Existing Business Models for Brokering and their Adaptation to Electronic Markets[1]

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ABSTRACT

In this paper we report an extensive analysis of the different business models for auctions found on the Web. Three hundred websites randomly selected from the main search engines are analyzed, classified, commented and compared in terms of their basic parameters. Departing from a theoretical review of the classical auction theory applied to the online world, twelve business models are defined and analyzed. The confusing terminology regarding the new online auction models is also conveniently organized. The results show that the new possibilities brought by the popularity of the Internet and the World Wide Web are making possible emergent business models in both the business-to-consumer and the business-to-business arena.

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INTRODUCTION

In the past few years we have witnessed a huge, explosive growth of new marketplaces on the Internet, under the common name of "auction sites". Those include sites specialized in business-to-consumer, consumer-to-consumer and business-to-business transactions. Within these three categories, we also find sites specialized in all sorts of goods and services, from rare and collectible type of objects, to sophisticated banking services to individuals and organizations. Just as an example, a five years old site, eBay, had, in mid-2000, more than ten million registered users, over four million offerings and was worth more than 13.5 billion US dollars.

A more detailed study of some of these auction sites reveal that not all of them operate in the same way. Several auction mechanisms are employed, depending on the site, type of good or service, type of customer, etc. While some of those mechanisms are well known, and have been carefully studied, new ones are also emerging, with variations that rank from subtle to radical ones. The mere translation of the five basic auction mechanisms defined in William Vickrey's seminal work[3] – English, Dutch, First, Second and Double – to the Web involve changes in the way auctions are conducted, and sometimes also in the underlying concepts. Additionally, new mechanisms emerge, enabled by the "lack of friction" inherent to the Internet. These new models receive names, sometimes even trademarked, which cause a whole new terminology to appear. Mechanisms such as the Yankee[©4] auction, Japanese auction or Priceline's Name-Your-Own-Price[©5] are now consolidated into the normal practice of Internet commerce, although lacking a formal academic definition.

The present paper analyzes the range of auction mechanisms and business models existing on the Web, attempts to consolidate the confusing current terminology and examines the relevant parameters for each mechanism. The remainder of the paper is organized as follows: next section reviews the relevant literature in the online auctions world. Section 3 briefly discusses the data and outlines the methodology employed for the analysis. Section 4 presents the results obtained, which are then discussed in Section 5. Section 6 concludes the article, and suggests directions for future research.

LITERATURE REVIEW: THE ONLINE WORLD

The effect of the Internet on the auctions' panorama has been twofold: first, the classic auction models get their online parallelism and/or adaptation, and second, a set of new models based on variations of the original ones emerge. These new models are enabled by the very own characteristics of the Internet: less friction, universal availability and

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[3]   For reference, see reviews by Milgrom and Weber (1982), McAfee and McMillan (1987), Smith (1987), Milgrom (1987, 1989), Maskin (1992) and Feldman and Mehra (1993)

[4]   Yankee[©] auction is a trademark of OnSale.com

[5]   The slogan "Name-Your-Own-Price"[©] is trademarked by Priceline.com

reach, rich media for providing additional information, audience tracking[6], etc. To that extent, we must consider that the old, offline versions of auctions were inefficient in terms of number of bidders, variety and breadth of goods[7] and transaction costs.

According to analysts, Internet auctions will grow to an expected $52.6 billion by 2002 (Forrester Research, 1999). New markets for sellers, bargains for buyers, and lower costs for everybody are the main benefits. Online auctions allow merchants to minimize their risk of price erosion on unsold products and allow them to find new market niches in the same way as in the offline world. On the manufactured goods side, most auctioneers sell surplus – offering efficient liquidation that reduces the companies' need to sell to brokers at fire sale prices. On the other hand, buyers benefit in that they gain access to a greater number of products at favorable prices (IDC, 1999). From an economic perspective, auction mechanisms provide a much better fit for the profile of demand than fixed pricing, as observed in Figure 1.

