

# **Pricing Strategies in the E-Business Age**

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By utilizing the leveraging functions of the Internet, companies have been able to gain a wide range of flexibility in pricing their products and services. It has also become possible for online retailers to measure a customer's willingness to pay (i.e., the maximum one is willing to pay) by utilizing the data they have collected on past purchases and consumer behavior or by introducing auction systems, and to reflect these results in determining prices (i.e., the overall process of setting prices).

Digital contents such as software, music and video offerings—all of which are considered to be highly promising products for online distribution in the age of e-business—share one major characteristic in that they can be reproduced and distributed at extremely low costs. Accordingly, a key to success in today's e-business era will be the ability to utilize this characteristic by incorporating value-based pricing (i.e., pricing that takes into account the willingness to pay of individual consumers) in business strategies.

# I Impact of Digitization and Networking on Pricing

## 1 Accelerating the Distinction Between Information and Goods

Because of the continuing progress in digitization and networking that is manifested in the rapid spread of the Internet, information about product attributes and pricing—which has long been considered a concomitant part of any article placed on the market—is now being distributed independently from the product itself.

This growth in digitization has significantly increased a company’s freedom to both combine and diversify products, thereby enabling them to easily produce and offer a wide variety of product versions to their customers. Moreover, progress in networking has substantially increased the speed at which various product-related information such as prices can be distributed. At the same time, it has considerably expanded the range over which such information can be disseminated.

## 2 Price Changes Becoming Easy

The maximum amount that any consumer is willing to pay for a product is generally seen as a measurement of the willingness to pay. While the prices for most products have traditionally been uniform (i.e., a single price for each single product), the willingness to pay among consumers is highly diverse and varies depending on various circumstances.

As the willingness to pay changes in accordance with a consumer’s preferences and various conditions, it would be theoretically desirable that prices be adjusted in parallel with such changes. In the case of actual merchandising, however, price changes usually require a substantial workload (often called “menu costs”) in terms of replacing the price tags affixed to products and/or posted

in showcases, or revising the overall product menu. Accordingly, price changes are practically difficult to carry out.

On the other hand, online sellers can easily and almost instantaneously change the prices posted on the Internet. Depending on the circumstances, moreover, online pricing can even be flexibly adjusted and controlled.

## 3 Marginal Costs for Digital Content Distribution Close to Zero

Another feature of the e-business era is that digital contents can be marketed and distributed as easily and extensively as can physical goods and services.

In general, of course, it is difficult to determine the value of digital contents as the product itself is intangible and the willingness to pay tends to vary widely depending on each consumer. Furthermore, while the initial development costs of digital contents can be considerable, the marginal costs for reproduction and distribution are very close to zero. Therefore, if pricing (which means the overall process of determining prices) for digital contents is based on the same cost-based determinations used for tangible goods, prices would tend to converge around zero marginal costs under a competitive environment, thereby leading to the failure of the business.

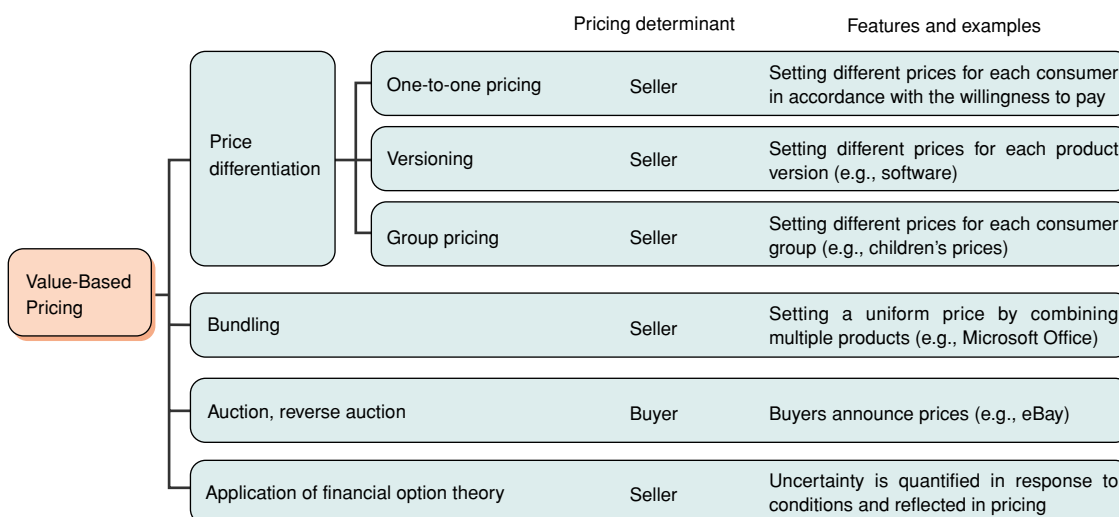
As a consequence, pricing for digital contents must be determined in accordance with the consumer’s willingness to pay rather than on a cost basis.

