

# Introduction to 'Innovative Auction Markets' Special Issue

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## INTRODUCTION

This special issue of *EM* — *Electronic Markets* on 'Innovative Auction Markets' illustrates the increasingly pervasive and diverse applications of online auctions. From auctions for keywords tied to search engines, to B2B and financial auctions, or the use of auctions to generate predictive information for decision making — online auctions are becoming more widely applied in practice. Since the last special issue on auctions was guest edited in this journal by Stefan Klein in 1997, research on online auction designs and implementation has also become much more popular in information systems, marketing and economics.

Online auctions have a number of advantages for the social assignment of value, trading and resource allocation. Online auctions enable:

- *Wide participation* by many sellers and buyers on a worldwide scale;
- *Tailored allocation mechanisms* along many dimensions. For example where speed matters, some auctions can be fast while others occur slowly. On eBay auctions can occur over days, in B2B reverse auctions in a few hours and in a few seconds at the Dutch flower auctions;

- *Structured negotiation models* that can be automated to support buyers and sellers; and
- *Trusted third party* services to reduce seller and the buyer transaction costs.

While auctions were traditionally conducted outside the hierarchy of organizations — as we note in our book (Kambil and van Heck 2002), we expect a key frontier in the future to be increased use of auctions within companies to support decision making, resource allocation and possibly the valuation of intangibles. Five years ago when we initiated our effort to write a book on the design and use of online auctions and exchanges the number of innovative auctions was sparse. Today as illustrated by the papers in this issue tremendous progress is underway in refining the design and application of online auctions to diverse problems.

## SELECTED PAPERS

We selected papers for this special issue using three key criteria: peer review, novelty of insights related to online auction design, and the innovativeness of the auction and its potential business impact.

The first paper 'Entry Fees and Endogenous Entry in Electronic

A u t h o r s

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Auctions' by Radosveta Ivanova-Stenzel and Timothy Salmon investigates the seller's dilemma of charging an entry fee. On the one hand theory suggests that entry fees increase the surplus that sellers can extract from buyers. On the other hand entry fees might discourage bidders from entering the online auction. This paper reports on experiments carried out for different auction formats and entry fees. The results show that even though buyers appear to have quite strong preferences for certain auction formats, the preferences are not strong enough to be profitably exploited by entry fees.

The second paper 'An Empirical Investigation into the Use of Heuristics and Information Cues by Bidders in Online Auctions' by Arun Vishwanath analyses bidder behaviour in online consumer-to-consumer auctions. Predicated on bounded rationality and limited information processing capabilities of bidders the author investigates the choice and impact of heuristics and information cues on bidding behaviours. Two studies analysed eBay auctions for a variety of products (Rolex watches, Swarovski crystal figurines, Palm VII PDA's, and Apple Imacs). The results indicate that within all product categories, auctions with lower initial prices attracted more bidders and therefore that bidders in these auctions use the posted initial price as a pre-screening heuristic. This study also indicates that auctions with reserve prices and with pictures of the products seem to attract more bidders and therefore prices were higher in these auctions.

The third selection 'Optimal Bidding on Keyword Auctions' by Brendan Kitts and Benjamin Leblanc presents an innovative trading agent for Pay Per Click (PPC) auctions. These online auctions allocate advertising space to the second highest bidder in search engines through continuous second-price auctions. The query keywords that users specify in their search process trigger a list of sponsored links to appear along with the search engine response. A higher ranking on this list will usually generate a higher click rate and therefore a higher price will be paid for the ranking in the online auction. The paper discusses rules that allow users to determine a desired goal for a keyword and a bidding agent automatically adjusts the bid price to meet this goal. The bidding agent follows a simple algorithm and develops a future look-ahead bidding plan that enables it to hold back cash for more desirable times of the day. The agent has been tested on the Pay Per Click auction Overture, where it quadrupled the clicks for the same expenditure.

The fourth paper 'Topological Analysis of Online Auction Markets' by James Ho constructs a topological model and interesting visualization of different online auction markets. The topological model is based on the star plot for displaying multivariate data with an arbitrary number of dimensions. The topology is visualized by mapping key buyer and seller activities and characteristics such as buyer diversity, buyer experience, duelling, stashing, proxy bidding, seller diversity, seller experience,

matching, sniping and retailing. The topology is constructed by using data of 500 auctions on eBay. The author suggests that by this type of visualization one can analyse the auction market efficiency and changes in the market that may favour either buyers or sellers.

