e-Procurement
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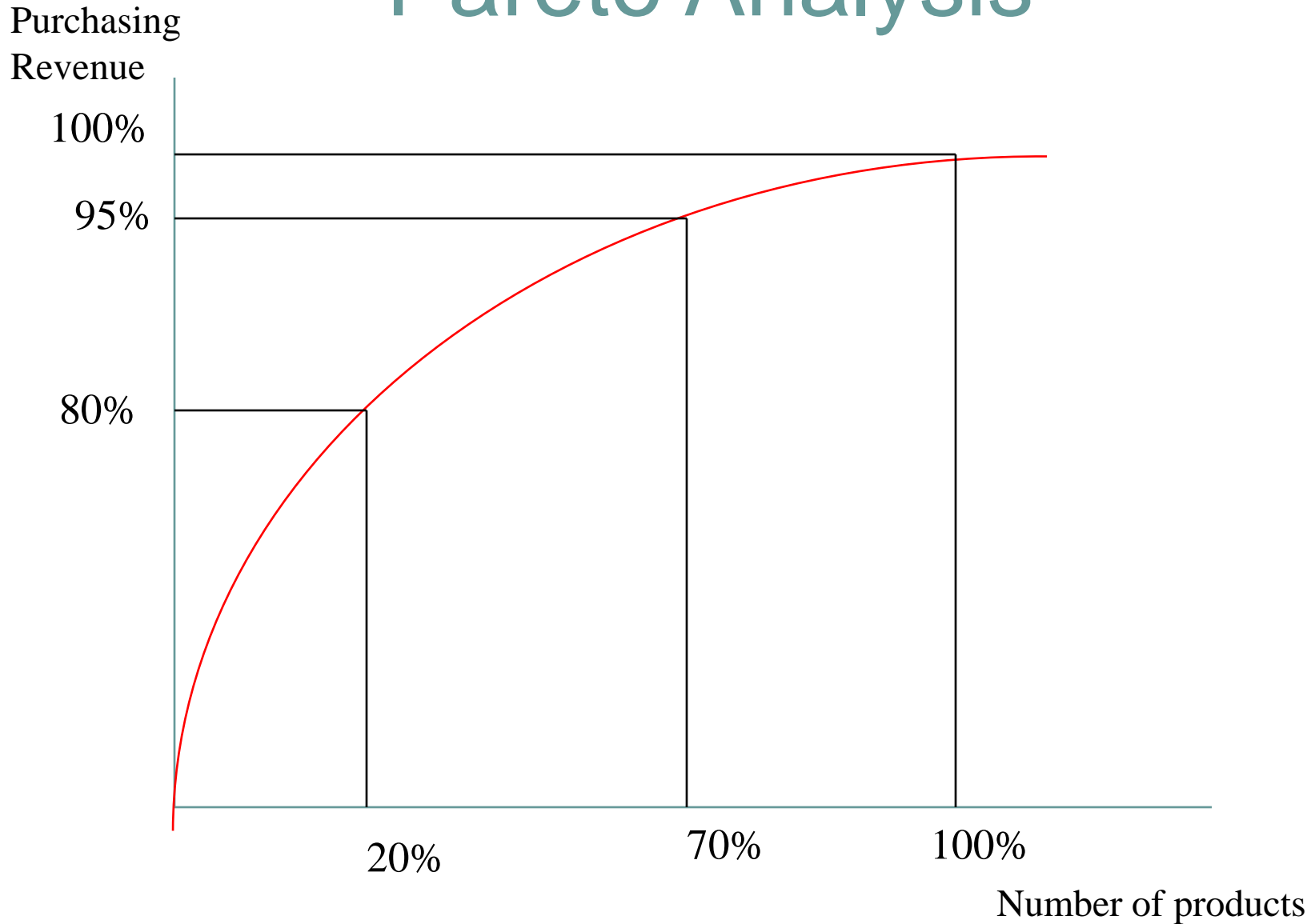 - Kraljic's framework
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purchasing

- external acquisition at optimum conditions of goods, materials (including machinery and tooling), and services that are needed for production, sales and maintenance

- requires optimization of not only the costs of the goods and services, but also of the organization involved

- average industrial company in US spends around 56% of its sales income on purchases from outside sources

- purchased products and services are the single largest expense at most organizations, accounting for $.5 - .55 of every dollar earned in revenue

- objectives of the purchasing function

  - acquiring materials and services of the right quality, in the right quantity, at the right time, at the right price, and from the right supplier

categories of goods purchased

- basic raw materials
- components
- semi-finished products
- capital goods (buildings, land, machinery, ...)
- MRO
- finished products (for direct sale)
- services (market research, consulting, ...)

