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The *Encyclopedia Britannica* has been regarded as a classic reference work for more than two hundred years. And, as a classic, it has commanded a premium price: a few years ago a hardback set of the thirty-two volumes of the *Britannica* cost \$1,600.

In 1992 Microsoft decided to get into the encyclopedia business. The company bought rights to *Funk & Wagnalls*, a second-tier encyclopedia that had been reduced to supermarket sales by the time of the purchase. Microsoft used the *Funk & Wagnalls* content to create a CD with some multimedia bells and whistles and a user friendly front end and sold it to end users for \$49.95. Microsoft sold *Encarta* to computer original equipment manufacturers (OEMs) on even more attractive terms, and many computer manufacturers offered the CD as a freebie.

Britannica started to see its market erode and soon realized that it needed to develop an electronic publishing strategy. The company's first move was to offer on-line access to libraries at a subscription rate of \$2,000 per year. Large libraries bought this service—after all, it *was* the *Britannica*—but smaller school libraries, offices, and homes found CD encyclopedias adequate for their needs and much more affordable. *Britannica* continued to lose market share and revenue to its electronic

competition. By 1996, its estimated sales were around \$325 million, about half of 1990 sales.

In 1995 *Britannica* made an attempt to go after the home market. It offered an on-line subscription for \$120 per year, but this attracted very few customers. In 1996 the company offered a CD version for \$200, still significantly higher than *Encarta*.

Unfortunately for *Britannica*, consumers were not willing to pay four times as much for its product as for Microsoft's, and *Britannica* was soon on the ropes. In early 1996 Jacob Safra, a Swiss financier, bought the company, disbanded its sales network of 110 agents and 300 independent contractors, and started aggressive price cutting. He slashed the yearly subscription to \$85 and experimented with a direct mail campaign offering CDs at different prices in an attempt to estimate demand. Everyone agrees that the quality of the product is high; *PC Magazine* gave it the top rating in its comparison of multimedia encyclopedias. But these efforts yielded only 11,000 paid subscribers. The big question *Britannica* now faces is whether it can sell to a large enough market to recover its costs.

Meanwhile, prices for CD versions of encyclopedias continue to erode. *Britannica* now sells a CD for \$89.99 that has the same content as the thirty-two-volume print version that recently sold for \$1,600. In a flyer we received recently from a computer store, Microsoft's *Encarta* matched *Britannica's* \$89.99 price . . . and threw in a mail-in rebate for an additional \$20.00 off.

THE COST OF PRODUCING INFORMATION

The *Britannica* example illustrates some of the classic problems of information pricing. One of the most fundamental features of information goods is that their cost of production is dominated by the "first-copy costs." Once the first copy of a book has been printed, the cost of printing another one is only a few dollars. The cost of stamping out an additional CD is less than a dollar, and the vast bulk of the cost of those \$80 million movies is incurred prior to the production of the first print. What's more, with recent advances in information technology, the cost of distributing information is falling, causing first-copy costs to comprise an even greater fraction of total costs than they have historically. Just

compare the printing, selling, and distribution costs for the traditional printed version of *Britannica* with the costs of the CD version or the on-line version.

Information delivered over a network in digital form exhibits the first-copy problem in an extreme way: once the first copy of the information has been produced, additional copies cost essentially nothing. As we said in Chapter 1, information is costly to produce but cheap to reproduce.

Information is costly to produce but cheap to reproduce.

In the language of economics, the fixed costs of production are large, but the variable costs of reproduction are small. This cost structure leads to substantial *economies of scale*: the more you produce, the lower your average cost of production. But there's more to it than just economies of scale: the fixed costs and the variable costs of producing information each have a special structure.

The dominant component of the fixed costs of producing information are *sunk costs*, costs that are not recoverable if production is halted. If you invest in a new office building and you decide you don't need it, you can recover part of your costs by selling the building. But if your film flops, there isn't much of a resale market for its script. And if your CD is a dud, it ends up in a pile of remainders at \$4.95 or six for \$25. Sunk costs generally have to be paid up front, *before* commencing production. In addition to the first-copy sunk costs, marketing and promotion costs loom large for most information goods. As we said in Chapter 1, attention is scarce in the information economy, and sellers of content have to invest in marketing new products to grab their potential customers' attention.

The variable costs of information production also have an unusual structure: the cost of producing an additional copy typically does not increase, even if a great many copies are made. Unlike Boeing, Microsoft does not face appreciable and lasting capacity constraints. Normally there are no natural limits to the production of additional copies of information: if you can produce one copy you can produce a million copies, or 10 million copies, at roughly the same unit cost. It is this combination of low incremental costs and large scale of operation that leads to the 92 percent gross profit margins enjoyed by Microsoft.

The low variable cost of information goods offers great marketing

opportunities. We said earlier that information is an experience good—you have to experience it to know what it is. Just as sellers of new brands of toothpaste distribute free samples via direct mail campaigns, sellers of information goods can distribute free samples via the Internet. The toothpaste vendor may pay a dollar or two per consumer in production, packaging, and distribution to promote its product; but the information vendor pays essentially nothing to distribute an additional free copy. For information goods, copies are free for the producer as well as for the consumer; we will investigate the implications of this fact in detail in Chapter 4.

Large fixed costs and small incremental costs—that is, substantial economies of scale—are hardly unique to information goods. Many other industries have cost structures that share these characteristics. It costs a lot to lay optical fiber, buy switches, and make a telecommunications system operational. But once the first signal has been sent, it costs next to nothing to send additional signals over the fiber, at least until capacity is reached. It costs United a huge amount to purchase and operate a 747, but the incremental cost of an additional passenger is tiny, so long as the plane is not full. The first-copy costs common to information goods are “merely” the extreme version of what we see in other industries where scale economies are powerful, which includes many high technology industries like chip fabrication.

COSTS AND COMPETITION

So far we’ve seen that:

- Information is costly to produce but cheap to reproduce.
- Once the first copy of an information good has been produced, most costs are sunk and cannot be recovered.
- Multiple copies can be produced at roughly constant per-unit costs.
- There are no natural capacity limits for additional copies.

These cost characteristics of information goods have significant implications for competitive pricing strategy.

The first and most important point is that markets for information

will not, and *cannot*, look like textbook-perfect competitive markets in which there are many suppliers offering similar products, each lacking the ability to influence prices. Such a market structure may be a plausible description of the market for wheat or government bonds, but it has little relevance to information markets.

We’ve seen business plans for “information auctions,” where digital content is sold to the highest bidder(s). That sort of market structure works well for goods in fixed supply, like stocks or airline seats, but it simply isn’t viable for a good in which the incremental cost of production is zero. Selling a generic product—say, a digital map, for 10 cents—isn’t viable when your competition can sell the same map for 9 cents and still make a profit.

