

A SCHEMATIC STUDY OF ONLINE PRODUCT SYSTEM USING AUCTION MECHANISM

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ABSTRACT

Information goods, which we define as goods capable of being distributed in digital form, have been always characterized by a distinctive cost structure: producing the first copy is very expensive, but producing subsequent copies is very cheap. In addition, the fixed cost tends to be sunk cost, and the variable cost typically does not increase even if a great many copies are made. Information goods have few capacity constraints, thus offer vast economies of scale. The extremely low marginal costs of information production rule out many traditional pricing strategies, for example, use cost-based pricing. Nor can I set prices according to the competition - that will ruin all the players. The only viable strategy is to set prices according to the value customer places on the information. The value of a piece of information can vary dramatically from one person to another. In a perfect world, an information producer would sell its 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. Some methods of pricing information and of making information goods to market are being tested, yet not an integrated, widely accepted paradigm has been established

Keywords: Trade, Internet , Auction, Vickery, Dutch Auction, Online Pricing

I. INTRODUCTION

The Internet has brought many changes to the business landscape, and will bring more. It supplies us a big stage to trade information goods. The cheap interconnection of millions of people, the online distribution and delivery, the technically possible management of the term information is used very broadly. Essentially, anything that can be digitized encoded as a stream of bits of is information. Baseball scores, books, databases, magazines, movies, music, stock quotes, and Web pages are all information goods.

II. COST STRUCTURE OF INFORMATION GOODS

Information goods are costly to produce but cheap to reproduce. Production of information goods has involved high fixed cost but low marginal cost. The cost of producing the first copy of an information good may be substantial, but the cost of producing (or reproducing) additional copies is negligible. Moreover, the fixed cost tends to be sunk cost, and the variable cost does not increase even if a great many copies are made. There are few capacity constraints, thus offer vast economies of scale. Traditional cost-based pricing doesn't work: a 10 or

20 percent markup on unit cost makes no sense when unit cost is zero. I should price the information goods according to consumer value, not according to the production cost.

III. PRICING SYSTEMS FOR INFORMATION GOODS

A few pricing methods for information goods are being tested, but an integrated paradigm has not been developed. Economist A. C. Pigou in 1920 described three types of price differentiation, while Varian (1996) gives examples of them. Varian argues that small, niche markets are generally not well served if the producer is required to charge a uniform, single price. Sairamesh (2000) concludes that in a population of price-sensitive buyers, most pricing strategies lead to large-amplitude cyclical price wars. Shapiro et al (1999) point out that versioning provides a way to sell information to those customers in trading Online. The important reason I choose the Internet as the background of our paper is that Internet is a wonderful way to offer free samples of information content. Since information goods are experienced goods, information business has devised various strategies to get wary consumers to overcome their reluctance to purchase information before they know what they are getting. Internet is a convenient vehicle to use in this way, such as the permission of browsing and illustration with short demos.

Internet can be readily used to provide different versions to personalize your price in mass-market consumer information goods and communicate with your consumers on a one-to-one basis. Some samples are listed as below:

- Whole packages separation: break up the fixed packages into flexible independent units. (CD to songs, book to chapters, etc.)
- Customized bundles: e.g. customized textbook/CDs. personalized newspaper
- Different payment systems: Credit Card, Visa, Money Order, Check, Saving Accounts, etc.
- Delaying time: Information is like perishable products, devaluing across time. Uses canpay different prices according to the time interval they can get it.
- Deliver mechanism: Internet itself an efficient delivery mechanism for information goods; Customer can either choose digital format or physical packages
- Online version vs. Offline version: Online and offline versions are also an important way to differentiate information goods.

IV. ONLINE AUCTIONS

The online auction format is finding favor for buying and selling of commodities that are traditionally subject to - in the new lingo - "dynamic pricing" (Quee, 2000). Auction markets provide centralized procedures for the exposure of purchase and sale orders to all market participants simultaneously (Lee 1996. p.398). Virtues of auctions include a coordination mechanism, a social mechanism to determine a price, an effective allocation mechanism, and a highly visible distribution mechanism (Klein, 1998).

The Internet creates an environment in which the cost of buyer-seller interactions is cheaper than ever, and consumers can participate in the price-setting process-revealing their willingness to pay - making it the most efficient one-on-one selling environment anywhere, approaching the efficiency of the financial markets (Bayes,



1998). Lee and Clark (1996) present economic forces underlying this transaction. Several success stories about Internet auctions are cited by Turban (1997).

