each of these principles follows. What is important to remember is that the e-Commerce revolution is not occurring in a vacuum? Businesses would not be moving to e-Commerce unless there were convincing economic realities that support these decisions. Managers need to be aware of the economic impacts of these decisions so that they can accurately forecast the benefits from the change and exploit all advantages available to them.

4.1 Principle #1: Substitution of Information for Physical Processes

As discussed above, networked organizations are able to displace physical activities. It is not just the cost savings that are important here, although these are not inconsequential. A firm that has information at its command can short-circuit long and cumbersome physical systems to respond more effectively to customers.

[11] To see how this works in actual firms, see Choudhury et al. [(1998)
[12] Jaworski (1998)

Let's take the example of the Dutch Flower Market once again. Suppose that there is a pressing need for certain varieties of flowers in Sicily, but that the physical fulfillment process requires that this less popular variety must be inspected and graded first in Holland. The physical process of shipping the flowers to the Netherlands is not only more expensive, but likely to result in the loss of sales in the case where a specialized order calls for speed.
The ability to grade and immediately ship flowers directly from Spain to Sicily maximizes the information-rich capability of a process enabled by e-commerce.

4.2 Principle #2: Use of Open Systems Architectures and Standards

For the moment, we can define "open" systems architectures and standards as those technical features of a network that allow for free and open exchange between all parties in a market. More will be said about these architectures and standards in Chapter x, Infrastructure.

The economic impact of architectures and standards on a marketplace is related to competitive power. If certain players in a marketplace control the technical standards, they can also control prices and availability of products that utilize those standards. With 90% of the microcomputers in the world using the Wintel platform, for example, Microsoft through its Windows Operating System and Intel through its patented central processing chips are in a dominant economic position. The effect of this market dominance is to suppress competition and to exploit a monopoly position. This, and reasons below, are why the US Dept. of Justice was able to pursue an anti-trust legal case against Microsoft.

At one time, standards for Web browsers were more competitive with Netscape as the leader in browsers, with Microsoft's Internet Explorer (IE) a distant second. Microsoft has, however, gained a commanding lead in the browser market as they did in PC operating systems. This, the US government argued, resulted in restraint of trade and a non-competitive business climate.

In spite of the "closed," proprietary standards of many of the basic infrastructural elements of the client-side of e-commerce, the rest of the industry structure is much more competitive. There are dominant players, like Cisco in routers, Dell and Compaq in servers, but none enjoy the monopolistic power of Microsoft and Intel in their respective industries. The telecomm industry is highly competitive in the US and becoming deregulated elsewhere at a blistering pace, so that access to the Internet is becoming universally less and less expensive.

In order to retrieve and display Web pages, browsers read html (Hyper-Text Mark-up Language) code and that of a group of other programming languages like Java, C++, etc. HTML is an open international standard, as is its successor XML (extensible Mark-up Language). No firm has a proprietary hold on the selling or licensing of this standard.

We shall see many other cases of "open" e-Commerce systems and standards in Chapter 4. The economic principle that is being argued here is that the more open systems and stan-

dards are, the more competitive the marketplace. This should lead to a more vital and innovative e-Commerce industry and better products and services for consumers and businesses.

4.3 Principle #3: Enhancing Products and Services with Information

Embedding information into what businesses trade on allows for more informed processes throughout the entire system. A product that can be tracked back to specific times, machines, labor, shipments, and so forth can lead to improvements in manufacturing. Defective lots can be linked to defective machines or work habits, for example. Service-provision can be much more efficient and of higher quality, especially when maintenance is involved. Linking repair work with parts and the replacement of defective parts can inform the entire business process of after-sales support.

From a marketing standpoint, information embedded in products (and services) allows managers to forecast demand and quickly respond to changes in the marketplace. Walmart's sharing of information about its sales is only possible because each sale item is uniquely coded, and this information tells suppliers when shelves need to be restocked.[13]

Tapscott's "smart" bread is a classic example of the essential meaning of this principle.[14] No bread is truly "smart," of course. But if information about the purchasing of certain kinds of bread at certain times is utilized, a firm can learn a great deal about customer behavior. If a customer regularly purchases a speciality bread every Friday, then this helps to forecast demand, most immediately, and to cross-sell, more indirectly. Speciality breads may accompany gourmet dinners, and customers may be induced to buy with promotions sent by email over the Internet, or "pushed" as a Web page when they are online. We will examine the circumstances under which a firm may want to pursue this strategy later in the chapter on "e-Marketing." For now, it is enough to see that without embedded information, none of this advanced marketing would be possible.