## 4 Structure of Value-Based Pricing Techniques

In actuality, it is difficult to quantitatively define a consumer’s willingness to pay. Indeed, consumers themselves do not accurately understand their own feelings in many cases.

However, it is possible for companies to develop a generalized sense of any customer’s willingness to pay by

Figure 1. Value-Based Pricing Structure



utilizing client information relating to tastes and attributes, data obtained through dealings and information exchanges with customers, and the accumulated record of past online purchasing behavior. There are also mechanisms such as auctions whose main feature is to encourage consumers to quantify and publicly announce their willingness to pay.

There is little doubt that the progress in digitalization and networking has facilitated the diversification of such price-setting mechanisms. We have applied the term value-based pricing to the various methodologies that take the willingness to pay of individual consumers into account in determining prices, and have categorized such techniques in the following section. (See Figure 1.)

First of all, pricing techniques that are based on a buyer's willingness to pay include such factors as price differentiation and bundling.

Price differentiation can be further classified into the following three subsets: (1) one-to-one pricing whereby different prices are set for each consumer; (2) "versioning" in which various product versions are created by function and quality to promote consumer selection according to the willingness to pay, and thereby realize price-setting based on the willingness to pay; and (3) group pricing that classifies customers into groups that each represent a different willingness to pay and sets different prices for each group.

Bundling is a technique that bundles together (i.e., combines in sets) different products, which are then sold at a price that is lower than the sum of the prices for each individual item. This technique makes it possible to develop a pricing strategy that sets a single price that is acceptable to customers for a group of products by averaging the consumer's willingness to pay in overall terms by increasing the number of product components that are bundled.

An auction, on the other hand, is a pricing technique that directly encourages consumers to quantify and announce their respective willingness to pay, and in which the successful buyer determines the price.

Another field where further studies are expected in the future is the application of financial option theory to product pricing. We believe that options will make it possible to deal with various uncertain conditions that consumers do not fully understand, and thereby lead to a pricing method that will gain wide consumer appeal.

## II The Emergence of Value-Based Pricing in the E-Business Era

This section explains various value-based pricing techniques and offers specific examples. While the cases covered here need not necessarily be limited to online transactions, we have adopted the perspective that each of the pricing techniques can be more easily realized via the Internet as discussed previously.

### 1 One-to-One Pricing Benefiting Both Companies and Consumers

Let us use a simple example to explain why price differentiation may be beneficial for both companies and consumers in some cases.

Suppose that a company can produce a product at a cost of ¥700 for the first unit and ¥0 for the second and subsequent units. Customer A is willing to pay ¥500 for this product, and Customer B thinks ¥300 is a reasonable price. (See Table 1.)

If the company sets the price of this product at ¥500, Customer A will be the only purchaser. And because only ¥500 in sales revenues can be generated, the company will be unable to recover its initial investment. If the price is set at ¥300, both Customers A and B will buy the product and generate revenues of ¥600—still not enough to recover the initial investment. Despite the fact that the total willingness to pay of the two customers (¥800) is higher than the total costs (¥700), the company would

**Table 1. Examples of Price Differentiation**

		Consumer A	Consumer B	Total
Willingness to pay		500	300	800
Uniform pricing	Price	500	500	
	Sales revenues	500	0	500
	Cost	700	0	700
	Consumer surplus*	0	0	0
	Price	300	300	
	Sales revenues	300	300	600
	Cost	700	0	700
	Consumer surplus	200	0	200
Differentiated pricing	Price	475	275	
	Sales revenues	475	275	750
	Cost	700	0	700
	Consumer surplus	25	25	50

Note: The consumer surplus is set at zero, as the companies do not actually produce any goods.

