ePROCUREMENT

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Knowledge Society

LEVEL III Participation
- eCollaboration
- eDemocracy
- eCommunity

LEVEL II Production
- eProcurement
- eService
- eContracting
- eSettlement

LEVEL I Information & Communication
- eAssistance
• How can eProcurement be characterized?
• How does the Seller-Side procurement model looks like?
• What are important components of the Buyer-Side procurement model?
• Which are the pros and cons of the procurement model Marketplace?
• What are important functions of Desktop Purchasing?
• How should the public offering process be implemented?
• How could we profit from inverse auctions?
Definition of eProcurement

- eProcurement is more than ePurchasing
- eProcurement → web-based procurement process
- eProcurement includes
  - Search for suppliers
  - Contract formulation
  - Maintenance of supplier relations
  - Operational purchasing task
  - After sales services
• Stages of eProcurement:

**Internet-based Procurement Process**

- **Strategic Procurement**
  - Specification
    - Conditions
    - Standards
  - Selection
    - Procurement model
    - Suppliers
  - Contract
    - Qualities
    - Prices
    - Dates
    - Conditions

- **Operative Procurement**
  - Order
    - Order
    - Payment
  - Control
    - Delivery
    - Quality
  - After Sales Service
    - Support
    - Information

- **Operative Procurement**
  - Tactical Procurement
    - Specification
      - Conditions
      - Standards
    - Selection
      - Procurement model
      - Suppliers
    - Contract
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      - Dates
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    - Order
      - Order
      - Payment
    - Control
      - Delivery
      - Quality
    - After Sales Service
      - Support
      - Information
Internet-based Procurement Process

- Potentials of Public Offering (Public procurement contracts):
  - Acceleration of processes $\rightarrow$ use of ICT
  - Reduction of costs $\rightarrow$ dynamic pricing mechanisms (e.g. using inverse auctions)
  - Quality improvement $\rightarrow$ desktop purchasing systems
  - Increasing transparency $\rightarrow$ controlling functions
  - Security $\rightarrow$ Digital signatures, PKI (public key infrastructure)
### 3.3 Basic Types of eProcurement Solutions

#### 3.3.1 Market Models for eProcurement

Three fundamental market models for eProcurement to who controls the marketplace. There are platforms controlled by the provider (sell side) or by the consumer (buy side), as well as those controlled by market organizations which in turn are provided and controlled by a neutral third-party authority. Figure 3.3 gives an overview of the three market models.

- **Sell-Side Market Model**
  - e.g., shop systems like www.amazon.com or www.dell.com

- **Buy-Side Market Model**
  - e.g., bulletin board or desktop purchasing systems like www.ariba.com

- **Market Place**
  - e.g., advertising platforms and auction platforms like www.fastparts.com
Component of a Procurement Model

- Electronic catalog of products & services
- Definition of user profiles
- Content management system
  - Content
  - Search engines
  - Basket
  - ePayment
  - Reports
- Interface to ERP systems → stock, availability or customized prices.
Software services in the electronic procurement (Seller-Side) by Schubert
### Pros & Cons of Sell-Side Solution

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Configuration of complex products possible</td>
<td>- No possibility of automatic product comparisons</td>
</tr>
<tr>
<td>- No capital outlays for an ordering system</td>
<td>- Limited support of the procurement process with the buyer</td>
</tr>
<tr>
<td>- Operating costs for maintenance of current product lists and prices do not apply</td>
<td>- Consumer or requesting customer must use a different information system for each provider</td>
</tr>
<tr>
<td>- Short delivery times through direct input of the order into the supplier’s system</td>
<td>- Limited integration of the procurement process into the operational information systems of the customer</td>
</tr>
<tr>
<td>- Can query current availability and prices</td>
<td></td>
</tr>
</tbody>
</table>

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**Figure 3.5: Advantages and disadvantages of sell-side solutions**
Software services in the electronic procurement (Buyer-Side) by Schubert
## Pros & Cons of Buy-Side Solution