Figure 1: Additional demand brought by the addition of an auction mechanism to a conventional, fixed price one.
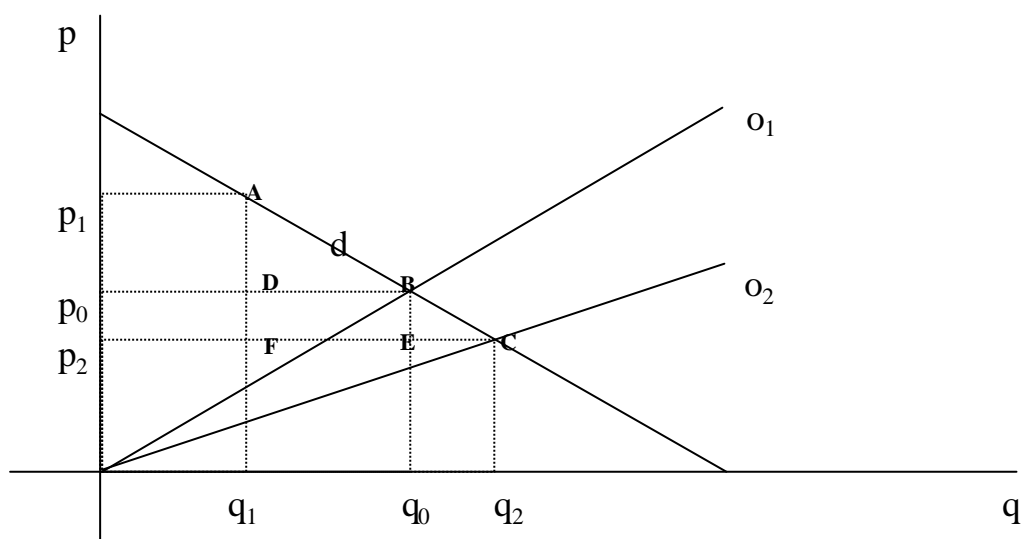
Once the original demand (price p_0 and quantity q_0) has been satisfied, auction mechanisms provide with the opportunity to reach an additional demand at a higher price p_1 (such as collectors, etc.) and another one at a lower price p_2 (bargain seekers, etc.) This possibility of price-discrimination enables firms to offer their goods or services in a more efficient manner (o_2), and allows them to access secondary markets that previously would have required huge marketing efforts to target.

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6   For instance, the possibility of tracking individual users' behavior fosters the appearance of new business models based on the so-called "informational rents": the information we obtain from the participants in an auction regarding their preferences, products and prices they are willing to pay constitutes an extremely interesting database for marketers.

7   Many of the items being auctioned in online auctions would have been completely unconceivable in a classic, offline one, such as Pez dispensers, Beanie Babies, etc…

An additional factor to add up to the popularity of Internet auctions is the strong network effect due to the increase in scale and reach. That is, the value of the Web site to each individual buyer and seller increases as more people use the Web site. Network effects give very popular sites like eBay a type of monopoly power, which increases as the site becomes more popular.

There is no general rule about whether auctions fetch higher or lower sales prices. It all depends upon how certain the seller can be about market demand. The less certain he is, the more likely that he will benefit from an auction as compared with setting a fixed price. This is why auctions have historically been popular when it comes to selling unique goods like fine art and real estate. According to Vakrat and Seidmann (1999), auction winners enjoy an average discount of 25% relative to the catalog prices for identical items sold at the same site. One might expect that rational consumers would view the available catalogue prices as an upper boundary for the highest bid they would be willing to submit in an auction. Given the catalogue price, bidders update their private reservation price and hence bid lower. Two factors determine the discount: the number of bidders who participate in the auction, and the bidders' cost of participation.

The additional costs for the bidder in an Internet auction are basically three (Vakrat and Seidmann, 1999):

- Monitoring Costs: A bidder who participates in an auction has to learn its rules, sign up and monitor it.
- Delay Costs: Not all items in the catalogue are being auctioned off continuously. Consumers incur in a consumption delay cost when they have to wait for the right auction to conclude.
- Search Costs: Consumers have to spend time looking for the site selling the particular items of interest. When the items are sold to others, they incur in additional search costs as they look for alternative sources.

Search, delay and monitoring costs are mainly a function of the auction length, but are not a function of the product's value. Therefore, discount required by consumers is a direct result of the costs they incur. Since these participation costs are not a function of the item's price, consumers will expect higher relative savings when purchasing less expensive items through auctions.