### Positioning of value-based pricing from the demand curve perspective

Value-based pricing offers significant advantages to companies.

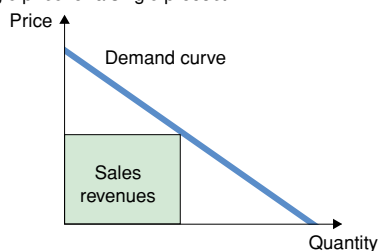
As indicated below, companies can achieve higher sales revenues by adopting a price differentiation strategy (group pricing, versioning and one-to-one pricing) than in the case of a single price for a single product. In particular, one-to-one pricing can realize larger sales revenues because of the very small consumer surplus (the difference between the actual and acceptable price as determined by the willingness to pay;

hence a higher price can be set if this surplus is ignored).

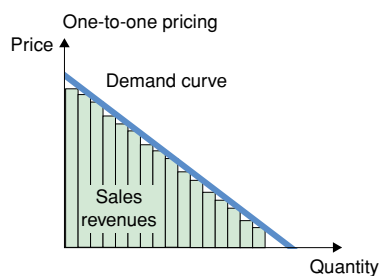
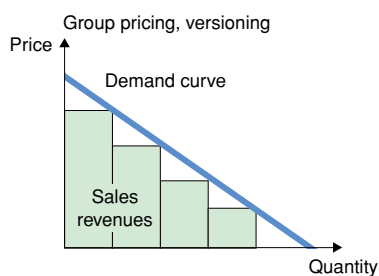
Bundling is an effort to change the demand curve itself. This strategy is aimed at increasing sales revenues by meeting the demand of as many customers as possible at a single price.

In the case of auctions, the supply is limited (hence, a scarcity value). The small quantity means that pricing can be based on the highest price proffered by interested participants.

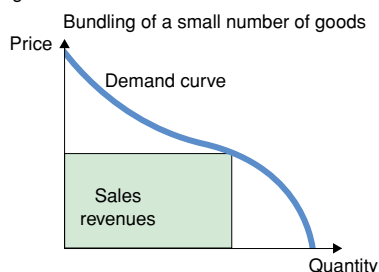
In the case of a single price for a single product:



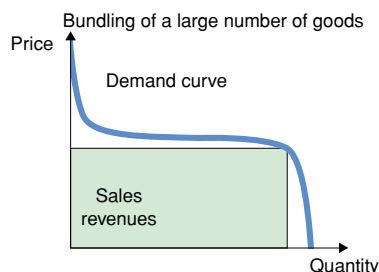
In the case of price differentiation:



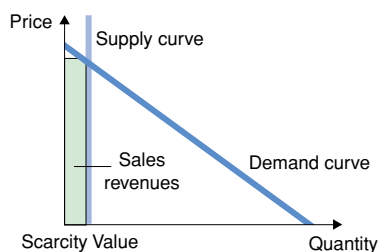
In the case of bundling:



Adding to bundle



In the case of auctions:



have no choice but to abandon production of the product under uniform pricing.

But suppose that the price for Customer A could be set at ¥475 and that for Customer B at ¥275. The company would generate total sales of ¥750, with a profit of ¥50. Moreover, both Customers A and B would be fully satisfied at getting a good deal that had yielded a total in per-

ceived savings of ¥50 (which we call “consumer surplus”). As this example illustrates, price differentiation does not always work against consumers.

Examples of one-to-one pricing that sets different prices for different consumers have long been widely used, and include such techniques as direct mail solicitations by banks and financial institutions that offer different rates

on housing loans for each customer. More recently, various Internet firms have started the trial distribution of coupons with different discount rates depending on the recipient, and even changing the display pricing at the time a customer completes the login process at a shopping site.

