

Knowledge Technologies 2002, Seattle, 2002/03/11

Call centers powered by knowledge technologies

Dr. Jasmin Franz

Consultant

empolis  GmbH – Bertelsmann MOHN Media Group

jasmin.franz@empolis.com - <http://www.empolis.com>



Road Map

- Customer Support Challenges
- Content Management – Can't do without it
- Digital Infrastructures – FAQs & Co.
- Call centers *powered by* knowledge technologies
- What's the outcome? A case study
- What's next? The future



Customer Support Challenges

Focusing on customer support ...



Key facts - customer support

- 40-80% of all customers are dissatisfied with customer support
- 65% change contractor after unsatisfactory service
- Forrester:
 - Implementation of electronical self service reduces the costs up to 43%
- Gartner Group – costs per customer request with response by:
 - Call Center 5.01 US\$
 - eMail 2.00 US\$
 - Self service 0.04 US\$



Enterprise, customers, partners, channels

- Customers / partners retrieve information from different communication channels
 - Call Center, Mailing, Internet, Marketing, ...
- Customer wants to select channels by him/herself
- All types of communication with the customer should be consistent and have the same status
 - Sounds trivial, but **is** the real challenge (technical and organizational)
- Integration of traditional and modern communication media



Status Quo - customer service

- Complex products and services cause increased costs to customer service
- 80:20 rule applies
 - 80% of all requests apply to 20% of the potential problems
- Extraordinary potential, if 80% are handled by an intelligent self service system
 - plus: higher quality and faster responses to the remaining complex 20%



Acceptance of the electronic advisor

- The acceptance of the self service depends directly upon quality of service and attractiveness
- Service:
 - Better response time
 - Understand and define problems through specific questioning
 - Customer must have the feeling of being understood; must be able to communicate with the advisor in natural speech
- Attractiveness:
 - Fun and the social interaction (B2C)
 - The real advisor (= human) in the background
 - Feedback indicates how seriously the customer is taken



Who is actually the “customer”?

- “The customer should never know more than the employee”
- Requirements for advising customers are transferable to other user groups:
 - Partner companies
 - Internal employees
 - Call center employees
- The same information could fit employee’s knowledge requirements
- Synergy effects of self service are enormous, if used “internally”



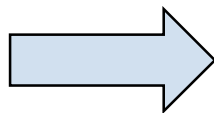
Content Management

Can't do without it ...



Top Priority: Information Consistency

- “Information consistency over all channels” necessitates central data storage
- Goal: accurate, complete and up-to-date information on every channel
- Professional management and distribution of content



