Research Issues in Electronic Commerce

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Mismatch 1: Catalog Heterogeneity

- Different catalogs use different structures, different terminology and encoding.
- Some translations can be exact, some are inexact approximations.

Mismatch 2: Transaction Paradigm

- Databases interactions are “stateful” while web interactions are “stateless.”
- Traditional database transactions are short, while web interactions last a while before commit or timeout.

Mismatch 3: Free vs. paid sources

- Some sources are free, some charge fees.
- Sources vary in quality, response rate, and “Internet distance” from query engine.

Research Issue 1: Heterogeneity

- Managing multiple representations to avoid data loss through multiple translations.
- Automatic translation: specification, processing, and timing.
- Intermediate representations that are efficient but do not lose information.

Research Issue 2: Transaction Processing

- Quick response requirement.
- Source data widely dispersed.
- Support for multiple web servers.
- Transaction timeout.
- Intermittent interaction.
- Locking paradigms.
  - Maintenance of derived data.
  - Reservations of resources.

Research Issue 3: Distributed Optimization.

- Optimization for:
  - Response time.
  - Resource usage.
  - Recency or quality of answer.
  - Costs charged by sources.
- Allocation of costs to queries.
  - Costs vs. pricing.

Other research issues

- Executable ontologies defining e-commerce domains.
- Extraction of structured data from unstructured sources.
- Combined structured and non-structured search.
- Secure distributed transactions over unsecure channels.

More Research Issues

- Ordering of results.
- Which sources to use.
- Handling source access timeout.
- Better paradigms for describing and specifying heterogeneity and translations.
- Modeling and monitoring performance and behavior of distributed systems.