Pareto Analysis

Purchasing Revenue

100%

95%

80%
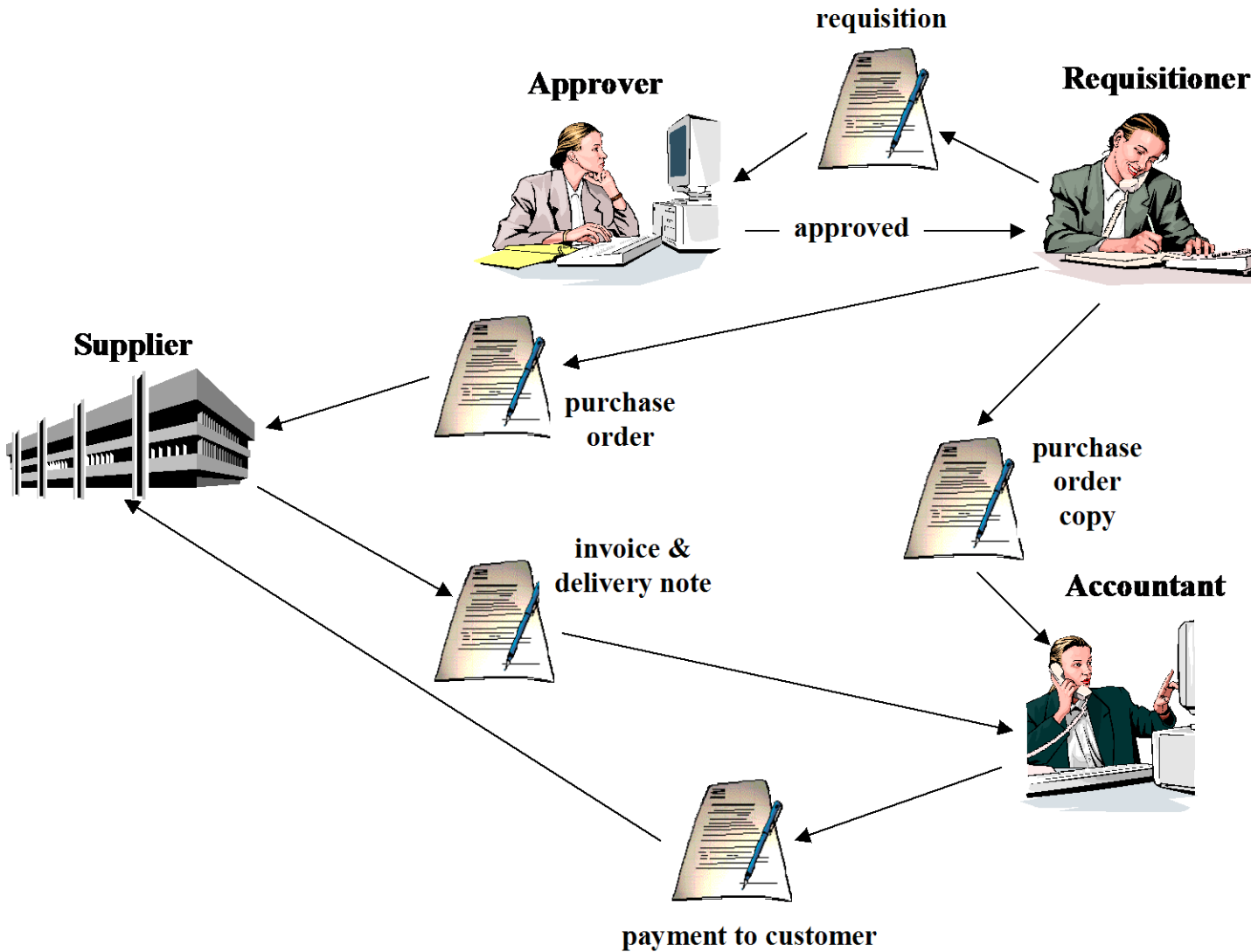
20% 70% 100%

Number of products

Pareto analysis

- class A articles
  - 20% of the articles that account for 80% of purchasing budget
- class B articles
  - 50% account for 15%
- class C articles
  - 30% account for 5%
  - the costs of the buying process are often higher than those of the goods and services purchased