Content Management System

The “Publishing House” within the organization: Method



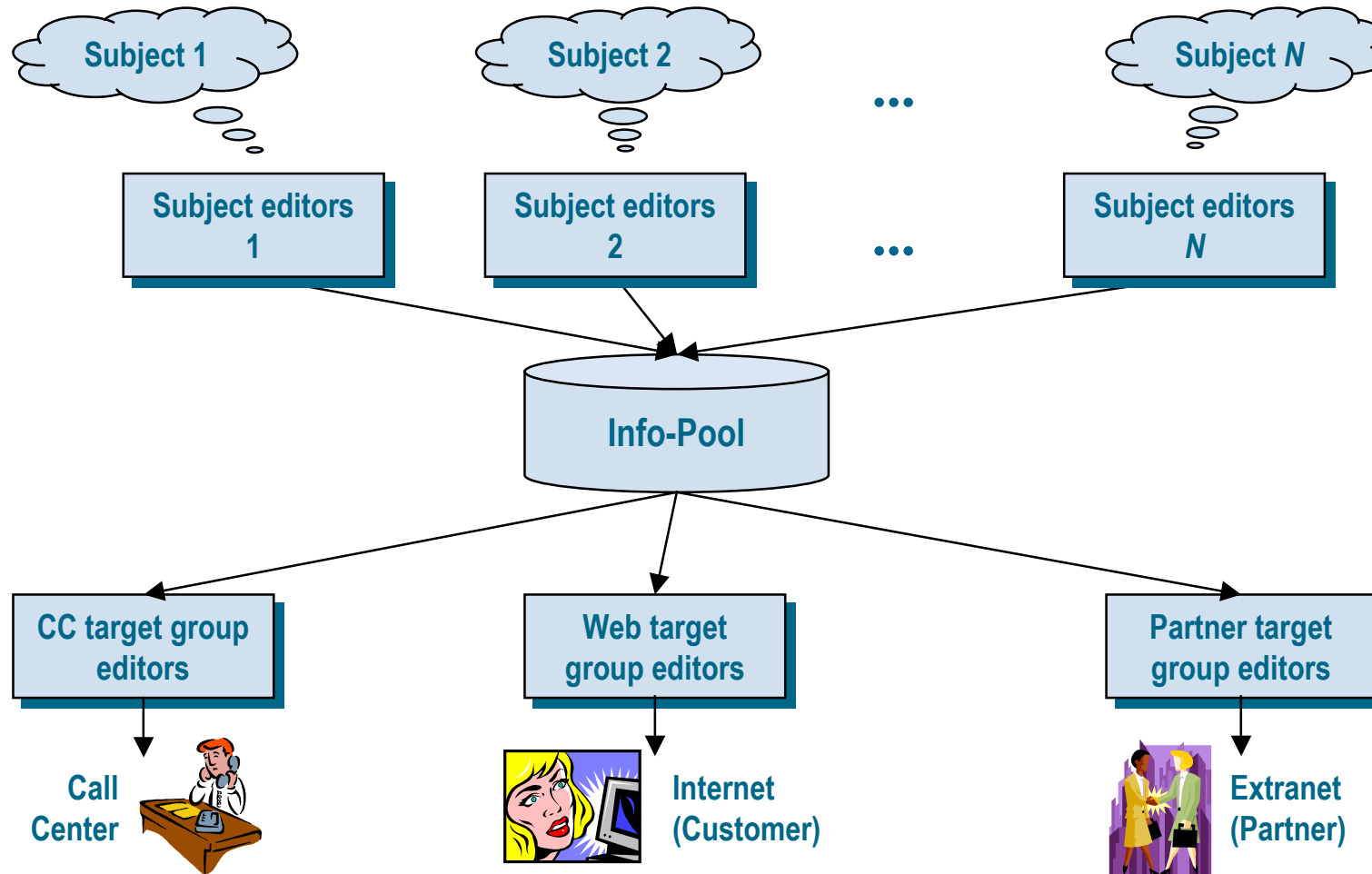
Internet
(Customer)