When Information Is Commoditized

To see why “information commodity markets” don’t work, let’s examine the history of CD phone books.

CD phone books first appeared in 1986 when Nynex developed a directory of the New York area. Nynex charged \$10,000 per disk and sold copies to the FBI, the IRS, and others. The Nynex executive in charge of the product, James Bryant, left to set up his own company, Pro CD, to produce a national directory. A consultant who worked on the project, Claude Schoch, had the same idea and created Digital Directory Assistance.

The phone companies wouldn’t rent their computerized listings to the CD companies at a reasonable price, since they didn’t want to cannibalize their \$10 billion Yellow Pages services. So Pro CD hired Chinese workers to do the transcriptions in a Beijing factory, at a cost per worker of \$3.50 per day. These Chinese workers typed in all the listings in every phone book in the United States—in fact, they typed them in *twice* to check for errors!

The resulting database had more than 70 million listings. These data were used to create a master CD, which was then used to create hundreds of thousands of copies. These copies, which cost well under a dollar a piece to produce, were sold for hundreds of dollars in the early 1990s and yielded a tidy profit.

But other producers caught on: within a few years competitors such as American Business Information adopted essentially the same

business model, with minor variations. By now there are at least a half-dozen companies that produce CD telephone directories, and prices have fallen dramatically. You can buy CD phone directories for less than \$20, and there are also several directory listings on the Internet that provide the same service for free, covering their costs through advertising.

The story of CD telephone directories is a classic one: once several firms have sunk the costs necessary to create the product—be it a CD or a rail line—competitive forces tend to move the price toward marginal cost, the cost of producing an “additional” copy.

To see why, consider a simple example. Suppose that Numbers R Us and Fone Your Friends each offer a CD telephone directory for \$200 a disk. Imagine that these two CDs are essentially identical—they have the same amount of information and similar user interfaces, and they are both reasonably current.

What happens if Numbers R Us decides to cut its price to \$189.95? Since the products are essentially identical, consumers gravitate to the cheaper product. In response, Fone Your Friends cuts *its* price to \$179.95. Numbers R Us responds with a \$169.95 price . . . and so it goes. This downward spiral of prices may be hard to prevent. Once the sunk costs have been sunk, there is no natural floor to the price except the cost of producing and distributing another CD, which is only a few dollars. Nowadays, CD telephone directories sell for \$19.95 or less, a far cry from the heady days of the 1980s.

Commentators marvel at the amount of free information on the Internet, but it’s not so surprising to an economist. The generic information on the Net—information commodities such as phone numbers, news stories, stock prices, maps, and directories—are simply selling at marginal cost: zero.

Market Structures for Information Goods

The high sunk cost, low marginal cost feature of information markets has significant implications for the market structure of information industries. In the final analysis, there are only two sustainable structures for an information market.

Competition among sellers of commodity information pushes prices to zero.

1. The *dominant firm* model may or may not produce the “best” product, but by virtue of its size and scale economies it enjoys a cost advantage over its smaller rivals. Microsoft is everyone’s favorite example, since it controls the market for operating systems for desktop computers.
2. In a *differentiated product* market we have a number of firms producing the same “kind” of information, but with many different varieties. This is the most common market structure for information goods: the publishing, film, television, and some software markets fit this model.

Amalgams of the two models are not uncommon; many software markets involve both differentiated products and disparate market shares. Indeed, one can say that all products are differentiated, it’s just a question of how much. TV listings are an interesting example. *TV Guide* is the dominant firm in this industry, selling nearly a billion copies a year and offering some differentiated content. However, there are many local advertiser-supported guides, distributed for free as standalones or with hundreds of Sunday newspapers, that compete with the commodity information in *TV Guide*. After a period of relative calm, the TV listings market is gearing up for a heated battle with GIST TV and other on-line TV listing services. On-line listings are likely to give the print media a run for their money, especially if Web TV takes off.

Your basic strategy will depend on what kind of industry you are in. At the most fundamental level, we have the classic time-tested principles of competitive strategy:

- **Differentiate your product.** If you are in a differentiated products industry, you must add value to the raw information, thereby distinguishing yourself from the competition.
- **Achieve cost leadership.** If you are in a dominant firm industry, your strategy should be to achieve cost leadership through economies of scale and scope.

These classic prescriptions are just as valid as they ever were, but the unique characteristics of information markets offer new opportunities to implement them.

Pricing policies are central to successfully implementing either strategy. To succeed, you must either become the price and cost leader

based on your scale, or you must create a unique information resource and charge for it based on the value that it offers to consumers.

Even if you have the good fortune to dominate a market and don't have to worry about competitors, you still have to worry about pricing, since you need to price your products in ways that maximize their value. Stockholders naturally want high returns on their investments and can be just as difficult to deal with as competitors.

Differentiation

The lesson of the CD phonebook example is clear: don't let your information product become a commodity. Do everything you can to make sure there are no close competitors by differentiating your product from others that are available.

We opened this chapter with a description of the *Britannica* and *Encarta* battle. The latest strategy in that competition involves product differentiation. As we indicated earlier, *Britannica's* product is far more complete and authoritative than Microsoft's. Simply on the dimension of quantity, *Britannica's* 44 million words dwarf *Encarta's* 14 million.

Britannica's price cuts have certainly had an effect on *Encarta's* sales: Microsoft's share of unit sales of multimedia encyclopedias was 27.5 percent in 1996, down from 44.8 percent in 1995. But Microsoft is striking back. It increased the word count in the most recent release of *Encarta* by 30 percent and has purchased rights to use content from *Collier's*, a highly respected print encyclopedia.

It now looks like the market might be shaking out into two or three segments: a multimedia, bells-and-whistles market, an educational market, and an authoritative reference market. However, these market segments are still being contested. Whichever industry player wins these various market segments, consumers are likely to be the ultimate winners. Despite the intense competition and steep price declines, industry revenues surged 32 percent last year to about \$60 million.

Even information commodities can be successfully differentiated if you exploit the unique features of the Internet. Bigbook is one of several business directories available on the Internet. These directories are essentially nationwide Yellow Page servers that allow the user to look up businesses by name or category. But Bigbook has a gimmick that differentiates it from its paper-based competitors. It has linked a geographic

information system with its database of phone numbers and addresses, allowing it to display maps showing the location of each business the user looks up. These maps help to differentiate Bigbook's product from other business directories. However, even this clever idea isn't immune to competition—there are other sellers of geographic information systems, and competitors have already started to copy the idea.

