

ECommerce: Concepts & Technologies

Lecture: Prof. Dr. Ralf Möller (r.f.moeller@tuhh.de, office hours, Fr. 2-4 pm)

Lab classes: Mubashir Aziz, Michael Wessel

TU Hamburg-Harburg, Software Systems Group

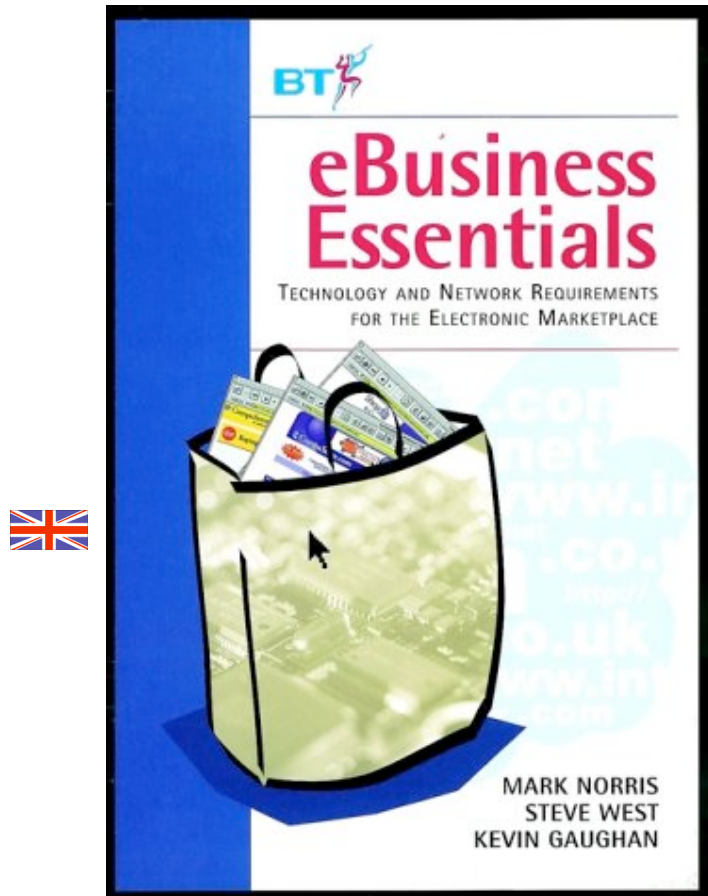
Lab classes: Location: HS 20 Room 214 / Time: Mon 10:30am – 11:30am

<http://www.sts.tu-harburg.de/teaching> > Ecommerce

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Prof. Dr. F. Matthes, Prof. Dr. J.W. Schmidt, P. Hupe

Web Support / Literature

<http://www.sts.tu-harburg.de/~r.f.moeller/lectures/ec-ws-04-05.html>



many, many more ...

References in brackets [...] (see web page or additional material for this lecture)

Learning Objectives

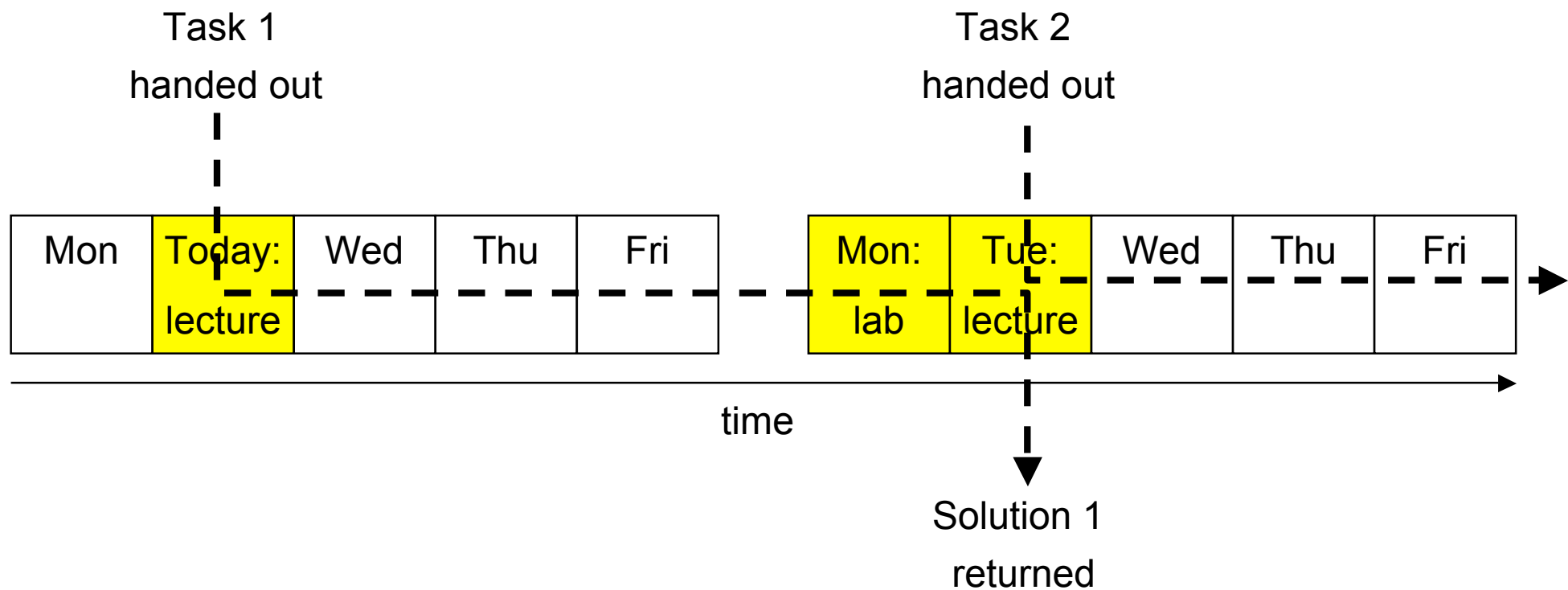
Students will be able to

- ❑ understand and evaluate fundamental and advanced Internet and software technologies relevant for EC,
- ❑ describe, identify and classify EC applications and systems,
- ❑ classify and identify existing and emerging EC business models.

The lab classes strengthen the understanding of these concepts through hands-on experience with selected EC technologies and commercially relevant systems.

Rules of the Game

- ❑ Written exam at the end of the semester ❑ 2 credits (IMT)
- ❑ Exercises ❑ 1 credit (IMT).
- ❑ Regular attendance & successful solution of the tasks in time (one week).



1. Introduction and Overview

1.1 Introduction

1.1.1 ECommerce: Definition

1.1.2 Commercial Opportunities on the Internet

1.1.3 Basic ECommerce Models

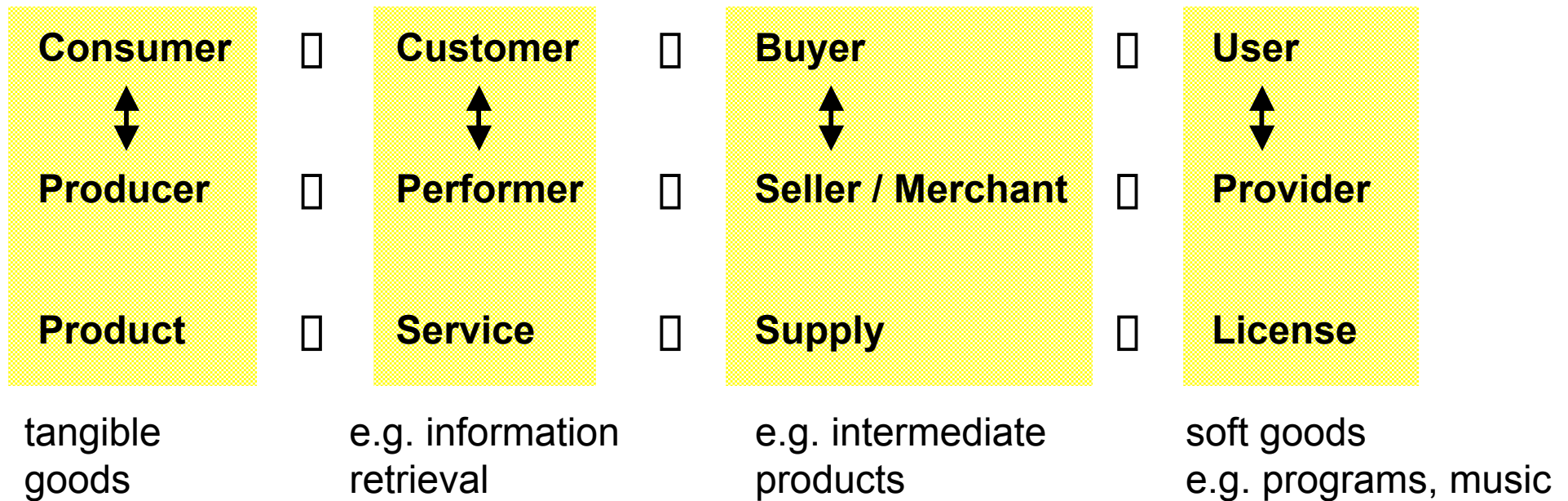
1.2 Outline and Overview over the Lecture

What is ECommerce?