## 2 One-to-One Techniques Approximated in Group Pricing

In contrast with one-to-one pricing in which prices are set for individual consumers, group pricing is a technique that establishes unique prices for groups whose members share roughly the same willingness to pay. Discounts for students, senior citizens, and female customers, or for specific time periods, are examples of group pricing, wherein different prices are set for distinct customer segments on the basis of various objective yardsticks (e.g., budget-conscious purchasers or other segments such as business customers).

## 3 Versioning Offers Multiple Versions and Prices

Both one-to-one and group pricing techniques assume that the willingness to pay of each customer visiting an outlet can be identified in advance. In actual practice, however, there are many cases in which it is difficult to clearly ascertain the willingness to pay of any single customer, as the available information is limited to statistical data that broadly distribute such information among strata rather than individuals. Versioning can be an effective means to deal with such a situation.

Easy-to-understand examples of versioning include hardcover vs. paperback, movies shown at theaters vs. videotape rentals, and premium vs. regular gasoline. In short, prices are differentiated in such a way that consumers are encouraged to select the version that suits their own willingness to pay by providing essentially the same product in multiple versions that differ in terms of timing, quality, performance, etc.

While it is generally assumed that production costs are lower for low-version products, there have recently been strategic cases involving low-version products that have been intentionally created by raising the costs. One example involves a laser printer that is sold at a reduced price by deliberately decreasing the printing speed from 10 to five pages per minute by adding a control chip to slow the operation.

Another example relates to Federal Express in the United States that provides both express service and regular service. In the case of parcels for the same customer that are scheduled for morning delivery under express service and those to be delivered under regular service in the afternoon, the company makes two deliveries—once in the morning and again in the afternoon—even if both of these packages are available at the time of the morning delivery.

Yet a further example comes from the world of stock quotation services, where the usage charges for real-time information service are generally much higher than those for information provided some 20 minutes later. In actuality, however, additional system investments must be made to store the real-time information in order to provide it 20 minutes after the real-time release.

As shown by these examples, an important point in setting prices is how to dissuade consumers who are attracted to higher version products and service functions (and who are willing to pay more) from opting for lower rated and less expensive versions.

Let us look at an example of software versioning in considering a specific price setting case. (See Figure 2.) Here we assume that there are 100 purchasers each in the home user and office user segments for a software package that is available in two versions: “Office Easy” and “Office Pro.” The home users are willing to pay ¥20,000 for Office Easy and ¥22,000 for Office Pro, while the office users can accept Office Easy at ¥30,000 and Office Pro at ¥50,000.

The question now is what price should be set for each of these versions to maximize revenues. To simplify the situation, let’s assume that reproduction and distribution costs for these products are negligible. Setting the price for Office Easy at ¥20,000 and that for Office Pro at ¥50,000 will not produce the desired result, as office users will buy the lower-version Office Easy (yielding a consumer surplus of ¥10,000 per buyer), while no surplus will be generated with Office Pro. The net result will produce ¥4 million in total revenues.

