An Infrastructure for Meta-Auctions

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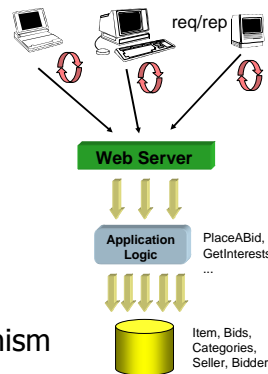Databases and Distributed Systems Group

(Large-scale) Dissemination-based Information Systems

Emerging applications involve distribution of data *from sources* to many consumers

- stock and sports tickers
- traffic information systems
- software distribution
- news and entertainment delivery
- auctions and reverse auctions

req/rep

Web Server

Application Logic — PlaceABid, GetInterests, ...

Item, Bids, Categories, Seller, Bidder

Online Auctions Today

- Auctions: a popular trading mechanism
- A broad public can trade anything
- Users want to (continuously) monitor the data of interest
- If users participate in multiple auction sites
  - different user interfaces
  - different categories setups
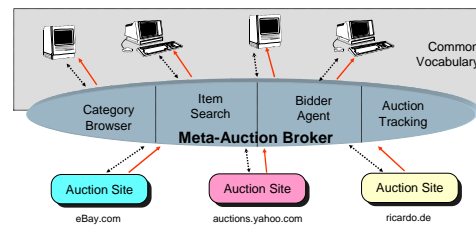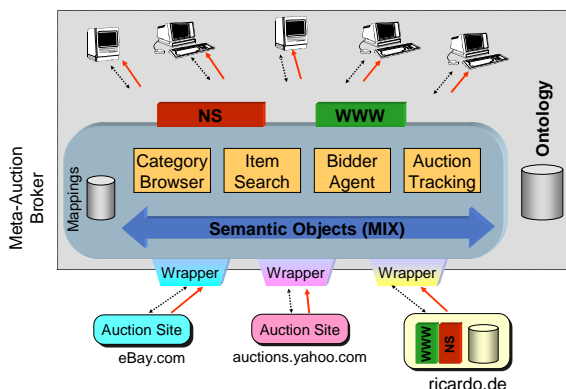 - different terms

Shortcomings

- Limited interaction potential due to C/S request/response
- User-initiated: data is transferred upon client request
- Possible inconsistencies due to implicit assumptions and semantic heterogeneities between different sources (e.g. date format, currency,...)

Meta-Auction Proposal

Unified view of different Auction sites:

- category browsing
- item search
- auction participation
- auction tracking

Common Vocabulary

Category Browser | Item Search | Bidder Agent | Auction Tracking
Meta-Auction Broker

Auction Site — eBay.com
Auction Site — auctions.yahoo.com
Auction Site — ricardo.de

Meta-Auction Requirements

- Notifications of events (as first class information)
- Publish/subscribe as an additional interaction paradigm
- Need for semantic metadata-based infrastructures for integration
- Common vocabularies for semantically meaningful exchange of data and notifications

Meta-Auction Broker | Mappings | NS | WWW | Ontology
Category Browser | Item Search | Bidder Agent | Auction Tracking
Semantic Objects (MIX)
Wrapper | Wrapper | Wrapper
Auction Site — eBay.com
Auction Site — auctions.yahoo.com
WWW NS — ricardo.de

Meaningful Data/Notification Exchange

- Ontologies as common interpretation basis
  - provide an extensible description basis to which data providers and consumers refer
- Organized in
  - user level (categories, representation of information)
  - infrastructure level (exchange of notifications)
  - heterogeneity at the database level (data organization)

Information Dissemination: PPSS

- Server-initiated
  - proactive information system
- Aperiodic and publish/subscribe
  - subject-based addressing (multicast) 1:n communication
  - encapsulates user preferences (categories, interests,...)
  - seen as continuously evaluating queries
  - reduces the load at the backend
  - inter-node caching, snooping and state reassembling
  - data replication as a side-effect benefit