Electronic Markets:

Legal
Organizational
Technical
Perspectives

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Legal perspective

- Legal status of electronic markets
- legal status of transactions (contracts)
- liability of electronic markets
- Trusted Third Parties
- Tax payment
- ....
Organisational role of markets

- Bring supply and demand together
- Provides services:
  - Price discovery mechanism
  - Payment mechanisms
  - Trusted third party
- Integrator of
  - Marketing
  - Information
  - Formats, etc
Organizational perspective

Supply chain

supplier → distributor → retailer → customer

Market or Hierarchy
Organizational

• Transactions through market
  – no longstanding relations
  – supply and demand determine price

• Transactions through hierarchy
  – tight relation between supplier and customer
  – price is management decision
Transaction costs in market

- Information phase
- Negotiation phase
- Fulfillment phase
- Satisfaction phase

- Gather information
- Negotiate contracts
- Protect against opportunistic bargaining
Transaction costs in hierarchy

- decision making
- accounting
- planning
## Market vs. hierarchy

<table>
<thead>
<tr>
<th></th>
<th>Production costs</th>
<th>Coordination costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>markets</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>hierarchy</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
Electronic interconnections

- Lower communication costs
- Lower coordination costs
  - market efficiency
    - information gathering
    - price comparison
    - global competition
  - hierarchy integration
    - use of EDI in supply chains
From hierarchy to market
Other influences on coordination

• Asset specificity
  – location specificity
  – time specificity
  – customer specificity

• Product complexity
  – specification problem
Virtual Markets and products

Virtual auctions

Impact on financial result

Leverage products

Competitive bidding

Routine-items

‘Systems contracting’

Supply risk

Strategic products

‘Performance based partnership’

Bottleneck-items

‘Secure supply + search for alternatives’

E-Procurement solutions

Electronic data interchange

Supplier specific E-solutions

Supply risk

Impact on financial result

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Leverage products

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‘Systems contracting’

Strategic products

‘Performance based partnership’

Bottleneck-items

‘Secure supply + search for alternatives’

E-Procurement solutions

Electronic data interchange

Supplier specific E-solutions
## Virtual Markets and products II

<table>
<thead>
<tr>
<th>Type of sourcing</th>
<th>MRO Hubs</th>
<th>Catalogue Hubs</th>
</tr>
</thead>
<tbody>
<tr>
<td>systematic sourcing</td>
<td>Ariba, <a href="http://WWW.Grainger">WWW.Grainger</a>, MRO.com, BizBuyer.com</td>
<td>Chemdex.com, SciQuest.com, PlasticsNet.com</td>
</tr>
<tr>
<td>operating inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturing inputs</td>
<td></td>
<td></td>
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</tbody>
</table>
Transactions

• Direct transactions
  – shopping mall
  – classified ads
  – direct negotiation

• Brokered transactions
  – distributors
  – brokers
    - auctions
# Market functions/models

<table>
<thead>
<tr>
<th>function</th>
<th>model</th>
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<tbody>
<tr>
<td>Marketing &amp; sales</td>
<td>E-shop</td>
</tr>
<tr>
<td>procurement</td>
<td>E-procurement</td>
</tr>
<tr>
<td>Price discovery</td>
<td>E-auction</td>
</tr>
<tr>
<td>Aggregate services</td>
<td>E-mall</td>
</tr>
<tr>
<td>Common marketing &amp; transaction</td>
<td>3d party marketplace</td>
</tr>
<tr>
<td>Communication, info</td>
<td>Virtual communities</td>
</tr>
<tr>
<td>Logistics, payments</td>
<td>Value chain service provider</td>
</tr>
<tr>
<td>Integration information</td>
<td>Value chain integrator</td>
</tr>
<tr>
<td>Trust, information</td>
<td>Brokers</td>
</tr>
</tbody>
</table>
‘New’ Business Models
from pilots and actual business

Degree of innovation

Single function
lower

Multiple functions/integrated

Functional integration

lower

higher

- e-shop
- e-procurement
- e-mall
- e-auction
- trust
- info brokerage
- virtual business community
- value chain service
- third party marketplace
- collaboration platform
- value chain
Business Models - Examples