In the business-to-business arena, auctions are getting increasingly popular, as buyers are able to achieve significant savings by forcing their suppliers to compete directly through a reverse auction. In the future, retailer participation is likely to be driven more by necessity than by choice. Currently, players such as Freemarkets assert that their customers can extract a 15% value in average savings. Other studies find significant dispersion in Internet markets, which may be explained by heterogeneity in retailer-specific factors such as branding, trust, retailer efforts to build customer lock-in, and price discrimination strategies (Bailey, Brynjolfsson and Smith, 1999).

DATA AND METHODOLOGY

Since the inception of the Internet auction phenomenon, in late 1995, there has been a skyrocketing growth in the number of sites devoted to this activity. However, given the wide variety of players and strategies, any attempt to classify a sample of these sites has to be necessarily inductive, in order to avoid losing potential sources of variability. With this concept in mind, a sample of 301 auction sites was randomly selected from the main search engines[8], including both directories and spiders, during the summer of 2000. From the original listing, each site was first tested to ensure the integrity of the link (a non trivial number of links referenced in search engines were proved to be outdated or inactive), and then incorporated to a database. For each entry in the database, the following parameters were introduced:

- Name, Web address
- Main auction format: B2B, B2C, C2C
- Auction types used: English, Dutch, reverse, etc.
- Categories of products being auctioned: According to Beam and Segev (1998), classified into thirteen categories (antiques, arts and crafts, automotive and equipment, collectibles, computers, consumer products, financial products, food and beverages, information, real estate, recreation and travel, sports equipment and memorabilia, and others.

RESULTS

From a first overview of the data, it appears clear that the discriminating price, multiple unit auctions is the predominant format for Internet auctions at this time. They account for the lion's share of dynamically priced sales on the Internet. Name your own price, group buying, haggling and reverse auctions appear to be relevant too, but only under narrowly defined circumstances. Specifically, a 74% of the sites used English auction. The second mechanism in popularity appears to be the Yankee[©] auction, present in 25% of the cases. Reverse auction systems accounted for 14% of the sample, whilst Dutch (online version) represented 11%. The remaining systems were scarcely used, with occurrences all below 5%.

According to their target, business-to-business auctions represented 42% of the examined sites, while business-to-consumer were 35% and consumer-to-consumer added up to 37%. Obviously, some sites can be considered to run auctions in more than one category. The complete distribution of sites according to the auction model being used appears in Figure 2, and a classification of sites according to the categories of items being auctioned is shown in Table 1.

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[8]   The search included all the major search engines at that moment: AltaVista, Excite, HotBot, InfoSeek, Lycos, Northern Light, Yahoo!, AskJeeves, MetaCrawler and Dogpile.

Figure 2: Distribution of sites according to the auction model being used
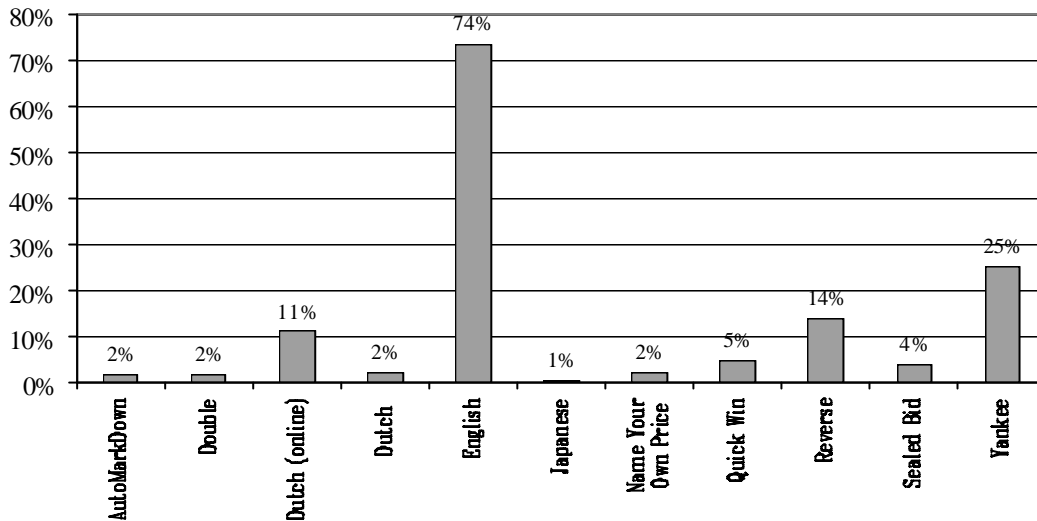
Note that some terms are used differently on the Internet. For instance, the term "Dutch Auction" is used much like in the financial markets. This and other terminological issues are discussed later.