The fifth paper 'Xetra BEST — Integration of Market Access Intermediaries' Requirements into Market Design' by Peter Gomber and Kai-Oliver Maurer provides an innovative auction market model Xetra BEST that enables execution services directly at the customer interface thereby circumventing centralized markets and exchanges. This market model was launched in August 2002 by Deutsche Borse and used successfully by market participants in executing their orders. Criteria such as cost effectiveness, openness, non-discretionary rules, incentive compatibility, limit order display, best execution, and consistent surveillance are used to come up with a practical market design that integrates the trends of internationalization with a centralized market regime. Order flows are concentrated on a single trading system and a price — time priority rule executes orders.

The sixth contribution 'Continuous Trading in Thin Private Value Markets: The Multiple-Quote Double Auction' by Eric Tallroth presents an innovative double auction that enables participants to trade immediately at a centralized market in an anonymous way. Buyers and sellers can continuously provide their demand and supply, and a matching algorithm allows traders to avoid direct price competition while trading is still continuous. Experiments were carried out and the multiple-quote double auction was compared with the standard double auction and the bilateral exchange. The results of the experiments indicate that this new type of institution will be preferred by traders in thinner markets that also involve the greatest degree of bargaining.

The seventh paper 'Auction-Based Variety Formation and Steering for Mass Customization' by Thorsten Blecker, Nizar Abdelkafi, Gerold Kreutler and Bernd Kaluza proposes an innovative auction mechanism to overcome the problem of external and internal complexity with regard to mass customized products. External complexity deals with the huge number of product variants and is dealt with by variety formation. Internal complexity deals with the operations and manufacturing-related tasks and is dealt with by variety steering. By combining a Dutch auction system with agent-based technology the authors claim that the proposed system achieves web-enabled mass customization.

The eight paper 'Prediction Markets: Does Money Matter?' by Emile Servan-Schreiber, Justin Wolfers, David Pennock and Brian Galebach looks at the emerging use of markets to aggregate the intelligence of multiple participants to generate predictions. Prediction markets have the potential to improve decision making by capturing the judgements of multiple participants and to construct a distribution of their beliefs. In this paper the researchers compare an artificial market where a point

system is used in contrast to paying real money to buy futures on similar predictions. The researchers found that real money is not necessarily important in deriving similar predictions. The preliminary results contribute to debunking a widely held belief that real monetary rewards are vital to information revelation in predictive and internal markets.

The papers in this issue focus on improving the design and deployment of innovative auction markets. As always, successful deployment requires careful design and attention to detail. We think there are many areas to investigate to improve our understanding of successful design and deployment. One pathway is to broaden the scope of research to investigate the relationship between specific auction models and other market processes. Another is to investigate how to make innovative online auctions within organizations to support managerial decision making and address vexing management problems common to large firms.

## ONLINE MARKETS AS BUNDLED PROCESSES

Online markets are ultimately bundles of IT-enabled processes and the success of online markets will be determined by consistent linkages across processes and the level of maturity of each market process. We have identified five primary market processes. These processes are:

1. search processes that allow buyers and sellers to discover and compare trading opportunities;
2. pricing processes to help buyers and sellers discover prices and value. Here auctions are used to dynamically discover the value of products and services;
3. logistics processes that coordinate the transfer of physical and digital goods between buyers and sellers;
4. payment and settlement processes to transfer funds from buyer to seller; and
5. authentication processes to verify the quality of the goods sold and the credibility of the buyers and sellers.

Five additional market-context processes enhance trust among trading partners and legitimize the trade. These are:

1. product representation processes that specify the presentation of products and services to buyers and sellers;
2. regulation processes that record and recognize the transaction within a framework of laws and rules to signal it as legitimate and conforming to a set of market rules and social principles;
3. risk management processes to reduce buyer and seller risks in a transaction;

4. influence processes to ensure commitments among trading partners are met; and
5. dispute resolution processes that resolve conflicts among buyers, sellers, and market makers such as auction houses.