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Procurement process can be organized in a company-specific manner</td>
<td>• Complex products are not usually supported</td>
</tr>
<tr>
<td>• Internal authorization and licensing procedures are well supported</td>
<td>• Advertisements are not planned</td>
</tr>
<tr>
<td>• Process turn around times can be reduced</td>
<td>• Capital outlays for information systems are with the procuring company</td>
</tr>
<tr>
<td>• Stocks can be kept small</td>
<td>• Operating costs for content management are to be supplied</td>
</tr>
<tr>
<td>• Central administration produced by negotiated products</td>
<td>• Not all suppliers have an electronic product catalog</td>
</tr>
<tr>
<td>• Elimination of maverick shopping</td>
<td>• Suppliers sometimes provide poor-quality product data</td>
</tr>
<tr>
<td>• Consumer/solicitor can operate system themselves</td>
<td>• Coordination of the exchange format must be achieved by the procurer and supplier</td>
</tr>
<tr>
<td>• System with uniform menu prompting</td>
<td></td>
</tr>
</tbody>
</table>

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Fig. 3.7: Advantages and disadvantages of buy-side solutions.
Marketplace Procurement Model

- Operated by an intermediary (infomediary or information broker)
- Infomediary → responsible for multi-supplier catalog and for catalog integration
- Offers product descriptions and comparisons
- Reduces the search expenditures of market participants
- Infomediary carries out the business transactions while preserving anonymity
Software services in the electronic procurement (Marketplace Procurement)
PROS & CONS OF MARKET PLACE SOLUTION

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduction of search time</td>
<td>• Lacking integration into the ERP systems of the procuring company</td>
</tr>
<tr>
<td>• Representation of current and detailed market offerings</td>
<td>• Intermediaries usually cover only a narrow product range in sufficient depth</td>
</tr>
<tr>
<td>• Efficient transactions</td>
<td>• Frequently a large company can negotiate directly with the provider/manufacturer for better prices</td>
</tr>
<tr>
<td>• Comparability of different offers</td>
<td>• Classified directories are frequently not upto-date</td>
</tr>
<tr>
<td>• Anonymous procurement opportunity</td>
<td></td>
</tr>
<tr>
<td>• Bundling of supply and demand in order to achieve better conditions</td>
<td></td>
</tr>
</tbody>
</table>
• A catalog lists eProducts and eServices
• Detailed information about functions, quality, and prices can be obtained
• Catalog Management offers services for maintaining the catalog
• Classification criteria help to search and select products and services
• Very often a multi-supplier catalog (multi-sourcing product catalog or MSPC) is necessary
Catalog Integration

- The product catalog is the core of all eProcurement market solutions (Sell-Side, Buy-Side, Marketplace)
- Suppliers, intermediaries and purchaser have different requirements
- different contracting parties have negotiated different prices
- eventually, purchasers have different quality requirements (e.g. governmental institutions, local public offices, citizens)
- A meta structure is needed to merge different catalogs
• The marketplace eProcurement solution asks for integrating different catalogs
• A meta structure to merge different catalogs is SPSC
• It is derived from the service code of ‘Dun & Bradstreet’

<table>
<thead>
<tr>
<th>SPSC Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>511</td>
<td>Paper and office supplies</td>
</tr>
<tr>
<td>5112</td>
<td>... Office supplies</td>
</tr>
<tr>
<td>5112 04</td>
<td>... Computer and copier supplies</td>
</tr>
<tr>
<td>5112 04 05</td>
<td>... Printing supplies</td>
</tr>
<tr>
<td>5112 04 05 01</td>
<td>... Toner cartridges</td>
</tr>
</tbody>
</table>
Exchanging Product Information

- XML-based (eXtensible Markup Language) document formats are necessary for exchanging information about products and services
- In Europe, the BMEcat standard (German Bundesamt für Materialwirtschaft & Einkauf) is heavily used
- The exchange formats offers the integration of pictures, graphics, technical descriptions, video recordings besides formatted data (article number, short description, price and others)
The SPSC is used foremost in applications which require the identification and classification of goods. The service spectrum of the supplier is included. In addition, an entry can be made into electronic catalogs with information systems as well as with data warehousing such as during the evaluation of the item and degree of detail given.