One way to avoid such copying is to assert intellectual property rights to protect information commodities. West Publishing offers a good example of this strategy. Historically, only a few firms went to the trouble of collecting and publishing statutes and legal opinions. With high sunk costs, there was only room in the market for a limited number of competitors. But now, because these materials can be scanned and put onto a CD and are available in electronic form from the government, the fixed costs of collecting the information has fallen and several new suppliers have entered the market. CDs containing huge amounts of valuable legal information became available at bargain-basement prices. Fortunately for West, it was able to differentiate its product, notably through its copyrighted key number system, so as to protect its margins and survive, at least for a time. In the fall of 1996, U.S. Judge John S. Martin ruled that West could not claim copyright in its citation system, allowing rivals to cross-reference West numbers. West, seeking to protect an important source of product differentiation, appealed this ruling, hoping to maintain its primary competitive advantage.

Cost Leadership

If it is hard to differentiate your product, you can at least try to sell a lot of it. If you can sell more than others, your average costs will be the lowest, allowing you to make money when others cannot. But be careful—to sell a lot you will need to lower your price (at least to match any discounts offered by others) and so will necessarily earn a smaller amount on each unit sold. To win, you have to make up for it in volume. You also have to prevent others from capturing the inside track by selling more than you do. This can be a dangerous game; if two or more firms discount heavily, counting on the scale economies that come with market leadership, both cannot succeed. When Microsoft priced *Encarta* at \$49.95, it was betting that it could move a lot of CDs at that price and drive competitors out of the mass market. Distribution skills,

marketing expertise, and channel control are critical in this type of pricing game.

In traditional industries, reducing your average cost of production usually means focusing on unit costs of production: using supply chain management, workflow analysis, and other tools to cut costs of parts, assembly, and distribution. With information goods, unit costs of production are negligible and supply chain management and related techniques usually don't help much with the first-copy costs. The key to reducing average cost in information markets is to increase sales *volume*.

One great thing about information is that you can sell the same thing over and over again. Think of how a TV show is marketed. It's sold once

**Reduce average cost
by increasing volume
through reuse and resale.**

for prime time play in the United States. Then it's sold again for reruns during the summer. If it is a hot product, it's sold abroad and syndicated to local stations. The same good can be sold dozens of times. The most watched

TV show in the world is *Baywatch*, which is available in 110 countries and has more than 1 billion viewers. In the United States, *Baywatch* isn't even broadcast on national networks; it is available only via syndication. The shows are cheap to produce, have universal appeal, *and* are highly reusable.

One company that is trying to exploit this strategy in the information industry is Reuters. Its core business is financial information; Reuters provides data to more than 255,000 terminals around the world, more than twice as many as its nearest competitor. It currently controls about 68 percent of the information market for foreign exchange, 33 percent of the equity market, and 24 percent of the fixed income market.

Reuters also provides news stories as a complement to its data services. Though its managers would be loathe to admit it, this is pretty much a commodity business. Several other news services, such as Associated Press, Bloomberg, and Dow Jones, sell similar material.

Despite the commodity nature of the news product, Reuters has managed to do well at this business. One of the reasons is that it has been able to package news items that are of interest to particular industries. This packaging adds value to the product by providing filtering and sorting services—services that are highly valuable to customers suffering from information overload.

For example, if you are in the shipping industry, you can purchase a news service from Reuters that will send you news that is relevant to shipping. Currently, these customized news services also cover foreign exchange, money, securities, fixed income, commodities, and energy.

Much of the news in these industries overlaps, allowing Reuters to sell many of the *same* pieces of information over and over again. The company avoids the trap of having its prime product commoditized by *organizing* it in ways that are useful to customers, thereby differentiating its product from the competition.

Reuters has been experimenting with Internet news services for several years. It has been a long-time supplier to ClariNet, an early on-line news provider. Recently Reuters has begun selling news feeds to Web-based news providers, such as Pointcast. Pointcast is a combination Web browser/screensaver that displays noteworthy headlines in categories chosen by the user. When a user clicks on a headline, the whole article appears. Furthermore, users can customize the browser/screensaver so that only information about certain industries, cities, or sports teams is displayed. Since Reuters already classifies its news items as a matter of course, it is easy for Pointcast to organize them for its users.

As of 1996, Reuters was the dominant news service on the Internet, supplying stories to thirty-five Web sites and making a profit doing so. This example shows that a volume-based strategy of cost leadership must be rooted in adding value to raw information to broaden appeal and fully exploit the economies of scale and scope.

Not surprisingly, Reuters' success has caught the attention of other information providers, most notably Michael Bloomberg, who has forged agreements with @Home, CNet, and AOL to provide on-line content. Bloomberg makes no secret of the fact that he wants to become "the business-news site for a very large percentage of the world's Internet users." Reuters has a head start, but it will have to fight hard to keep its market share.

First-Mover Advantages

We have suggested that market leadership through aggressive pricing can be a successful strategy in the presence of the scale economies endemic to information industries. However, such leadership may not be worth winning if victory only comes after a bloody price war. The

best way to secure such a leadership position is through an early presence in the market, combined with a forward-looking approach to pricing.

As the *Encyclopedia Britannica* example shows, historical leaders in many information markets are at risk today of losing their leadership positions, as new technologies arise that vastly reduce the cost of creating or distributing the information that has been their mainstay. Reuters has responded by filtering and sorting its information to add value; West has protected its position by using its copyrighted key number system of legal references. Differentiation strategies such as these are often enabled by the very same new technologies that threatened to dethrone the industry incumbents.

Even if differentiation is difficult or limited, incumbent information providers are well placed to adopt a cost leadership position, so long as they are not rigidly wedded to their historical pricing practices. Owing to strong economies of scale, the market leader often tends to be the cost leader. If you have the good fortune to be the historical market leader, and if you are on par with a newcomer in terms of cost and technical prowess, you should be able to find a pricing strategy to retain your leadership position. Indeed, if you are alert, scale economies should work to your advantage, not against you. After all, you have the scale to start with. Just don't think you are entitled to continue to set selling prices as high as you have in the past.

A two-pronged approach offers the best chance for the historical leader in an information category to make money, even if it cannot prevent its information from becoming a commodity.

First, don't be greedy. Even while the incumbent remains the sole supplier of certain types of information, the threat of entry by look-alike information providers is very real for most information. Recognizing this, incumbents should be willing to sacrifice some of their short-term margin by dropping prices to make their markets less attractive to would-be entrants. This is what economists call *limit pricing*: set prices as high as you can without encouraging others to invest the sunk costs necessary to enter your market. If the information you sell is durable, like a piece of computer software or a reference tome, more aggressive pricing today can slow down or prevent entry tomorrow by taking some customers out of the market for a time: your sales today reduce demand for similar information in the future. Sales today may also serve the function of locking in customers who find it costly to

switch from one supplier to another as they update their information (see Chapter 5). For all of these reasons, it pays to sacrifice some current profits through lower prices when facing a real threat of entry.

