

Chapter 10: New Types of Firms

“In this book, we argue that companies playing the infomediary role will become the custodians, agents, and brokers of customer information, marketing it to businesses (and providing them with access to it) on consumers’ behalf, while at the same time protecting their privacy.”

John Hagel III and Marc Singer, *Net Worth: Shaping Markets When Customers Make the Rules*, p. 19, Boston, MA: Harvard Business School Press, 1999.

Prologue

Infomediaries, as the above quote suggests, are a special kind of intermediary, trusted third parties acting as agents for consumers. In this intriguing, and admittedly speculative idea, Hagel and Singer, drawing on their work for consulting giant McKinsey, argue that while the technologies of the Internet now make capture of information about consumers easier, consumers will eventually be able to control their personal information. That means that sellers of products and services will have to become information buyers. At the same time, the explosion of information about products and services (and in the variety of those products and services) means that “Consumers won’t have the time, the patience, or the ability to work out the best deals with information buyers on their own.” Enter infomediaries.

Infomediaries as described by Hagel and Singer are just a very particular and dramatic example of how the information revolution can lead to new types of firms. Information services of all kinds have proliferated. Search engine firms became portals and e-tailers. Digital information has become something that can be packaged with anything. Is the information being used to entertain? Is it to inform? Is it to entice? What exactly is that web site for? Can we sort out and classify the kinds of firms that are emerging in the e-commerce landscape, in terms of what they sell and how they sell it?

When does e-commerce involve selling new products and services, and when is the firm itself, the way of selling, the only new thing? Is there anything different about retailing online? How is Priceline a different kind of firm than Travelocity, if I can buy airline tickets from either of them?

Read on!

10.1 Introduction

In the last chapter, we described the physical characteristics of digital products and services, and the fundamental economic properties of information products. Now we examine the kinds of firms that offer various products and services. E-commerce firms are distinguished by the particular combinations of information services, time services and (possibly) physical products and services. One of the distinguishing features of e-commerce is that information can be separated from physical products. Information no longer has to be delivered tied to a physical form. The economics of information mean that many kinds of firms that specialize in providing information can operate. We provide a classification of many of these kinds of firms.

In the next section, we briefly discuss different standard ways of classifying firms, and then provide a classification scheme for e-commerce firms: information request services, e-tailers, exchanges and brokers, community creators, portals, infomediaries and infrastructure providers. The distinguishing features of the first six of these different types are the nature of the information that is provided, and how it may possibly be combined (or not) with time services and physical products and services. We examine the different cases in Sections 10.3 through 10.8.

Section 10.9 looks again at infrastructure providers, which were first examined in Section 9.6. The Internet's infrastructure is far from weightless, and it may provide some of the most attractive economic opportunities for firms striving to meet the needs of e-commerce. A parallel may be offered here. Wal-Mart's huge success as a retailer has been built on managing its distribution and inventory, just as much as on the products it carries and the service provided in its stores. Firms that can manage the storage and distribution of information for e-tailers, and information in general, may be in a position to capture much of the value that is created in the process of e-commerce.

10.2 Classifying Firms

Many broad classifications of firms are possible. We can do so by the kinds of products and services they provide, by the kinds of industries they are in, the competitive structures of those industries, and how firms conduct themselves. All these methods of classification are, to some extent, related. We outline some alternative classifications of firms in this section, as a basis for discussing the new types of firms that the new economy engenders.

Classification by Product and Industry This focuses on what firms make, or what service they provide. Industries are broader than products, though we might define products to coincide with industries. For example, computers are the product of the computer industry. Within the computer industry, however, there are mainframes, minicomputers, servers, and desktop PCs, as well as a host of other products. We might narrow the definition of the industry further, so that we speak of the PC industry. However, we can always narrow down the definition of products further than the definition of the industry. Hence, we can classify PC products by manufacturer (Dell, Compaq, HP, Apple, etc.) and by other characteristics (processing speed, storage capacity, accessory capabilities), but it does not make sense to speak of 'Compaq PCs with Pentium processors' as an industry.

If firms are extremely diversified, then they may not even fit into one industry, but in general we can classify firms by the industry they are in, which implies that they provide a set of closely-related products and services. The relationship is usually determined by the technologies used in production, and the nature of the needs being fulfilled and customers being served. This classification of firms is the one that was used in Section 5.6.

Classification by Industry Structure An economist may often abstract from the particular nature of the products or services being provided, to focus on the economic essentials of the industry. Thus it may not be economically relevant if firms are producing cars or computers, but only whether the firms in the industry have some market power or not, and what the source of that market power is. To put it very simply, the two sources of market power are product differentiation and barriers to entry. Product differentiation alone can lead to pricing power, but not to positive economic profits. Barriers to entry can lead to both pricing power and positive economic profits, either alone or in conjunction with product differentiation. Barriers to entry can arise from economies of scale, or from various incumbency advantages (reputation, and customer switching costs in particular). Thus we are simplifying somewhat by identifying free entry with firms that are also not large relative to the market.

Clearly the nature of the products and services provided is closely connected to the industry structure. In transportation, for example, airlines require substantial up-front investments, and have large fixed costs. Road transportation does not have the same kind of economies of scale, and one would expect more firms to be in the industry. Intermediate products such as steel or industrial chemicals are standardized within categories defined by technical and scientific specifications. Almost all consumer products and services can be differentiated along multiple dimensions. Table 10.1 summarizes the standard economic classification of firms by the structure of the industry they are in.

Table 10.1: Classifying Firms by Industry Structure

| Product type | Homogeneous | Differentiated |
|----------------------------|---------------------|--------------------------|
| Entry situation | | |
| Free entry and exit | Perfect Competition | Monopolistic Competition |
| Entry barriers | Oligopoly | Oligopoly |

Recall, from Chapter 4, that free entry and exit with a homogeneous product and small firms must lead to zero economic profits in an ‘equilibrium’ where firms do not have an incentive to enter or to exit. We have characterized an additional possibility in Table 10.1, where there are many small firms, but their products or services are differentiated (by physical characteristics, or by location). This is called ‘monopolistic competition’. Product differentiation gives monopolistically competitive firms some

pricing power, but not the ability to earn positive economic profits in the long run. In practice, the above classification may be of limited use, because most real-world industries are various kinds of oligopolies, and the real differences among industries are in the different ways that firms compete strategically.

Classification by Strategic Approach Michael Porter, in his path-breaking work on competitive strategy, provided a two-way classification of strategic approaches, that characterizes firms by how they behave. He identified two ‘generic’ approaches: striving for low cost leadership, and trying to create and capture value through product differentiation. The ‘low-cost’ and ‘differentiation’ approaches therefore provide a good way to classify firms. They partly distinguish between the two ‘oligopoly’ boxes in Table 10.1.