One final observation is relevant here. Products and services that can be tracked, monitored, and dyamically rerouted or repurposed depend on information visibility. "Information visibility" is a term that represents the amount of sharing of internal information, much of which is embedded, with suppliers, strategic partners, and customers. The concept of "full" information visibility has been bandied about in the press, and, for sake of discussion it calls for a working definition, at least. It appears to mean that information about goods and services are "visible" to all parties up and down the value chain. If a wholesaler is clued into the sales of retailers, this party can ensure that stock-outs do not occur, assuming that the wholesaler can acquire merchandise. If the manufacturer is aware of the sales of the wholesaler, and even the sales of the retailers, plant capacity will be better planned, and wholesalers will be well supplied.

As we shall see in the chapter on intermediation, there are reasons why "full" information visibility may or may not develop among firms, or within an industry. Distributors do not

[13] Walmart EDI case needs to be cited here.

[14] Tappscott's Digital Economy?? Not quite sure which of his books this is from.

want to be disintermediated, and hiding information may be perceived as part of their value-added. Moreover, few firms will be sharing their internal cost structures, as this will signal how low a price for their offerings can be made.

The point of this discussion is that information can enhance services and products, in wuch a way that it goes beyond a simple substitution for physical processes.

4.4 Novel Sources of Income in the New Economy

Loebbecke et al. (1999) present four income sources for 'Net'-enabled businesses.

1. Increased revenues via products/services from larger global market from more effective product marketing on Web
2. Increased margins from lower internal costs (low cost computers deal with the customer and the delivery of goods and services) from higher prices due to value-added services to the customer (information attached to product)
3. Increased revenues from selling cyberspace, from becoming a portal
4. Value-added content sold from selling searches, access to data, electronic documents

Whereas the first two of these income sources are not any different from traditional business sources of income, the latter two are. All firms try to expand their markets and lower their costs, but traditional, Old Economy firms are not able sell cyberspace nor are they able to sell content over the Web. As also argued in section 3 above, Loebbecke et al. emphasize that there are economic efficiencies inherent in Internet commerce.

Web content offers a unique presentation format, accessible worldwide and 24x7, but in other respects it is not terribly different from print media. Income source #3, however, is particular to e-Commerce and represents an e-Commerce business model that has no analogue in the bricks and mortar world.

5 INCREASING RETURNS TO SCALE IN THE NEW ECONOMY (E.G., MICROSOFT) VERSUS DECREASING RETURNS TO SCALE IN OLD ECONOMY (E.G., SMOKESTACK INDUSTRIES)

5.1 Marginal costs nearly zero for Microsoft

Economies of scale mean that a firm can produce such high volumes of goods that its production costs are minimized. Why would this be so? When manufacturers in a free market buy raw materials from suppliers in bulk, they are able to negotiate the lowest cost since the suppliers can make a profit on the volume of materials sold. Larger volumes on all sides result in lower prices all around.

The concept of low price producer readily moves up and down a value chain in that each intermediary can pass cost savings onto their own customers in order to induce larger volumes of sales. The fundamental principle is that a larger scale of production leads to lower costs of production and thinner margins, which are made up in volume.

The ability to fully use the production capacity of a plant is another example of economies of scale. If the overhead needed to support a plant pays for only one 8 hour shift, then the plant is only being utilized ½ (or even 1/3) of the workday. Adding shifts increases the efficiency of the use of the physical assets.
As another example, think about the economies of scale in the airline industry occur when there are slack resources[15] in fleet utilization that would allow flights to depart rather than be cancelled. Smaller airlines do not have a large enough fleet to have resources that can be repurposed at a moment's notice. By not having such degrees of freedom, smaller firms will have to pass up sales opportunities and deal with maintenance impacts on the means of production in other, less efficient ways.

New economy producers of intellectual goods experience the same economies of scale, but it is sometimes manifested in a slightly different way. In software, for example, companies do not need factories with certain machine tools to design and make software, but they need cadres of qualified professionals who can turn out well-formed code that is error-free. Since machine tools are not involved in the creation of products, the relationship between the intellectual capital required to innovate and productivity is present, even though it is not physically-derived. Large pools of expertise to draw on and large libraries of reusable code should equate to production efficiencies.

The terminology used in economics to stand for this concept is "returns to scale." Returns to scale can be either constant, decreasing or increasing. Economies of scale suggest that as the scale of production go up, the efficiencies of production also go up (as in costs of goods going down). Figure 2.8 depicts these as "increasing returns to scale." Constant returns represent that equilibrium point where adding quantities of production does not yield economic advantages. Supplier prices may have been driven to their absolute minimum and increasing the scale of production does not affect these costs. Also known as the "law" of diminishing returns, decreasing returns to scale occur[16] when the labor capacity of a plant is maxed out, and additional units of production require paying workers overtime, or one and half times their usual wages. The average cost of a production unit determines when the economies change[17] and all that is crucial to know at the present time is that in Old Economy, physical, traditional manufacturing, firms reach a point where adding production will not help the firm's bottom line.[18] New Economy firms, however, may be exceptions to this rule in certain cases.