Definition

Electronic Commerce is the sale and procurement of supplies and services using information systems technology [NoWeGa00].

Related concepts and terminology of different perspectives:



Development of ECommerce

The „3 waves of ECommerce“ [Keenan]:

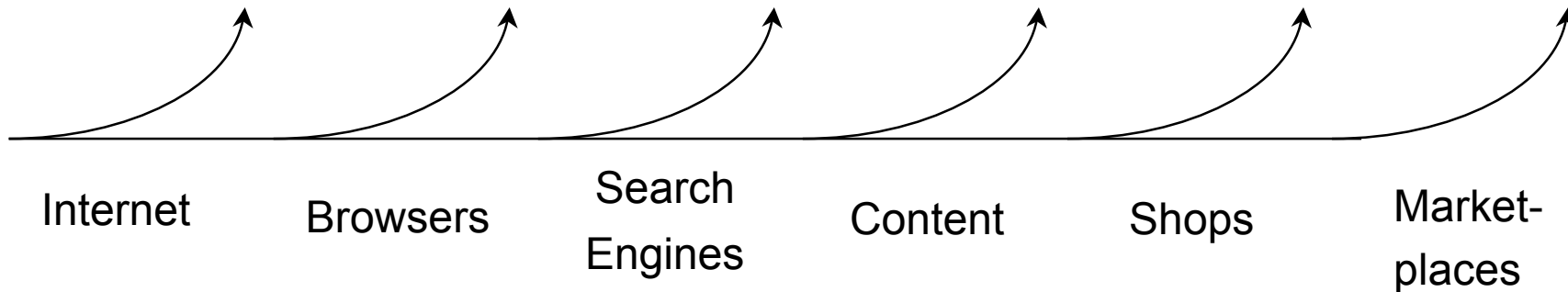
- Put marketing information on the web
- Allow online order taking
- Construct electronic exchanges

Differentiation:

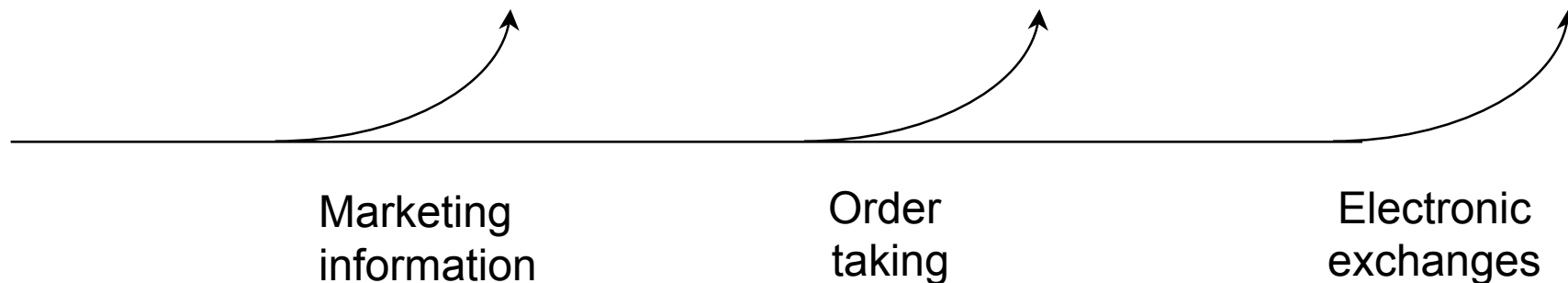
- Evolution of ECommerce at large
- Evolution of ECommerce in a particular company

EC at large vs. EC in a company

Development of **ECommerce at large**: Steps of ECommerce development



Development of **ECommerce in a particular company**: What part of a company is involved in ECommerce?



Electronic Business: Terminology (1)

Overview of electronic business terminology:

e-business:

- Generic term for all internal and external business processes of a company. Coined by IBM in 1999.
- Structured into e-commerce, e-cooperation and e-information.

e-commerce:

- Electronic marketing and trading of goods and services over the Internet.
- Within e-business, e-commerce is the driving force.

e-cooperation:

- Business models that support the cooperation of business partners, e.g. virtual enterprises, supply chain management (SCM) and customer relationship management (CRM).

e-information:

- Mainly addresses the procurement and delivery of information (e.g. digital libraries and web portals).

Electronic Business: Terminology (2)

Electronic business terminology continued:

e-procurement:

- Electronic purchase of raw materials, semifinished goods and components (normally in large quantities).
- Requires an integration of company's ERP system with suppliers' ERP systems.
- Part of e-cooperation.

e-government:

- Provision of governmental and official processes over the Internet for residents, usually administrative processes, e.g. tax return, change of address.
- Exchange of electronic data between different authorities for the acceleration of official processes.

The lecture will focus on e-commerce aspects, and will also give insight into e-cooperation and e-information topics.

Commercial Opportunities on the Internet ⁽¹⁾

Effects of the Internet On Commerce [Rappa02]:

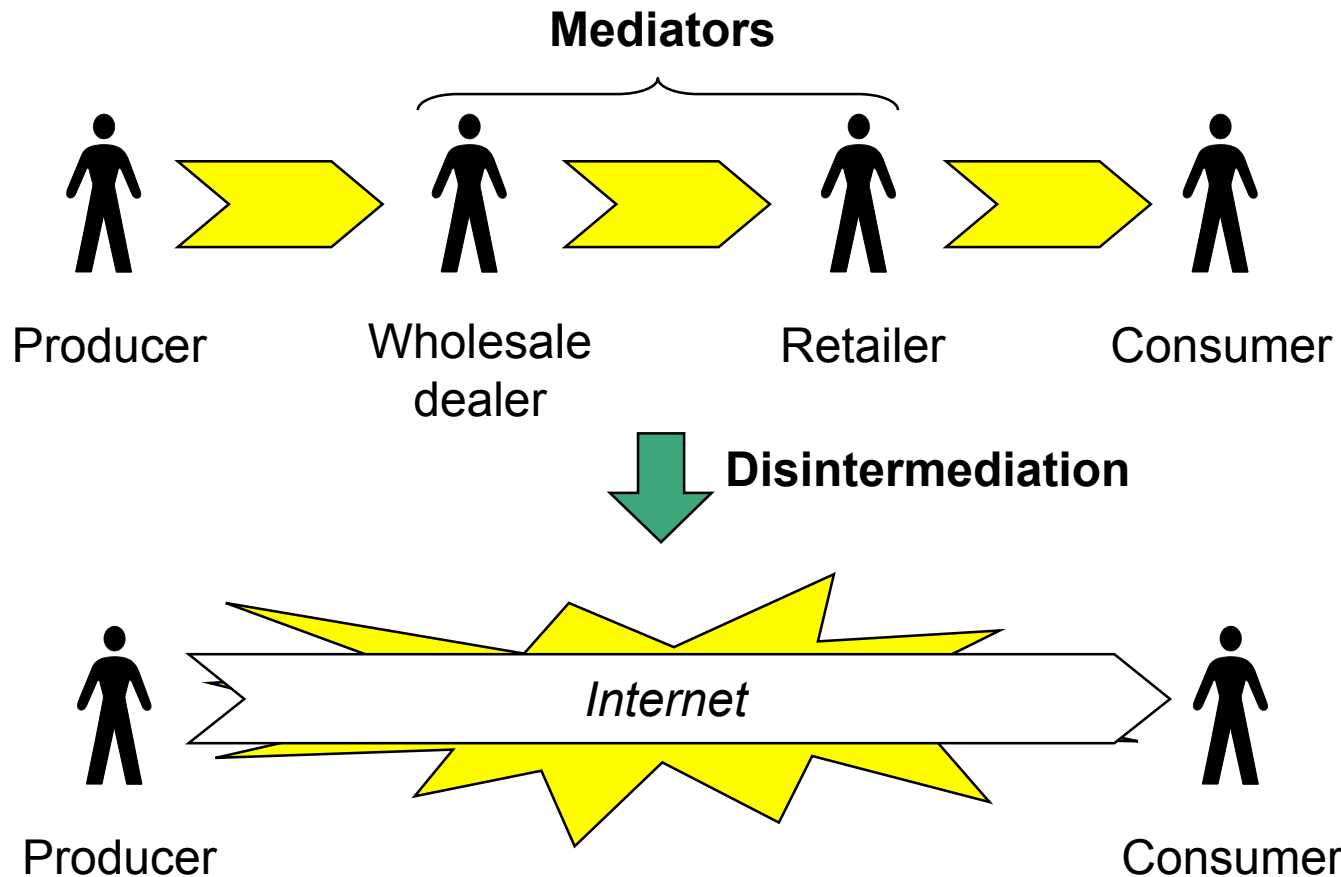
- ❑ Disintermediation / Reintermediation
- ❑ Frictionless Commerce
- ❑ Dynamic Pricing
- ❑ Personalized Marketing

