

Computer Mediated Transactions

Hal Varian

American Economic Review

Presentation by: Paulo Albuquerque



Summary



- Stage of Innovations
- Benefits of Computer Mediation
 - New Forms of Contract
 - Monitoring
 - Data Extraction and Analysis
 - Controlled Experimentation
 - Personalization and Customization



Stage of Innovations



- Combinatorial Innovation
 - The component parts of these technologies can be combined and recombined by innovators to create new devices and applications
 - E.g., Internet and Web, with a huge number of novel applications, from web browsers, to search engines, to social networks
 - Reason for rapid diffusion: the component parts were all bits! There was no time to manufacture, no inventory management, and no shipping delay
 - Parallel invention: the web came from Switzerland, Linux from Finland, Skype from Estonia.
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Facilitate new forms of contract



- E.g., Transportation industry: Car dealers are selling cars with “starter interrupt” devices that inhibit operations if car payments are missed
 - E.g., Computer mediated contracts: Video industry went from a fix fee to a share revenue system between video stores and distributors
 - E.g., Online Advertising
 - Impressions (banner ads) vs. Clicks
 - The publisher wants to sell impressions
 - The advertiser (manufacturer) wants to buy clicks (which lead to sales)
 - Solution: find an exchange rate = clickthrough rate!
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Monitoring



- Accounting has been in place since 3300 BC; use of small pebbles to represent shipments, put in a sealed envelop, and opened at the end to the trip
 - Cash Register: invented in 1883, by James Ritty; avoid money being stolen by employees
 - Computer: records everything!
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Data extraction and analysis



- Better decisions and improve welfare (see the next two benefits)
- E.g., Airline reservations, which allows for price discrimination
- E.g., Supermarket scanner data
- E.g., Search engine data



Controlled Experimentation



- Cloud Computing: storing in one data center allows for experimentation, which is hard with packaged software
 - When experiments are cheap, decisions can be based on results, instead of based on the Highest Paid Person's Opinion(HiPPO)
 - E.g., in 2008, Google ran 6,000 experiments involving web search which resulted in 450 to 500 changes in the system
 - “tweaking everything from the background color of the ads, to the spacing between the ads and search results, to the underlying ranking algorithm”
 - E.g., Experimental platforms: “Ad Rotation”, “Website Optimizer”
 - E.g., Bid Simulator and Bid Forecasting tools
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Personalization and Customization



- Recommender Systems: based on monitoring and experiments
- Third Welfare Theorem (Varian, 2005): combining perfect price discrimination and free entry
 - Perfect price discrimination results in the optimal amount of output being sold, while free entry pushes profits to zero, conferring all benefits to the consumers
- E.g., Amazon makes suggestions of things to buy based on your 12 previous purchases, or on purchases of consumers like you



Transactions Among Workers



- Knowledge Worker Productivity:
 - Prior to the widespread use of the personal computer, office documents were produced via a laborious process:
 - “A memo was dictated to a stenographer, who later typed the document, making a half-dozen carbon copies. The typed manuscript was corrected by the author and circulated for comments.”
 - With the personal computer, editing became much easier, and the process of collaborative document production involved handing floppy disks back and forth.
 - Email, eliminated the floppy disk and simply mail attachments from person to person
 - Nowadays: Cloud Computing, where documents live in a cloud
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Deployment of Applications



- Cloud Computing

- Offer both “software as service“ and a “platform as service”
- E.g., a small company to purchase data storage, hosting services, an applications development environment, and Internet connectivity of the shelf from vendors such as Amazon, Google, IBM, Microsoft, Sun and others, turning a previous fixed cost into a variable cost, reducing entry barriers

- Micro-multinationals

- E.g., Amazon’s Mechanical Turk, where workers are matched with tasks; in March 2007, there were 100,000 workers, from 100 countries providing services
 - “Brain Circulation” (Saxenian, 2006): email, webpages, wikis, etc..
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