Play tough. Turn the threat of commoditization on its head and use it to your advantage. The key is to find a way to send a credible signal that entry will be met with aggressive pricing. After all, who would invest in duplicating the information you provide if convinced that you would lower prices aggressively to meet any new competition? One way to establish this reputation, painful though it may be in the short run, is to fight tooth and nail when faced with me-too entries for specific information products, both to hold your ground on the threatened product and to send a signal to companies who might otherwise attack you in other product areas. If you can convince potential entrants that you will respond with dramatic price cuts if they enter, then you won't have to lower prices now to discourage entry. A credible threat of price cuts after entry may be enough to convince would-be competitors that they won't be able to recover their sunk costs and thus discourage them from entering the market in the first place.

It's true that cutting prices in the wake of entry can precipitate a price war—so you should do it only if you think you can win. When trying to estimate the benefits of price cutting, it is important to realize that you are investing not only in eliminating a potential competitor but also in establishing a reputation as a formidable opponent. This investment will be amply repaid down the road by discouraging potential entrants.

In our experience, information providers with established brand names often hesitate to drop prices quickly enough to warn off potential entrants, perhaps because they think their brand name shields them from competition. Sure, a valuable brand name will allow you to command *some* premium, but it will not guarantee you the same prices or margins you enjoyed before new information technologies arrived that caused per-copy and distribution costs to fall.

Companies slow to accept the inevitability that new technologies will force lower prices for basic information may find themselves losing market share rapidly on all fronts. Competitive advantages based on access to raw information are under siege; the trick is to migrate incumbency and

**To discourage entry,
avoid greed and
play tough.**

scale advantages into value-added aspects of information, where advantage is more sustainable.

If you think your position as a market leader is totally secure, try reciting the following mantra three times: “CP/M, WordStar, VisiCalc.” Each of these products had, at one time, a 100 percent market share. But because their producers failed to respond to the competition quickly enough, each is now history.

PERSONALIZING YOUR PRODUCT

If you are successful in creating a unique source of information and avoiding commoditization, you have some breathing room in terms of both pricing and product design—that is, how you package and present your information. But how do you make the most of that room? How do you extract the most value from the information you have created? The

answer comes in two parts: First, personalize or customize your product to generate the most value for your customers. Second, establish pricing arrangements that capture as much of that value as possible.

Personalize your product and personalize your prices.

A good example of how information technology can be used to personalize information services and thus add value is the previously mentioned news provider Pointcast. The news stories that a user sees are highly *personalized*. If you are interested in the Boston Red Sox, the computer industry, international business, and the weather in New England, you can instruct Pointcast to show you news headlines and stories on those topics.

What is even more interesting is that Pointcast will show you ads that are personalized in the same way—ads having to do with baseball, fast food promotions, discount travel agencies, and Boston restaurants. This ability to customize and personalize advertising is a very powerful marketing tool that Internet businesses are only beginning to understand and exploit. Intermediaries like DoubleClick and Softbank Interactive Marketing sell ads targeted by day of week, time of day, continent, country, state, or operating system, and they are adding more capabilities each day.

Table 2.1. Bulk versus Targeted Ad Rates for Web Search Engines (Cents per View)

<i>Site</i>	<i>Bulk</i>	<i>Targeted</i>
DejaNews	2.0¢	4.0¢
Excite	2.4	4.0
Infoseek	1.3	5.0
Lycos	2.0	5.0
Yahoo!	2.0	3.0

Source: Michael Lesk and Hal Varian, eds., *Internet Publishing and Beyond: The Economics of Digital Information and Intellectual Property* (Cambridge, Mass.: MIT Press, 1998).

Search engines such as Yahoo! provide another example of this kind of personalization: when you search for Web sites about, say, “fishing,” you will be shown a list of sites having to do with fishing . . . along with an ad for some fishing-related product. When we tried this recently, we saw an ad for the Florida Keys touting the great deep sea fishing in the area.

Yahoo!, like other search engine companies, sells ads linked to search terms (“hot words”) for a premium price. Table 2.1 shows some rates search engine companies charge for bulk and targeted ads. Note that targeted ads sell for about 50 percent more than bulk ads. The reason is simple: consumers of the targeted ads likely put a higher premium on the product being advertised and hence are more likely to buy.

“Search engine spamming” is a variant on this theme. For example, one Web site selling children’s clothing added hidden tags containing the words “child care.” The operators of the site figured that people looking for child care would also be interested in children’s clothing. The search engine operators are fighting this practice, since it reduces the value of their product. Several refuse to index invisible words. In September 1997 the U.S. District Court in San Francisco issued an injunction against a Web site that used the invisible words “playboy” and “playmate” in its Web site, upholding *Playboy’s* claim of copyright infringement. Being invisible was no defense!

KNOW YOUR CUSTOMER

If you want to personalize your information product, you have to know something about your customers. The hoary injunction “Know Thy

Customer” is as important in the information economy as in the industrial economy, if not more so. What has changed is that the two-way communication offered by the Web greatly increases the opportunities for information providers to learn about their customers. While cable television companies know where their subscribers live and what channels they subscribe to, information providers on the Web have the ability to know what Web surfers are actively looking for, where they spend their time, and more. Those companies that are first, and best, at figuring out how to use the unique customer information available on the Web stand ready to reap substantial rewards.

Consumer information is valuable, however you seek to generate revenues: by subscription, by pay per use, or by advertising. If you require users to pay, you need feedback on what they like and dislike. If you are supporting your content with advertising, you need feedback on who your users are and whether they are likely to buy the products that your advertisers want to sell. The two main ways to get user information are (1) registration and billing, through which you can ask for demographic information, and (2) observation, which allows you to get information about customer behavior by means of their search queries and clickstream (both to be explained shortly).

Registration and Billing

The *New York Times* Web site doesn't charge users for content but does require them to register. This allows the *Times* to collect information on the demographics and reading habits of 2.1 million users, which can then be used to set ad rates. The *Times* asks for the classic information used in the paper-based subscription business, the ZAG: zip code, age, gender.

Zip code information is an automatic requirement for mail-based subscriptions. These numbers convey a lot of information about the customer, which makes it easy for a publication to describe the demographics of their subscribers to advertisers. Web sites, on the other hand, have had a very difficult time getting users to provide information about themselves. Remember the joke about the two dogs at the computer, where one says to the other, “On the Internet no one knows you're a dog”? Well, no one knows your zip code either—unless you tell them.

Sites that require payment, such as the *Wall Street Journal*, ask for your zip code as part of the billing process. This number can be checked against credit card records, which makes it pretty reliable.

Registration and billing are fine for major sites such as the *New York Times* or *Wall Street Journal*. But many Web sites don't require registration, either because of the nature of the content they provide or because of user resistance. But Internet services providers (ISPs) such as AOL do have access to this critical piece of information about their customers. Since AOL bills users and authenticates them at log-in, AOL can provide advertisers with information on user demographics. This gives ISPs a big advantage in marketing and allows them to charge a premium for hosting Web sites. Remember the AOL-Amazon.com deal described in Chapter 1? Part of that \$19 million is payment for customer demographics.