Disintermediation

Definition

Shortening the value chain, especially concerning soft-goods (music, software, ...) [Merz99]. Lowers customer prices: Get products *cheaper*.

- Reduces costs for producers and customers.

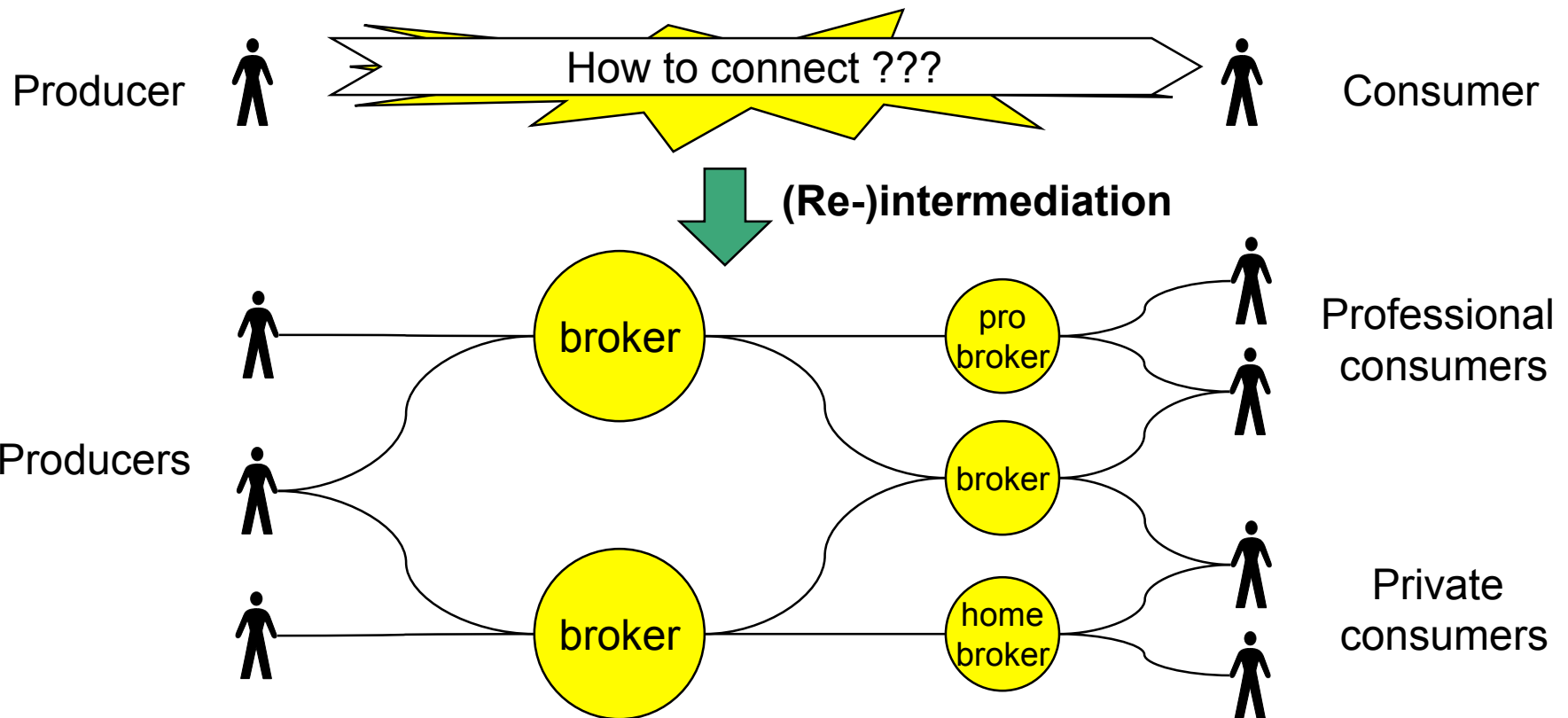


Reintermediation

Definition

Adding trading partners (brokers) to a value chain as filters / selectors. Brokers select products / producers: Find *better / more suitable* products.

- Increases quality of service.



Examples: Photograph brokers (CORBIS, Gettyone)

Commercial Opportunities on the Internet ⁽²⁾

ECommerce is viewed as a possibility for enabling **Frictionless Commerce** [Rappa02].

Causes for *friction* in traditional commerce are *costs*:

- ❑ Costs of finding partners
- ❑ Costs of gathering information
- ❑ Costs of establishing trust

In a frictionless economy everyone has perfect information at any time (e.g. about all potential trading partners, products, offers, etc).

NOTE: This is a claim of economical *theory*!

Dynamic Pricing

- ❑ Prices adjust to exactly balance supply & demand (can be realized in e.g. auctions, see chapter 2)

[Rappa02]

Commercial Opportunities on the Internet ⁽³⁾

Personalized Marketing (1:1 Marketing)

- ❑ Any seller's offers, ads, incentives are customized and personalized to each customer
 - single seller – single buyer relationship.

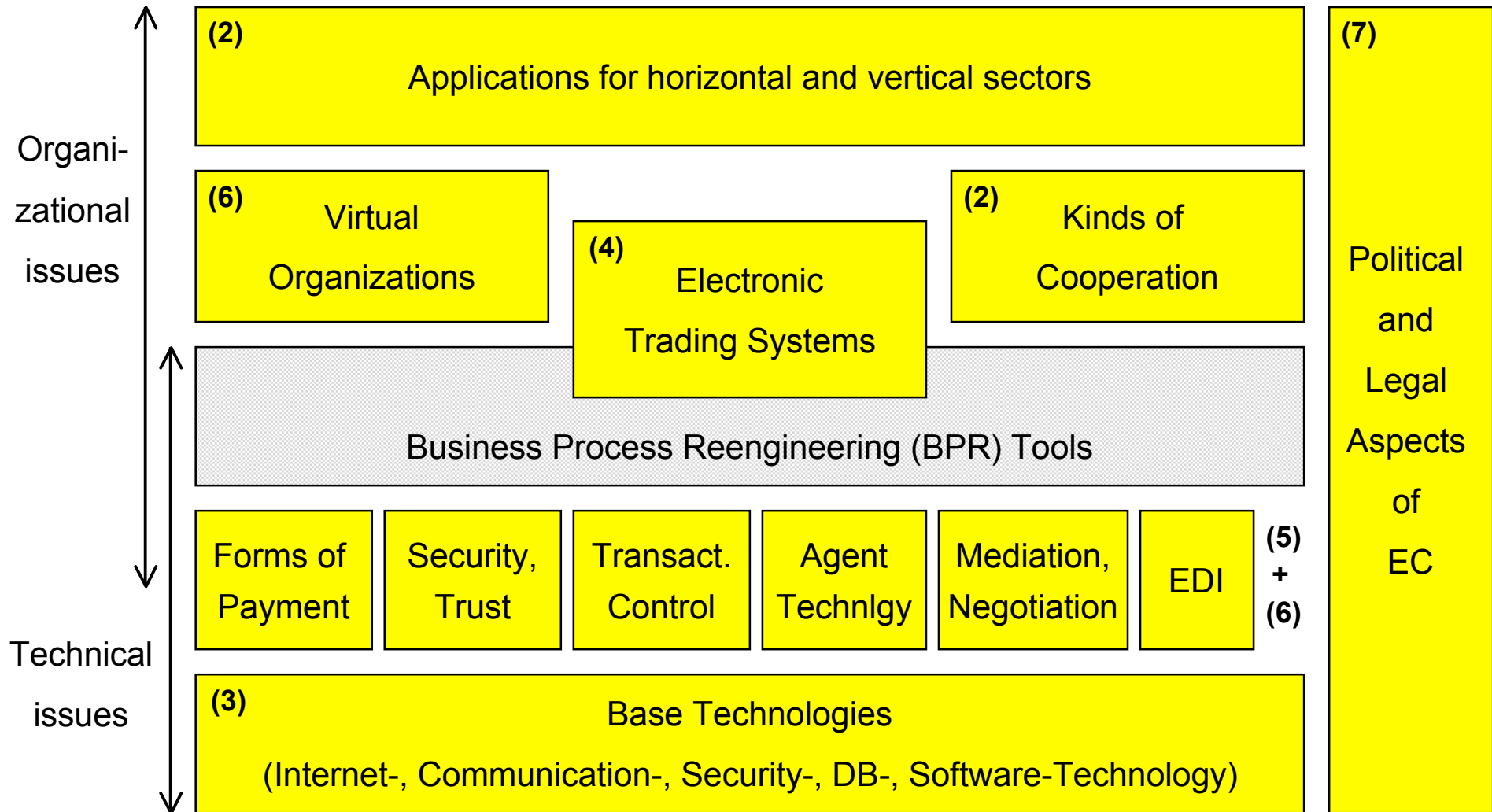
Seller is supported by Customer-Relationship-Management Software (CRM), see chapter 5.