In order to describe products in even greater detail, the ten-digit SPSC number can be extended by two digits. Digits 11 and 12 represent services associated with the product. Typical services are repairing (91), servicing (92), leasing (93), or renting (94).

The SPSC system is regarded as stable due to the relatively restricted level of industry-wide use. Detail employed. If the level of detail was higher, the information in the system would have to be continuously revised with the development of new products.

Because of the scope of the system, it can be used in different industries. Aside from the prominent credit card companies, numerous software manufacturers such as Ariba (http://www.ariba.com) align with their structure with the SPSC.

XML-based document formats are chosen for the exchange of electronic product data. BMEcat is a standard for the transfer of electronic product data drawn up by the German Bundesverband Materialwirtschaft, Einkauf und Logistik (BME). The catalog documents allow for the integration of multimedia product data such as pictures, graphics, technical representations, or video recordings. The header of a catalog document in the BMEcat format is given in Fig. 3.11.
A Desktop Purchasing System is a web-based information system. It implements the decentralized procurement of MRO (Maintenance, Repair, Operating) goods through electronic solutions. Content of catalogs are provided by suppliers. Desktop Purchasing Systems may be integrated with ERP systems.
### Service Categories for DTP Systems

<table>
<thead>
<tr>
<th>Products</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Ppre-configured computer</td>
<td>- Travel services</td>
</tr>
<tr>
<td>- PDAs and mobile devices</td>
<td>- Training courses</td>
</tr>
<tr>
<td>- Software</td>
<td>- Advertising services</td>
</tr>
<tr>
<td>- Magazines and newspapers</td>
<td>- Consultation and hotline</td>
</tr>
<tr>
<td>- Books</td>
<td>- Financial services</td>
</tr>
<tr>
<td>- Office furniture and office equipment</td>
<td>- Cafeteria</td>
</tr>
<tr>
<td>- Vehicles</td>
<td>- Copying service</td>
</tr>
<tr>
<td>- Work clothes and work equipment</td>
<td>- Courier service</td>
</tr>
<tr>
<td>- Advertising material</td>
<td>- Parking lot reservation</td>
</tr>
<tr>
<td>- Maintenance material</td>
<td>- Light entertainment programs</td>
</tr>
<tr>
<td>- Office supplies</td>
<td>- Cultural programs</td>
</tr>
<tr>
<td>- etc.</td>
<td>- etc.</td>
</tr>
</tbody>
</table>

DPS can greatly relieve the burden placed on the logistics and purchasing departments of companies. Different services, from the workplace layout and office equipment to services for business trips and company socials, can be efficiently procured and supervised via such systems. Well-known examples of DPSs are those offered by Ariba Technologies, Inc. and the CommerceOne Corporation: Ariba Operating Resources Management System and BuySite by CommerceOne. The company CommerceOne sells an eProcurement solution under the name BuySite. This platform supports the procurement of MRO goods, settlement with the issuance of an invoice, and process control.
Basic Functions of Desktop Purchasing Systems

Identification of supplier
- Online search on Internet
- Reversed Marketing
- Use of software agents
- Electronic Catalogs
- Online tendering and auctions
- Direct selection by software system

Ordering Process and Handling
- Support of ordering process
- Authorization procedure
- Transfer of order
- Status information about ordering process (suppliers’ side)
- Online tracking of ordering processing

Receipt and Checking of Goods
- Automatic booking
- Electronic complaints management
- ePayment
- Vendor evaluation
The Ariba ORMS (Operating Resource Management System) from Ariba Technologies Inc. is the best known Desktop Purchasing System. It runs on a company’s intranet and consists of:
- a high-performance search engine
- and a workflow management system

Ariba has
- specific procurement regulations for each company
- and can do the booking of the ordered products

The Ariba customer pays
- a subscription fee for software adaptations
- and for hotline services

The maintenance of the supplier catalogue is handled by the suppliers, the demanders or by a third party.
### 3.6 Market for eProcurement Service Provider

An eProcurement service provider specializes in the procurement processes of companies and mediates different supplier relationships.