Obviously, content providers would prefer to have direct access to their users' demographics rather than pay AOL a premium for that information. Their strategy should be to bribe users to give them the appropriate demographics, which can in turn be passed on to advertisers. One way to do this is with promotional offers: send out a coupon that will be honored only if the user returns it with the requested demographic information. Reliable demographics will become more and more valuable as the on-line advertising market heats up. Another way to get this kind of information is to offer a valuable service in exchange. Recall the example of Hotmail, described in Chapter 1, which offers free e-mail services in exchange for responses to its questionnaire.

Consumers are often reluctant to provide information about themselves since they don't know how it will be used. According to a study by Donna Hoffman, Tom Novak, and Marcos Peralta of Vanderbilt University, 94 percent of Web users surveyed have refused to provide information to a Web site, and 40 percent have given fake information. There are two interesting developments in this area, one technological, the other institutional.

The technological development is the open profiling standard being developed by the W3 group. This is a way for consumers to store information about themselves, such as name, address, buying habits, interests, etc., and release it on a controlled basis. Such a standard should make it both easier and safer for individuals to manage their personal information.

The institutional development is the creation of “privacy auditors,” such as TrustE, that will verify that firms’ claimed privacy practices are in fact followed. Such neutral auditing may play a critical role in inducing consumers to give content providers the information they want. With reasonable safeguards, we expect that many consumers will be happy to sell information about themselves for a nominal amount, in part because consumers value receiving well-targeted information, especially via asynchronous communication channels that allow consumers to control *when* they receive the information.

Observation

The other primary way to learn about your customers is by observing their on-line behavior. Most Web sites now allow users to search their contents. But the Web hosts rarely save the users’ queries. Knowing what your users are looking for—and whether they find it—is extremely valuable information; save it and analyze it.

In addition to monitoring searches, you should also monitor your customers’ “clickstream,” the sequence of actions they take while visiting your site. Web log files contain much useful information about user behavior, but they are difficult to analyze for several reasons. First, there is simply a lot of data—sorting through it all takes time and effort. Second, the HTTP protocol that underlies the Web is “connectionless.” The protocol treats each request (or hyperlink click) from each user as a separate transaction: there is no explicit concept of a series of transactions with a particular user.

This means that the Web developer has to build in support for recognizing a series of interactions with a given user. This information can be stored on the server side (in memory for short transactions, or on disk for extended ones) or on the browser side in the form of “cookies,” files stored on the user’s hard drive that contain information about the browser-server interaction.

Neither of these options is as powerful as one would like, however, since the design of the HTTP protocol makes it difficult to observe a lot of useful information about user behavior. For example, psychological studies have shown that user ratings of “interesting items” are very highly correlated with how long they look at the item. (Think of how you read the newspaper.) But the standard browser-server interaction makes it very hard to collect this information.

Java offers a very promising solution to this problem. With Java, you can write your own browser and measure every aspect of user behavior that you want—including time spent inspecting each item. This allows you to collect a much, much richer set of information about your users.

How can this information be used? Consider an on-line shopping service such as Peapod. Peapod, whose slogan is “Smart shopping for busy people,” allows you to order groceries over the Internet, which are subsequently delivered to your home. Peapod gives you significantly more information about products than is available at the supermarket. For example, you get the price per unit, to enable comparison shopping, as well as detailed nutritional information. Imagine how useful it would be to marketers to know what aspects of product information people really look at and care about. Such information is valuable to any on-line retailer, whether in the business of selling computer components or automobiles. When you know more about your customer, you can design and price products in ways that better match consumer needs. Obtaining and using such customer information is essential to maximizing the value of your business.

The Internet makes it easy to personalize information products, thereby adding value.

PRICING YOUR PRODUCT

In addition to making it easy to personalize your product, the Internet also makes it easy to personalize your price. If the information products you sell are highly tuned to your customers’ interests you will have a lot of pricing flexibility, since you won’t have to worry as much about generic competitive products.

The purest example of tailored goods are research reports, such as those produced by Gartner Group, Forrester Research, the Research Board, and other similar organizations. The Research Board, for example, sells research reports to CIOs that are highly targeted to their interests and needs. In exchange, member companies pay subscription fees of \$50,000 to \$70,000 per year for this information, simply because it is hard to find such detailed and personalized information elsewhere.

But it isn’t only high-priced information that can be personalized. You can do much the same thing with mass-market consumer informa-

tion goods. To see the basic trade-offs, put yourself in the place of the marketing director at Intuit, who is trying to decide how to price the company's next release of its home accounting software, Quicken. The company recognizes that consumers have different values for this software: some can't function without it, others are only casual users.

If you set your price at \$60 only the zealots will buy. If you set your price at \$20, you will sell to lots of casual users but will pass up the potential profits from selling at a high price to the zealots. Which way should you go? Answer: It depends on how many customers of each type there are. If there are 1 million zealots and 2 million casual users, you would sell to a million people if you set a price of \$60 and 3 million people (the zealots plus the casual users) if you set a price of \$20. In this example you make the same revenue either way, but if there are more than 2 million casual users, the \$20 price generates more revenue.

This simple calculation gives us the revenue picture; to figure out which price is more profitable, we would have to know something about the production, distribution, and support costs. In the interests of simplicity, we will ignore these costs for the moment and focus just on revenues.

We can use the numbers in this simple example to plot a bar chart showing the relationship between price and sales in Figure 2.1. Panels A and B show the revenue trade-off just examined: set a high price, and sell only to the consumers who place a high value on your product, or set a low price and sell to lots of consumers.

Now this story has an implicit assumption. It assumes that there is only *one* price being charged for Quicken. Wouldn't it be nice—for

Intuit—if it could charge several prices? Then it could sell Quicken to each different consumer at that consumer's maximum willingness-to-pay. In the simple example described above, Intuit could sell a million copies at \$60 and 2 million at \$20, yielding a total revenue of \$10 million. As shown in Panel C of Figure 2.1, this is much more than the company could get by selling at any single price. Charging each customer just what he or she is willing to pay is what economists refer to as “perfect price discrimination.” As the modifier “perfect” suggests, it's rare to be able to discriminate to this extent in the real world. (We discuss Intuit's solution to this pricing problem in Chapter 3.)

There are many reasons why it is hard to achieve perfect price discrimination, but one of the most obvious is that it is awfully hard to determine what is the maximum price someone will pay for your product. And even if you do know what someone is willing to pay for your product, how can you offer it at a low price to those unwilling to pay more without allowing more eager buyers to take advantage of the same favorable terms?

