Versioning: The Smart Way to Sell Information

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In 1986, NYNEX issued the first electronic phone book, a compact disc containing all the telephone listings for the New York area. Charging $10,000 a copy, the company sold the CDs to the FBI, the IRS, and other large commercial and governmental organizations. Sensing a great business opportunity, the Nynex executive in charge of the project, James Bryant, left to set up his own company, Pro CD. His goal was to produce an electronic directory covering the entire United States. The phone companies, fearing an attack on their lucrative yellow pages businesses, refused to license digital copies of their listings to Pro CD. But that didn't stop Bryant. He went to Beijing and hired Chinese workers-at $3.50a day-to type into computers every listing from every U.S. telephone book. The resulting database, containing more than 70 million phone numbers, was used to create a master disc, which in turn was used to create hundreds of thousands of copies. The CDs, which cast well under a dollar each to produce, sold for hundreds of dollars, yielding a tidy profit for Pro CD.

But the CD-phone-book boom was short-lived. Attracted by the seemingly strong profit potential, competitors such as Digital Directory Assistance and American Business Information rushed to launch competing products containing essentially the same information. Because their products were indistinguishable, the companies were forced to compete on price alone. Not surprisingly, prices plunged. Soon, CD phone directories were selling for a few dollars in discount software bins. A high-priced, high-margin product just months before, the CD phone book had become a cheap commodity. The rapid rise, and even more rapid fall, of CD telephone directories stands as a cautionary tale for the purveyors of information products, particularly those sold in digital form. It reveals that the so-called new economy is still subject to the old laws of economics. In a free market, once several companies have sunk the costs necessary to create an undifferentiated product, competitive forces will usually move the product's price coward its marginal cost- cost of manufacturing an additional copy. And because the marginal cost of reproducing information- tends to be very low, the price of an information product, if left to the marketplace, will tend to be low as well. What makes information products economically attractive-their low reproduction cost also makes them economically dangerous.

Many information producers make the mistake of assuming that their products are exempt from the economic laws that govern more tangible goods. But, as Pro CD found out, that's just not so. Although information goods have unusual production economics, they are nevertheless subject to the same market and competitive forces that govern the fate of any product. And their success, too, hinges on traditional product-management skills: gaining a clear understanding of customer needs, achieving genuine differentiation, and developing and executing an astute positioning and pricing strategy.

Information's Dangerous Economics

To forge a winning strategy for an information product, you need to understand the economics of information production. Information goods, which we define as goods capable of being distributed to

digital form, have always been characterized by a distinctive cost structure: producing the first copy is often very expensive, but producing subsequent copies is very cheap. A book publisher, for example, may spend hundreds of thousands of dollars to acquire, edit, and design a manuscript, but once the first copy of the book has been printed, the cast of printing another is usually only a few dollars. To get a movie made, a producer may spend a hundred million dollars on cast, crew, script, and sets, but making a print of the final cut will cost only a few hundred dollars. The fixed costs of producing information are large, in other words, but the variable costs of reproducing are small.

The sharp skew toward fixed costs is not the only thing distinctive about the cost structure of information goods. The fixed costs and the variable costs themselves have unusual characteristics. The fixed costs tend to be dominated by sunk costs-costs that are not recoverable if production is halted. If you invest in a new office building or factory and later decide you don't need it, you can recover part of your fixed costs by selling the facility. But it your film flops, you probably won't he able to sell off the script or the sets, and if your CD is a dud, it ends up in the cut-out racks at $4.95.

The variable costs of producing information also have a unique feature: the unit cost of creating an additional copy of an information product typically does not increase even if a great many copies are made. Information producers, in other words, have few capacity constraints, which is quite a different situation from that faced by most manufacturers. If sales of microchips grow, for example, Intel will at some point need to build an expensive new fabrication facility to meet the added demand. And if sales of airplanes increase, Boeing will have to invest heavily in new plants, machinery, and people. When these and other traditional manufacturers reach the limit of their existing capacity, the cost of producing an additional unit goes way up. That doesn't happen with most information products, which can be reproduced with a high degree of automation at very low cost. If you can make one copy, you can make a million copies, or ten million copies, at roughly the same unit cost.