V. COMPARISONS OF ONLINE AUCTIONS AND HAGGLING WITH ONLINE FIXED PRICES

Anyone can buy and sell just about anything by auction on the Internet (Komado, 1999). Significant advantages can be gained for both sellers and buyers. Savings are made by reducing transaction costs, increasing the circle of potential customers as well as by improving the search-and-find capabilities for all parties concerned (Kambil, 1997; Malone, 1987). In the Online auction, dynamism permeates all aspects of the commercial transaction but first is the element of price'. In addition, online auctions can also supply a form that they will value without cannibalizing the existing high-price, high-margin market. The Internet, on the other hand, provides a perfect vehicle for extending this form of price discrimination to an optimum level in which prices are charged on the basis of usage and where most reading is accessed online by readers (King, 1998). The strategy of bundling a large number of information goods, such as those increasingly available on the Internet, and selling them for a fixed price, is also studied. The optimal bundling strategies for a multiproduct monopolist are studied, and it is found that bundling very large numbers of unrelated information goods can be surprisingly profitable (Bakos, 1999). The reason is that the law of large numbers makes it much easier to predict consumers' valuations for a bundle of goods than their valuations for the individual goods when sold separately. The possibility of setting an optimum price for an information resource, based on the observed willingness to buy at two or more test prices, is considered (Kantor, 1998). It is shown that for simple assumptions about the dependence of willingness on price, it is that, in the university library setting, the arrival of customers is not predictable enough to permit variations to be used in the arrival rate as a surrogate for willingness to pay. This paper does not examine the specific pricing models in particular niche, but wants to give a new angle to value the information goods the demand side decides it. I compare the online fixed pricing scheme with online dynamic pricing - online auctions and bargaining, to identify the preferences of users when trading information online. The online auction changes the parameters of the traditional auction, and allows the seller and buyer more degrees of freedom (Kumar, 1999; Beam, 1997). Transaction cost is significantly reduced with the development of information technology. Fraud is a problem in online auction since bidders and sellers do not meet each other. Goods auctioning in Internet range from the intangible to the unwieldy. Niche/collectibles, overstocks, commodities, perishables, software, and information, are all actively auctioned in Internet. The delay, security, and easy collaboration aspects of the Internet will cause online auctions on the Internet to be different than the traditional auctions. Information is an experienced good each time it is consumed. I don't know whether today's Wall Street Journal is worth 75 cents until I have read it. Its intrinsic value varies across people. People tend to buy it at higher price if they value it more. When supplier is difficult to determine the price of the information goods, why not use auctions? Let bidding side to determine the price. Hypothesis 1a: People prefer online dynamic pricing to online fixed pricing when trading information goods. Hypothesis 1b: The degree of preferences to online dynamic pricing system is contingent on product categories of information goods.



VI. COMPARISON AMONG ONLINE AUCTION TYPES

Auction design matters for the seller. Sellers have adopted different auction designs in different circumstances, and the specific choices have had great revenue consequences. Specification of market areas, duration and number of licenses, joint bidding policies, payment schemes, and bidder financing can have a nontrivial effect on the expected revenue of the seller. In this paper I also want to elaborate the different preferences among English auction, Reserve auction, Dutch auction and Reverse auction across different categories of information goods. English auctions, the price starts low and gets bid up. Reserve Auction is the English Auction with minimum starting bidding price. In Dutch auctions, the price starts high and drops by fixed increments until a buyer steps forward. There are open call auctions and sealed-bid auctions. Any kind of auction can be run in reverse, with a buyer looking for the seller who will deliver at the best price. According to Heck (1998), I choose the popular English Auctions, Reserve Auctions, Dutch Auctions, and Reverse Auctions to represent typical online auction types.

Buyers in a reverse auction submit a detailed request for merchandise and the floodgates, open to competitive quotes from a greater number of organizations than any purchasing agent could possibly hope to entertain by traditional means. Reserve auctions interact with what the supply and demand of the marketplace can bear. It lets the end-user determine the actual price of that product. Sellers also may benefit by opening new markets without much expense, but the process can reach out and bite vendors in their planning process. "Reverse Auctions speeds the process up because normally negotiations can be held at one time. Secondly, it makes it easy to include nonincumbent suppliers in the process, and this helps to increase the spectrum of competition." Four dimensions contribute to information value, relevancy, accuracy, time, and completeness (Zmud, 1978). Information is frequently time sensitive. I require information when I need it (timeliness), as often as I need it (frequency), and that is up to date when I receive it (currency). This matches the characteristics of Dutch Auctions, when products being auctioned devalue as time goes by. Therefore, convinced to think buyers like Reserve auctions and Dutch Auctions, while sellers like Reserve Auctions.

Hypothesis 2a: Sellers like reserve auctions more, while buyers like Reverse Auctions and Dutch Auctions more.

Hypothesis 2b: The degree of preferences to a particular kind of online auction is contingent on product categories of information goods.