To some extent, one can see this classification as being driven by the nature of the products. Steel mills can not differentiate (beyond the physical properties of the steel itself), so they must compete through trying to bring costs down. Farmers also sell commodities, and must compete on cost. In practice, there is greater flexibility in the strategic possibilities. General retailing is a good example. Firms compete all along the spectrum. Department stores like Nordstrom’s try to differentiate themselves by offering superior service. Discount stores like K-Mart compete on their low prices alone. One might say that Nordstrom’s and K-Mart are really in two different industries, but that neglects the similarities in the roles that they play (see the next classification method). Firms like Wal-Mart, on the other hand, primarily strive for low costs, but have also tried to build an image of providing good, friendly service. This suggests that the ‘pure’ dichotomy of low-cost versus differentiation may not hold in practice. Goods and services may be differentiated by ancillary characteristics: service, time taken for delivery, and so on. Even so, the ‘general retailing’ industry, and many other industries that allow for a variety of strategic approaches, still permit these approaches to be roughly put into Porter’s two categories.

Classification by Value Chain Function We can also classify some firms by their place in the value chain. While many firms are more or less integrated, operating through most of the value chain, other firms specialize in particular segments, providing products or services to other firms. Raw material and component suppliers, and specialists in accounting, human resources, legal services, marketing, logistics, and customer service are all examples of firms that provide a particular value chain function. Sometimes particular firms will specialize in particular industries. This is obviously necessary for components such as automobile or computer parts. However, even service firms in areas such as customer service and marketing may specialize by industry. In other cases, firms may offer their services across a variety of industries. Accounting, human resources and legal services providers often fit this pattern. Of course many of the firms in this category can be classified all together as providers of business or professional services, where that becomes the industry or sector by definition.

Classifying E-Commerce Firms All of the above classification schemes are also possible for e-commerce firms. Yet another way to classify new types of e-commerce

firms is in terms of how they combine information, time services, and physical goods and services in new ways, in their offerings to customers. In the last chapter, we discussed how one could think of online grocers as offering such a new combination, one that was not economically feasible for traditional grocery stores (and one which may still turn out to be unprofitable for their online competitors). We will use this perspective to examine new types of firms in seven broad categories:

1. Information request services
2. E-tailers
3. Exchanges and brokers
4. Community creators
5. Portals
6. Infomediaries
7. Infrastructure providers

We can think of these categories as being distinguished by differences in flows of information, flows of physical goods and services, and, often implicitly, the savings in time that are offered. An additional possible dimension of difference is the precise nature of the information being offered, what Philip Evans and Thomas Wurster have called 'richness' in their book, *Blown to Bits* (see Illustration Box). However, 'richness' is something that firms in all of our categories will strive for. While the concept is helpful in understanding the overall impact of e-commerce, it is not crucial for understanding the different types of e-commerce firms.

Illustration Box Richness of Information

Evans and Wurster list six aspects of information (*Blown to Bits*, p. 25) that together determine the degree of richness. These characteristics are:

- **Bandwidth** How much information can be communicated in a given period
- **Customization** How personalized is the information
- **Interactivity** How quickly two-way communication can occur, if at all
- **Reliability** How trustworthy is the sender and the message
- **Security** How well can unauthorized access be prevented
- **Currency** How up-to-date is the information

As you can see, these characteristics of information are a mixed bag. One aspect of reliability depends largely on who the sender is, but technology may also matter (the ability to check if a message has been tampered with – see Chapter 2). The nature of the communications infrastructure largely determines bandwidth, currency and interactivity. Interactivity is also affected by the ability to program concise instructions to enable and manage the interaction: the Java language does this across a range of software 'platforms'. The fundamental properties of digital information (easy to modify and copy), discussed in Chapter 9, are ultimately the underlying enablers of all these dimensions of 'richness'.

Source: *Blown to Bits: How the New Economics of Information Transforms Strategy*, Philip Evans and Thomas S. Wurster, Boston: Harvard Business School Press, 2000.

who access this storehouse. Encyclopedias are arranged alphabetically, and books typically have some organizational scheme laid out in a table of contents, as well as alphabetical indexes. Furthermore, the information is laid out in a linear, page-numbered format. These characteristics allow the reader to search for and find information relatively quickly. Clearly this approach is of extremely limited use with respect to the information distributed all around the Internet.

Search engines, software programs that automated the search for information over the World Wide Web, were therefore quite naturally the first service to be offered to general users. Search engines provide lists of Web pages in response to keyword queries. For example, you can search for Web pages on 'e-commerce' or 'electronic commerce', and an engine will provide a list of search results. Some of the earliest search services were Yahoo!, AltaVista, InfoSeek, Lycos and Excite. Search engines originally started out as 'crawlers', software programs that would crawl the Web looking for matches to keywords. Yahoo! led the way in introducing behind-the-scenes human effort in creating directories of relevant items, based on pure human judgment and a filtering of automated searches. Many search services now have some mix of human and automated criteria for providing answers to queries.

In addition to how search services mix human compilations and automated Web crawls, they also differ in the rules used for each of these activities, and in how results are presented. Ranking of results is very important when a request for information can lead to thousands or millions of responses. A significant general guiding principle in ranking results has been past experience. Search results that many people click on will be ranked higher in future results. Search engines have also become more sophisticated in how keywords may be combined, and in how they permit successive refining of searches.

As the Web has exploded, so have information request services. In addition to more sophisticated search rules and the use of human-managed directories to complement automated engines, other developments have included:

- **Specialized search engines**, targeted by category (e.g., news) or target group (e.g., children)
- **Metasearch engines**, that simultaneously initiate searches by several engines
- **Natural language services**, that offer responses to questions, such as "How can I install Microsoft Office 2000", in addition to keyword searches

All three of these developments have been driven by attempts to make the responses to information requests more relevant. There are now hundreds of search engines and general information request services. Additional information on search services, what they are, and what they do, can be found at two Web sites:

- **CNet's Ultimate Guide to Search** at www.cnet.com/internet/0-3817-7-1922932.html
- **SearchEngineWatch** at www.searchenginewatch.com

Some information request services use other search engines for their automated searches. For example, Yahoo! (which is now much more than a search engine, and is a portal, to be discussed in Section 10.7) used Inktomi's engine until recently (July, 2000), but then switched to Google's search engine. Ask Jeeves provides its own human-compiled directory of responses to questions, as well as metasearch results from several popular engines.