Virtual Communities

(Global / local) communities of people who share an interest or get together to act as a single economical player.

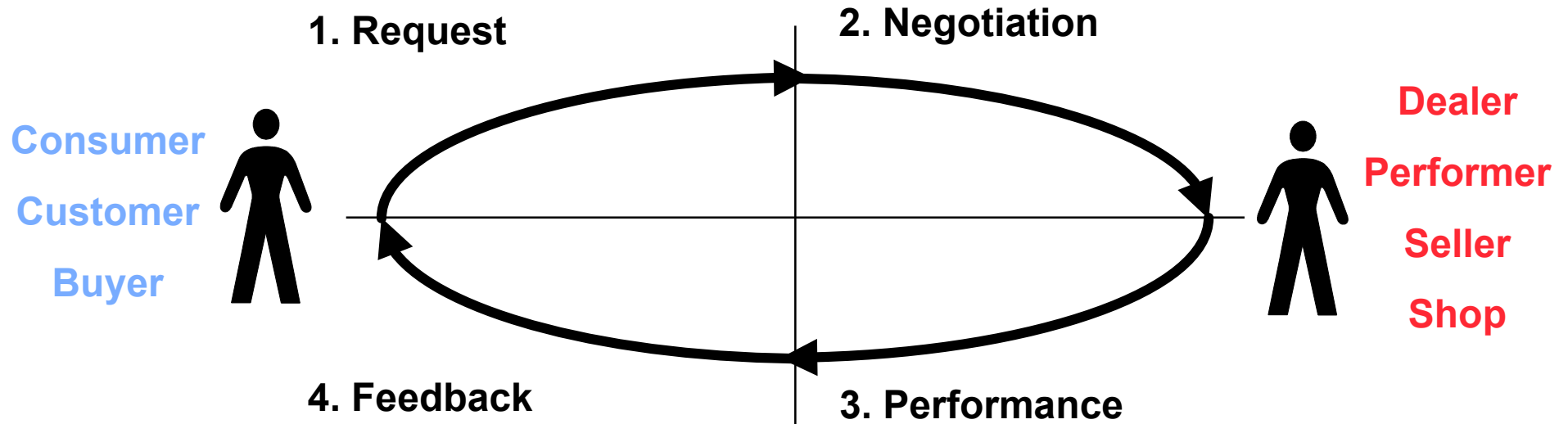
- ❑ Communities of Interest
- ❑ Buyer Communities (get reduced prices by ordering large quantities of products)

ECommerce Reference Model



[MeTuLa99]

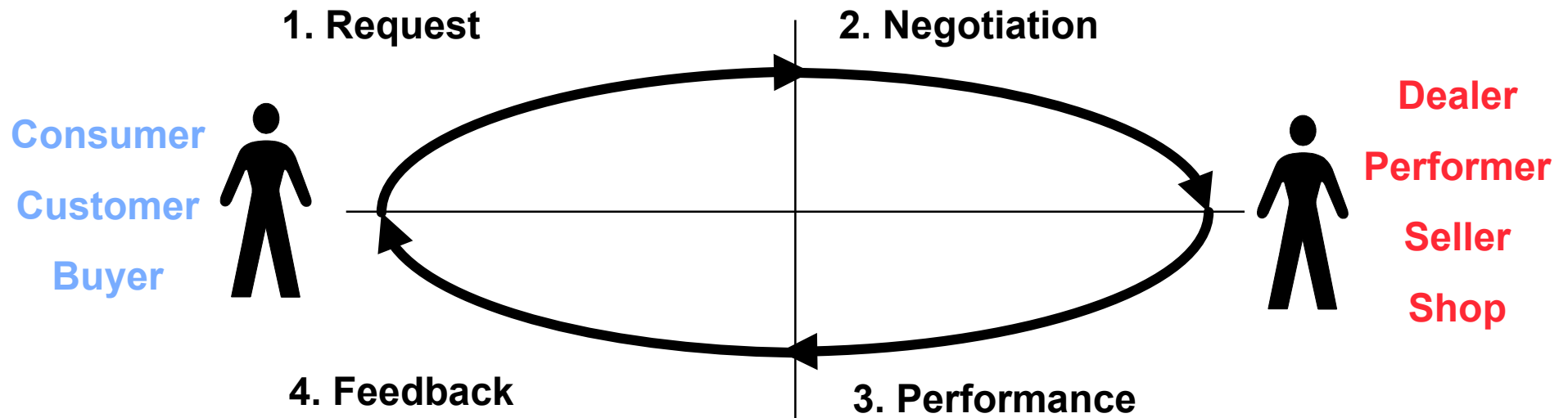
ECommerce Transactions 4-Phase Model



1st phase: Customer finds a business partner

2nd phase: Customer and performer negotiate and finally commit transaction details (products, quantity, quality); commit might include payment

ECommerce Transactions 4-Phase Model

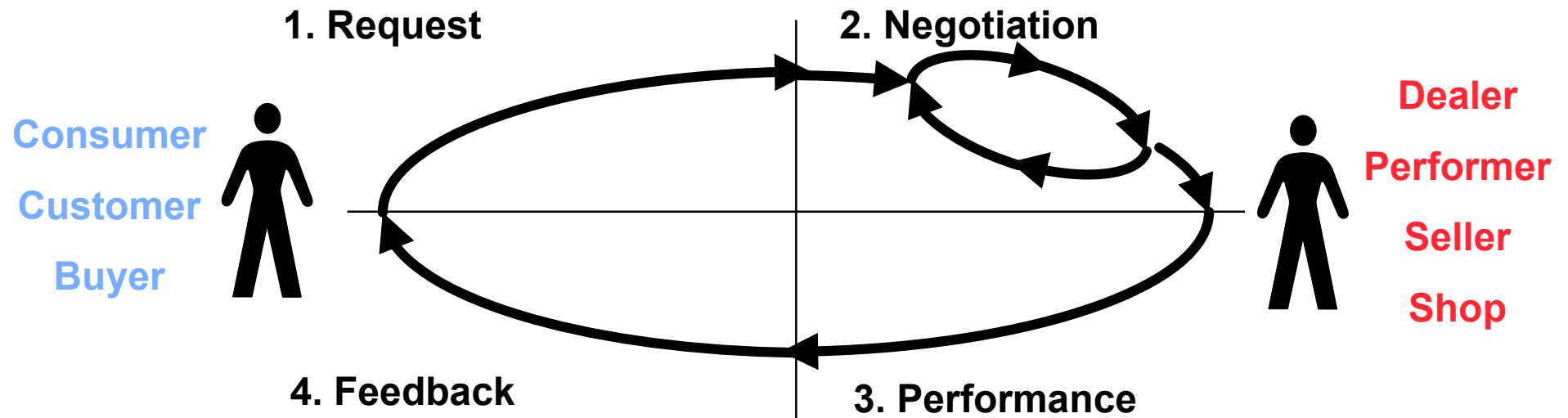


3rd phase: Performer carries out the service / manufactures and delivers the goods