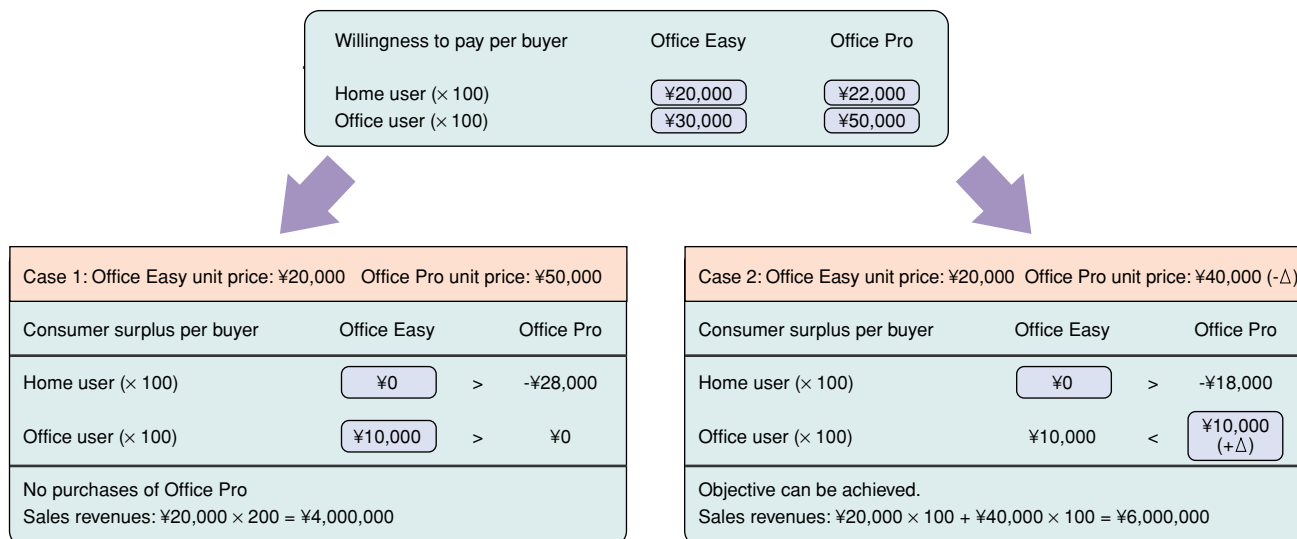
In order to avoid this situation, it is desirable to set a price of ¥20,000 for Office Easy and ¥40,000 (in actuality, a little lower would be more effective) for Office Pro. This will result in achieving the anticipated effect—i.e., generating total sales of ¥6 million as ¥2 million will come from home users buying Office Easy and ¥4 million will come from office users buying Office Pro.

## 4 Bundling to Combine Complementary Products and Services

Bundling means offering services or products in a packaged format by combining mutually complementary products or services. This style of marketing (often called “tie-in sales”) has a long tradition, and can be successfully used to improve profitability by confining the expected consumer surplus even under the inherent limitation where a uniform price is applied to the same product package.

To use an example, let us assume that an online information service offers news clippings (OP) and stock quotations (OQ) as mutually complementary services. Subscriber A is willing to pay ¥4,000/month for OP and ¥2,000/month for OQ, and Subscriber B is willing to subscribe to both services ¥3,000/month for each. Reproduction and distribution costs are ignored in this case as well.

Figure 2. Examples of Software Versioning



If a uniform price is set for each of these services, it is obvious that selling services to both users by setting the price for OP at ¥3,000 and OQ at ¥2,000 is more profitable than selling to one user only, as this will generate ¥10,000 in revenues. If the two services are bundled and sold at ¥6,000, however, revenues can be increased to ¥12,000, as both users will subscribe. (See Figure 3.)

In actual business cases, the scope of the bundling technique covers a wide range of applications, such as time-based bundling and customer-based bundling in addition to product-based bundling. Examples of product-based bundling include: (1) CATV programming combinations; (2) the combination of AOL's (America On Line) pay contents and Internet access service; and (3) the combination of software applications included in the Microsoft Office program.

The most common example of time-based bundling is a daily newspaper subscription. As some articles may be of interest on one given day but not on others, subscription pricing is determined by averaging over a designated period.

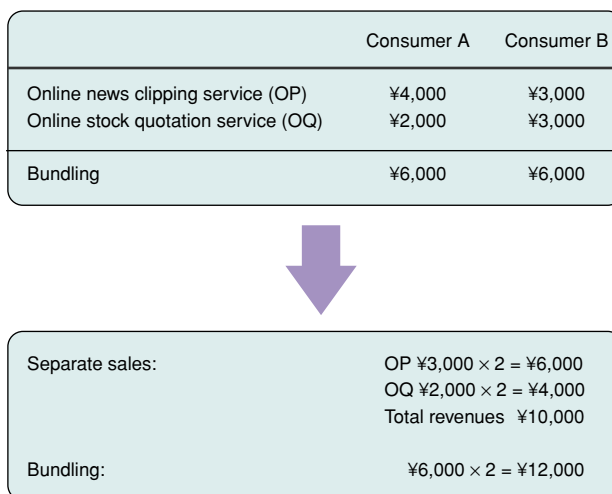
Site licensing that sets the price according to the site (companies, schools, etc.) that uses software applications—rather than the number of copies used—is a good example of customer-based bundling. For example, Microsoft Excel seems to be used more frequently by accounting personnel, but less frequently by sales representatives. Conversely, presentation software such as PowerPoint is often used by sales personnel but not by accounting personnel.