Since search engines have not been able to charge directly for responses to queries, or to charge subscription fees, licensing their technologies to other information businesses has been a useful source of revenue. Of course advertising has been a major source of revenue. As noted earlier, searching for information is the most basic function that users of the World Wide Web require, and they use it in large numbers. Not surprisingly, the most popular searches on the Web are a reflection of popular mass culture, particularly of the generation that has grown up with the Internet. This is illustrated in Table 10.2 with a sampling from the Lycos search engine's ranking of the most popular Web searches, in two different weeks in the summer of 2000. One attraction of this method of advertising can be tailored to the search topic (see Chapter 15 for more on this).

Table 10.2: Top Ten Most Popular Searches, as Ranked by Lycos

| Rank | Week of May 20, 2000 | Week of August 5, 2000 |
|-------------|-----------------------------|-------------------------------|
| 1 | Pokemon | Britney Spears |
| 2 | Britney Spears | Napster |
| 3 | Dragonball | Dragonball |
| 4 | The WWF | Pokemon |
| 5 | Eminem | Big Brother |
| 6 | Tattoos | Pitt-Aniston Wedding |
| 7 | Napster | Survivor |
| 8 | Pam Anderson | Tattoos |
| 9 | Mother's Day | N Sync |
| 10 | Victoria's Secret | Diablo II |

The difficulty of charging for responses to information request services, either individually or through subscriptions, partly reflects the nature of information as an economic good, and the nature of the competition that results. Since marginal costs are low or negligible, firms competing with each other to provide information request services have an incentive to cut prices to marginal costs and capture market share. Market share ('eyeballs') is attractive because of the increased revenue it can bring from advertising. Furthermore, the origins of the Internet as a noncommercial undertaking have also instilled an 'information is free' expectation among users. Finally, there is the problem of guaranteeing quality, with search still very much a hit-and-miss affair. An

example of problems is the manipulation of searches by using hidden words in Web sites to guarantee showing up in search results.

Information request services have tried with some success to overcome the pricing problem by selling their services to other firms in general. Thus Ask Jeeves provides some resources for Dell's technical support Web site. In this case, the information request service becomes a customer service specialist in Dell's value chain. The information user pays for the service bundled with the product, in this case Dell's computers. Of course a casual user of the site, or someone with a different brand, may be able to 'free ride', but the cost of excluding such users typically rules out that approach. A final avenue for revenue, pursued by relatively few search services, is being paid for listings. Usually the top five listings in such a search will be paid listings, with the rest generated by a crawling search engine.

Information request services do not provide physical products or services. The information they point to may be about such products and services, or it may be pure information: news, entertainment, or other content. These services do save time. This time-saving is inextricably linked with the Internet and the World Wide Web, but in the case of search, it is vital. How significant it is depends on the nature of the search. One can collect product information from store visits, telephone calls, talking to friends and so on, based on our knowledge of our physical environment. These are feasible alternatives to getting the information online. The search service may tell us where that information is available on the Internet, not the information itself. There is no substitute for that – manual search is near impossible. In other cases, online information request services aim to provide more information, essentially content on demand. Searching for an answer on Ask Jeeves may substitute for going to the library and consulting a reference book there. The online information request is fulfilled more quickly than the traditional approach. Our next category is quite different from information request services, focusing on the selling of products and services.

10.4 E-tailers

E-tailers, or electronic retailers, are one of the most common types of online firms, because they are a natural carryover from the world of physical retailing. Since traditional retailing typically involves sales by businesses to consumers, e-tailing and the B2C category of e-commerce are almost synonymous. In Chapter 9, we argued that online grocers offer something different from traditional grocers. They bundle the physical products with time and information services. Even if the information services as a consumption good (nutritional and health information, and recipes, for example) are not of high value, the information flows that the World Wide Web and Internet make possible are crucial to enabling the bundling of time services and physical products to be accomplished efficiently.

All e-tailing of physical products and services involves trying to create a new combination of the physical item, time services and information services. To some extent, the innovation over some traditional retailing is only a matter of degree. Catalogue selling, in particular, seems to be very close to e-tailing. A catalog is sent to

the consumer's home, he or she browses, orders by mail or telephone, and receives the order by mail or UPS. How is this different from doing it online? From the firm's perspective, there may be cost savings from having an online catalogue versus a print one. In particular, updating a digital catalogue may be considerably cheaper than modifying, reprinting, and resending a print catalogue. An electronic catalogue may also be much more comprehensive than a print catalogue. Amazon.com and Barnesandnoble.com can offer online information on millions of books: this would be impossible in print, or in a physical store.

Thus the possible availability and flow of information is greater in e-tailing than in store-based or mail-order retailing. Large quantities of up-to-date information ('rich' information, in Evans and Wurster's terminology) can be accessed on demand in e-tailing, in ways that are impossible in traditional approaches. In the grocery example, mail order is not an option, because no print medium can provide a comprehensive list of grocery store items for the shopper to choose from.

Depending on the nature of the physical product, e-tailers also offer possibilities for easy specification of customized features (Dell for desktop computers) and tracking of consumer preferences (online grocers that can provide starter lists for virtual carts, or online booksellers that make recommendations of similar books to the one being browsed or purchased). Clothing e-tailers have tried to offer virtual fitting rooms, with limited success. Toy e-tailers have also faced problems. Many of the problems have arisen because the cost of providing rich information to consumers has been underestimated, or because e-tailers have overspent on marketing. The difficulties of fulfilling orders in time at peak periods has also been underestimated. We discuss these and other strategic issues that have arisen in online retailing of physical products and services in further detail in Chapter 18.

E-tailers of digital products and services are in a somewhat different situation from physical goods e-tailers. Digital products can be delivered over the Internet. Music files and software programs can be downloaded directly by the buyer. Of course the power of traditional channels and formats works against digitization. We still mostly buy digital products in traditional formats. Music CDs and shrink-wrapped software dominate sales in their respective categories. Since digital delivery is so much more efficient, and since, in the case of music in particular, piracy is a problem, the pressure is strong to switch to a fully electronic transaction for digital products. Music sites such as MP3.com are seeking to build subscription bases, and traditional media giants such as Sony are also aiming to offer digital music directly on line.

News and related information media can be considered to be another category of e-tailer, offering content online. They differ from information request services in providing bundles of content, rather than responses to specific queries. As in the case of information request services, they have often been unable to charge for this service, or to charge extra. *Business Week*, for example, offers its online content free to print subscribers. *The Wall Street Journal*, on the other hand, charges for its online edition to everyone, print subscribers or not. Magazines and newspapers are quite different from

traditional physical retailers, but in the online world, their presences and interactions with customers look quite similar: a Web site that allows one to order the product, for physical delivery if it is physical, with instant digital delivery if it is digital. If one wants a nonsubscription example, then consider research services such as Forrester Research. I can go to their Web site, browse the titles and abstracts of their reports, as well as the posted prices, and order online, for physical and/or digital delivery. Thus sales channels that are quite different in traditional settings tend to converge on the World Wide Web. We can all be e-tailers now! We will take a closer look at some of the main digital e-tailing strategies in Chapter 19.