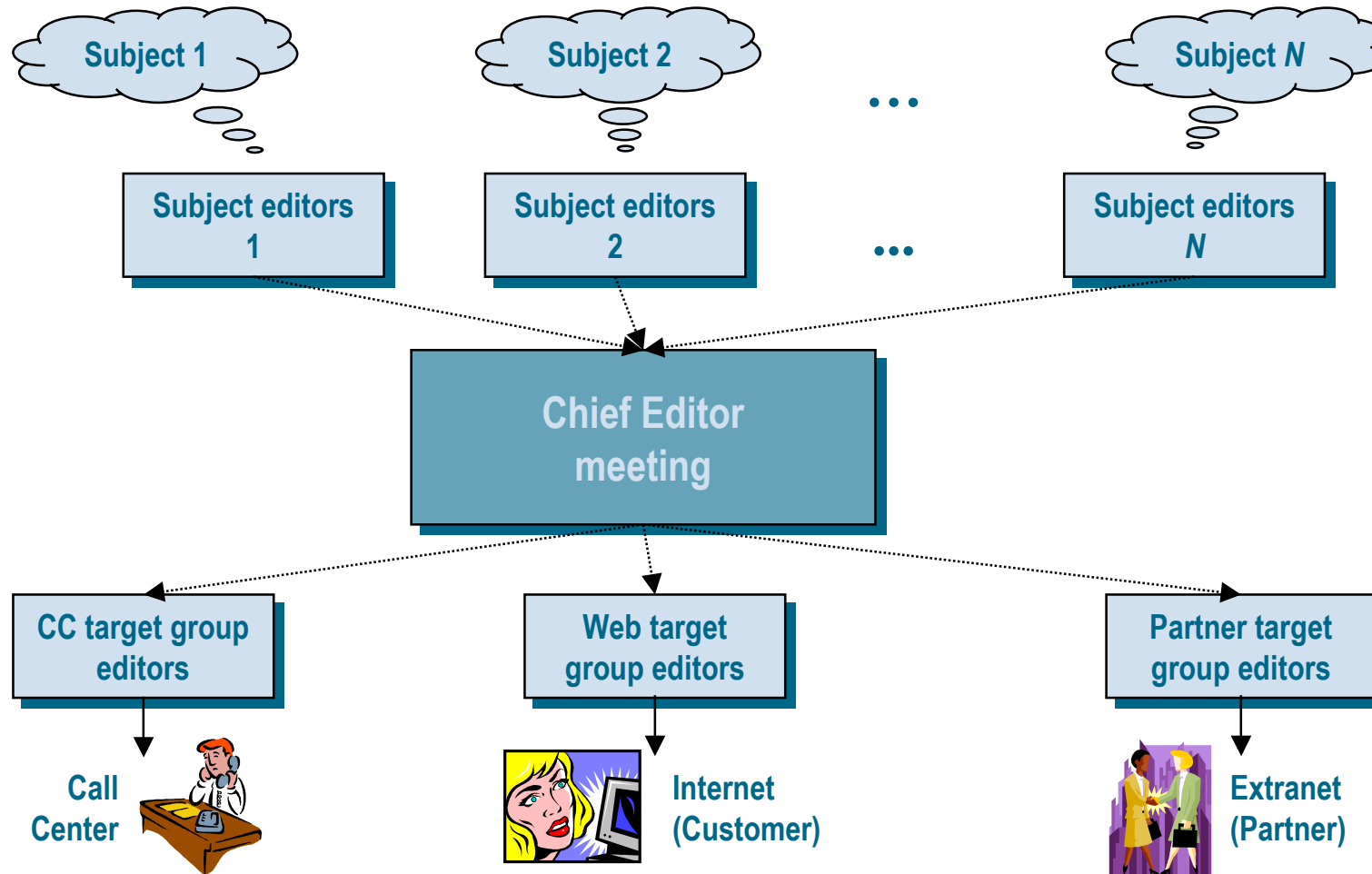
Extranet
(Partner)



The “Publishing House” within the organization: Method



The “Publishing House” within the organization: Method



XML as key technology

- Media neutral data management
- Multi-media publishing
- Single source / multiple use
- Flexible document composition



Basic functionality of a CMS

- Link management
(target group oriented context)
- Meta data on documents and on links
- Document variants
- Workflow
- Distributed work stations for editorial staff
- Easy implementation in system environment



Digital Infrastructures

FAQs & Co ...



Available information

- Information comes from all departments
 - Development, Production, Purchasing, Documentation, Marketing, Sales, After Sales, Customer Support
- Carefully selected information for customer support
- Selection and harmonization by subject editorial staff
- Information about customer plays a major role (CRM)



FAQs – Frequently Asked Questions

- Describe frequently asked questions (customer requests) and their solutions
- FAQs can be generated for each source of information in the organization
- Disadvantages of FAQs:
 - They document solutions to problems, but not the source of the problem
 - Lack of knowledgeable experience from experts
 - Only describe technical procedures and processes
 - Specialists have to deal with routine jobs anyway



Organizing chaos

- Methods:
 - Classification
 - Thesaurus
 - Terminology lists (Data Dictionary)
- User must be familiar with methods/approaches to receive the best support
- Particularly large volume classifications can only be used by experts in an efficient way



Seek and you will find! Really?