4th phase: Customer gives feedback; pays for the service / for the goods
Feedback is important for long-term positive customer relationship

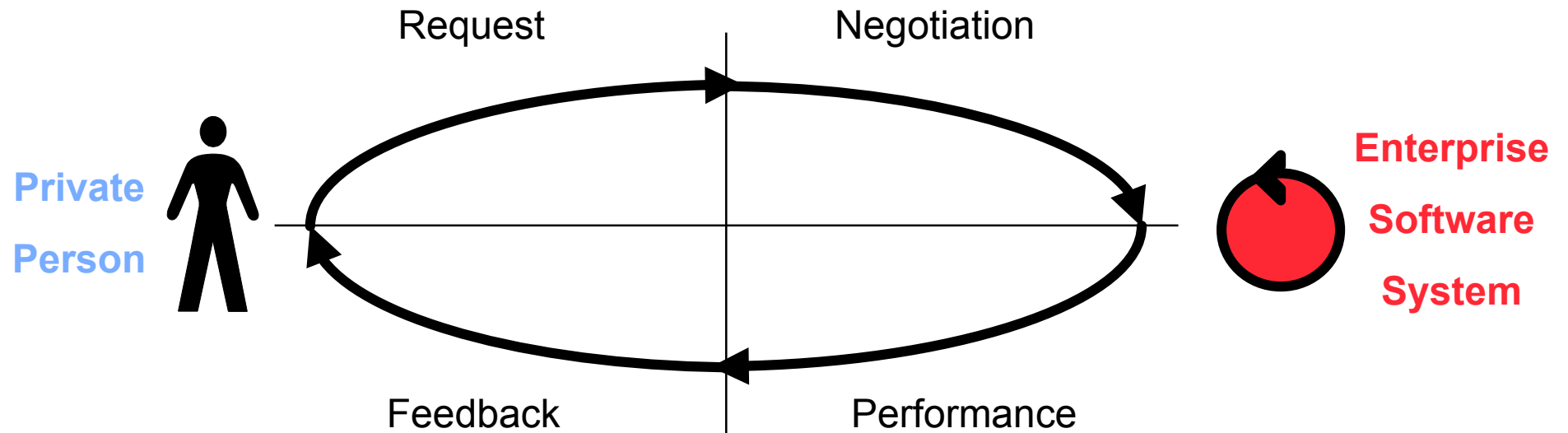
Payment: Depending on the business model, payment might be moved to end of 2nd phase (pay before performance) or to the end of 4th phase (pay after delivery)

ECommerce Transactions 4-Phase Model



Structure: An electronic transaction phase itself might be composed of subordinated electronic transactions.

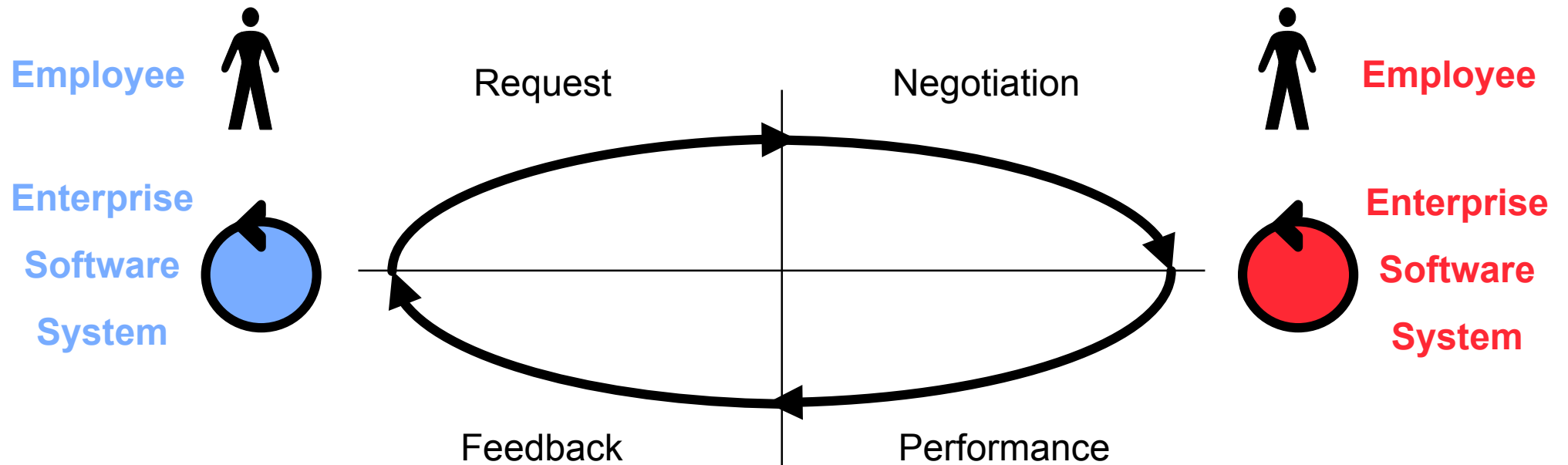
Business to Customer (B2C)



Examples:

- Online – Shops (Amazon, BOL, etc.)
- Local services (e.g. traffic information service)
- News, publication services

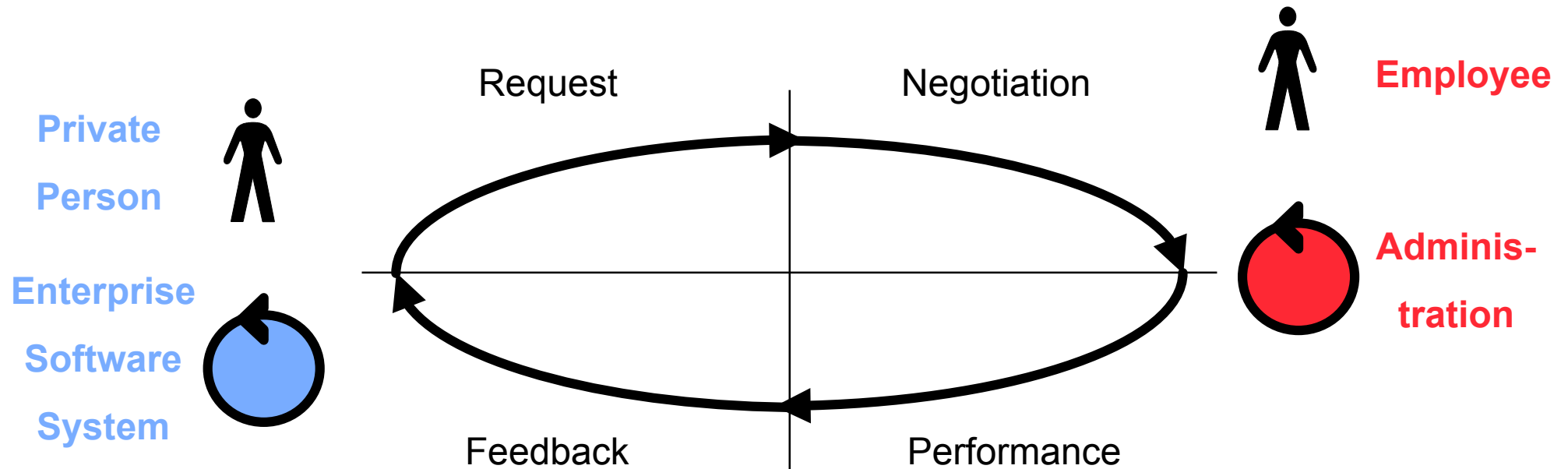
Business to Business (B2B)



Examples:

- Supply chain
- Electronic procurement
- Vertical industry tendering and bidding systems (e.g. in the maritime industry)

Business / Customer to Administration (B2A / C2A)