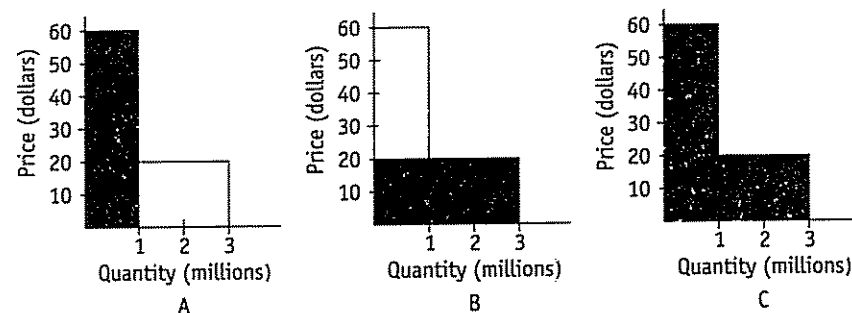
If you sell goods for a posted price on a store shelf, you're pretty much stuck with the “one price fits all” model, augmented perhaps by coupons and occasional discounts. But if you sell goods to people using a “point-to-point” technology, as is possible on the Internet, you can sometimes arrange for multiple, and even personalized, prices. The current buzzword for this strategy is “one-to-one marketing,” but it was first described by the economist A. C. Pigou in 1920 under the admittedly less catchy phrase “first-degree price discrimination.”

Pigou distinguished three types of differential pricing, which he called first, second, and third degree, but we'd like to use more descriptive terms:

- **Personalized pricing:** Sell to each user at a different price.
- **Versioning:** Offer a product line and let users choose the version of the product most appropriate for them.
- **Group pricing:** Set different prices for different groups of consumers, as in student discounts.

We'll discuss personalized and group pricing in this chapter and devote the entire next chapter to versioning.

Figure 2.1. High, Low, and Differential Pricing



PERSONALIZED PRICING

Personalized pricing is being used today in traditional print media. Mail-order catalogs, for instance, often arrive with a stapled insert announcing “special offers” of one form or another. What is not widely known is that these special offers often involve prices that differ across consumers: your “special offer” might just be a premium price!

The vendor may offer different consumers different prices as a form of market research. The consumers can differ by location, by demographics, or by past purchase behavior. Sometimes the vendor has a good idea of what the price responsiveness of the different groups might be, and sometimes it is conducting market research to discover price responsiveness. (When the *Encyclopedia Britannica* wanted to determine consumer demand for its CD offering, it used a direct mail campaign, with prices ranging from \$70 to \$125.) Whatever the motivation, the vendor selling via catalog can charge different prices to different consumers because it is able to personalize the price.

But think how much *more personal* prices can be with intelligent use of information technology. Remember our fishing example? If your on-line travel agency knows that you are interested in deep-sea fishing, and it knows that deep-sea fishermen like yourself are often wealthy, it may well want to sell you a high-priced hotel package. On the other hand, if the travel agency knows that you like snorkeling, and snorkelers prefer budget travel, then they can offer you a budget package.

In these examples, the provider can design a package that is optimized for your interests and charge you accordingly. But be careful about those premium prices for deep-sea fishermen: even wealthy deep-sea fishermen can change travel agencies.

Personalized Pricing in Traditional Industries

Airlines are, of course, masters of differential pricing; they often have dozens of different fare classes on a particular flight. Your fare may depend on when you book, what restrictions you are willing to accept, and what your travel history has been.

Other participants in the travel industry have followed the airlines' lead. When customers call travel franchiser HFS to make a hotel reservation, they are invited to listen to a pitch for a “great travel service” that

offers a variety of discounts. About 25–30 percent of the people who listen to the ad accept, which is twice the number the company would get from cold calls. By using the discount card, customers identify themselves as price-sensitive, travel-loving consumers; sellers of travel services can then offer them attractive personalized prices.

Information is also sold at highly personalized prices. The on-line database provider Lexis-Nexis sells to virtually every user at a different price. The price that you pay may well depend on what kind of enterprise you are (corporate, small business, government, academic), the size of your organization, when you access the databases (during the day or during the evening), how much you use the databases (volume discounts), which databases you use, whether you print the information or just view it on the screen, and so on and so forth. Just as with the airlines, almost every customer pays a different price.

The “smart” cash registers now being deployed in supermarkets provide another example of personalized pricing. With these machines in place, stores can offer you discounts (cents-off coupons) if they think you are price-sensitive. For example, suppose you buy a lot of guacamole and tortilla chips. The business that wants you to buy its salsa may well offer you some cents-off coupons. Even better: it can offer you the cents-off coupons only if you are currently buying a *competitor's* salsa. This is great from the viewpoint of the salsa producer, who can effectively sell at two prices—a high price to people who are willing to buy his product anyway, and a lower price to those who aren't currently consuming it.

Such techniques have been a boon to the grocery industry. From 1993 to 1996, the net profit margin rose from 0.49 percent of sales to 1.2 percent of sales, a new high in this \$400 billion a year industry. According to industry analyst Brian Woolf, a frequent shopper program can add as many as two percentage points to gross margins within two years. Calmetta Coleman describes some of the strategies used by the supermarket chain Dorothy Lane:

Club DLM enabled Dorothy Lane to stop running item-price ads. Now, much of the \$250,000 it used to spend each year on newspaper advertising is plowed into the card program. Price discounts go only to club members. Direct mail is customized, based on individual shopping

habits: Buy a lot of bread and you get bread coupons. Monthly newsletters are sent to the top 30 percent of card holders, who account for about 82 percent of the company's sales. Their loyalty is rewarded: Dorothy Lane gives them a free Thanksgiving turkey.⁴

Dorothy Lane had to invest heavily in expensive infrastructure for gathering and analyzing scanner data about consumer purchases. But on-line businesses already have the information technology in place—the big challenge they now face is to use it effectively.

Personalized Pricing on the Internet

Because it is even more individualized and interactive than catalogs, the Internet offers even more attractive pricing opportunities. Catalog producers know your zip code and your buying history and can condition their offers on these variables, but they can't easily offer you prices based on what you are buying *now*. But this is a snap on the Internet.

Virtual Vineyards tracks the clickstream of each user and can instantaneously make them special offers based on their behavior. Amazon.com tracks the purchases of each consumer and recommends additional, related books the next time the user logs on. And these are just some of the marketing advantages that the Internet offers.

Catalog writers have to commit to a particular price for a printing of the catalog. Items that are the “wrong” color or style pile up in their inventories. They can address overstock problems in special supplemental catalogs, but these are expensive to produce and distribute. If your prices are all on-line, you can mark down items in excess supply immediately. Airlines already do this with their seats, using sophisticated yield management programs. More and more companies are acquiring the capability not only to track their inventory in real time but to adjust prices just as fast.