Table 1: Classification of the sites according to the type of items being auctioned

Type of articles	Number	Percentage
Antiques	46	26%
Arts and crafts	51	28%
Automotive equipment	48	27%
Collectibles	66	37%
Computer	85	47%
Consumer products	76	42%
Financial products	9	5%
Food and beverage	27	15%
Information	80	45%
Real estate	16	9%
Recreation and travel	54	30%
Sports equipment	64	36%
Others	85	47%

The detailed analysis of the three hundred sites yielded a total of twelve auction models: Besides the direct online translations of English, Dutch, First Price, Second Price and Double auctions, we find also some new models. Those are the Japanese, Quick-Win, Yankee©, AutoMarkDown, Double Continuous, Double Sealed, Dutch Online, Reverse and Name-Your-Own-Price©. Detailed descriptions and examples of each auction model are shown in the next section.

DISCUSSION AND FINDINGS

This section introduces the different types of auctions found on the Internet. Each auction is described and characterized[9].

English auction (Ascending Auction, Oral Auction)
It corresponds to the discriminating price, multiple unit auctions. Seller announces initial low bid, which is progressively increased until demand falls to match the fixed amount at auction. It is important note that bidders are able to reassess bids during the bidding process. Winner is highest bidder and pays the price bid. The process continues in the case of a single item until that item is "sold" to the last and highest bidder for the amount bid. In an auction involving multiple units, the process continues until arriving at a price at which the fixed amount supplied at auction is just matched by total demand. This is clearly the most commonly used auction mechanism on the Internet at this time. This auction format is essentially an extension of the classical English auction mechanism with observable bids and multiple units of the same item. The priority order file in online auctions is more evolved than the one used for conventional English auctions. The first priority is given for price. When multiple shoppers bid the same price, then a priority is given for the one who bids for a higher quantity. If the latter does not break the tie, priority is given for the earlier time-stamp. However, this prevalence of criteria could be modified, new criterion could be added, or even be left in the hands of the owner of the item(s) for sale, usually furnishing him or her with some counseling. When the auction ends, the top bidders at that moment are the auction winners. They get the goods for the price they bid. Typically, the auction closes at the posted closing time, or five minutes after the last bid is received, whichever is later.

Japanese Auction
Price rises at set increments and participants drop out until only winning bidder remains. It can be considered equivalent to the English auction. The main advantage is that the system is more "automatic", so is usually faster

Quick-Win Auction
A seller can enter her product into a quick win auction by specifying a minimum price that she will accept. When a buyer agrees to pay that amount the item is immediately sold, i.e. a quick win.

Yankee[©] Auction
A Yankee[©] Auction is a variation of the Dutch Auction (Online Version) where successful bidders pay what they bid as opposed to paying the price determined by the lowest qualified bidder.

Dutch Auction (traditional version), Descending Auction, AutoMarkDown
An auction in which the bidding starts at a high price that is progressively lowered until a buyer claims the item by shouting "mine!" or in modern times, by pressing a button that stops an automatic clock at an acceptable price. When multiple units are being auctioned,

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[9]   A list of examples for each type of auction (current at the time of the study) is available from the author.

there are normally more willing takers as the price declines; this process continues until arriving at a price whereby the fixed amount supplied is just matched by total demand. Listings offer a product group at an Opening Price. This Opening Price then falls at set time intervals. As long as there is Quantity available for the item, the bid guarantees the item listed at the specified bid price. However, if one waits for the price to drop further, the item may sell out, and the listing will close.

First Price Sealed Bid Auction (Discriminatory-Price Auction, Multiple Price Auction, English Auction[10], American Auction[11])

This type of auction is normally a sealed bid auction rather than an open bid auction. Bidders submit written bids in ignorance of all others; bids are opened simultaneously, and the highest is declared the winner. There is no chance to update a bid once submitted, and winner pays the price bid. The term "first price" commonly applies when a single item is being auctioned. In such cases the highest bidder is awarded the item at a price equal to the amount bid. In a multiple unit auction the sealed bids are sorted from high to low, and the auctioned items are awarded at the highest bid prices until the supply is exhausted. The auction discriminates between bidders in the sense that they can pay different prices according to the amount bid.