10.5 Exchanges

Exchanges are descendants of the marketplaces of the middle ages, where buyers and sellers congregated to transact. Over the last three centuries, financial exchanges have flourished and become more and more sophisticated, at the same time losing much of their physical moorings as buyers and sellers have connected electronically, either directly or through intermediaries. At the same time, the reduction in transportation costs, the possibility of long distance communication, and the rise of large-scale factory production have driven markets for physical products in a different direction. Physical products have been sold by contract, negotiation, and take-it-or-leave-it offers, with sales and procurement being important tasks carried out by a large segment of corporate workforces. This system emphasized efficiencies in manufacturing over efficiencies in transacting. As manufacturing has become more flexible, and as the costs of searching have fallen, exchanges for physical products become more attractive once more.

Human intermediaries have continued to do some of the work of exchanges, finding and matching buyers and sellers. Travel agents played this role for households and airlines. Individuals also played this intermediary role for specialized industrial equipment. These kinds of transactions were governed by ad hoc procedures without any transparency. We may view these intermediaries more as brokers than full-fledged exchanges. The idea of an exchange is to offer rules and transparency, leading to greater efficiency in transactions.

The Internet and the Web allow exchanges to be constructed without physically bringing together buyers and sellers or the objects being sold. Firms that organize these exchanges become 'market-makers' or 'market-expanders'. Consider eBay, the best known and most successful exchange, where buyers and sellers are primarily individual consumers (so a C2C exchange). A market for collectibles has always existed, through specialty dealers, and collectors, advertising in special-interest magazines. Items which did not quite reach the status of collectibles might be sold in garage sales or flea markets. eBay offers a low cost method for sellers to advertise any kind of item. Since firm posted prices would not be the best way of maximizing expected revenue from such items, auctions have been a natural alternative. Online auctions offer time savings, and permit rich information about the items to be sold to be posted. Thus online auctions have tended to be associated with exchanges. The exchange offers a set of rules for providing information, for reaching an agreement, and for completing the agreed-on transaction. It offers a 'meeting place' online, where these activities occur. It may also provide

additional services, such as escrow, and some insurance. For this package of services, the firm that provides the exchange services collects fees, without taking ownership of the products being sold. This is one important distinction between eBay and Amazon's primary business, for instance, and exchanges from e-tailers in general. Of course Amazon and Yahoo! also offer online auctions, so have added this exchange function to their portfolio of businesses.

We may also think of exchanges that connect consumers and businesses. whether we think of these as B2C or C2B is somewhat arbitrary. We normally think of B2C as involving e-tailing with posted prices. Priceline.com, on the other hand, allows consumers to make offers for certain types of products and services, being best known for airline tickets. Priceline serves the matching role of an exchange, much as a human travel agent would traditionally do, searching among airlines to try to find a flight that matched the consumer's requirements and willingness to pay. This broker or exchange role of Priceline has again been overshadowed by the mechanism of reaching an agreement, the so-called 'reverse auction', which is really a variant of the standard procurement bidding procedure used by some firms and governments. In the 'reverse auction', the potential buyer stipulates a product or service, and the maximum willingness to pay, and sellers make bids to satisfy this stated demand.

If we think of Priceline.com as a broker or provider of exchange services, then firms such as Travelocity are not that different. Travelocity also brings buyers and sellers together. Sellers make offerings available through Travelocity, while buyers search for what they want among these offerings. The value creation through matching is quite similar for the two firms. What is different is the rules that determine value capture. Travelocity uses the sellers' posted prices, making it similar, in this respect to an e-tailing channel. Interestingly, Travelocity does not take temporary possession of what it sells. Priceline.com apparently does so, but this is illusory, since it is only notional possession in the middle of a guaranteed transaction. The main function of this accounting convention is to boost revenues! Thus neither type of firm qualifies as an e-tailer.

Another kind of B2C/C2B exchange involves group buying schemes, where an intermediary aggregates potential buyers in a group, and gets them a lower price as a result. Including such institutions in the category of exchanges also involves a broad use of the term, but it satisfies the basic criterion of matching buyers and sellers according to a stated set of rules. Alternatively we can think of this case as one of brokerage.

B2B exchanges have become the most common type of online exchange, promising to make transactions of industrial intermediate products, such as automobile components and chemicals, more transparent and rule-governed. One of the first B2B exchanges was Chemdex, which aimed to provide services for buying and selling industrial chemical products. It quickly expanded to other sectors, offering several industry-specific exchanges, and is now called Ventro. Another B2B exchange firm is CommerceOne, and there are numerous others. Note that not all 'B2B' firms are

exchanges. In particular, some firms offer the technologies and software tools to enable B2B exchanges, without actually organizing or running them.

The economic principles behind all such exchanges are the benefits of a single marketplace for potential buyers and sellers to ‘meet’, exchange information about products and needs, negotiate prices, and complete transactions. Reducing search time, conveying information that otherwise could not be exchanged at low cost to many potential buyers (product specifications and pictures), and automating the process of reaching agreement and completing the transaction are all benefits of an exchange. The software to govern all these actions has only to be written once, and the marginal cost of running an exchange can be quite low.

At an abstract level, therefore, the economics of online exchanges are quite similar to e-tailers. Physical products and services are bought and sold, with savings of time and information being offered. The key difference is that a separate entity, the firm that organizes and runs the exchange, provides the information and time services, and charges separately for them, either from the buyer or the seller, or both. In the case of e-tailing, there is no other intermediary, and the seller charges for the bundle of physical product, time services, and information services. We discuss exchanges in more detail in Chapter 12, since they represent an important aspect of the impact of e-commerce on the organization of markets.

10.6 Community Creators

Exchanges create a particular kind of community, one of potential buyers and sellers. Online exchanges remove the final spatial barriers to participation, a process that began with the telegraph and the telephone. This is a community of a limited sort, since the main or only interest of participants is transacting on the best terms possible for themselves. We might traditionally use the term community to mean something more, a group with an ongoing shared interest. Communities in this sense continually exchange information on topics of mutual concern. The Internet is ideally suited for this type of interaction. Communities of interest were one of the first uses of the Internet, well before the World Wide Web came into existence, and e-commerce took off.