VII. METHODOLOGY

Given the preliminary state of current knowledge and evidence on the impacts of such systems, the belief expressed in this paper is that the appropriate strategy for gathering empirical evidence is not a broad-based survey but rather in-depth studies of multiple pricing systems on a particular set information goods teaching notes, case studies, test and quiz, chap. of books, etc. The underlying premise in advocating this approach is that the adoption of pricing systems of information goods may be influenced by attributes that have not been identified in the literature to date. A cumulative body of case evidence that helps identify these variables needs to be built. This paper takes a first step toward that objective with a study of www.global-ecom.org, then extends categories of the information goods to a broader range. first developed a website www.global-ecom.org



to trade academic information goods, such as teaching notes, reading materials, case studies, test banks, and other miscellaneous information goods. . Questionnaire A is about the preferences toward pricing system, while Questionnaire B is about the attitudes to the specific website www.global-ecom.org. I use postgraduate students as our subjects, and this website will serve perfectly for our questionnaire, since postgraduate students will have adequately motivations to trade on this website as both sellers and buyers. The role (buyer or seller) when trading information goods: Subjects evaluate their preferences from two perspectives: seller and buyer.

- Roles in trading: buyers or sellers. Dependent Variable
- The selection of different pricing system

Fixed Price Online English ** with min Dutch Reverse Bargainin
online auction (no price Auction auctions g reserve)** (reserve auction)

I let the subjects rate the first three pricing systems they prefer when trading a particular information good, to gain more information on their preferences toward pricing systems. This method of measuring dependent variables is adopted because I can not tell in an absolute way which pricing system is favorite, but have some slight preference toward some of them. This method gives more flexibility in judging their preferences.

7.1 Control Variable

I use Status and Gender as control variables. handles the general preferences toward different pricing systems. I let subjects rate the six pricing systems product by product. Meanwhile, they need to express their agreement or disagreement for some statements that can be used to justify the results I get. deals with the particular website www.global-ecom.org. Users will depict the improvement of this website, to fit their need and requirements. Some general statements about this website are also put to evaluate.. Besides the primary purpose of increase the external validity, I also want to add the measures of different categories of information goods, such as timeliness, value, in formativeness, frequency, and standardization. Table indicates the contents surveyed in the two samples respectively.

Table 1. Contents of the survey for two samples

| | | |
|--------------------------------------|---|---|
| Opinions to www.ebay.com | | |
| Buyer preference to academic IG | X | |
| Seller preference to academic IG | X | |
| Buyer preference to general IG | X | X |
| Seller preference to general IG | X | X |
| Measures of attributes in general IG | X | |

Fig. 1 General preferences between fixed and dynamic pricing in sample

No significant difference has been found in preferences caused by control variable of both Gender and Status (Two-Way ANOVA). Through aggregating the ratings users give5, I plot the general preferences toward dynamic pricing across information goods,



VIII.COMPARISON ACROSS DIFFERENT CATEGORIES OF INFORMATION GOODS

Non-parametric Chi-square test 8 tells us that among academic information goods there is no significant difference across product categories, seller: p-value = 0.105; buyer: p-value = 0.143), while there are marginal significant differences across product category of general information goods and types of dynamic pricing systems , seller: p-value = 0.086; buyer: p-value = 0.052; Thyd: seller: p-vlaue = 0.052 p-value The more important implication lies in practice. It is an alternative way to manage intelligent property in the Internet. The resources of free information on the Internet, to date, have been donated by individuals or are supported by academic institutions, companies, or government. However, it is likely that incentives to provide such free services will diminish and user charges will be required more frequently. The proper pricing systems, however, will prosper information goods in the Internet, which will speed up the communication and education. Consider, for example, electronic publishing where some electronic journals are provided free on the Internet. The incentive for participants to donate or absorb costs range from altruistic, to obtaining publicity for an origination. Whether such incentives will continue to warrant such free journals over the long run is hard to say. Current print publishers, who are considering Internet access to their entire journals (or separate copies of articles), are having a difficult time deciding whether to do so and, if so, how much to charge for such services. The problem is that their information infrastructure costs are very high, and these costs must be recovered, regardless of whether the articles are distributed in paper or electronic media. The right pricing systems will value information goods effectively and efficiently, to guarantee the coverage of cost. The information-based and information rich services and goods auctioning in Internet perhaps optimally delivered via Internet, and some are best sold in a fluid pricing model. If appropriate pricing system is adopted, people are more willing to trade in Internet, which will push the development of information industry and the applications of new technology. For example, many websites are selling information goods nowadays. But they are typically delivered in physical format, e.g. paper, CDs, software packages, etc. The advantages of digital format are not fully made use of. Hopefully this study will give some guide in making to the market digital information goods.

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