Purchasing Processes

- Slow and Inefficient (C-type products)
- Communication Intensive
- Little IT support
- Candidate for BPR

requisition

Approver

Requisitioner

approved

Supplier

purchase
order

purchase
order
copy

invoice &
delivery note

Accountant

payment to customer

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modeling purchasing process

- organizational buying behavior: the decision making process by which formal organizations establish the need for purchased products and services, and identify, evaluate and choose among alternative brands and suppliers

- buygrid framework
  - internal perspective

- Kraljic's framework
  - external perspective

buy-grid purchasing process model

- organizational buying process
  - recognition of a need
  - determination of characteristics and quantity of the item needed
  - description of characteristics and quantity of the item needed
  - search and qualification of potential sources
  - acquisition and analysis of Proposals
  - evaluation of proposals and selection of suppliers
  - selection of an order routine
  - performance feedback and evaluation
- creeping commitment
  - at first a maximum of alternative products, qualities, and suppliers is available, but as you go further, conditions are increasingly fixed

reduced version of buy-grid model

- information
  - prospective buyers identify their needs and evaluate potential sources to fulfill them, gathering information about market conditions, products, and sellers
- negotiation
  - business partners start to interact, determining the prices and the availability of the goods and services, as well as delivery conditions; successful negotiations are finalized with a contract
- settlement
  - the terms of contract are carried out and the goods and services are transferred in exchange for money or other forms of compensation

buying situations

- based on 'newness' of the buying situation
  - New Task (NT)
    - company buys for the first time
  - Straight Rebuy (SR)
    - everything is fixed, except the quantities and delivery schedule
  - Modified Rebuy (MR)
    - all parameters are re-evaluated (e.g., alternative suppliers)
- typically, NT → SR→ MR

buygrid framework

- A: automation is easy
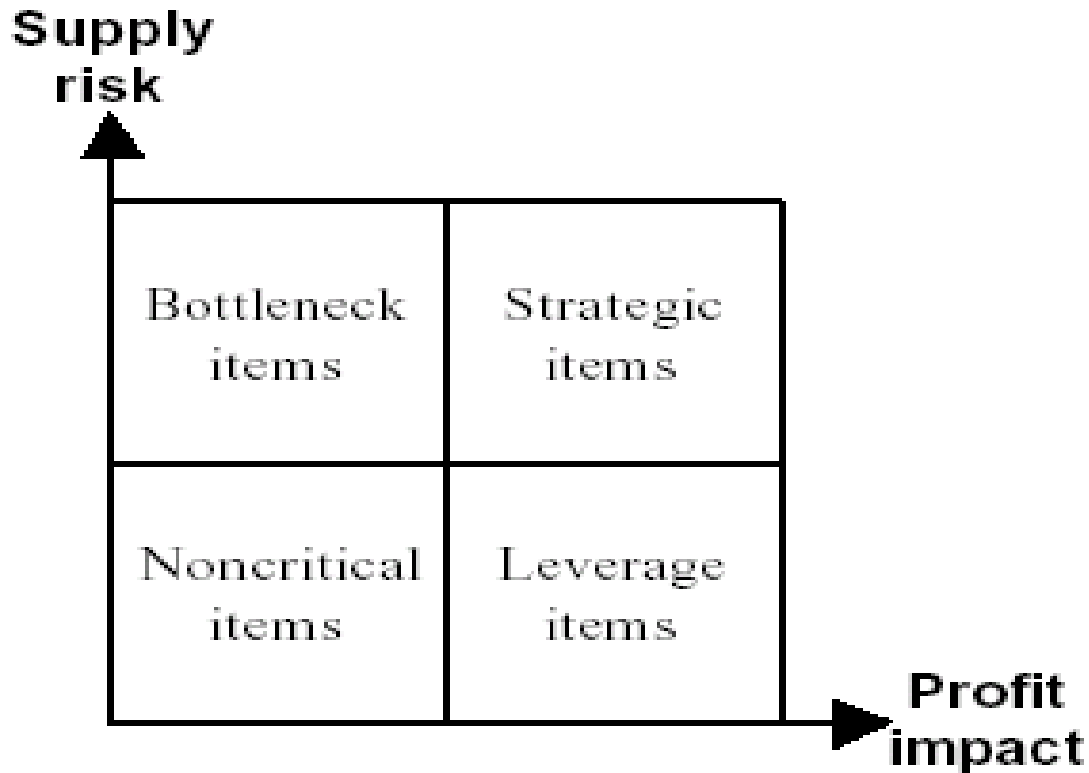- B: comples -> largest number of decision makers and buying influences is involved