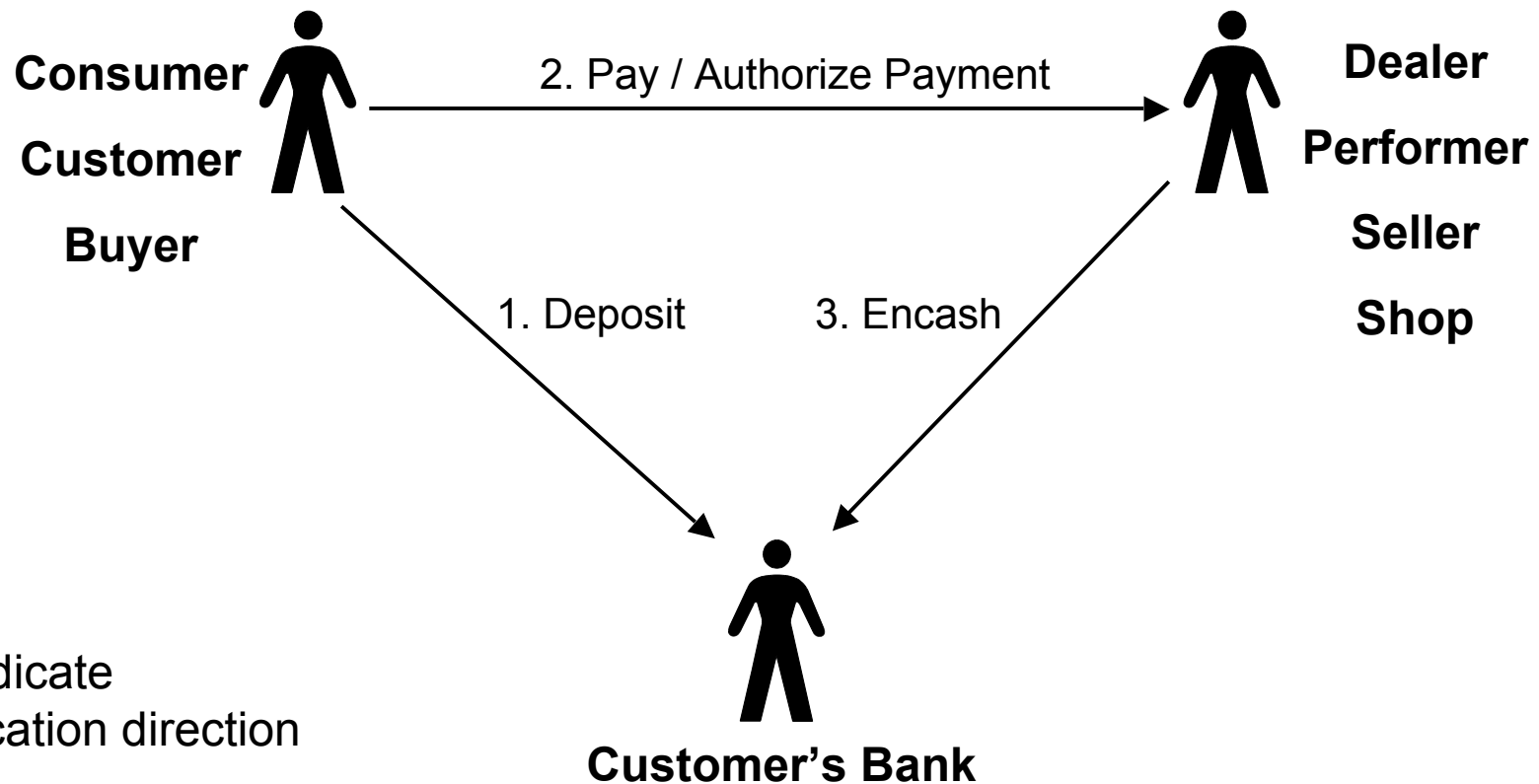
Examples:

- Paying taxes & fees
- Change of address
- Licenses

Electronic Payment

Payment: Typical clearing and settlement process between a customer, performer and the customer's bank.

Naive view:



Arrows indicate communication direction

Lecture Outline and Overview

1. Introduction and Overview

- ❑ ECommerce: Definition, buzzwords, expected benefits, ...

2. EC from a Business Perspective

- ❑ A Taxonomy of EC Business Models

3. Web- and Software Technologies for Enabling of EC

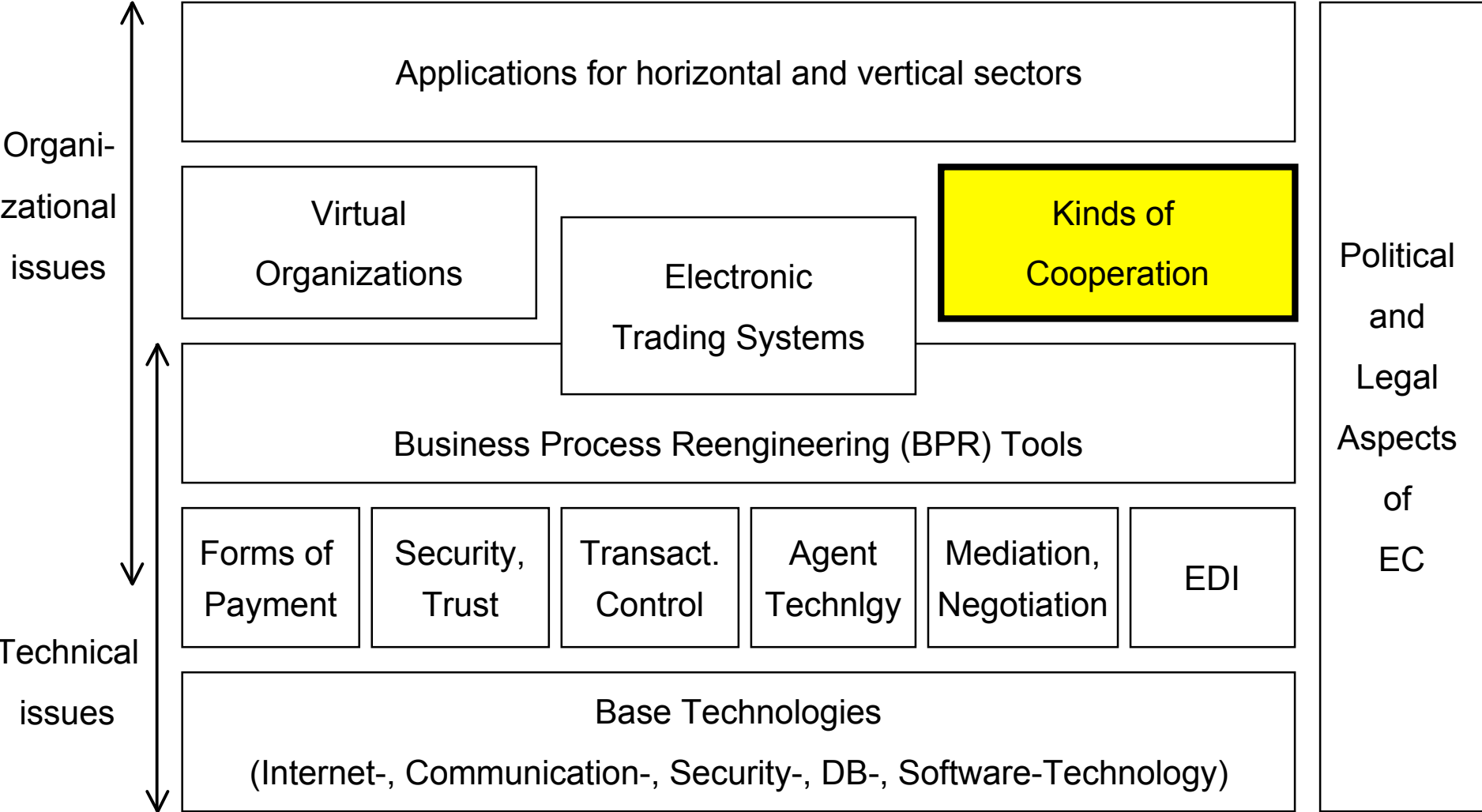
4. Selected Products, Frameworks, and Systems for Business to Consumer Transactions

5. Concepts and Technologies for Business-to-Consumer Transactions

6. Concepts and Technologies for Business-to-Business Transactions

7. Legal Aspects of ECommerce

2. EC from a Business Perspective



[MeTuLa99]

Further Reading / Acknowledgments

Most of the following is taken as is from the ecommerce lecture of Michael Rappa [Rappa02a].

Michael Rappa, Business Models on the Web:
<http://digitalenterprise.org/models/models.html>

Business Models

Current business models are:

- Advertising Model
- Affiliate Model
- Broker / Brokerage Model
- Community Model
- Infomediary Model
- Manufacturer Model
- Merchant Model
- Subscription Model
- Utility Model

Some of these business models are still successful, whereas other have not proven to be accepted by Internet customers.