There are also many cases in which the bundling technique is used in combination with the versioning technique.

### 5 Willingness to Pay Accurately Reflected in Auctions

An auction is one of the world's oldest marketing formats and traces its origins back to 500 BC. While many

Figure 3. Examples of Bundling



styles of auctions are adopted to meet various purposes, the type now extensively used on the Internet is a system known as the “English auction,” which is typically employed in the sale of collectables and *objets d'arts*. Under this format, the price goes up with each successive bid by the participants, and the person who demonstrates the highest willingness to pay from among all participants acquires the target item.

The English auction format also offers an advantage in terms of suspense and entertainment value, as it involves a repeated process whereby participants can determine their own responses by watching the actions of other buyers. While a disadvantage is the prolonged time required for each transaction, auction sites can effectively use this time by employing revenue-enhancing techniques such as advertising aimed at the large number of customers who repeatedly visit the site to check on the ongoing progress. Another factor that has contributed to the success of auction sites is that such generated revenues can offset the need to levy high fees on the participants to cover Website operating costs.

Moreover, an auction is built upon a unique feature that looks to the buyer, rather than the seller, to present the price. As such, it provides a venue that incorporates a price-setting mechanism that enables transactions to take place at a price that is very close to the buyer's announced willingness to pay. And as customers themselves present the price they are willing to pay, claims arising out of price dissatisfaction are eliminated in principle.

Because of this, using auctions for sales to consumers as well as C2C transactions is coming in for a second look. Auction sites such as egghead.com in the US are offering a new venue for B2C sales, and the number of B2C transactions has recently been increasing even at eBay, which is a well-known auction site among consumers.

In the case of physical auctions, of course, market participants must come together at a specific location, and such restrictions in terms of time and place constitute a major barrier to participation. For online auctions, however, anyone can join by using the Internet at any time and from anywhere, and the more widely known the site becomes, the greater the number of people who would participate in the auction.

Sellers tend to select auction sites with a greater number of participants to gain the advantages of exposure to a larger number of potential buyers. Similarly, buyers also prefer larger rather than smaller auction sites, as substantial participation by a greater number of sellers increases the possibility of finding a product that suits their individual preferences.

As noted above, online auction sites that have a large number of participants develop a critical mass that attracts additional participants, thereby building up an enormous market scale that can dominate the entire arena. The US auction site eBay is a good example of this. If the market becomes extremely large, its price determination process becomes more efficient and can successfully provide a highly efficient value-based pricing mechanism in a competitive environment that can engender a price level that is acceptable to consumers.

A reverse auction is a technique that enables multiple sellers to compete with each other in selling a product based on the purchasing price proposed by a buyer. The seller who offers the lowest price can successfully complete the transaction. As a reverse auction enables the transaction to take place at the price desired by the buyer (i.e., the buyer's announced willingness to pay itself), it can be viewed as a technique that is close to one-to-one pricing.

At the same time, reverse auctions are targeted at customer strata with a relatively low willingness to pay and a high sensitivity to price. In other words, customers can be separated into segments that are price sensitive and not price sensitive depending on whether or not reverse auctions are used. The key point to improving the effect of versioning under reverse auctions is to intentionally set stringent conditions of trade (e.g., the responsibility of the buyer to make the purchase if any seller comes

forward, the waiving of all refunds, etc.) and to offer a lower quality than that of ordinary products.

## 6 Option Pricing Using Financial Theories

Basically, an option is the sale or purchase of the rights to buy or sell certain assets or products at a specified price, and is often used as a means of hedging risks arising from asset price fluctuations.

The most familiar example of options for general consumers is insurance products such as life and casualty insurance. In return for the payment of the insurance premium (which is a type of option fee), the insurance company will compensate the owner or beneficiary of a policy for the loss sustained by a person's death or damage inflicted on some asset, such as an automobile. Essentially, non-life insurance means purchasing the rights to prevent any loss in the value of an owned asset.

While the concept of options has historically been mainly used in the field of financial products, it has recently come in for use in the purchase or sale of physical assets and services. Take airline tickets as an example.