	New Task	Modified Rebuy	Straight Rebuy
Anticipation of need			
Determ. of characteristics	B		
Desc. of characteristics			
Search for sources			A
acquisition of proposals			
supplier selection			
order routine			
Feedback			

drawback of buy-grid model

- importance of the goods and services bought, and the potential consequences of the buying situation, are left undifferentiated

purchasing portfolio (Kraljic's framework)

- introduces 2 variables
  - profit impact of purchased items
  - buying risks
    - e.g., scarcity and entry barriers

Supply risk (vertical axis) / **Profit impact** (horizontal axis)

Bottleneck items	Strategic items
Noncritical items	Leverage items

distinctive purchasing approach to each category

- routine items (non-critical)
  - minimize the cost of acquisition by standardization, automation, and wherever practical, contracting out the purchasing process itself
- leverage items
  - maximize the commercial advantage
- bottleneck items
  - ensure supply continuity
- strategic items
  - require considerable time and effort w.r.t. quality assurance, supply continuity, and overall costs

purchasing as part of SCM

- buyer-supplier relations should be partnerships
  - become formidable entry barriers to competitors
  - more the processes between a supplier and its customer are linked, the higher will be their mutual dependence, hence the more difficult it is for competitors to gain a foothold
- collaborative planning: the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole

developments in purchasing

- purchasing's impact on profitability
  - major area for (potential) cost savings
  - major impact on quality
  - impact on technology development and improvement of product/process design of a company
- as a result, buyers are increasingly active in strategic areas such as
  - supplier development and improvement
  - early supplier involvement
  - cross-functional teams
  - full-service suppliers
  - total cost supplier selection
  - integrated IS providing links with suppliers

IT and purchasing

- CD-Rom for product and supplier info.
- EDI for contracting and ordering
- Electronic Catalogue in centralized database
- Internet Technology

procurement

- direct
  - deals with items that are required for the direct production
  - well planned and predictable
- indirect
  - deals with items that support the production
  - happens ad hoc basis, less predictable
- cost to process each is roughtly the same

e-Procurement

- definitions
  - the use of Internet technologies over Intranets, Extranets or the web to streamline the procurement process
  - Electronic procurement automates, streamlines and customizes a company's operating resource purchasing process
- characteristics
  - includes inbound logistics such as transportation, goods-in, and warehousing
  - services include consolidation, control, and automation of purchasing process
  - allows buyers to access supplier information, including catalogs, generate requisitions, obtain approvals, send POs to suppliers, receive invoices, and process payment

types of e-procurement schemes

- online catalogs
  - management-selected purchasing catalogs that enable various departments in the purchasing company to buy items directly out of this catalog
  - reduce the purchasing cost
- auctions
  - enable buyers to efficiently disburse excess assets and inventories
- reverse auctions
  - let organizations set a price they are willing to pay for goods or services, which suppliers then can bid to fulfill

advantages of e-procurement

- reduced cost
  - aggregated, cross-enterprise sepnding -> high-volume purchasing
- improved process efficiency
- increased control
- global reach
  - provides access to a global supplier base