Second Price Sealed Bid Auction (Uniform-Price Auction, Marginal Price Auction, Vickrey Auction or Dutch Auction[12])

This type of auction is also a sealed bid auction. Bidders submit written bids in ignorance of all others. When a single item is auctioned, the highest bidder is awarded the item at a price equal to the highest unsuccessful bid – hence the name second price. The multiple unit extension of the second price, sealed bid auction is referred to as a uniform price auction (or competitive auction), since all winning bidders receive the auctioned items at the same price. There is empirical evidence (Vickrey, 1961) that the dominant strategy in a private value Vickrey auction is to bid one's true valuation. If an agent bids more that that, she may end up with a loss if she wins and the second-highest bid is higher than her true value. If she bids less, she reduces her odds of winning the object, but the wining price is unaffected, since it depends on the second valuation anyway.

Continuous Double Auction

Similar to NASDAQ. Buyers and sellers continuously view market and prices, make real-time offers, which clear at market price. Using this format, both sellers and buyers submit bids, which are then ranked from highest to lowest to generate demand and supply profiles. From these profiles, the maximum quantity exchanged can be determined by matching sell offers, (starting with the lowest price and moving up) with demand bids (starting with the highest price and moving down).

Sealed Bid Double Auction

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[10] In the financial community
[11] In the UK
[12] Exclusively in the financial community

Buyers and sellers simultaneously submit secret sealed offers to buy and sell. Auctioneer opens offers and clears market. The auction repeats several times to give a continuous market price.

Dutch Auction (online version)
Dutch auctions are special type of auction designed to handle the case where a seller has a number of identical items to sell. The seller should specify the minimum price (starting bid) and the exact number of items that are available at that price. The bidders bid at or above that minimum price for the number of items that they are interested in buying, this is, bidders submit both the number of units they wish to buy and how much they are willing to bid per unit. The final per unit auction price is determined by the lowest of the winning bids. Bidders who submit bids higher than the cut price are entitled to the quantity they specified, but at the per-item uniform cut price. This means that, at the end of the auction, the highest bidders earn the right to purchase those items at the minimum successful bid. Successful bids are usually ranked in the order of price, quantity and time.

Name Your Own Price / Price Discrimination
Customers make an offer to a seller or group of sellers for goods based on their estimate of the sellers' lowest acceptable bid.

Reverse Auction
Buyer driven auction where sellers rather than buyers compete to offer the lowest price for goods.

A number of interpretations can be extracted from combining the specific attributes of each auction mechanism with its use within the business-to-business arena (versus the business-to-consumer and the consumer-to-consumer world). Sites targeting consumers attempt to exploit the community-building site of the activity: they tend to be sticky, fostering users to spend longer periods in the site (the average user spends an average of 38 minutes in the site, and most of the users are repetitive ones), thus being able to target the user with more advertising, a fundamental revenue generator in these models along with the commissions paid. On the other hand, sites targeting businesses are logically more motivated by efficiency and speed, fostering functionality. Consequently, we see higher proportions of auction mechanisms designed to be fast (e.g., for perishable or time-sensitive goods such as fresh products or airline tickets), or to favor competing offers (designed to fetch higher or lower prices, depending on whether the marketplace is driven by offer or demand), or to reduce collusion. Entertainment is, according to our conclusions, a key element when targeting consumers, while being completely unimportant when it comes to motivate business users.

Figure 3 shows to what extent each of the auction mechanisms are popular in the business-to-business versus the sum of the business-to-consumer and the consumer-to-consumer worlds. Sealed-bid auctions, with much less value in terms of entertainment, are widely used for business-to-business transactions, while neglected in the consumer-oriented world. Double auctions follow the same pattern, although this is much obvious

due to the huge coordination effort required to set up one of these highly organized marketplaces. The traditional Dutch auction, very fast and less entertaining, is also much popular in business-oriented transactions. Reverse auctions, although existing in the consumer-oriented arena, are much more frequent in the business-to-business environment, since they can be efficiently used in monopsony or oligopsony situations in which a particular buyer concentrates most of the transactions (suppliers in the automotive industry, etc.). Finally, the Yankee© Auction appears as widely popular in both worlds, but always with a business in either side of the transaction. It involves multiple-unit transactions, an uncommon situation in consumer-to-consumer scenarios, but its rules are simple enough to make it work in both environments.