Business Models: Advertising Model

Extension of the traditional media broadcasting model

The broadcaster, in this case, a web site, provides content (usually, but not necessarily, for free) and services (like e-mail, chat, forums) mixed with advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model only works when the volume of viewer traffic is large or highly specialized.

Specializations:

- ❑ Portals:
 - Generalized Portal
 - Personalized Portal
 - Specialized Portal
- ❑ Classifieds
- ❑ Query-based Paid Placement
- ❑ Contextual Advertising
- ❑ Bargain Discounter

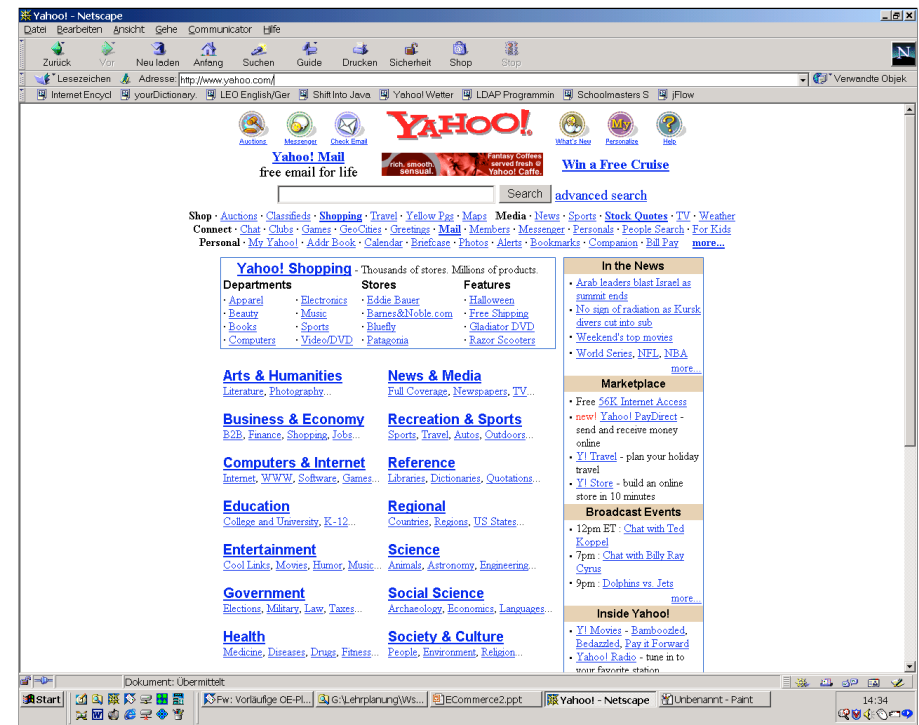
Advertising Model: Generalized Portal

High-volume traffic, typically tens of millions of visits per month, driven by generic or diversified content or services. Competition for volume has led to the packaging of free content and services, such as e-mail, stock portfolio, message boards, chat, news, and local information.

Examples:

Search engines and Web catalogs like *Excite* (www.excite.com), *AltaVista* (www.altavista.com), *Yahoo!* (www.yahoo.com).

Content driven sites like *AOL* (www.aol.com). The high volume makes advertising profitable and permits further diversification of site services.



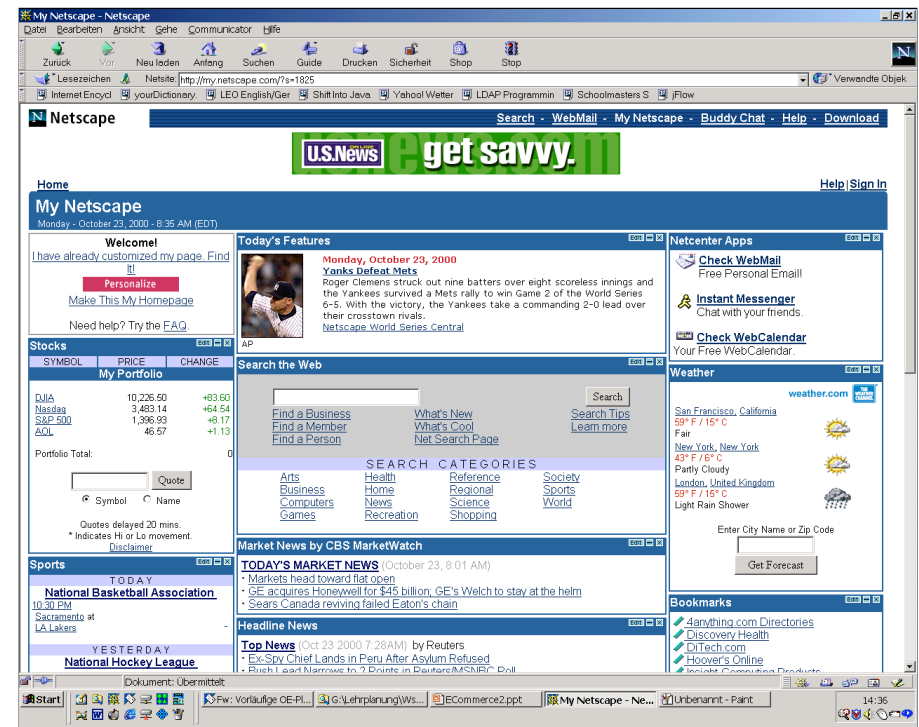
www.yahoo.com

Advertising Model: Personalized Portal

The generic nature of a generalized portal undermines *user loyalty*. This has led to the creation of *personalized portals* that allow *customization* of the interface and content. This increases loyalty through the user's own time investment in personalizing the site. The profitability of this portal is based on *volume* and possibly the value of information derived from user choices. Personalization can support a "specialized portal" model.

Examples: *My Yahoo!*

(my.yahoo.com), *My.Netscape*
(my.netscape.com).



my.netscape.com

Advertising Model: Specialized Portal

Also called a "vortal" (i.e., vertical portal). Here volume is less important than a *well-defined user base* (perhaps 0.5 - 5 million visits per month). For example, a site that attracts only young women, or home buyers, or new parents, can be highly sought after as a venue for certain advertisers who are willing to pay a premium to reach that particular audience.

Example: *iVillage.com*
(www.ivillage.com).

The screenshot shows the iVillage website interface. At the top, there's a search bar and navigation links for message boards, chats, magazines, shop, quizzes, and free stuff. The main content area is divided into several sections:

- HELLO, new member!** (join now! it's free) with links for my email, my horoscope, my recipes, my newsletters, and my website.
- WILLAGERS' TOP 10** list: 1. Breast Exam Debate, 2. Pregnancy Calendar, 3. Dr. Perricone's Advice, 4. Daily Crossword, 5. Name Finder, 6. IQ Test, 7. Relationship Tester, 8. Hairstyle Finder, 9. \$100 from Amazon, 10. Live at iVillage.
- MILLAGE SOLUTIONS** (NEW) Vitamins for Women: 1. Everyday Essentials, 2. PMS Peacemaker, 3. Energy Up, 4. Seriously C, 5. Restful Sleep.
- MAGAZINE SITES**: Cosmopolitan, Country Living, Good Housekeeping, Redbook, House Beautiful, Marie Claire, Prevention, Town & Country.
- Specialized Content:** babies (names, crying, teething), beauty (hair, skin, makeup), diet & fitness (weight loss, yoga, abs), entertainment (games, jokes, books), food (recipes, chicken, quick), color compatibility (Is it meant to be? Click on the color you MOST prefer to look at: YELLOW, BLUE, RED), great gifts (For him, her and baby: Under \$25, \$25 - \$50, \$50 - \$100, Over \$100), pregnancy (fertility, labor, loss), home & garden (decorate, organize), horoscopes (love, celebs, charts), money (debt, budget, divorce), parenting (potty, sleep, behavior), pets (dogs, cats, breeds), quizzes (iq test, love match), relationships (sex, dating, cheating), work (jobs, home biz, salary), carb counter (Find out how many carbs are in: Breads & Pasta, Baked Goods, Fruits, Vegetables).
- Advertisements:** "What will you be for Halloween this year?" (20 costumes you can make for under \$10, 5 Halloween makeup tips, 12 costume personalities decoded), "WIN a ski trip for 2!", "find women like you In Your 30s", "Single? Looking for Love?", "\$5 OFF this month's Single's Love Forecast", "Road-tested beauty advice" (Real women choose their favorite hair products: Shine enhancers, Volumizing shampoos, Home hair coloring, Deep conditioners).

www.ivillage.com

Advertising Model: Classifieds

List items for sale or wanted for purchase. Listing fees are common, but there also may be a membership fee.