An early example of electronic communities was UseNet newsgroups, which are electronic bulletin boards. Members can post messages which can be read and responded to by all other members. Messages can be archived, and can provide a useful repository of knowledge on specific topics. Universities may archive technical material from newsgroups, and make these archives publicly available over the Web. The World Wide Web and e-mail have allowed more open bulletin boards to develop. Financial sites such as Motley Fool and Raging Bull have message boards where anyone can post information or comments on individual stocks. CNET searches and aggregates messages from several such boards. Investors in particular stocks therefore form online communities, though with an underlying economic motive.

Many other firms offer variants of messaging capabilities. Online chat rooms for teenagers are probably one of the most common and compelling uses of the Web. As in

the case of financial Web sites, these messaging communities are often just one part of the services that the firm offers. Of course they may be strategically important: AOL's instant messaging service is something it wants to protect from access by non-AOL members, for reasons we discuss later in this chapter. Here we give examples of firms that focus solely on creating communities.

Firedrop, for example, is a startup with a Java-based messaging technology it calls 'Zaplets'™. 'Live, shared email. Discuss big issues. Gather opinions. Make decisions.' says the slogan. Communities built this way can be small or large, short-lived or long-lasting. Membership is controlled by those who start the group, rather than being open to anyone, as with chat rooms. Suggested purposes include sharing pictures, taking opinion polls (see Figure 10.1), discussing schedules, and so on. While most electronic messaging requires a string of emails, Zaplets are automatically updated with recipients' responses. Quickdot.com offers a similar kind of service, with 'dotboards' for friends, family and collaborators.

Figure 10.1: A Zaplet™ by Firedrop

The screenshot shows a web interface for a Zaplet. At the top, it says "zaplet by Firedrop" and "www.zaplet.com". A notification banner reads: "You've received a Zaplet from Brian Smith: It's time to put the finish touches on the yearly family newsletter. We've received pictures from the most distant members of the family and now need to make a decision." Below this is a poll titled "Poll" with the question "Which picture do you like the best for the family newsletter cover?". The poll includes a pie chart and a table of results. There are six picture options, each with a "Vote for this one" button. Below the poll is a "Comments" section with a table of user comments and their votes.

| Choice | Votes | % |
|--------|-------|--------|
| A | 1 | 20.0% |
| B | 1 | 20.0% |
| C | 1 | 20.0% |
| D | 0 | 0.0% |
| E | 0 | 0.0% |
| F | 2 | 40.0% |
| Total: | 5 | 100.0% |

| Name | Date / Time | Vote |
|---------------|--------------------|------|
| Fred Jones | 8/7/00 2:11 PM PST | F |
| Peter Nguyen | 8/7/00 2:09 PM PST | A |
| Jenny Andrews | 8/7/00 2:07 PM PST | C |
| David Thomas | 8/7/00 2:02 PM PST | F |
| Brian Smith | 8/7/00 2:00 PM PST | B |

While these messaging services firms allow individuals to create communities for everyday communication and tasks, other firms try to build more specialized communities, which not only communicate, but also collaborate on projects. For example, Fullscope says it is 'your online workgroup headquarters, allowing you to communicate instantly with all of your customers and employees using our collaborative software applications. members of the communities created on Fullscope receive access to software tools, as well as being able to conveniently exchange information. Thus the community may be one whose primary aim is to accomplish specific tasks, rather than just exchange information. At one level, the difference from the consumer-oriented community creators such as Firedrop is only one of degree. However, the focus on business users and business uses requires a different level of offering of functions. In particular, Fullscope also aims to provide information relevant for the communities it serves: consultants, legal services providers, accountants, marketers, public relations specialists, and so on.

Online community creators provide mechanisms for communication and for collaboration. People may simply enjoy sharing opinions, they may provide information of value to others and receive information of value to them, or they may use the communication as a basis for jointly completing tasks online. Community creators need not directly provide information, though some may do so. Their economic value is in enabling matches, raising the value of information exchanges that occur, and in saving time. Information may be exchanged more effectively and efficiently through online communities than by other means. Other communication methods do not permit simultaneous two-way participation by multiple users.

How do community creators make money? While eBay can charge a fee for each transaction that it facilitates, charging by the message is not feasible for community creators. Subscription fees are more practical, but the pressures of competition, and the need to spur adoption and build large communities result in free membership being the norm. Community creators do collect information, which may be valuable to marketers. They test and validate technologies that might be useful as part of bundled offerings by other firms, just as ICQ was bought by AOL to give it the capability of offering instant messaging to its existing community (that paid for membership). Community creators, like everyone else online, can also sell eyeballs, by featuring advertisements and promotions on their Web sites. Pure community creators are unlikely to thrive on a commercial basis. Online communities that are driven by passionate interests are the online equivalent of clubs, hobbyist groups, and all kinds of social organizations. However, they are not run by typically not profit-making firms.

Community creation is more likely to be a component offering for other kinds of firms. E-tailers, information request services, and online exchanges all have incentives to make their customers or users into communities. This enhances the value of visiting those sites, and generates repeat business. For example, Amazon.com and other online booksellers feature reviews and recommendations by readers, who become not just individual customers, but potentially a community with common interests. Interacting

with others in this community may make sticking with a particular seller valuable, even if it is not the lowest-priced seller. Community creation is also an important part of the next category of e-commerce firms that we examine.

10.7 Portals

Portals are a big tent. All sorts of firms shelter under the term, or claim that status. A **portal** is literally a gateway, but gateway to what? Portals evolved from search engines, which offered practical access to the information treasures of the Internet. A search service only offered directly to consumers does not make an economically viable firm. It does not generate enough revenue. Portals therefore offer a host of services, all driven by the provision of information. They are general purpose information intermediaries, aiming to benefit themselves from economies of scope, and to provide economies of scope in information gathering to their users, as well as reputation to overcome asymmetric information about quality. Thus the economic rationale for portals draws on many of the economic principles discussed in Chapters 5 through 8.

One of the best-known portals is Yahoo!, which was one of the first search engines for the World Wide Web. Yahoo! offers search services (where it now relies partly on technologies provided by other firms), but it also offers content gathered and filtered for users. Other services that it offers include: web-based email, online auctions, and access to e-tailers. This is typical of portals. Thus portals are aggregators, or diversified firms. They combine the four types of firms we have already discussed – information request service, e-tailer, exchange, and community creator – into one firm. Where the physical product or service component is least important, the portal is like a virtual department store for a range of information services. Thus a portal performs those services ‘in-house’. In the case of the physical e-tailing component, portals typically are more analogous to malls, where specialty stores and department stores are gathered together in the same location. To use a reverse analogy, the mall is thus a portal for physical shopping. While e-tailers such as Amazon also offer the same services as portals (search, exchange, community), their primary emphasis is selling physical products.