Figure 1 illustrates each of these market processes with an example of a current specialist for that processes.

Future research may include:

- creating newer auction methods for better pricing and value discovery. A promising application is the development of new multidimensional auction markets;
- innovatively linking the auction process to other primary processes such as search, logistics etc.;
- embedding the auction process in context processes such as product representation, regulation etc.;
- integrating auctions onto new Internet and mobile technologies which will create new platforms for executing the different market processes; and
- building new agents to reduce the cognitive costs of participating in markets.

Understanding how to make the pieces fit together well is as important as improvements in any one piece of the market puzzle.

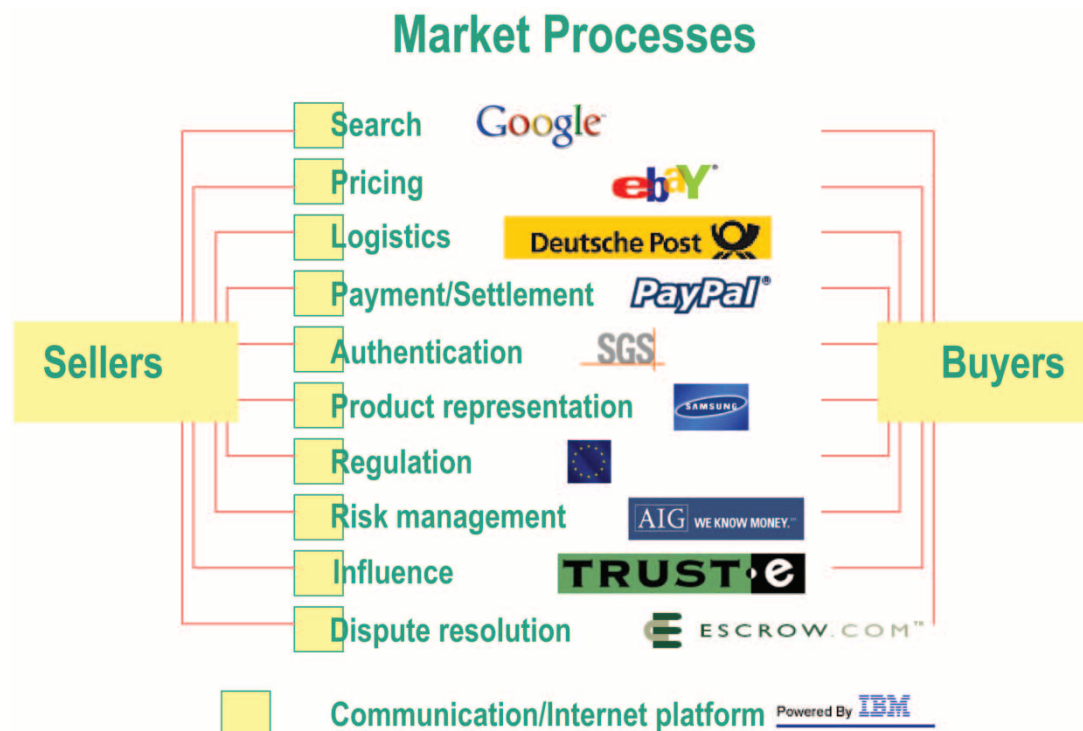
## MAKING PROGRESS ON BRINGING MARKETS INSIDE

Much of the prior work on markets and auctions has focused on markets at the boundaries of the firm. Today as we note in our book we can bring electronic markets more easily within the firm. Most large firms have vexing problems that can be very costly. These include: accessing distributed knowledge, correctly predicting demand, valuing intangibles, allocating resources efficiently across multiple business units or to new ventures, or timing the entry into new markets. As discussed in the paper on predictive markets, innovative online auction markets promise to play a role in addressing these problems by capturing the ideas distributed across the firm and creating insightful signals to decision makers. But much remains to be done in refining the design and application of online auctions within the firm.

In short, despite exciting research progress, a lot of work remains to be done to improve our understanding of how to design innovative auction markets and increase their practical applications.

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Source: Derived from Kambil and van Heck, 2002: 27

Figure 1. Market processes between sellers and buyers

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