- Single function
  - e-shop
  - Fleurop
  - Travelocity
  - JAL

- Multiple functions/integrated
  - e-procurement
  - e-auction
  - value chain service provider
  - virtual community
  - collaboration platform
  - 3rd party marketplace
  - value chain integrator

Degree of innovation:
- lower
- higher
Market makers

- Producers
- Consumers
- Distributors
- Financial service providers
- Technical service providers
Requirements for an infrastructure for electronic markets

• Different transaction types
• Effective control of fraud
• Secure and private payment
• E-commerce language
• Robust exception handling
• Scaleable
• Extensible to third parties
• Interoperate with other EC services
Components for electronic markets

• Registration facility (both products and parties)
• Settlement facility
• Banking facilities
• Marketing (catalogue, advertisements,...)
• Price discovery protocols
• Contracting (implicit, explicit)
• Logistic support
Infrastructure for electronic markets

• Banking facilities
• Communication
  – confidentiality
  – integrity
  – authentication
  – non-repudiation
• Transfer and storage of products
• Advertising
Banking facilities

• Different payment methods should be supported (credit cards, SET, post-delivery payment,...)

• Payment should be safe

• Payment and delivery guaranteed
Secure Electronic Transaction (SET)

• Standard developed by Visa and Mastercard
• Electronic substitute for creditcards
• Public key based
• Has some privacy
Using SET

Send Coat XYZ to Alice street; my Credit# is: 1234 5678 9100

Ok Alice, that’s $500

Bank: has Alice $500 Credit on #: 1234 5678 9100?

Yes

Bob Shop knows too much about Alice!
Order Info: $500, TransID Coat XYZ to Alice street
Payment Info: $500, Hash(OI) My Credit# is: 1234 5678 9100
Order Info:
$500, TransID Coat XYZ to Alice street

Can I have $500 on Hash(OI)?

Payment Info:
$500, Hash(OI)
My Credit# is: 1234 5678 9100
Video on demand

1. Anonimity
2. No TTP
3. Amount to pay depends on time
Methods:

Connection through telephone line:

  Call a 09 line with the PC
  • Advantage: direct payment, anonymous.
  • Disadvantage: slow connections, difficult with multi-media

ADSL / cable / LAN systems:

  09 extern
  SMS payments
09 extern:

Customer code

Film selection

DATABASE
movies

TELCO

talking computer
Customer sends customer code to a 09 phone line and pays indirect
Movie is broadcast as long as telephone connection exists.
SMS:

Customer code

Content selection
Plus "browse time"

DATABASE movies

TELCO

SMS Server
Customer sends SMS with customer code to provider

BANK  TELCO  BANK  PAYSITE

DATABASE
movies

Customer code

Customer code

SMS  Customer code

SMS  Customer code

SMS  Server

BANK  TELCO
BANK  PAYSITE
Provider sends expensive SMS to customer

Diagram:

- **TELCO**
  - SMS time code

- **DATABASE**
  - time code
  - movies

- **SMS Server**
If customer has enough money the telco sends money to provider and forwards time code.
Customer uses time code to receive movie

- Time code
- DATABASE
  - movies
- Stream during fixed time
- TELCO
- SMS Server
Communication

• Some common language should be used.
• Ontology defined
• Constructs in the language should have a precise and formal meaning.
  – Note: currencies should be clear
• Contracts should be legally binding.
  – Obligations should be visible
Storage and transfer of goods

• Physical products can be sold only once. Their digital representation can easily be copied and sold more than once.

• Downloading of digital products should be possible.

• Transport should be arranged for other products.
Marketing

• How is advertisement arranged?
  – Blackboard?
  – Shopping mall?
  – One-on-one advertisement allowed?

• Format of advertisements?

• Payed advertisements?

• Who can advertise?
Examples

Commercial market places
• http://www.nasdaq.com/
• http://www.ebay.com/
• http://www.houstonstreet.com/

From research laboratories
• http://www.sics.se/tac/
• http://www.iiia.csic.es/Projects/fishmarket/