Because of their cost structure, information products offer vast economies of scale: the more you produce, the lower your average cost of production. That's why Microsoft, with its dominance in personal computer operating systems and business applications, enjoys gross profit margins of 92 %. But the cost structure has a big downside as well. Because the fixed costs are both large and sunk, companies that don't enjoy market dominance can be caught in devastating price wars. If competition forces a company to reduce its prices to a level near its marginal production costs-as was the case with publishers of CD phone books that company will never be able to recoup its big up front investments. It will, in note, face economic doom. What economists call a perfectly competitive market represents a disaster scenario for information producers. The dangers inherent in the economics of information production when the information is produced digitally. Copies of information in digital form-such as CDs or digital video disks-are much cheaper to reproduce than analog or print copies. Think of encyclopedias. Printing an encyclopedia set can cost more than a hundred dollars. Cutting a CD-ROM of that same set costs just pennies. By reducing variable costs, digital reproduction further exaggerates the skew toward fixed costs.

"When information is produced digitally, versioning becomes an even more powerful and flexible strategy. Because it's easy to manipulate digital data, many different versions can be created cheaply and quickly."

And that's not all. When digital information is delivered over a network, the variable costs can disappear almost completely. Because the product has no physical form-it exists purely as bits of data-there's no cost for manufacturing, no cost for packaging, no cost for shipping. Once the first copy of the information has been produced, transmitting additional copies is essentially free. Consider again the case of electronic phone books. Today, if you want to quickly look up phone numbers for people around the country, you don't even need to buy a CD-no matter how cheap they've become. You can search phone listings for free at dozens of Web sites. It costs next to nothing to let an additional customer search an on-line database, so competing providers give the information away to all comers, hoping to make their money by selling ads.

Many commentators have marveled at the amount of free information on the Internet, but to economists lake us it's no surprise. The generic in formation flowing through cyberspace-phone numbers, news stories, stock prices, maps, and the like-is simply selling at its marginal cost: zero.

Linking Price to Value

The extremely low marginal costs of information production rule out many traditional pricing strategies. You can't, for example, use cost based pricing nor can you set prices according to the competition-that's a sure road to ruin. The only viable strategy is to set prices according to the value a customer places on the information. But which customer? The value of a piece of information can vary dramatically from one person to the next. A stock market speculator will place a far greater value on stock quotes than will a long-term investor who buys and holds. A computer "power user" will value the latest operating system upgrade much more than the average home user will. And a drug company executive will likely place more value on the text of the latest FDA rulings than a pharmacist, who, in turn, will place greater value - on it than a premed student. Information never has the same value for every potential customer.

In a perfect world, an information producer would sell is product to each buyer at a different price, reflecting the value that the different buyers place on it. In reality, though, such personalized pricing is rarely possible. For one thing, even in these days of cheap computing, it is awfully expensive to capture, store, and distribute data on the tastes of individual customers. For another, traditional sales channels, like retail scores, cannot set an array of prices for the same good. (Even if they could, it would be next to impossible to get customers to stay within then intended pricing strata- look at all the gyrations airline customers go through to locate the cheapest routes.) And finally, information producers run the risk of annoying or even alienating their customers if they charge different prices for the same product.

But there is a practical way to set different prices for basically the same information without incurring high costs or offending customers. You do it by offering the information in different versions designed to appeal to different types of customers. With this strategy, which we call versioning customers in effect segment themselves. The version they choose reveals the value they place on the information and the price they're willing to pay for it.

Traditional information providers have always used versioning in one form or another, as a way to structure their product lines. Publishers release a hook first in hardback and later in paperback, selling the same text at a high price to readers who must have the book right away and at a lower puce to people who don't mind waiting. In a similar way, movie houses charge & or more for a ticket to a film that can be rented six months later for $y household.

