Auctions on the Internet: What's Being Auctioned, and How?

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Presented by
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Elevator summary: this paper presents a brief history of the development of Internet auctions as a type of e-commerce, the business models, the auction sites, goods offered for sale and what kinds of auction mechanisms they use.
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Key concepts, messages & terms

- eBay is the largest C2C auction site
- Most of the sites deal with collectibles
- Online auctions offer several advantages to both buyers & sellers, mainly in the areas of convenience
- B2B auction models include merchant & listing agent
History of Internet Auctions

- 1995- Earliest web based commercial auctions-eBay and OnSale (retail merchant of refurbished computers with auctions)
- Oct 1997 OnSale added an auction listing service similar to eBay
- 1998- OnSale transferred to Yahoo, also started OnSale At Cost (fixed price selling format)
- July 1999-merged with Egghead (both auctions and fixed price)
- Growth of eBay- 12% per month in 1998-99
### Appendix 4: List of Surveyed Auction Sites

<table>
<thead>
<tr>
<th>Auction Site</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>4a Travel</td>
<td><a href="http://www.4a.com/auction">http://www.4a.com/auction</a></td>
</tr>
<tr>
<td>AB!C Absentee Auctions</td>
<td><a href="http://nas.net/~draaks/anindex.html">http://nas.net/~draaks/anindex.html</a></td>
</tr>
<tr>
<td>ABC Live Auction</td>
<td><a href="http://www.abeliveauction.com">http://www.abeliveauction.com</a></td>
</tr>
<tr>
<td>ABQ</td>
<td><a href="http://www.abq.com">http://www.abq.com</a></td>
</tr>
<tr>
<td>Advantage Auction</td>
<td><a href="http://advantageauction.com">http://advantageauction.com</a></td>
</tr>
<tr>
<td>American Image gallery</td>
<td><a href="http://www.diamondlightphotos.com">http://www.diamondlightphotos.com</a></td>
</tr>
<tr>
<td>Antebellum Covers</td>
<td><a href="http://www.antebellumcovers.com">http://www.antebellumcovers.com</a></td>
</tr>
<tr>
<td>Antique Canada</td>
<td><a href="http://www.antiquecanada.com">http://www.antiquecanada.com</a></td>
</tr>
<tr>
<td>Antique Country</td>
<td><a href="http://www.antiquecountry.com">http://www.antiquecountry.com</a></td>
</tr>
<tr>
<td>Antique Photo.Com</td>
<td><a href="http://antiquephoto.com">http://antiquephoto.com</a></td>
</tr>
<tr>
<td>Art Auction</td>
<td><a href="http://www.artauction1.com">http://www.artauction1.com</a></td>
</tr>
<tr>
<td>Arte Primitivo</td>
<td><a href="http://www.arteprimitivo.com">http://www.arteprimitivo.com</a></td>
</tr>
<tr>
<td>AuctionX</td>
<td><a href="http://www.auctionx.com">http://www.auctionx.com</a></td>
</tr>
<tr>
<td>Auction Hoss Town</td>
<td><a href="http://www.auctionhosstown.com">http://www.auctionhosstown.com</a></td>
</tr>
<tr>
<td>Auction Inc.</td>
<td><a href="http://www.cd.com">http://www.cd.com</a></td>
</tr>
</tbody>
</table>

142 web sites surveyed
Gross value of total transactions concluded in dollars per month = Total $ changing hands

### Table I: Estimated Size Distribution of Auction Sites

<table>
<thead>
<tr>
<th>Monthly volume ($)</th>
<th>Number of sites</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10,000</td>
<td>83</td>
<td>58%</td>
</tr>
<tr>
<td>10,001 to 100,000</td>
<td>27</td>
<td>19.01%</td>
</tr>
<tr>
<td>100,001 to 1,000,000</td>
<td>21</td>
<td>15%</td>
</tr>
<tr>
<td>Over 1,000,000</td>
<td>7</td>
<td>5%</td>
</tr>
</tbody>
</table>

Note: sizes estimated as of November 1998. See Appendix I, available on the JIE Web site, for details about the estimation procedure.

### Table II: The Largest Online Auction Sites in August 1998

<table>
<thead>
<tr>
<th>Site</th>
<th>Monthly revenue ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>eBay</td>
<td>70,000,000</td>
</tr>
<tr>
<td>First Auction</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Onsale</td>
<td>5,000,000</td>
</tr>
<tr>
<td>uBid</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Going-Going-Sold</td>
<td>1,800,000</td>
</tr>
<tr>
<td>AuctionVine</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Encore Auction</td>
<td>1,300,000</td>
</tr>
</tbody>
</table>
# Types of Goods Sold

<table>
<thead>
<tr>
<th>Category</th>
<th>Sites featuring that category</th>
<th>Sites specializing in that category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collectibles</td>
<td>90(^a)</td>
<td>56(^b)</td>
</tr>
<tr>
<td>Antiques</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Celebrity memorabilia</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Stamps</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Coins</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Toys</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Trading cards</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Electronics and computers</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>Jewelry</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Computer software</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Used equipment</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Sporting goods</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Travel Services</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Real Estate</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Wine</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

\(^a\) This figure includes all of the sites listed as featuring the various subcategories of collectibles—and there is plenty of overlap, with some sites featuring both memorabilia and toys, for example. It also includes several other sites featuring types of collectibles (postcards, phone cards) not large enough to warrant their own subcategories.