Examples:

Monster.com (www.monster.com) and *Match.com* (www.match.com).



www.monster.com

Advertising Model: Query-based Paid Placement

Sell favorable link positioning (i.e., sponsored links) or advertising keyed to particular search terms in a user query, such as Overture's trademark "pay-for-performance" model.

Example:

Google (www.google.com), Overture (www.overture.com).

The screenshot shows a Google search for "Business Models". The search bar contains "Business Models" and the search button is "Google-Suche". Below the search bar, there are navigation links for "Web", "Bilder", "Groups", and "Verzeichnis". The search results are displayed in a list format. The first result is a sponsored link from "www.mens-magazine.de" titled "Der Model-Contest 2002 - hier sind die Models!". The second result is a sponsored link from "www.ebay.de" titled "Models - Angebote zum Thema Models". Below these, there are several organic search results, including one from "ecommerce.ncsu.edu/business_models.html" and another from "digitalenterprise.org/models/models.html". A sidebar on the right contains a "Sponsoren-Links" section with a link to "Download a Paper Now" from "www.research-assistance.com".

www.google.de

Advertising Model: Registered Users

Content-based sites that are free to access but require users to register (other information may or may not be collected). Registration allows inter-session tracking of users' site usage patterns and thereby generates data of greater potential value in targeted advertising campaigns.

Example: *NYTimesDigital*
(www.nytimes.com).

SEE IT IN THE SAME FORMAT AS THE PHYSICAL NEWSPAPER

The New York Times

ON THE WEB

UPDATED TUESDAY, OCTOBER 16, 2002 11:58 AM ET | Personalize Your Weather

SEARCH [Go to Advanced Search/Archive](#)

SEARCH SPONSORED BY **Small Business center**

GO TO **MEMBER CENTER** | LOG OUT

Welcome, **wortrauf**

MARKETS

Dow Jones Industrials

DJIA	8,167.60	↑ 290.20	+3.68%
Nasdaq	1,272.71	↑ 52.18	+4.28%
S&P500	872.74	↑ 31.30	+3.72%
10yr Tres. Yield		↑ 3.96%	+0.14

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Stock Quotes: [Symbol](#) [Lookup](#)

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IN SCIENCE

On Scientific Fakery

Fraud cases this year at major labs have led to re-examinations of the scientific process.

- [Interactive Feature](#)

Police Tie Killing of Virginia Woman to 8 Others by Sniper

By FRANCIS X. CLINES with TERENCE NEILAN 11:46 AM ET

The fatal shooting of a woman on Monday night has been "conclusively" linked by ballistic evidence to a suburban sniper.

Indonesians Questioned in Search for Al Qaeda Clues

By REUTERS 9:40 AM ET

Investigators searching for links between the Bali bomb blasts and Al Qaeda were interrogating two Indonesians today.

- [Bush Ties Bali Bombing to Qaeda Network](#)
- [Seeking Names for Bali's Anonymous Dead](#)

ImClone's Ex-Chief Pleads Guilty in Insider Trading Case

By ANDREW POLLACK 11:12 AM ET

Samuel D. Waksal, the former chief executive of ImClone Systems, pleaded

Indonesians Questioned in Search for Al Qaeda Clues

Agence France-Presse

Five Japanese abducted by North Korea, including Yasushi Chimura, left, and Fulkie Hamamoto, set foot on home soil today for the first time in 24 years.

[Go to Article](#)

BUSINESS

Stocks Surge on a Busy Day of Earnings Reports

NATIONAL

11 Found Dead in a Rail Car in Rural Iowa

www.nytimes.com

Advertising Model: Contextual Advertising

Freeware developers which bundle ads with their product. For example, a browser extension that automates authentication and form fill-ins, also delivers advertising links or pop-ups as the user surfs the web. Contextual advertisers can sell targeted advertising based on an individual user's surfing behavior.

Example:

Gator (www.gator.com), *eZula* (www.ezula.com).



**"LESS TYPING, FASTER SHOPPING
MAKES CYBERSHOPPING A ONE-CLICK AFFAIR."**
—PC WORLD NEWS

The Gator Corporation

FREE DOWNLOAD **SEE PRODUCT DEMO**
CLICK HERE CLICK HERE

HOME **ADVERTISE WITH US** COMPANY INFO ABOUT GATOR SUPPORT CENTER CONTACT US

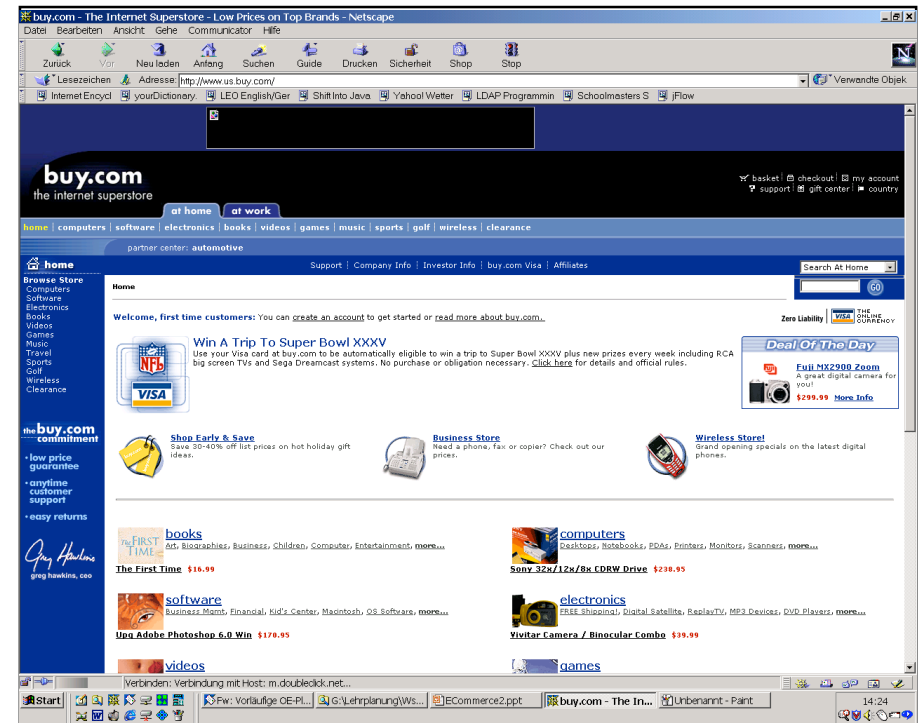
GATORSM eWALLET. THE SMART ONLINE COMPANION.

- ▶ Fills in FORMS with no typing!
- ▶ Remembers PASSWORDS automatically.
- ▶ Protects and encrypts your data on YOUR computer.
- ▶ The Gator eWallet comes bundled with [OfferCompanionSM](#) separate software- your direct link to some of the Web's most valuable offers.
- ▶ The Gator eWallet and OfferCompanion are ad-supported software. They are part of the Gator Advertising and Information Network ([GAIN](#)), which helps keep software free by delivering messages based on the sites you view.

www.gator.com

Advertising Model: Bargain Discounter

The most notable example is *Buy* (www.buy.com), which sells its goods typically at or below cost, and seeks to *make a profit largely through advertising*.



www.buy.com

Business Models: Affiliate Model

In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites. The affiliates provide purchase-point click-through to the merchant.

It is a pay-for-performance model -- if an affiliate does not generate sales, it represents no cost to the merchant. The affiliate model is inherently well-suited to the web, which explains its popularity. Variations include, banner exchange, pay-per-click, and revenue sharing programs. Potential problems loom ahead that may inhibit the diffusion of the affiliate model due to the granting of a broad patent to Amazon.com.



www.amazon.com

Business Models: Brokerage Model

Brokers are market-makers: they bring buyers and sellers together and facilitate transactions. Those can be business-to-business (B2B), business-to-consumer (B2C), or consumer-to-consumer (C2C) markets. A broker makes its money by charging a fee for each transaction it enables. Brokerage models can take a number of forms.

Specializations:

- Auction Broker, Reverse Auction (Demand Collection System)
- Marketplace Exchange
- Buyer Aggregator
- Search Agent
- Business Trading Community or Vertical Web Community
- Virtual Mall
- Buy/Sell Fulfillment
- Distributor
- Bounty Broker
- Transaction Broker