tools for internet-based procurement

- tools
  - search engines: support information phase
  - e-catalogs: allow to browse, search and place orders
  - internet EDI: less costly than VAN EDI
  - online auctions and bidding systems: support negotiating phase
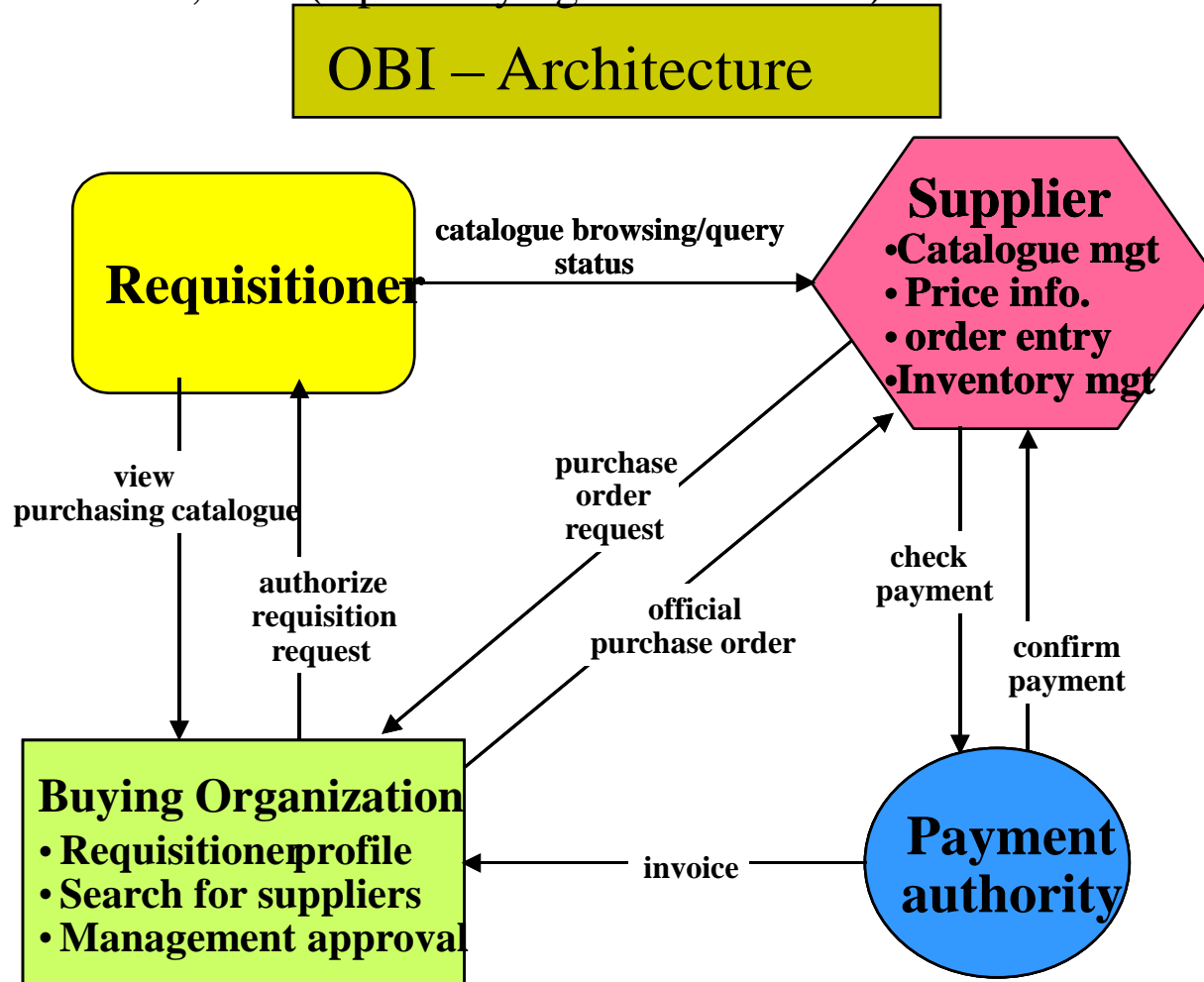- MRO Procurement: the most successful developments