Within the category of portals, several other variations in the business model are possible. Portals such as Yahoo! and Netscape require no membership, though they will try to gather information about regular users when offering services such as customized web sites (MyYahoo!, MyNetscape). AOL, on the other hand, is a portal which is bundled with Internet access provision, and a membership fee is charged for the bundle. MSN, the Microsoft Network, plays it both ways, offering the open version as well as a closed, members-only version. All these portals are general purpose portals. Furthermore, their services are aimed broadly at household users, that is, at final consumers. Revenues come from advertisers and from e-tailers that are accessed via the portals.

Portals may specialize in providing information and services for particular industries. For example, travel portals aim to provide information request services, travel-related physical products, and exchange services for travel. Again, offering just

one of these services has not been economically viable. Examples of travel portals are Travelocity (metamorphosing from being just an exchange) and Microsoft's Expedia. Specialized industry portals are known as **vertical portals**. Other examples of classes of vertical portals aimed at consumers are financial services (e.g., CNET, MoneyNet) and healthcare portals (e.g., WebMD). Again, most of these portals are open, or have free membership with registration. A few do charge subscription fees, and one can expect that model to gain ground as industry leaders are established, losers exit or merge, and competition becomes less fierce.

Another variation on the portal model is portals that aim at businesses rather than households. In such cases, the portals are likely to be vertical portals, specializing in particular industries. Again, these portals are emerging as extensions of B2B exchanges, where facilitating information acquisition and communication goes hand-in-hand with providing exchange services. Another model of a specialized portal aimed at business users involves focusing on particular value chain activities. For example, OfficeClick.com (see Figure 10.2) provides a portal for 'office admins', who handle all sorts of routine tasks that help businesses function smoothly: ordering supplies and equipment, arranging meetings and travel, and so on. These mundane activities represent several billion dollars' worth of economic activity.

Figure 10.2: A Vertical Portal for Office Admins



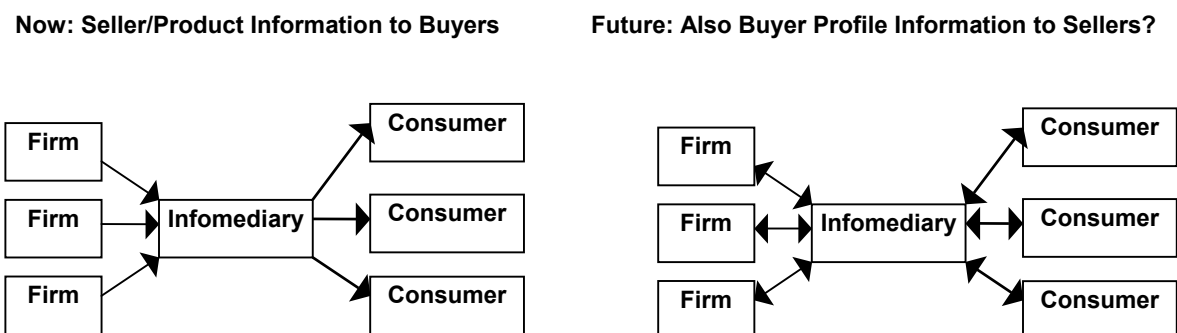
Will portals be the only type of e-commerce firm that survives? After all, it is relatively easy for a firm to provide the bundle of services that portals provide, and reputation and economies of scope on both sides should favor them over smaller, specialty providers. In practice, though, the portal may be the aggregator and the brand manager, with independent partners providing the actual services or the technologies that enable the services. We will discuss these issues further in the next chapter.

10.8 Infomediaries

The broadest possible definition of infomediaries would include information request services, content providers, exchanges, community creators, and portals. They all more or less act as information intermediaries. Hagel and Singer, on the other hand, define infomediaries in a very particular way, as agents of consumers that will “aggregate their information with that of other consumers and...use the combined market power to negotiate with vendors on their behalf.” (p. 19) In this specific sense, infomediaries are a prediction rather than a reality. Portals, community creators and exchanges are all discussed by Hagel and Singer as possible candidates for this role (see Chapter 4 of *Net Worth*), with relative strengths and weaknesses. However, there is no firm that currently fits this definition of an infomediary.

Probably the closest existing examples, are firms such as MySimon and Gomez Advisors, particularly the latter. MySimon collects and presents information on product characteristics and prices from e-tailing Web sites. Consumers may use MySimon for comparison shopping of products. Gomez Advisors provides a similar service for e-tail Web sites, ranking such sites for cars, electronics and other product categories, according to cost, ease of use, and so on. User feedback is an important component in constructing and updating these rankings. We will term such firms infomediaries, since they act in a limited way as agents of buyers. They do not collect, aggregate and sell customer information to sellers, nor do they make choices for buyers, but they do provide buyers with time savings in their own choices among competing sellers.

Figure 10.3: Infomediaries and Information Flows



Infomediaries are distinct from information request services, in that they focus only on market information (particularly B2C markets). They are different from content providers in that they do not provide news, entertainment, or other such content. The information they offer only pertains to potential market opportunities. At the same time, they do not become involved in transactions in the way that exchanges or e-tailers do. Infomediaries provide market-related information on sellers and products to dispersed potential buyers. This is perhaps much less than Hagel and Singer's vision, but it is, in fact a complementary component of the main infomediary role as envisioned by them (see Figure 10.3).

10.9 Infrastructure Providers

All the types of firms that we have discussed so far need to be able to store and send the information that makes their businesses possible. The economy of weightless bits still relies on an underlying economy of a massive physical infrastructure. E-commerce firms can try to provide such infrastructure themselves, but the costs are typically too great. In some cases, firms do try to combine infrastructure with content, but this is probably driven as much by considerations of market power as by any economies of scope. Examples of this integrated approach are AT&T and AOL-Time Warner.

AT&T is, of course, the long distance remnant of the old Ma Bell. It has spun off some of its infrastructure components (Lucent, Telcordia), but retains its communications network of high speed, high capacity lines that make up part of the Internet backbone. What AT&T lacked was infrastructure covering the last mile to households, and the content to go with it. Its acquisition of cable TV company TCI gave it these capabilities. Cables used for piping in TV shows and movies can also be used to provide Internet access, at speeds potentially higher than dial-up modems. Whether AT&T can use this infrastructure to build a business that provides Internet content and access together remains to be seen.