Figure 2: Use of each auction mechanism in business-to-business marketplaces versus the sum of the business-to-consumer and the consumer-to-consumer sites.
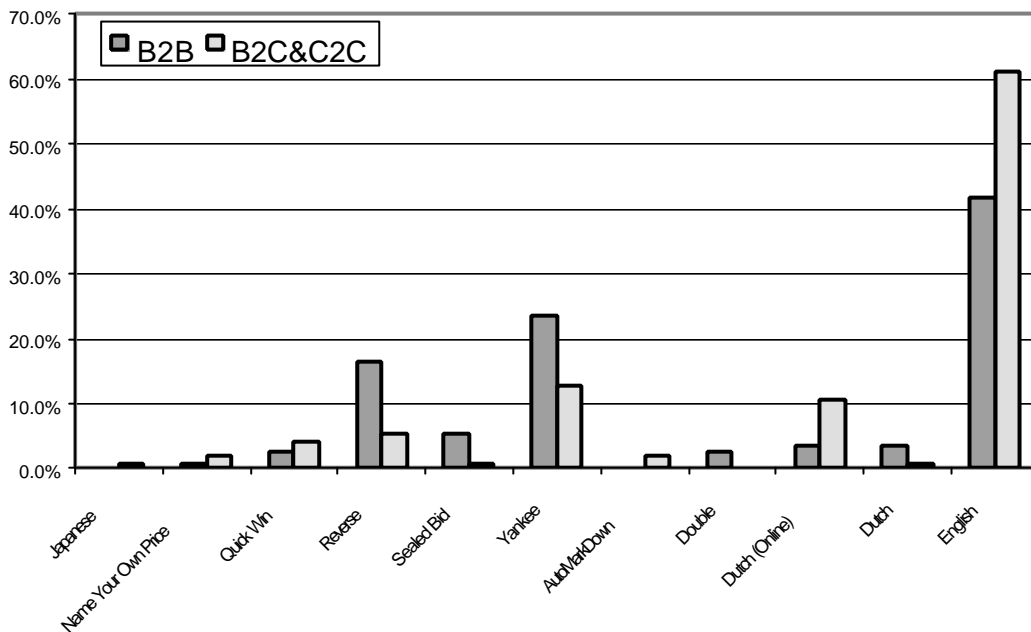
While this line of reasoning for sites targeting businesses appears to follow common sense, this sort of "digital divide" could be misleading. By focusing in a specific type of auction, sites could be missing the opportunity to exploit certain attributes for certain users. For instance, a site could propose the business user a given auction mechanism given his or her "position" in the market: a system designed to fetch higher prices, such as an English auction, could be interesting for a seller offering a scarce good or service, even with the downside of being more time consuming for the user. Other sellers offering, for instance, perishable goods, could be interesting in using systems that foster very fast transactions, such as a quick-win auction, while users that put regularly important quantities of similar items in the market could make the case for Yankee©-type of auctions. These situations, however, could happen easily in the same marketplace, so it appears to be strategically important for the business-to-business community to be able to

offer a wide variety of auction mechanisms to their users so they could benefit from their specific attributes.

Consumer oriented sites, on the other hand, are more motivated by values related to entertainment. This fact might raise concerns about the sustainability of the model: will users keep wanting to be entertained when buying or selling goods? Will they turn an intrinsically pleasurable activity into a goal-oriented type when usage increases? This phenomenon is been happening in other activities developed on the Internet, such as newspaper reading (Dans, 2000): as users get more experienced, they switch from a hedonistic approach (known as the "ludenic or play" approach) to the "uses and gratification" mode, goal oriented and based purely on efficiency. This phenomenon appears to be happening also in other facets of the Internet activity, such as search engines[13]. In general terms, minimalism appears to be a growing tendency on the Internet world. On auction sites, this progressive bias towards efficiency could be represented by the advent of program trading. A vast array of tools based on efficiency has been lately designed for users. These tools are sometimes being offered by independent sites, which propose tools that can search all or most auction sites looking for a given good and fetch the lower price in all those sites. In other cases, the same auction site offers tools that save time and effort to their users by automating the auction process: the user specifies the auction and the reservation price, and the program increases the bid by the minimum amount every time the user gets outbidded. The advent of these "auction bots" or "advanced auction tools" might indicate a goal-oriented behavior for buyers: they concentrate more in getting the item, and less in the entertainment value of the process, which is recognized sometimes as dangerous and misleading (a participant may become "too involved" in the process and end up bidding more that his or her true valuation of the object). Although these sources of concerns do not apply to the rational business-to-business environment, the application of these auction agents to such environment has been widely predicted, and associated to the emergence of the so-called machine-to-machine commerce in which transactions would be conducted without any sort of human intervention.