\(^b\) This figure includes all of the sites specializing in a single subcategory of collectibles (the ten specializing in antiques, the five specializing in stamps), in addition to sites featuring several of the subcategories of collectibles, but no other top-level categories of goods.
Business Models: Merchant and Listing Agent Sites

- **Merchant site- Ex: OnSale**
  - Acts as a retailer, conducting transactions through auctions
  - Site where no independent seller is identified

- **Listing Site- Ex: eBay**
  - Acts as an agent for sellers
  - Avoid getting involved with the actual exchange
  - Details of shipping and payment are transparent
  - Site where independent sellers list their own auctions

- **Combination of retailer and agent- Ex: Up4Sale**
Auctioneers’ Fees

- Revenue from fees charged to buyers and seller - Sotheby’s 15% of final bid price
- No buyers premium at some sites - Ex: eBay, all fees paid by seller
  - 1. Insertion fee for auction listing
  - 2. Percentage of final bid price
  - 3. Additional fee for optional promotional services
- Variation between no fees (AuctionX and Up4Sale) to higher fees - 10-15% commission (Cyberhorse, Going going sold)
Auction formats

- English Auctions
- Scale-bid Auctions
- Dutch Auctions
- Double auctions
English Auctions

- Most prevalent
- Raising the current bid by filling out a form
- Outbid notification- if the bid is the highest bid at the end of the auction
- Fixed end time: Incentive problem
  - Sniping-waiting until the last minute of the auction to submit a bid
  - Auction becomes equivalent to first-price sealed bid auction
- Alternatives
  - Extension of time if there have been last minute bids: This obligates a genuine bidder to stay till the end.
  - Proxy Bidding mechanism: Setting a limit on the most u wish to spend-The automatic bidding goes on till that level.
Sealed-bid Auctions

- **First Price Sealed Bid auction**
  - Winning bidder pays the bid amount
  - Ex: Timeshare international

- **Second Price Sealed Bid auction**
  - Wining bidder pays one increment over the second highest bidder
  - Antebellum Covers, Sandafayre, Nauck’s vintage records
Dutch Auctions

- Price starts at a higher level and continues until the first bid (decremented bid) determines the winner
  - Ex: Klick-Klock, Auctions and Bid.com
  - Land’s end – initial offer (30-60% below retail), fall 25% by Monday, 50% on Wednesday, 75% on Friday
Double auctions

- Continuous update of seller’s offers and buyer’s bids
- As soon as a buy offer > a sell offer, a transaction occurs
- At any given time, there is no overlap between highest buy offer & lowest sell offer
- Ex: FastParts

Ref: external.nj.nec.com/homepages/ingemar/course/presentations/auctions-psu-fall-01.ppt
Multi-Unit auction

- Multi-Unit Pricing rules in Ascending-Bid auctions
- Open-IPO: A sealed-bid multi-unit auction
Multi-Unit Pricing rules in Ascending-Bid auctions

- Discriminatory or pay your bid rule
  - Each winning bid pays the amount of their own bid
  - Used at merchant sites (OnSale, Ubid, Encore Auction)

- Uniform Price rule
  - Each winning bidder pays the amount of the lowest accepted bid
  - Used at Listing sites

- Jump bids prevalent in both types but in Uniform price rule the winning bidders pay same price, unlike pay your bid rule (Thus it has higher revenue generation)
Open-IPO: A sealed-bid multi-unit auction

- Setting the opening price for a new issue of stock, mostly setting the price too low
- The investment bank sells the shares to its best clients who gain a lot on opening day
  - Disadvantageous for individual investors and companies
- OpenIPO
  - Auctioning shares through Sealed bid auctions
  - Using Uniform price rule- charging the amount of lowest accepted per-share bid
Time duration of auctions

- At most sites, sellers choose their own auction time.
- eBay - a seller can choose 3, 5, 7, or 10 days.
- Mean length of time: 9.3 days.
- Shortest auction at merchant sites – 30 to 60 mins.
- Longest auction – 90 days at government surplus items at their WW sales site.
Minimum Bids and Reserve Prices

- Minimum acceptable bid amount - below which no bids are accepted
- Reserve price - hidden from bidders. If the highest bid does not exceed the reserve price then the goods are not sold
  - Concept - $0 min bid price and $50 reserve price is more profitable to the seller than $50 minimum bid with no reserve price
  - A low minimum, high reserve auction will give a bidder more opportunity to observe the bidding of others than would a high minimum bid auction.
Winner’s curse