The Internet offers unique marketing opportunities that are extremely difficult to pursue via other media. American Airlines and Cathay Pacific have run several successful auctions for seats on their flights, and cruise lines are beginning to fill up empty cabins with last-minute sales using similar techniques.

Offering sales, close-outs, and other forms of promotional pricing is

incredibly easy on the Internet since prices can be changed instantaneously. These promotions are attractive in moving your product, but they are even more attractive in terms of estimating market response to price changes. It's easy to offer a price reduction to every twentieth person who logs onto your site; if this price reduction increases your revenue from those customers, it may make sense to extend these low prices to all your customers. The Internet offers a *very* inexpensive form of market research, which will become of greater significance as the volume of on-line commerce grows.

In fact, the auctions for airline seats mentioned above play a dual role: they sell off unused seats, and they also help the airlines estimate the demand for their product. Computer retailers such as Egghead and CompUSA are using e-mail to push special offers at attractive prices for the same reason: to sell overstocked merchandise and to discover the price points that move their products.

Lessons in Personalized Pricing

Here are the lessons to take away from our discussion of personalized pricing:

- **Personalize your product and personalize your pricing.** This is easier to do on the Internet than on virtually any other medium since you communicate with your consumers on a one-to-one basis.
- **Know thy customer.** You can learn about your customer demographics by registration and about their interests by tracking their clickstream and search behavior. Analyze this information to see what your customers want.
- **Differentiate your prices when possible.** Different consumers have different values for your product. You can offer different consumers different prices based on their buying habits and other characteristics, as the supermarkets have done.
- **Use promotions to measure demand.** Promotions to estimate price sensitivity are very easy on the Internet, which makes market research a snap.

GROUP PRICING

In the previous section we talked about selling directly to individuals at personalized prices. But the prices weren't really perfectly individualized. Instead, people who had certain purchase histories, zip codes, or behavior patterns were offered different prices. People who shared a particular set of characteristics would be offered the same terms.

Sometimes you can base prices directly on group identity, a strategy economists refer to as "third-degree price discrimination." In this section we explore this kind of group pricing.

There are four reasons why you might want to sell to groups rather than directly to end users:

- **Price sensitivity:** If members of different groups systematically differ in their price sensitivity, you can profitably offer them different prices. Student and senior citizen discounts are prime examples.
- **Network effects:** If the value to an individual depends on how many other members of his group use the product, there will be value to standardizing on a single product. Microsoft has exploited this desire for standardization with its Microsoft Office suite.
- **Lock-in:** If an organization chooses to standardize on a particular product, it may be very expensive for it to make the switch owing to the costs of coordination and retraining. Again, Microsoft serves as the obvious example.
- **Sharing:** In many cases it is inconvenient for the individual user to manage or organize all information goods that he or she will want to consume. Information intermediaries such as libraries or system administrators can perform this coordination task.

Price Sensitivity

Student discounts and senior citizen discounts are popular forms of group pricing. Why do sellers offer such discounts? The standard answer is price sensitivity. It is a common exercise in any undergraduate economics or marketing course to show that a profit-maximizing seller will

want to charge a lower price to consumers who are more sensitive to price.

This pricing strategy is commonly used for information goods that are sold internationally. A textbook that sells for \$70 in the United States sells for \$5 in India. True, it is printed on cheaper paper and lacks color illustrations, but it is essentially the same information. The price is lower in India because Indian customers simply cannot afford the U.S. price. The same holds for U.S. movies shown in India—they are priced at a fraction of the price paid in the domestic market.

This sort of market segmentation is quite well understood, so we won't devote much space to it. However, it is worth noting a potential problem: as more and more material becomes available on-line, differential international pricing will become more difficult.

Take the textbook example. If a U.S. publisher wants to sell a textbook on-line, it will probably have to set a single price, and this will likely be the high domestic price rather than the low Indian price. This means that the Indian market would not be served, depriving the Indian students the benefit of the U.S. textbook and the publisher of an extra source of revenue.

One way to deal with this problem is to try to localize the information, so that different versions of the book are targeted to different countries. An economics textbook that used examples in rupees and GDP figures from India wouldn't be very appealing to the U.S. market but would be highly welcome in India. Differentiating the product in this way allows for differential prices and has the potential to make all parties to the transaction better off.

It is common to see localized versions of software and dubbed versions of movies. The global Internet will localize all sorts of information goods because this will benefit producers in two ways: it allows them to sell to a larger market, and it prevents inexpensive foreign sales from cannibalizing domestic sales.

Network Effects

We're going to talk a lot more about network effects in Chapter 7, so we will just mention the basic idea here. As we said in Chapter 1, network effects arise when the value one user places on a good depends on how many other people are using it.

Such effects can arise for a variety of reasons (which we will describe later), but the reason that is most relevant here is the desire for standardization within an organization. It's a lot easier to get work done if your employees can share their files and experiences.

Sellers of software can exploit this desire for standardization and make it attractive for organizations to choose their product by offering them quantity discounts or site licenses. Typically, site licenses have applied to members of an organization or business at a particular physical location, but the Internet may well change this practice since geographic proximity is not as important as it used to be.

Software companies offer a plethora of licensing arrangements, based on the number of concurrent users, number of workstations, number of servers, geographic site, and type of industry to which they are selling. License management software can measure use along a variety of dimensions; the critical question is which dimensions to use.

There is no general answer. Everything depends on the specifics of the product. The guiding principle is to base pricing on the dimensions that are most closely correlated with the value of the software to the enterprise. This will generally mean offering a variety of pricing menus, allowing organizations to pick the one most appropriate for them.

A powerful photo-editing tool like Adobe's Photoshop might be used by one person in a small production house and by hundreds in a large one, so a quantity discount is a natural strategy. A statistical package may be used monthly in an accounting division but daily in a forecasting division. In this case, a concurrent licensing arrangement may be appropriate for the accountants, but a flat per-seat fee would make more sense for the forecasting division.

Lock-In

We said earlier that student discounts are attractive because students are very sensitive to price. But that's not the only reason for student discounts: another reason can be summarized by the slogan "Get 'em while they're young." If you are selling a good that has big switching costs (to be discussed in Chapter 5), then it pays you to offer deep discounts to get consumers "addicted" to your product. Although software producers don't hang around outside of schoolyards pushing their products (yet), the motivation is much the same. If you can get someone

to use your product when he or she is a student, you've got a good chance of building a loyal customer down the road.

The *Wall Street Journal* has used this strategy very effectively. One of the paper's major assets is its reputation as the premier source for business and economic news. To maintain this reputation, the *Journal* has created a Newspapers in Education program that offers inexpensive subscriptions to students in business and economics classes. Not only does the paper offer very attractive prices to the students, but it offers *free* subscriptions to the faculty members whose students purchase subscriptions. This has two effects. It gives faculty members the incentive to require, or at least encourage, the students in their class to subscribe to the *Journal*, and it encourages the professors to refer to *Journal* articles in lectures. Both effects have helped to maintain and enhance the *Wall Street Journal's* reputation.