CONCLUSIONS

This study attempts to examine the many different options available for auctioning goods and services on the Internet. A large number of new mechanisms have appeared, oriented both to consumer and to business type of transactions. The study found, documented and defined twelve different auction mechanisms. Although most of them are slight variations of the five original models described in Vickrey's seminal work, others bring many different attributes that make them interesting under certain circumstances.

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[13] Altavista, for instance, launched and marketed a "minimalist" version of its page targeting experienced users who want to get rid of all the "bells and whistles" and concentrate on getting the page loaded and the results of their search faster

The study deepens into the attributes of the auction mechanisms through examining in which settings are more popular. As expected, systems that use a value proposition based on entertainment tend to be used mainly in sites targeting consumers, while systems based on functionality, low-price fetching or other attributes are widely used in business-to-business environments. We argue the sustainability of business models based on entertainment, since frequent users may tend to switch to a goal-oriented mode and lose the idea of buying things in an auction as an intrinsically pleasurable activity. The rise of automated agents that reduce the stickiness of the auction site confirms this idea: users that decide to use these programs obviously reduce their dependence from the site, thus spending less time into it and therefore being able to receive much less advertising.

We see that most marketplaces adopt a particular auction mechanism in order to accommodate the typical transactions conducted in that site. This is particularly evident in the so-called "biased marketplaces": when set by the supply side, these sites tend to adopt auction mechanisms that allow them to auction their products or services in a more efficient way, by expanding the market, fostering more competitive relationships and forcing buyers to bid using ascending mechanisms such as the English or the Yankee© auction. Alternatively, marketplaces arranged by the demand side obviously choose mechanisms that force suppliers to compete fiercely among them to achieve the lowest price, by using descending schemes or reverse auctions. As a conclusion, any attempt to build a truly flexible marketplace should necessarily provide users with a variety of auction mechanisms in order to accommodate each user's needs, and provide users with some sort of coaching to help them determine which auction mechanism fits better their interests according to the structure of the market, type of product, etc.

A final consideration emerges from the importance of having a critical mass of bidders in order to get the appropriate processes of price formation. Previous research indicates the importance of this factor, and how the same auction can experiment processes of price buildup when the number of bidders is high, or price collapse – with the inherent risk of practically giving away the product – when the number of bidders is low. In a business-to-business environment, this type of problems clearly conditions the efficiency of the marketplace and its usefulness for specific customers, particularly when such marketplace constitutes an emerging setup competing with the more established traditional solutions. After one or two unpleasant experiences when trying to perform transactions through the site, users may choose to abandon it in favor of traditional methods.

Directions for future research would involve tracking individual users in order to check how the auction site's value proposition influences their purchasing behavior. Although the present study anticipates a change in users' behavior that would make them less sensible to values based on entertainment, this proposition still needs to be empirically validated. The attributes of each auction model in terms of functionality, entertainment or ability to fetch higher or lower prices are also a subject of this study. However, these attributes need also empirical validation from users' perspective. The addition of survey-based research to this field opens new and interesting venues for research in this promising area.