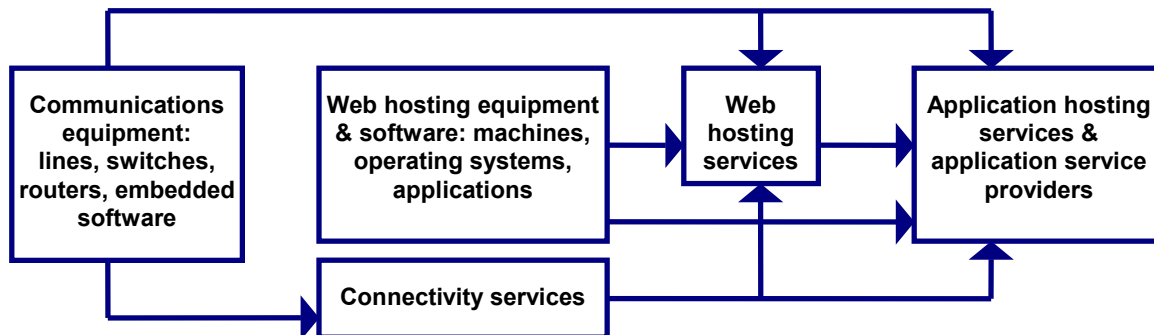
AOL started out as a provider of Internet content to members, who also obtained dial-up access to that content, and email capabilities. When members experienced problems with access, AOL had to get into the infrastructure business, making sure it had enough capacity to meet the increasing demand for Web surfing. Time Warner was a traditional media company, itself the result of several mergers, which also included ownership of cable TV assets. AOL's merger with Time Warner gives it the capability of providing broadband access to its members, again using cable lines, as well as more content to provide on its Web site.

Such vertically integrated strategies are yet to be proven. As we noted, the potential motives for a greater vertical presence in the value chain are two-fold. Integration can lead to greater efficiency, or greater value creation. Integration can also lead to greater market power, through control of key 'choke points' in the value chain, resulting in greater value capture. Experience up to now suggests that neither of these motives may be strong enough for a winning formula of bundling infrastructure with information services (including all kinds of content). Regulators are wary of allowing the exercise of monopoly power to favor the firm's own content on lines that belong to the

firm: rules provide for equal access. Furthermore, technological change is rapidly making real choice for broadband access available to households.

There may be greater scope for integrated provision of infrastructure and services at a different level. To examine this, we review the different components of Internet infrastructure provision, that we discussed in Section 9.6. We show some of these components visually, in a value-chain-type diagram, in Figure 10.4.

Figure 10.4: Infrastructure Providers



We now explain this rather complicated figure, by considering the classes of firms that provide the various infrastructure products and services.

Communications equipment Firms in this category make the basic wires and cables that connect everyone, whether on the Internet or over conventional phone networks. These lines also are background components of ‘wireless networks’, which use wireless transmission only for parts of the journey. For example, Corning, a traditional glass maker, has become an important supplier of fiber optic cables. A larger component of this category is the makers of switches and routers, which manage traffic over communications networks. These are basically special-purpose computers. Cisco, Lucent, Nortel, Alcatel, JDS Uniphase, Juniper Networks, Ciena and Corvis are all examples of firms that provide various kinds of equipment for conventional copper-based networks, as well as newer optic networks. Technological change is spurring new entrants in this category. Technological complexity and the size of the market both favor specialization: communications equipment firms do not venture into other aspects of infrastructure provision.

Web hosting equipment and software The major firms in this area are the household names that powered desktop computing for individuals and businesses, and client-server networks for businesses: Intel, Microsoft, Sun, Hewlett-Packard, Dell, Compaq, Oracle and IBM have all adjusted their strategies to embrace providing hardware and /or software for the Internet and Web. Essentially, hardware and software that were designed for stand-alone computers, or for desktop computers connected to central corporate servers, have been adapted to function in an environment where information flows back and forth between computers all the time. An early and obvious example of this adaptation was Web browser software, which sits on top of the operating system (or

is now part of it, according to Microsoft). Much of the adaptation in this category has been in the software. The hardware has retained its basic architecture, while increasing substantially in capabilities (essentially speed of processing and capacities for storage). Technological continuity has allowed existing firms to adapt to the new markets.

Most firms in this category have restricted themselves to providing this aspect of infrastructure. A notable exception is Microsoft, which had already moved from its initial focus on operating systems to providing applications – in particular, its market dominating Office software suite for word processing, presentations, spreadsheet functions, and so on. Microsoft has made its presence felt in providing Internet access, email services, and various kinds of content on the Web. As a pure software firm, it has tried to extend its reach to every aspect of software connected to the Internet and Web. Another firm that has begun to branch out is Dell, which has begun to offer Web hosting.

Connectivity services Firms in this category bundle various communications equipment components into a service: access to the Internet. Local phone companies such as Pacific Bell have been in the access business for conventional telephone communications, and this experience and their ownership of ‘last-mile’ infrastructure has made them candidates for providing connectivity, either by dialing up, or through the newer DSL technology that offers faster connections over existing phone lines.

Ownership of communications infrastructure has not been a precondition for entry into Internet service provision. Numerous firms lease access to lines, purchase the routers and switches they need, and become **ISPs (Internet Service Providers)**. AOL, of course, is by far the largest ISP. Microsoft has also established a large ISP customer base. Mindspring and Earthlink (now merged) are two other examples of dial-up ISPs. Covad and Northpoint are examples of DSL providers.

Web hosting services At a minimum, hosting services just provide the physical infrastructure (secure buildings) where firms can organize their own Web infrastructure: communications equipment, connectivity, and web hosting equipment and software. This model is proving to be too ‘thin’ a presence in the infrastructure value chain, and web hosters are moving toward providing the equipment and software, and the set-up and ongoing management services required for successful hosting of e-commerce web sites. This is indicated by the three arrows entering the web hosting box in Figure 10.4. Value creation and value capture come from being a one-stop shop for web hosting. Physical facilities may still be leased from traditional ‘colocation’ firms, but this becomes outsourcing of a standard kind.

The basic physical facilities are certainly critical to web hosting. However, this part of the web hosting business is easily replicable. Brand and reputation are the only barriers to entry, not technology. There are increasing returns to scale, but not at a level that can deter entry. Colocation firms include the pioneer, Exodus Communications, and newer firms such as Equinix. Exodus is certainly trying to extend its presence in the value chain, to provide it with a defense against ‘commoditization’ of its business.

Hosting services such as Interland and Digex provide a combination of facilities, equipment and services, and this is likely to be a stable business model. However, firms such as LoudCloud and LogicTier have taken the model a step further, outsourcing physical facilities to firms such as Exodus, while providing all the set-up and management services where the ultimate value capture is possible. They aim to automate web hosting services and benefit from economies of scale as well as intellectual property barriers to entry. Of course entry may occur in the long run in services provision as well. On the other hand, many Internet infrastructure services providers are small consulting firms that are like the craft shops driven out of business by assembly line manufacturing. How far this will happen in web hosting remains to be seen.