![Fig. 3.14: eProcurement service provider (according to Dölmetsch)](image)

- **Request and Ordering Services**
  - **Purchase Order Requests**
    - Ordering criteria
    - Advertisements
    - Status information
    - Pricing framework
  - **Approval Rules**
    - Position involved
    - Authorization categories
    - Control authority
    - Recording
  - **Orders**
    - Status of order
    - Posting
    - Settlement
    - Receipt of goods

- **Catalog Services, Content Management & Sourcing**
  - **Search**
    - Supplier search
    - Product search
  - **Sourcing**
    - Prioritization
    - Availability
  - **Configuration**
    - Modification
    - Assembly

- **Administration for eProcurement**
  - **Procurement Policy**
    - Procurement rules
    - Reporting
  - **User Profiles**
    - User specification
    - Payment arrangements
  - **Supplier Profiles**
    - Supplier specification
    - Delivery arrangements

- **Network Infrastructure and Security Layer**
Public Offering via Internet

- Publication → specification of services, conditions and deadlines
- Registration → registration of participants
- Grant → applicants receive tender documentation (using PKI)
- Submission → provider submits offer
- Assessment → evaluation of offer
- Processing → decision-making (clarifications are conducted if needed)
- Supplement → best offer is granted. Participants are notified.
Public Offering via Internet

Software services for public offering
Conducting Auctions

- **Goals:**
  - Lead a dynamic price negotiation
  - Decrease costs

- **Types of auctions:**
  - English auction (starts with a minimum price and bidders augment price)
  - Japanese auction (like English auction but augmentation of the price is done by the system)
  - Dutch auction (starts with a high price which falls down steadily ...)
  - Reverse auction (in a forward auction, buyers compete to get a product or service; in a reverse auction, sellers compete to obtain the business)
Tendering Process with Auctions

Tendering Process

Publication
- Publication of auction
- Process and Deadlines

Request for Opening
- Registration
- Certification

Checking
- Checking of offers
- Orientation of bidders

Negotiation
- Negotiation
- Decision-making

Awarding
- Awarding of contracts
- Notification
- Settlement

Submission
- Modalities
- Dates
- Regulations

Assessment
- Opening
- Implementation
- Completion

Auction Process

Sub-process is carried out by auctions house or authority
Case Swiss Federal Railways

is the national railway company of Switzerland

• in German: Schweizerische Bundes-Bahnen (SBB)
• in French: Chemins de Fer Fédéraux suisses (CFF)
• in Italian: Ferrovie Federali Svizzere (FFS)
• in Romansh: Viafiers Federalas Svizras

Since 1999 it’s a special stock corporation with all shares held by the Confederatio Helvetica (Switzerland)
The centralized procurement agency of SBB CFF FFS is responsible to organize inverse auctions periodically:

- first, interesting companies must pass a quality check for getting a ticket for bidding
- the bidders do not know how many competing parties are involved
- the bidders are informed about their own rank, but not about the highest offer in the auction
- the bidders have to underbid their own bid by at least 0.5%
- the base time period is 30 min
- if someone bids in the last 5 min of the period, the auction is prolonged for another 5 min
- the maximum prolongation is 180 min
Inverse Auction for Working Dresses

- seven suppliers offered prices for working dresses (contract volume CHF 300’000)
- result: the auction ended with over 10% price reduction compared to the best starting bid
Inverse Auction for Services

- six suppliers offered prices for a service (contract volume CHF 1.5 million)
- auction ended with an improvement of about 40% compared with the best starting bid (and 100% compared with the highest starting bid)
Lessons Learned

- the bidders should get to know the bidding platform
- the bidders should be allowed to raise questions about the bidding process before the actual date
- it is necessary to organize a test auction with fictional prices
- for privacy policy reasons, no names of the bidders or other information should be published
- inverse auctions facilitate transparent price negotiations
- in most cases bidders participated actively and Federal Swiss Railway could profit from the inverse auction
- however, not every inverse auction must end by a lower procurement price