REFERENCES

- Ardito, C., K. Delhagen, and E. B. Dykema, "*Consumers Catch Auction Fever*", http://www.forrester.com . Forrester Research, Inc., Mar-99
- Arnbjerg, M., R. Ellens, M. Olsson, A. Pinza, M. Van Der Veen, L. Vestergaard and R. Westerhof. "*European eCommerce Update*" http://www.idc.com International Data Corporation, May-00
- Bailey, J., E. Brynjolfsson and M. D. Smith, "Understanding Digital Markets: Review and Assessment", in "*Understanding the Digital Economy*", Brynjolfsson, Erik & Kahin, Brian (Eds.) MIT Press, Jul-99
- Baquía, "*La Utilización de Precios Dinámicos*" http://www.baquia.com, Jul-00
- Beam, C. and A. Segev, "Auctions on the Internet: A Field Study" *Fisher Center for Management and Information Technology. Working Paper WP-1032*, November, 1998
- Carnahan, I. "*The Economics of Priceline*" http://slate.msn.com, Microsoft, May-00
- Chu, J., G. Paglucia and A. Schwartz. "*Breaking Through the Static: From Fixed to Dynamic Pricing*" http://www.mainspring.com, Mainspring, Jul-00
- Chu, J., S. Rastogi, D. Rigby, and A. Schwartz. "*Assuring the Price is Right Online*", http://www.mainspring.com, Mainspring, Apr-00
- Dans, E., "Electronic Newspapers: Are Some More Equal than Others?" *Journal of Media Management*, Vol. 1, No. 2, June 2000
- Dalton, J. P., H. Manning and H. Goldman. "*Bid Farewell to B2C Auction Software*", http://www.forrester.com , Forrester Research, Inc. Feb-00
- Erwin, B., G. Lampher, V. Lief, M. Modahl and M. Putnam. "*Internet Auctions*" http://www.forrester.com , Forrester Research, Inc. Mar-98
- Feldman, R. A. and R. Mehra. "Auctions: A Sampling of Techniques", *Finance & Development* September, 1993
- Feldman, R. A. and R. Mehra. "Auctions: Theory and Applications", *IMF Staff Papers*, 1993, Vol. 40
- Frankle, J. L. "*Online Auctions: The New E-Commerce Enabler*", http://www.idc.com , International Data Corporation, Apr-99
- Gottlieb, B. "*eBay or the Highway*", http://slate.msn.com , Microsoft, Jul-00
- Hagel III, J. and A. G. Armstrong. "*Net Gain*", Harvard Business School Press, 1997.
- Hagel III, J. and M. Singer, "*Net Worth*", Harvard Business School Press, 1999.
- Hagen, P. R. and H. Manning, "*Person-to-Person Payments Will Prevail*", http://www.forrester.com Forrester Research, Inc., Mar-00
- Katka, S. J., B. D. Temkin and L. Wegner, "*B2B Auctions Go Beyond Price*" http://www.forrester.com , Forrester Research, Inc., May-00
- Latimore, D., M. Padden and I. Watson, "*B2B Netmarkets: If You're Not Involved, You Should Be*" http://www.mainspring.com , Mainspring, Jun-00
- McCarthy, J. C., J. Sharrad, and J. Stanley. "*Net Policy And The Candidates*" http://www.forrester.com Forrester Research, Inc., Mar-00
- McMillan, J. and R. P. McAfee, "Auctions and Bidding", *Journal of Economic Literature*, June, 1987 Vol. XXV

- Milgrom, P. R. and R. J. Weber, "A Theory of Auctions and Competitive Bidding", *Econometrica* September, 1982, Vol. 50
- Summer, L., "*The New Wealth of Nations*", available at http://www.ustreas.gov/press/releases/ps617.htm
- Turban, E. "Auctions and Bidding on the Internet: an Assessment", *Electronic Markets*, 1997, Vol. 7, n. 4
- Vakrat, Y. and A. Seidmann, "Optimal Design of Online Auctions" *William E. Simon Graduate School of Business Administration Working Paper*, November, 1999
- Vakrat, Y. and A. Seidmann, "Implications of the Bidders' Arrival Process on the Design of Online Auctions", *Proceedings of the HICSS-XXXIII Conference*, October, 1999
- Vakrat, Y. and A. Seidmann, "Can Online Auctions Beat Online Catalogs?", *Proceedings of the 20th International Conference on Information Systems,* December, 1999
- Varian, H. "*Auctions as Negotiations*", http://www.haas.berkeley.edu, Haas School of Business, Univ. Of California, Berkeley, Sep-98
- Vickrey, W. "Counterspeculation, Auctions, and Competitive Sealed Tenders", *The Journal of Finance,* March, 1961, Vol. 16