e-procurement architecture models

- all takes hub and spokes approach
- buyer-centric
  - buyer: hub, suppliers: spokes
  - buying org. implements software to support its procurement processes, obtains catalog data from its contracted suppliers, and aggregates the catalog data into a single internal catalog
  - offers tight control over software, catalog, data, and process and easier integration
- seller-centric
  - supplier: hub, buyers: spokes
  - buyers browse the supplier's catalog and place orders
  - buyers need to know where to find the sellers
  - only one supplier's catalog can be accessed at a time
  - integration with buyer's IS is difficult to achieve
- e-Marketplace
  - a third party: hub, buyers and sellers: spokes
  - least expensive initial costs from the perspectives of buyers and sellers
  - most expensive ongoing costs (subscriptions, transactions, ...) to buyers and sellers

open trading environment

- allows buyers and sellers to establish systems that meet their requirements without imposing them on their trading partners
- require a commitment to open standards on the part of buyers, suppliers, and e-marketplace providers: XML/EDI, OBI (Open Buying on the Internet)

OBI – Architecture

Diagram: **Requisitioner** (yellow box) connects to **Supplier** (pink hexagon, listing •Catalogue mgt • Price info. • order entry •Inventory mgt) via "catalogue browsing/query status". Requisitioner links to **Buying Organization** (green box, listing • Requisitioner profile • Search for suppliers • Management approval) via "view purchasing catalogue" and "authorize requisition request". Buying Organization links to Supplier via "purchase order request" and "official purchase order". Supplier connects to **Payment authority** (blue circle) via "check payment" and "confirm payment". Payment authority sends "invoice" to Buying Organization.
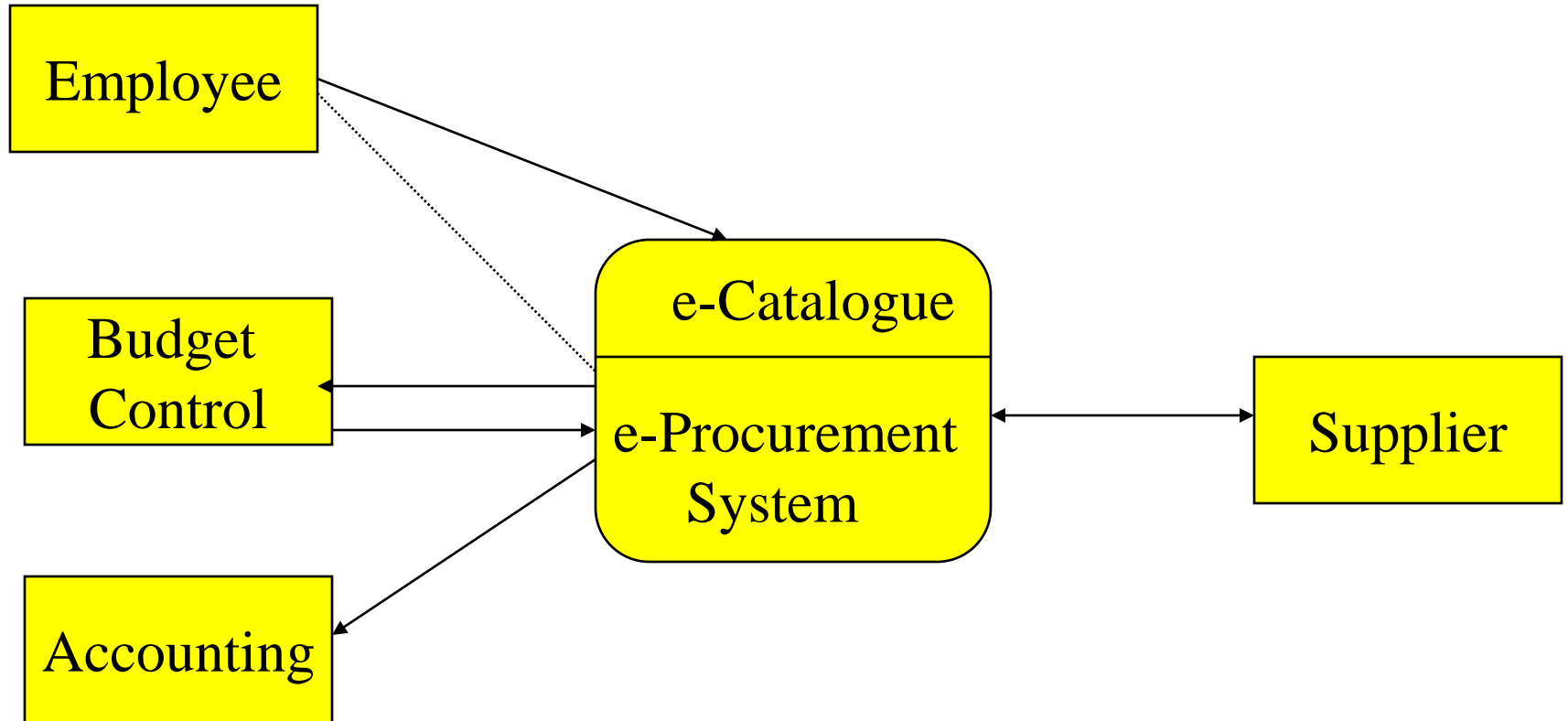
components of e-procurement systems