When information is produced digitally, version mg becomes an even more flexible and powerful strategy. For tine thing it's easy to manipulate digital data, so the colt and time required to produce and distribute different versions go way down. For another, the proliferation of CD ROM players, VCRs, and Internet browsers opens many kinds of information to a mucks larger and more diverse audience. When legal information was conveyed only m heavy and expensive tomes, lawyers were the only people interested m purchasing it. Now chat the information can he searched and bought by the hit, there are many more potential customers for is Versioning provides a way to sell information to those customers m a form that they will value without cannibalizing the existing high-pace, high-margin market.

The trick is to identify the best ways to distinguish the different versions of your product- You need to determine which features will be highly valuable to some customers but of little value to others. Then you need to create the right number of versions and set the tight prices *fro* them. The goal is to get each customer to pay the highest possible price for the produce, thus maximizing the overall returns Since the customers themselves are selecting the pace they'll pay, based on their own calculation of the information's value, they will be far less likely to cake offense at paying different prices than they would if the manufacturer were imposing the prices on them.

The Many Versions of Versioning

In the past, versions of information produces were usually based on timing or, more precisely, delay. Fur almost any type of information, some people will always he more eager to gee their hands on it than will others. That's the rationale for releasing hardcovers before paperbacks and for showing movies m theaters before putting them on cape. Delay is often a good basis fur versions of digital information as well- PAWWS Financial Network, for example, offers two versions of its portfolio accounting system, one at $8.95 a month and the other at $50.00. What's the difference? The inexpensive service uses stack quotes that are delayed by 20 minutes to calculate portfolio values, whereas quotes. Those 20 minutes are very valuable to one set of the company's customers.

But with digital information, delay is only one of many possible dimensions for versioning. Just consider the wide variety of ways in which digital produces are differentiated today:

Convenience. Restricting the time or place at which a customer can access information, or restricting the length of access, is often a good way to get buyers to reveal the value they place on the information. The more a customer needs the information the more freedom they'll want in accessing it. America Online, for example, offers different monthly membership plans based on convenience. The standard plan, which provides unlimited access, costs $21.95. An alternative plan costs $4.95 but allows only three hours of connection time - if you use more, you pay a high hourly surcharge. By offering the cheaper version, AOL can attract customers who have only a limited need for its service - they may use it solely for e-snail, for example-while maintaining much higher prices for customers with a greater dependence on it. Similarly, some on-line database companies offer discount subscriptions to users who agree to log on only outside of normal business hours.

Comprehensiveness. Some customers will pay a big premium for information that offers a depth of detail-in geographical coverage, historical scope, or statistical detail. Public affairs specialists and journalists, for example, will value the ability to search the full text of articles from newspapers around the world. Many scholars and students will value extensive historical information. Marketing managers will value information on individual customers and their long-term purchasing patterns.

Many newspapers and magazines are using comprehensiveness as the basis for creating versions of their on-line products. The New York Times and *Business Week, for* example, give away their current editions' content on the Web, but they sell access to their extensive archives. Because there are so ,,any sources of news on the Internet, these publications know that the only way to attract readers-and in turn advertisers-is to give away their freshest content. But they can charge for their past articles because the segment of customers that values those articles-writers, researchers, and the like-have no other practical source for them.

Manipulation. Another important dimension that can form the basis for versioning is the ability of the user to store, duplicate, print, or otherwise manipulate the information. Back in the days of copy protected software, companies like Borland sold two versions of their programs-one was low priced and could not be copied and the other was high priced and could. Many information providers today use similar constraints on information manipulation to distinguish their products. Lexis-Nexis, for instance, imposes additional charges on users who want to print or download information rather than just view it on screen.

Community. The chat rooms and bulletin boards that crowd the Web demonstrate that many people value the opportunity to discuss information with others who have similar interests. By restricting users' ability to join an on-line community, providers can identify customers who place value on the community in addition to the information.

Speed. A common strategy for software makers is to sell versions of their programs that at different speeds. The most serious users naturally gravitate to the faster versions even of they have to pay a lot more for them; the greater efficiency outweighs the higher cost. Wolfram Research, for example, used to sell two versions of Mathematica, its program for performing symbolic, graphical, and numerical mathematics. The high priced professional version used a computer's floating point processor to speed up the calculations. The cheaper student version disabled the processor, slowing the calculations considerably.