The network effects discussed above are a common source of switching costs. If your product becomes ubiquitous in an organization, so that it is very costly to switch to something new, you will enjoy a lot of power in setting prices and contract terms.

Microsoft originally offered Microsoft Office using a variety of arrangements, including per-seat and concurrent-user licenses. Recently they dropped the concurrent licensing policy, reasoning that their product was used by virtually everyone in the organizations that adopted it. Will this lose a lot of customers? Probably not, says Mary Welch, a research director at the Gartner Group. "When considering the cost of retooling, redeploying, retraining and rewriting custom applications built on top of Microsoft products, most companies will simply dig deeper into their pockets for the extra cash."² We'll have a lot more to say about this sort of lock-in in Chapter 5.

Sharing Arrangements

Site licenses are only one example of what we might call "sharing arrangements." Academic journals that sell at a high price to libraries and a low price to individuals are another example. Libraries are willing to pay the higher price since the material is shared among many users. Videotapes are another good example: some videos, especially children's videos, are priced for household purchase, but some are clearly priced for rental store use only. The consumers then "share" the rental store

copy. In these cases the library and the video store serve as “information intermediaries” that organize and manage the information for the end users.

One of the early appearances of “pricing for sharing” were the so-called “circulating libraries” in eighteenth-century England. During this period novels became a highly popular form of entertainment, so popular that printers had a difficult time keeping up with demand. In desperation, retail bookstores started “renting” out the latest hit novels. Many booksellers found this practice so lucrative that they dropped the

**Transaction costs
determine whether it is
better to sell or rent
information.**

selling side of their business and went entirely to the rental side, becoming, in effect, for-profit libraries.

Video stores in the United States followed much the same pattern. In the late 1970s, video machines were a rich man’s toy, selling for more than \$1,000.

Prerecorded tapes were also expensive, often costing nearly \$100. Just as books in the eighteenth century were initially available only to an elite, videos were only accessible to the rich.

The history of these two industries makes fascinating reading, shedding light on issues facing content owners today; we’ll examine it in depth in Chapter 4. Here we want to consider the practical question of how to determine whether to price a good for individual or group purchase. The primary consideration is transaction costs: is it cheaper for the intermediary or the end user to manage the information?

Consider videos. The major consideration in pricing a video is whether the video warrants repeat viewing. It’s no accident that the best-selling videos are generally children’s videos. Children watch videos over and over again, and every parent quickly learns the value of *owning* popular kid vids rather than making daily trips to the rental store. The primary question facing those who set video prices is estimating the desire for the repeat viewing. Ten years ago, the Hollywood marketing wizards used seat-of-the-pants intuition, but the industry has now moved to focus groups, which sometimes reveal surprising effects.

For example, Disney executives were surprised to learn that there was a significant desire for repeat viewing of *Good Morning Vietnam*, with Robin Williams. This is not a children’s movie, but people still showed a strong desire for ownership. Further investigation showed that

the desire arose from the fact that there were so many rapid-fire wisecracks in the film that people missed a lot the first time through. They wanted to watch it several times so they could get all the jokes.

The same issues come up when selling to libraries, schools, and other intermediaries. Items that are read only occasionally are often accessed via libraries: more than 70 percent of public library circulation is fiction, a figure that has remained constant for 200 years or more. Households commonly purchase books that people will use repeatedly, such as dictionaries and other general reference works.

The library and video examples show that rental and purchase arrangements coexist. By offering the product both for sale and for rental, the producer can segment the market. We discuss segmentation strategy in detail in Chapter 3, but the basic idea in the context of books and videos is to sell the good to the people who value it highly and allow the good to be shared among those with lower values. If you’re a big Stephen King fan, you may want to buy his latest book in hardback when it first comes out. If you’re not quite such a big fan, you’ll get on the waiting list at the library. The producer sells at a high price to the avid Stephen King fans and sells at a much lower price to those who are willing to wait.

The Electric Library

One Internet company that has struggled with the buy/share issue is Infonautics, which offers a product called the Electric Library. The Electric Library offers full text of 150 newspapers, hundreds of magazines, international newswires, radio transcripts, and many other high-quality sources of information. The product has a user friendly, natural language interface for full-text searches. The individual subscription price for the service is \$9.95 for one month or \$59.95 for one year, and the company has won a number of educational and industry awards for the quality of its product.

Infonautics originally planned to market the Electric Library to high school and college students who were writing term papers. However, this turned out to be tough going; it had to sell to the parents, who naturally wondered why their kids couldn’t just go to their local or school library. Since term-paper writing is episodic (at best!), the subscription model was problematic. The advent of large amounts of free

content on the Web has made this business model even more difficult. Like the battle between the *Encyclopedia Britannica* and *Encarta* described at the beginning of this chapter, purveyors of high-quality content can find it difficult to compete with lower-quality but lower-priced content.

Infonautics has had much more success with its site license program for schools and libraries. School teachers and librarians can judge the quality of the Electric Library's offerings more effectively than most parents, and the product can be used in the context of other complementary products, which makes for an easier sell. Furthermore, school and library use presents the potential to market the product to individual users: once users experience the product at libraries, the authority conveyed by the library subscription and the merits of the product itself may well convince users to purchase an individual subscription.

LESSONS

- **Analyze and understand how much you invest in producing and selling your information.** Information is costly to produce but cheap to reproduce. Large up-front sunk costs, minimal capacity constraints, and low incremental cost allow for only a few viable market structures. Understanding how your industry will shake out is critical to formulating an effective long-run strategy.
- **If you are forced to compete in a commodity market, be aggressive but not greedy.** If you are one of many firms selling similar information, grab market share and exploit economies of scale to become a low-cost producer. Find ways to add value to the information by means of superior organization, user interface, or timeliness.
- **Differentiate your product by personalizing the information and the price.** Create a product with few close substitutes so that you can base your price on the value you offer to the consumer rather than on the prices set by the competition.
- **Invest in collecting and analyzing data about your market, using focus groups, statistical analysis, promotions, and other marketing techniques.** Conducting market research in

real time is much cheaper to do on the Internet than with conventional channels, so exploit the information in your log files and clickstreams.

- **Use the information about your customers to sell them personalized products at personalized prices.** You can use buying histories, search choices, and clickstream behavior to differentiate prices and products.
- **Analyze the profitability of selling to groups.** Site licenses or rental plans may be more attractive than direct sales to individuals. Price sensitivity, desire for standardization, repeat use, and market segmentation are relevant considerations.