- content management
  - heart of e-procurement System
  - data administration: must be up-to-date
- requisition management
  - end user processes order
  - selection in e-catalogue
  - workflow support (e.g. authorization)
- transaction management
  - processing order to supplier through EDI, e-mail, etc.
  - standards: XML/EDI, Open Buying on the Internet (OBI)
- connectivity management
  - integration with supplier and internal systems – internal (ERP):
    - budget control
    - order registration
    - accounting
    - payment

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e-catalogs

- electronic representations of information about products and services of an organization

- advantages:

  - greater flexibility, personalize content, standard interface, reduce cost of coordination, easier data search, gathering and analysis

- disadvantages:

  - cost of system integration, distributed order and delivery volumes by individual employees

internal ordering process

types of e-Catalogs

- (peer to peer through) **supplier managed** catalogs
- (peer to peer through) **buyer managed** catalogs
- (intermediated through) **electronic marketplace managed** catalogs
  - public model: single aggregated
  - personalized model: additional personal info
- emergence of the catalog management intermediary

catalog aggregation

- one-to-many, buyer-focused model

- suppliers and distributors create e-catalogs once, disseminate them inexpensively through their distribution channels, and update them automatically when the need occurs

- Ariba, Commerce One, Requisite Technology, TCN, and Aspect Development sell technologies that help companies **aggregate** catalogs from their suppliers and **add proprietary content**

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auctions

- types: open, completely anonymous, closed, or in any combination between the two extremes

- duration of auctions is normally limited

- challenge: striking the balance between providing **enough information** to realize the highest price, but not so much as to give away **business secrets**

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benefits of e-procurement

- Reduced purchasing cycle time and cost
- Enhanced budgetary control (achieved through rules to limit spending and improved reporting facilities)
- Elimination of administrative errors (correcting errors is traditionally a major part of a buyer's workload)
- Increasing buyers' productivity (enabling them to concentrate on strategic purchasing issues)
- Lowering prices through product standardization and consolidation of buys
- Improving information management (better access to prices from alternative suppliers and summaries of spending)
- Improving the payment process (this does not often occur currently since payment is not always integrated into e-procurement systems).

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e-procurement solutions

- must integrate on the buyer's back-end with financial systems for invoice processing and accounts payable, including ERP systems to tie procurement in with the rest of an organization's BPs
- also provides integration with suppliers' existing back-office systems to help streamline the order processes and automate suppliers' activities
- Ariba (www.ariba.com):
  - Operating Resource Management (OMRS)
  - ORMX: provider based
  - Every employee can order from behind his PC
  - Only buying
- Commerce One (www.commerceone.com):
  - Marketsite (supplier)
  - Buysite (buyer)
  - Collaborate

Ariba Spend Management solutions

typeical abilities of modern e-procurement solutions

- performing catalog aggregation functions and managing content from multiple suppliers in disparate formats

- providing customized access to purchasing requirements

- maintaining role-based custom item catalogs that enable requesters to order from item categories that are relevant to their role in org

- matching validation between receipts, purchase orders, and invoices, and automatically generating debit memos

- providing requisition management and tracking

- providing budget checking and commitment control