[15] Bourgeois (1981)
[16] Nguyen (1990)
[17] Nguyen (1990)
[18] Varian (1996)

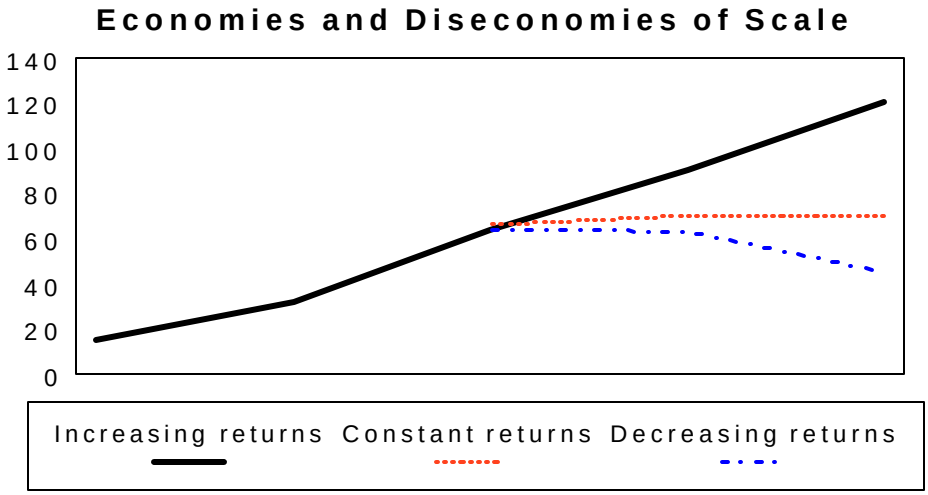

Figure 2.8 Scale Economies

Let us consider the case of Microsoft as a firm selling various forms of intellectual property in the New Economy. Whereas there may well be economies of scale involved with developing software (and, therefore, decreasing returns at some point), as argued above, the marginal cost of producing a unit of Microsoft Word 2003 once the R&D fixed costs have been recovered is very low, to the point of approaching zero. Software can be distributed online and payment for the product can also be handled electronically through various e-Payment options. Once the distribution application has been set up and the code for payment established, the same application can be used for a variety of software products, and it can be used over and over again.

To service 1,000 customers a month certainly requires a certain level of expenditure for hardware, but to service 1,000 time this number, a million customers a month, does not require a proportionately larger hardware investment. The hardware must have the capacity to handle 1,000 times the volume, but the cost of larger servers drops exponentially with size and so there are palpable savings for firms distributing their own intellectual property over the Internet.

If the firm's marginal cost is nearly zero for new units of production (which is the cost of creating and distributing one additional unit of Windows 2000), then a firm that is not in a smokestack industry can, conceivably, reap huge profits from increasing returns to scale. The more closely a firm resembles smokestack industries, with huge facilities for production, the less true this will be.

6 CAPITALIZING E-COMMERCE ACTIVITIES?

How much does an e-commerce effort cost a firm? From the standpoint of basic hardware, system software, and networks, the costs are not high. Powerful server- and client-side systems can be set up for relatively small investments. And the marginal cost of adding a supplier or partner or customer is very small.

The major s/w (software) and h/w (hardware) investments in e-commerce are twofold: (1) creation of initial and ongoing "stickiness" in their business-oriented or consumer-oriented Web sites and (2) links to legacy systems. Legacy systems are the application infrastructure of a firm, the computer systems that record and manipulate order, operational, logistical, and marketing functions. Integrating these systems, which may not be connected among the various product lines or divisions of the firm to begin with, must be tied in to the new e-Commerce system for both supplier-facing and customer-facing activities. This is a nontrivial investment.[19]

The economics of doing business in the New Economy require managerial due diligence to estimate the costs and benefits of implementing certain EC strategies. Links to legacy systems are going to be one of the highest costs.

The second major capital cost in e-Commerce is the functionality of the Web site. As we shall see in the chapter on "e-Strategy," there are options to bring different parts of the value chain "online." There are tradeoffs with each of these as well as costs. A site that offers only brochureware is not expensive to put up. But the advantages it offers and its ability to hold customer interest is minimal. First time visitors are one measure of success, but if users never return to the site, then the site may be actually counter-productive for the firm.

Web sites should be "sticky" for first-time and return visitors alike. The costs of maintaining up-to-date and valuable content is substantial and not an expense that many firms are willing yet to wholeheartedly embrace. The firm Web site is not the only way e-Commerce expresses itself in a networked organization, but it is one of the most visible ways. Sites that are ghost towns of never-visited hyperlinks will not serve the organization well. Sadly, many firms are in the position of having ghost towns for Web sites, however.

7 SUMMARY

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[19]Gartner group estimates that an initial investment for a large firm may be on the order of US $1million. This includes a fairly elaborate connection to legacy systems for processing orders. Clearnly, the extensiveness of the initial Web site has a lot to do with the size of the required investment. A site for inquiry by customers, partners, and prospective employees is not nearly as expensive as one that performs end-to-end order fulfillment.