- Common, unknown value for item (e.g., potential oil drilling site)
- Most overly optimistic bidder wins; true value is probably less
- If values are privately known the Winner’s curse argument does not hold.
- Linkage principle (Milgrom and Weber 1982) - more aggressive bidding would be rational in the low minimum, high reserve auction

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Buyout Prices

- Early ending of the auction if a buyer bids a sufficiently high bid
  - Ex: One Web place, Mackley and Company, LabX, newsgroup auctioneers 1994-95
  - Advantage - in terms of saving time
  - Disadvat - Buyer would not know if this is the right price, Seller would not know if the bid could have gone higher
  - Issue - to determine the optimal level of a buyout price in an ascending bid auction
Strategic Manipulations: Shilling and Bid Shielding

- **Shilling** - attempt by seller to drive up the price of the good
  - Only one bidder-seller can drive the price up by bidding themselves or asking others on their behalf to bid (or use a false identity) against the bidder

- **Bid Shielding** - technique designed to allow the bidder to get a “steal” on an item at low price
  - Artificial bids by a buyer for a very high bid shielding the initial low bid, so no one else bids
  - Just before the close of the auction extracting the high bid from the auction leaving the low bid as a winner
Fraud

- eBay and other auction sites actively discourage fraud
  - encouraging users to file formal complaints with Attorneys General or the U.S. Post Office. A recent conviction in California indicates that online auction fraud cases will be taken seriously by the courts.

- eBay pioneered a feedback and rating system, emulated by several other sites,
  - encourages buyers and sellers to rate each other at the close of a transaction. These ratings and comments are publicly available;
  - a numeric feedback rating (equal to the number of positive comments about a seller minus the number of negative comments about the seller registered by previous winning bidders).
  - a seller may see the feedback rating of the bidders in her auction, and always has the option to reject bids from any bidder.

- eBay and other auction sites encourage users to use a third-party escrow service
  - The buyer sends payment to the escrow agent, who verifies payment before the seller ships the good to the buyer.
  - The buyer then has a short examination period, to make sure that the item meets its description in the auction. After the buyer indicates consent to the transaction, the escrow agent releases the funds to the seller.
  - i-Escrow(1997) is the dominant firm in the Internet-auction escrow market, recommended by eBay and several other sites. It accepts payments via credit card as well as by check or money order, charging fees of between 1% and 6% of the transaction amount.
eBay was still 100 times as large as Amazon and 10 times as large as Yahoo!

Amazon and Yahoo! make the list of the ten largest auction sites on the Internet, But eBay’s size has more than doubled (with a continued growth rate of approximately 12% per month).
### Table IV
Size Estimates for eBay, Yahoo!, and Amazon, Summer 1999
(estimated standard errors in parentheses *)

<table>
<thead>
<tr>
<th></th>
<th>Auctions closing per day</th>
<th>Revenues per month ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>eBay</td>
<td>340,000</td>
<td>190,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(18,000,000)</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>88,000</td>
<td>19,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7,900,000)</td>
</tr>
<tr>
<td>Amazon</td>
<td>10,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(620,000)</td>
</tr>
</tbody>
</table>

* We computed these estimates by choosing a day in June or July to visit each site, observing the number of auctions closing that day, and taking a sample of closed auctions to estimate the average revenue per auction closing. Sample sizes were 1232 auctions at eBay, 259 auctions at Yahoo!, and 241 auctions at Amazon. (At Amazon and Yahoo!, we obtained simple random samples of goods, while at eBay we took a stratified sample over 12 different categories, computing weighted averages instead of simple averages). Compute monthly revenues from daily estimates, we multiplied by 30. Standard errors are based on sampling variation in the revenues per auction listing. We did not make a formal estimate of the sampling error in the number of auctions closing per day, because it was too difficult to obtain separate estimates on a large sample of different days. On eBay, where the past 30 days’ results are relatively easy to obtain, we estimated that the standard deviation of the number of auction closings per day is approximately 25% of the mean number of closings (though this was abnormally high due to an unusual eBay system outage which prevented auctions from closing on June 10–11, 1999.)
Differences

- **Auction end time**
  - Amazon has a 10-minute extension period when there is bidding activity at the end of the auction,
  - Yahoo! gives the seller the option of a 5-minute extension period or a hard close time,
  - eBay continues to use a hard close time.

- **Search Options**
  - eBay generally gives the user more options for searching through the auction data, such as the option of browsing through any auction which closed in the past 30 days according to date and time as well as category.

- **Fee structure.**
  - Amazon and eBay both charge sellers a listing fee and a percentage commission, while Yahoo! charges no fees at all resulting in less fraction of actual sale-16% as compared to Amazon 38% (less than eBay due to SummerDime promotion low fees) and eBay 54%
Conclusions