Japanese airline companies are now selling tickets at prices below regular tariffs to customers who make reservations in advance. For instance, while the regular ticket between Tokyo and Sapporo costs ¥28,000, the ticket cost for reservations made three weeks in advance is only ¥9,900 (subject to a handling fee of ¥3,800 if the ticket holder cancels the flight). If evaluated in the light of the option concept, this transaction can be described as securing the rights to purchase a ticket at the lower price in exchange for the payment of the option charge (i.e., the cancellation fee). In other words, the original discount ticket price can be seen to include the option fee.

As no handling fee is required for cancellation if the ticket is purchased at the regular price, it can be considered that the regular price includes the rights to receive a refund for the entire price even if the ticket is cancelled.

If it becomes possible to easily adjust prices on the Internet in the future, airline ticket prices may also be changed more frequently.

## III Future Challenges in Applying Value-Based Pricing to Corporate Strategies

In this final section, we will examine the extent to which each of the value-based pricing techniques so far described can be actually applied to corporate strategies and the future tasks before us.

### 1 Three Problems in One-to-One Pricing

One-to-one pricing is an ideal pricing method for companies as any consumer surpluses can be harvested. Consumers can also buy products at prices that meet their

willingness to pay. However, the technique presents the following three problems.

The first relates to the methods used to measure the consumer's willingness to pay. Even when data on past transactions or purchase histories are available, it is not easy to accurately determine the willingness to pay vis-à-vis new products or services.

From this standpoint, auctions are considered to be a more effective approach to measuring the willingness to pay among consumers, as the highest bidding price at an auction is a direct indication of the successful bidder's willingness to pay. In particular, information on not only the winning bid but also on how much each of the losers was willing to pay becomes valuable data in evaluating the willingness to pay with respect to the items offered.

The second concerns the protection of personal information. If companies log such information as consumer purchasing histories and Website activities, the excessive utilization of such data could constitute an infringement of privacy.

The third involves the possibility of confusing—or worse, antagonizing—consumers. The US online retailer amazon.com conducted a trial this autumn in which 68 DVD (digital video disk) titles were sold at varying discount rates ranging from 20 percent through 40 percent depending on the customer. The revelation of this practice on an Internet community site created considerable resentment, and consequently forced the company to offer customers a refund of the difference between their purchase price and the minimum price.

Such being the case, it would seem difficult to introduce one-to-one pricing without commensurate changes in the product function, performance, design or service. Conversely, one-to-one pricing could be an effective tool if flexible personalization of the product itself becomes possible.

## 2 Preconditions for Group Pricing

Realistically speaking, group pricing can be more easily applied than one-to-one pricing, and is especially effective

when the willingness to pay clearly differs depending on customer segments. However, the introduction of group pricing requires that certain factors be ascertained, such as (1) clearly distinguishable group attributes (e.g., a minimum age requirement), and (2) a definite means of verifying the designated group attributes (e.g., confirming age by ID card).

## 3 Utilization of the Context Effect in Versioning

Versioning is effective in cases where products or services consist of component modules and new versions can be easily created by combining various modules. This also means that versioning can be introduced without difficulty if products or services are created in a modular format in advance.

At the same time, due attention must be given to the “context effect,” whereby consumer interest can be easily directed towards higher version products by incrementally adding features to already marketed versions. (See Figure 4.) This makes it possible to utilize the psychology of consumers who tend to steer a middle course and shy away from extremes on either end when their willingness to pay is still unfocused.