Interestingly, Wolfram lead to write more code to get the student version to work without the floating-point processor. The inexpensive version thus cost more to produce than did the premium version. But offering the low speed version made economic sense because it expanded the overall user network, making the professional product even more valuable to the sophisticated users, such as professors who wanted to share files with their students.

Data Processing. Various data-processing capabilities can often be built into an information product, enabling certain users to carry out sophisticated tasks H&R Block, for example, offers the standard version of its Kiplinger's TaxCut software to people who lust want an automated way to fill in their tax forms. But it also offers a pricier premium version, TaxCut Deluxe, that includes a number of other tools-for example, it has air audit feature that examines your return and highlights entries likely to catch the attention of IRS agents.

User Interface. Varying the way that customers access information can he a particularly good bass

for versioning. Sophisticated users will often he willing to invest rime learning a complex interface that offers, for example, powerful searching capabilities. (And their up front investment of sine will make them less likely to shift to n competing product later.) More casual users will want a simpler, more intuitive interface even it its capabilities are rudimentary. Adobe's %on Photoshop software for manipulating photographic images has a complex interface intended for professional designers. But the company also sells a lower end product, the $50 PhotoDeluxe, that has a stripped down in interface geared for home users You can't do as much with PhotoDeluxe, but you don't have to spend a lot of rime learning how to use it, either.

Image Resolution. Many digital products include images, and different users will place different values on the quality of the images. The stock photo house PhotoDisk, for example, offers its photographs over the Web at different resolutions Professional designers creating glossy brochures purchase high resolution images at $49.95 each, but newsletter producers settle for lower resolution images at $19.95. The myriad pornography sites on the Web often offer low-quality "thumbnails" of their photographs for free but charge for the ability to view and download high-resolution copies.

Support. Some information providers offer different levels of technical support at different prices. You can, for example, download Netscape's Web browser for free over the Net or, for $40 you can become a subscriber and receive not only the software but also an instruction manual and one free phone call to a support technician. Using technical support as a basis for version ing can be tricky, though. Highlighting the added value of support may raise questions in customers' minds about the reliability of the product. And failing to deliver on promises of support can turn into a public relations nightmare.

In addition to being used in isolation, the different dimensions of versioning can also be combined. Dialog, the large on-line information provider, creates versions of its Web-accessible database by altering both its user interface and its comprehensiveness. A high-end version, DialogWeb, is designed for corporate researchers and ocher information professionals. It has a powerful but complex interface, allowing highly sophisticated searches, and offers access to the full range of Dialog's content Another product, DataStar, is much cheaper and much less powerful, offering a subset of the full Dialog database with a simplified interface. DataStar suits casual users well, but because of its limitations it does not siphon away professional users from DialogWeb.

The Mechanics of Versioning

So how many versions should you offer? There's no pat answer to that question. The number should be guided by two considerations: the characteristics of the information that you're selling and the value that different customers place on it. If your information can be used many ways, it probably makes sense to offer a wide array of versions. But if the value of your information hinges on the number of users who access it in the same format-if, in other words, the information is subject to network effects-you may want to restrict the number of versions you offer.

Kurzweil Applied Intelligence, for example, offers many versions of its voice recognition software. Kurzweil understands that voice recognition has many different applications and that they vary greatly in the value they provide to users. College students will be attracted a simple product that enables them to create documents by speaking into their computers. But given then limited budgets, they'll only buy such a product if its price is low. Doctors, on the other hand, will be drawn to a highly sophisticated product that is able to understand a specialized vocabulary-and because such a product will save them a lot of time, they'll pay handsomely for it.