Applications hosting and service providers Traditional applications hosters have provided functions such as email, their role as providers of outsourced services very much a technological version of outsourcing of traditional administrative business functions such as human resources or legal services (see Chapters 5 and 8). Critical Path is an example of such an applications outsourcer. Functions such as email might naturally be combined with connectivity services, and the applications hoster would also be a consumer of communications equipment and general purpose computers (servers). In such cases, the applications outsourced have been large, complex programs where usage is heavy or continuous.

Application service providers (ASPs) extend the outsourcing model to software in general. Even smaller applications such as Microsoft Office and Adobe Photoshop can be made available on a pay-per-use basis. Just as we may wish to rent a movie rather than purchase it, applications software can be rented when its use is likely to be infrequent or even one-time. The proliferation of ASPs has been amazing. Perhaps a hundred ASPs exist in various market segments, either specializing in particular sectors (healthcare, finance, etc.), or in particular software vendors (Microsoft, Oracle, etc.). The ease of entry and lack of economies of scale suggest that ASPs will not become large firms, except perhaps by merging. ASPs often have to customize applications for corporate customers, making economies of scale harder to attain. At the same time, this customization does provide greater scope for value capture, since substitution among ASPs becomes harder. Examples of ASPs are Corio and Usinternetworking, while firms such as Citrix provide ‘**middleware**’ for ASPs. Some software firms, such as Oracle (providing database software) and SAP (providing Enterprise Resource Planning software and services) are also ‘ASP-izing’ their software.

ASPs and applications hosters may use their own infrastructure, or they may lease it from web hosters. The importance of economies of scale and specialization versus economies of scope will determine where the boundary of the firm is drawn, as we discussed in Chapter 5. It is easy to envision web infrastructure set-up and management companies such as LoudCloud and LogicTier moving forward in the value chain to offer application software, either in the conventional hosting model or through application services. Since the ‘management’ side of web hosting involves making sure that e-commerce applications that perform tasks such as gathering customer data and processing orders are working properly, there are possible economies of scope in extending this

management to software applications that are offered over the World Wide Web instead of being installed on desktop computers.

In general, it seems that vertical integration in the infrastructure components of the Internet is a surer bet than the integration of infrastructure provision with content provision. Technical considerations alone suggest this outcome. Systems of software and hardware still work best when a single firm is able to make everything work together. Collaborations between firms that can achieve the same outcome typically require more information sharing than firms are comfortable with. Microsoft is well-known, for example, for not making full information available to other firms that wish to develop software to work well with Microsoft's own software (e.g., applications that run on its operating system). These technical considerations are not relevant for the kind of vertical integration pursued by AOL, for example.

10.10 Conclusion

Many of the small, specialist firms may not survive in the long run. Firms that provide only information and collect revenue through advertising are the most vulnerable. While most of the costs of running a web site may seem to be one-time set-up costs, there are ongoing costs of maintaining the site, monitoring it, updating content, and so on. Therefore even information businesses have positive marginal costs. Advertising revenue alone is unlikely to allow firms to break even. Subscription fees, referral fees and pay-per-use are likely to provide stable business models for information firms. Subscriptions for a bundle of services, perhaps including Internet access itself, will probably be the most successful, as in the AOL model. Even without subscription fees, information firms must probably provide bundles of content and information services to break even. Portals such as Yahoo! provide enough overall value to pull in large numbers of users, and eke out profits.

Brokers and exchanges may also succeed, since they can collect fees per transaction. The value of exchanges depends on the number of users, and this may work strongly in favor of a small number of exchanges, whether for C2C online auctions, or B2B transactions. Of course the power of the Internet is the lowering of costs of gathering information. If one can participate in several exchanges simultaneously, then the advantages of size for any one exchange are diminished. Thus eBay has worked hard to prevent specialized infomediaries from searching through its web site along with other auction web sites. We examine these issues more in Chapter 12.

E-tailers of physical products and services have the most complex task of succeeding in e-commerce. They must create enough additional value in their package of products, time services, and information services to enable them to price competitively. There is evidence that firms like Amazon will eventually succeed, since they are able to price higher than competitors. Offering other information and exchange services is certainly an important component of the e-tailer offering. Many successful e-tailers, though, may just be bricks-and mortar firms that have expanded to include the Internet as one more sales channel.

Finally, underlying the weightless bits of information flows is a massive physical infrastructure that must still be developed and maintained. To the extent that there are economies of scale and entry barriers in this aspect of e-commerce, infrastructure provision may be where much of the value created by transacting online is captured. Providers of software and hardware may be able to use a combination intellectual property rights and customer lock-in that comes with physical investments to succeed in that value capture.

Summary

- Traditional economic and management-oriented classifications of firms include classification by product and industry, industry structure, strategic approach and value chain function.
- One classification of new types of e-commerce firms is into: information request services, e-tailers, exchanges and brokers, community creators, portals, infomediaries and infrastructure providers. The distinguishing features of the first six of these different types are the nature of the information that is provided, and how it may possibly be combined (or not) with time services and physical products and services.
- Information request services are firms that provide listings of information collected by automated searches of the World Wide Web, or from human compiled directories, or answers to specific questions.
- E-tailers provide physical products or services bundled with time services and information. Content providers may also be considered to be e-tailers, to the extent that they sell information over the Internet.
- Exchanges and brokers bring together buyers and sellers of physical goods and services, without taking ownership or carrying inventory. They include online auction services and B2B exchanges.
- Community creators enable information exchanges and sharing, and, in some cases, accomplishment of collaborative tasks as well.
- Portals aggregate the informational functions of the different types of online firms (information request services, community creation, exchange and brokering), as well as providing a site for e-tailers to bring their offerings to the attention of buyers. The bundle of offerings by portals is likely to provide the basis for economic success.
- Infomediaries act as aggregators of information from sellers, without being involved in transactions. In the future, infomediaries may also aggregate buyer information for purchase by sellers.
- Infrastructure providers make, install, combine and maintain all the hardware and software that underlies the Internet and makes e-commerce possible. Various new kinds of infrastructure service providers are still evolving, and may consolidate into an important new class of firms.

Questions

1. Microsoft has been different from Sun, HP and IBM in specializing only in software. Its PocketPC is an example of a departure from this model. When do you think it is important to be the seller of bundles of hardware and software?
2. Is Napster a community creator? What services does it provide? How does it make money? How might it make money in the future?
3. Why can membership-based portals succeed against open, zero-cost portals? What makes people willing to pay and keep on paying subscription fees?