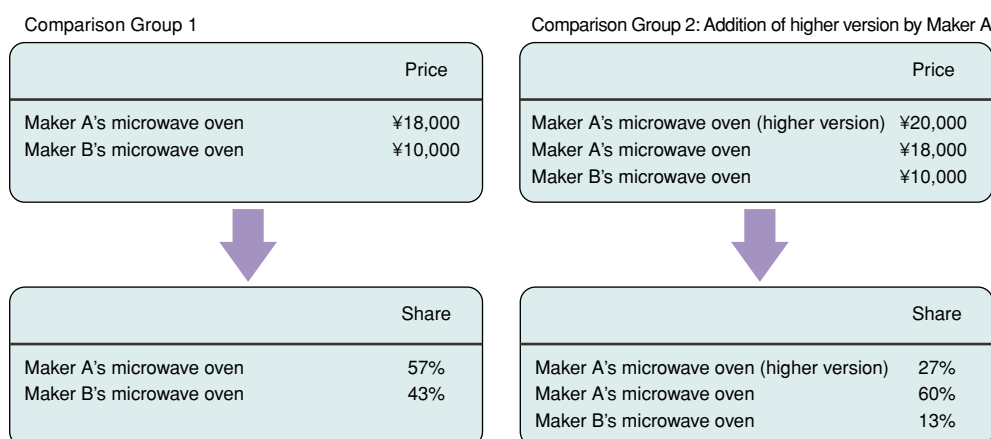
While the context effect makes it possible for a company to chip away at the market shares held by competitors by intentionally adding higher version products, the reverse is also true: one's own market share can also shrink if competitors introduce a higher version product.

## 4 Combining Mutually Complementary Products is Important in Bundling

Bundling is effective when it is used to offer mutually complementary products or services. As is the case with Internet access service and contents, or Internet access service and PC hardware, vertical bundling will take place in various formats in the fields of information service and IT (information technology) in the future.

However, it should be noted that reductions in distribution costs brought about by the spread of the Internet

Figure 4. Examples of Context Effects



are accelerating the trend towards unbundling—especially in the area of digital contents. For example, although pricing in the case of music has been set on a CD basis up to now, this charging structure is now being subject to some unbundling in order to set the price per single piece of music.

## 5 The Potential of Auctions and Reverse Auctions

While the time taken to complete a transaction (or the possibility that a transaction may never be realized in the worst case scenario) constitutes a shortcoming to auction sales, this venue can nevertheless be described as one means towards successfully achieving one-to-one pricing, as it is the most accurate reflection of a consumer's willingness to pay.

Auctions are effective for products that have an inherent scarcity value, which are not necessarily limited to tangible goods. In the US, for example, monster.com has been successful in using online auctions as a venue to trade professional labor services such as those provided by consultants and freelancers.

With respect to reverse auctions, the US firm priceline.com is developing a market for airline tickets on the basis of a patented business model. The company has come in for wide public criticism, however, as it adopts a system that bases transactions on the price a consumer is willing to pay without disclosing the actual minimum bidding price.

On the other hand, the Microsoft spin-off Expedia is also using reverse auctions for similar purposes, but discloses the actual minimum bidding price to consumers and refunds the difference from the desired purchase price.

## 6 Cultivating New Business Fields Using Options

If continued growth takes place in the number of products whose value cannot be appreciated unless one actually uses such products (which we call "experience goods") such as digital contents, automobiles and apparel—basically those products for which even the consumer cannot formulate any quantifiable willingness to pay in advance, option pricing will be able to demonstrate its full potential.

For example, some gameware magazines include a trial CD, for which an unlocking key can be purchased over the Internet to enable interested users to enjoy the full features of the game. This process can be considered as a type of option, as users who ultimately have no interest in the gameware can avoid the risk of paying a high fee for an outright purchase by paying only a small option fee (i.e., the purchase of a trial CD, which is included in the magazine price in this case).

Similar examples include services that permit users who like a rented software product to continue renting or to make an outright purchase after the end of the prescribed rental period. From the user's standpoint, this means avoiding any potential risk of disliking a purchased software package by paying the option fee in the form of a rental charge.

The option concept is especially effective for products or services that cannot be kept for a long period of time and/or those with a high risk of price fluctuations. For example, options can be applied to products or services requiring prior reservations such as passenger tickets or hotels, and those that cannot be stored such as electric power.

At the same time, it must be noted that the use of an option requires both a seller and a buyer. Even if an option can cover the risk of price fluctuations, a transaction cannot be realized if no one is willing to accept such risks in return for an option fee.

## 7 Needed Pricing Strategy in the E-Business Era

While value-based pricing strategies are now applied to only a relatively few actual transactions, businesses are coming to understand that only a small price change can result in significant earnings improvements. As the Internet has rendered obsolete the concept of a single price for a single product, establishing a new pricing strategy for the e-business age is one of the core challenges that companies must now confront.

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