To capture the different levels of customer value, Kurzweil offers seven different versions of its software, distinguished mainly by the size and specialization of the vocabularies they recognize. The top-of-the-line, $8,000 version for surgeons, VoiceOrtho, is 100 times more expensive than the $79 entry-level product for students, VoicePad Pro. Between those extremes are versions tailored to home users, business users, and lawyers, all at different pace points. Because each segment's needs are unique, there's little chance that buyers will be confused by the various options. And there's also little chance that customers targeted for high-priced versions will opt instead for lower priced versions. A version unable to recognize legal terms, for example, would have little value for an attorney. The way customers define the value of the product locks them into their intended segment. (See the table "One Product, Many Versions.")

For other companies, a more limited array of options makes sense. Intuit, for example, offers only two versions of its popular Quicken software

for personal financial management. Unlike Kurzweil's product, Quicken doesn't have a wide variety of applications-a lawyer balances her checkbook in pretty much the same way a doctor does - so having to choose from a broad range of versions would simply confuse customers. By limiting the number of versions, Intuit gets other benefits as well. Customer support stays simple, and users are able to share files with less risk of incompatibility.

But by offering only one high end product and one low-end version, Intuit, like many information companies, may be missing out on an important opportunity. The two version strategy, though enticing in its simplicity, ignores the psychological phenomenon known as "extremeness aversion." When buying products, consumers normally try to avoid extreme choices-they fear they'll pay too much if they go for the most expensive version, and they worry they'll get too little if they opt for the cheapest. They are drawn instead to a compromise choice-a version in the middle of the product line. Like Goldilocks, they don't want "too big" or "too small"-they want the product that's "just right."

By offering three versions of a product, companies can shift buyers away from the entry-level product and to the more expensive middle offering. The effect can be quite dramatic. In one experiment, researchers offered customers different sets of microwave ovens. When the choice was between a no frills oven at $109.99 and a midrange model at $179-99, customers chose the midrange oven 45% of the time. When a high end oven at $199.99 was added to the choice .set, people chose the midrange oven 60%, of the time. The existence of this phenomenon is the reason McDonald's offers its drinks in three sizes rather than just two.

Information producers can also capitalize on extremeness aversion. If they are currently offering only two versions, they should consider adding a third, high end product to their line If Intuit, for example, offered a third version of its Quicken software-Quicken Cold, say-at a price higher than that for the Deluxe version, many buyers who would have bought the standard product will instead move up to Quicken Deluxe. The important thing to recognize is that the product you really want to sell should be positioned in the middle- high end product is there mainly to pull people toward the compromise choice.
The optimum number of versions to offer is, as we've seen, rarely clear-cut. The best way to decide is often through trial and error. Because it's usually inexpensive to create new versions of an information product, a company can do a lot of experimentation. Recently, for example, Information America, a company that provides public records to banks, government agencies, and law offices, was trying to decide whether to offer its services to users operating at home. The company felt that demand would be high enough to justify entry into the new market, but it was concerned that a price low enough to attract home users might cannibalize its sales professionals. To gain insight into the problem, the company created a subsidiary, KnowX, to offer home users access to a subset of its databases via the Web. It turned out that the restricted offering was very popular-and it didn't attract the high end professionals. With today's powerful technologies for distributing information, more and more companies are, like Information America, finding it easy to explore market segments that were not reachable before.

Old Ideas, New Applications

Information has always played a central role in our economy-a simple fact that too often gets lost in all the hype about the information age. And the total amount of information in existence hasn't expanded all that much in recent decades. What has changed is that the information has become dramatically more accessible. Many of the great technological advances of the twentieth century radio, motion pictures, television, computers-have served to speed the flow and widen the availability of information. The arrival of the Internet is just the latest step-albeit a very big step-in a process that continues to unfold.

As access to information has expanded, so too have the opportunities for selling information goods to a broader and more diverse set of customers. Versioning provides a way to serve that larger market by tailoring the same core of information to the needs of different buyers. It not only enables you to gain more revenue from an existing product but also provides a basis for thinking creatively about how to distinguish your product from competing offerings. By monitoring how the market reacts to new versions, you gain ever greater insight into how customers define value, allowing you to continually refine your product line. A creative versioning strategy is often the best defense against the commoditization of information.