- Full text search is widely-used
- Disadvantages:
 - User must know the exact terminology and master the query methods
 - Does not differentiate between essential and non essential hits (=> unneeded perusal)
 - Strong source of frustration



Call centers *powered by* knowledge technologies

Take advantage of the synergy ...



The intelligent electronic advisor

- Data base systems and FAQ collections
 - do not provide expert know-how and
 - cannot “recognize” the user’s difficulties
- Artificial Intelligence developed expert systems in the 80s that are able to
 - diagnose problems and
 - arrive at conclusions and find answers
- But acquisition of knowledge is too costly, not maintainable, never complete



Statistical methods

- Document analysis
- Words handled as concepts
- Occurrences of concept combinations are calculated
- Mathematical evaluation of the occurrences leads to a “Black-Box” experimental knowledge model
 - There is **no** modeling of expert know-how
 - Model is not 100% correct
- Consequence:
 - Search easily provides wrong results
 - Frustration potential (for the self service user and provider)

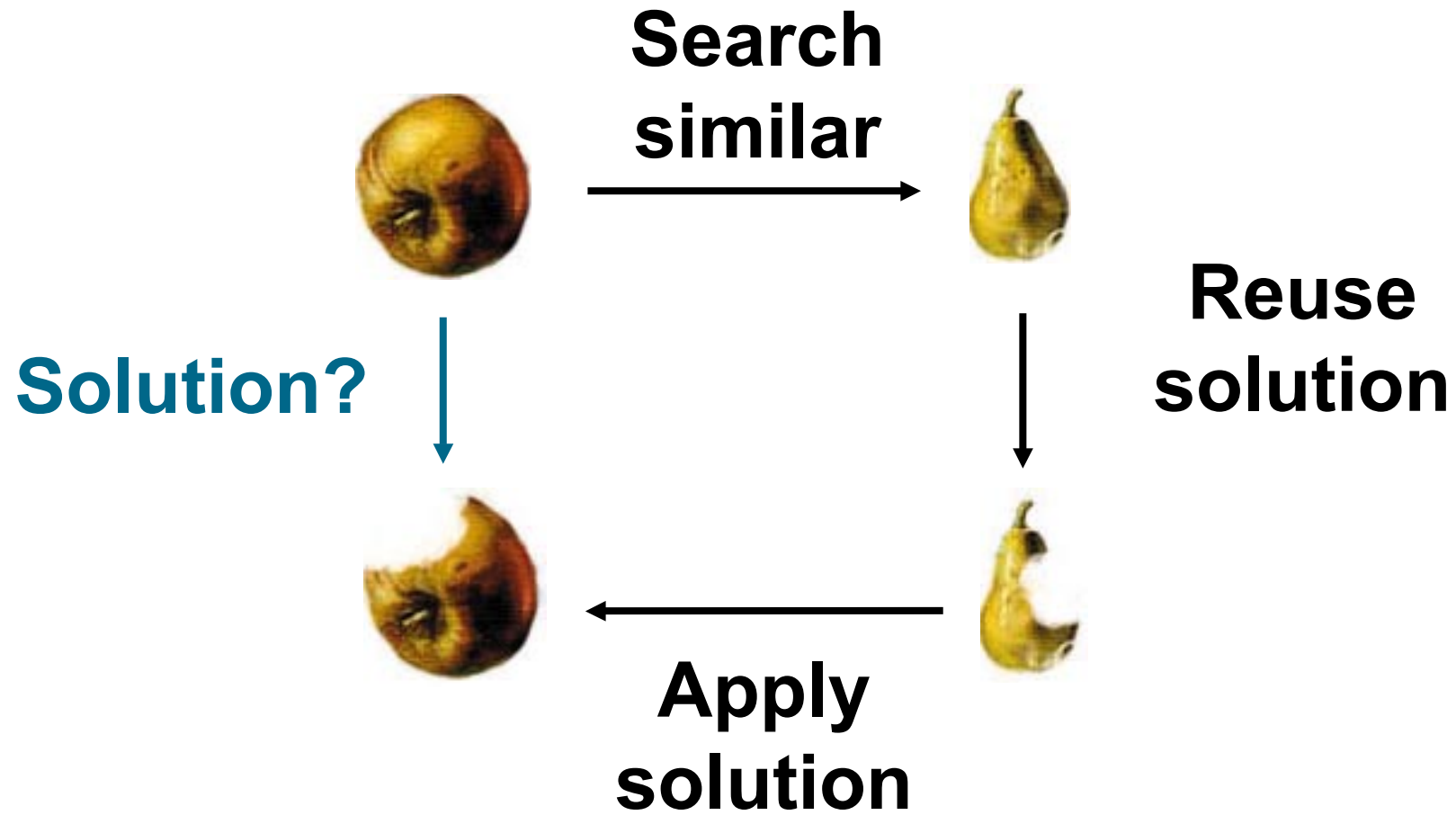


Experience makes you wiser – Case Based Reasoning

- AI method
- Solving problems by knowledgeable experience
 - A doctor remembers past patient illnesses and recalls similar symptoms
 - A lawyer argues based on precedence
 - An architect reuses blue prints of existing buildings
 - A service technician remembers similar defects on a different engine

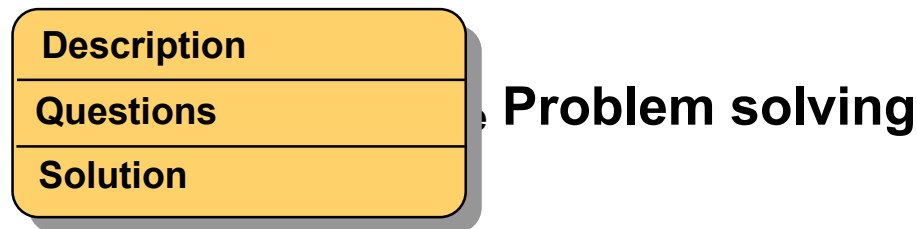


Problem Solving

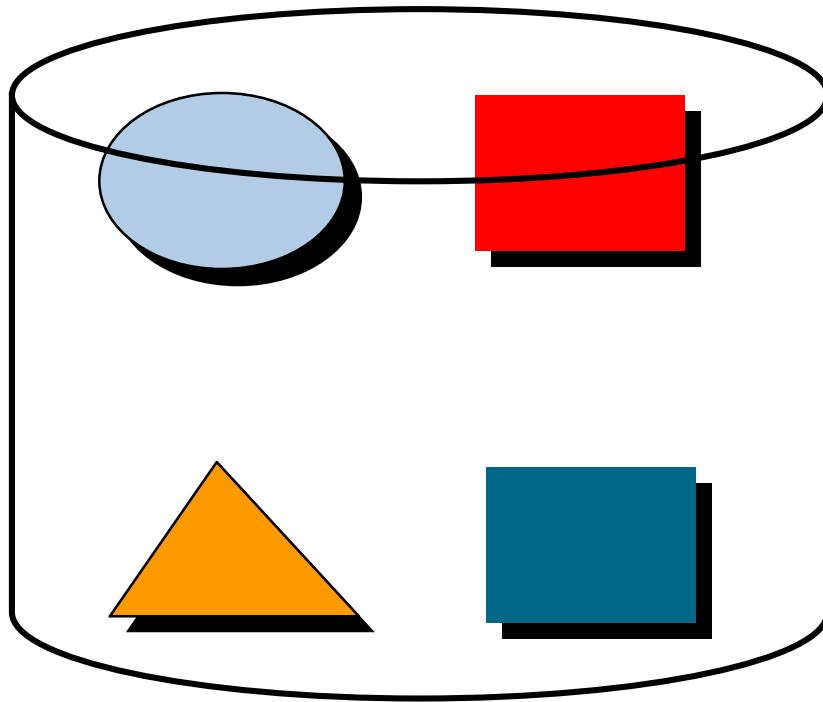


What is a case?

- A **case** consists of a single **situation** and its **solution**
- Each case is specific and has unique **characteristics**

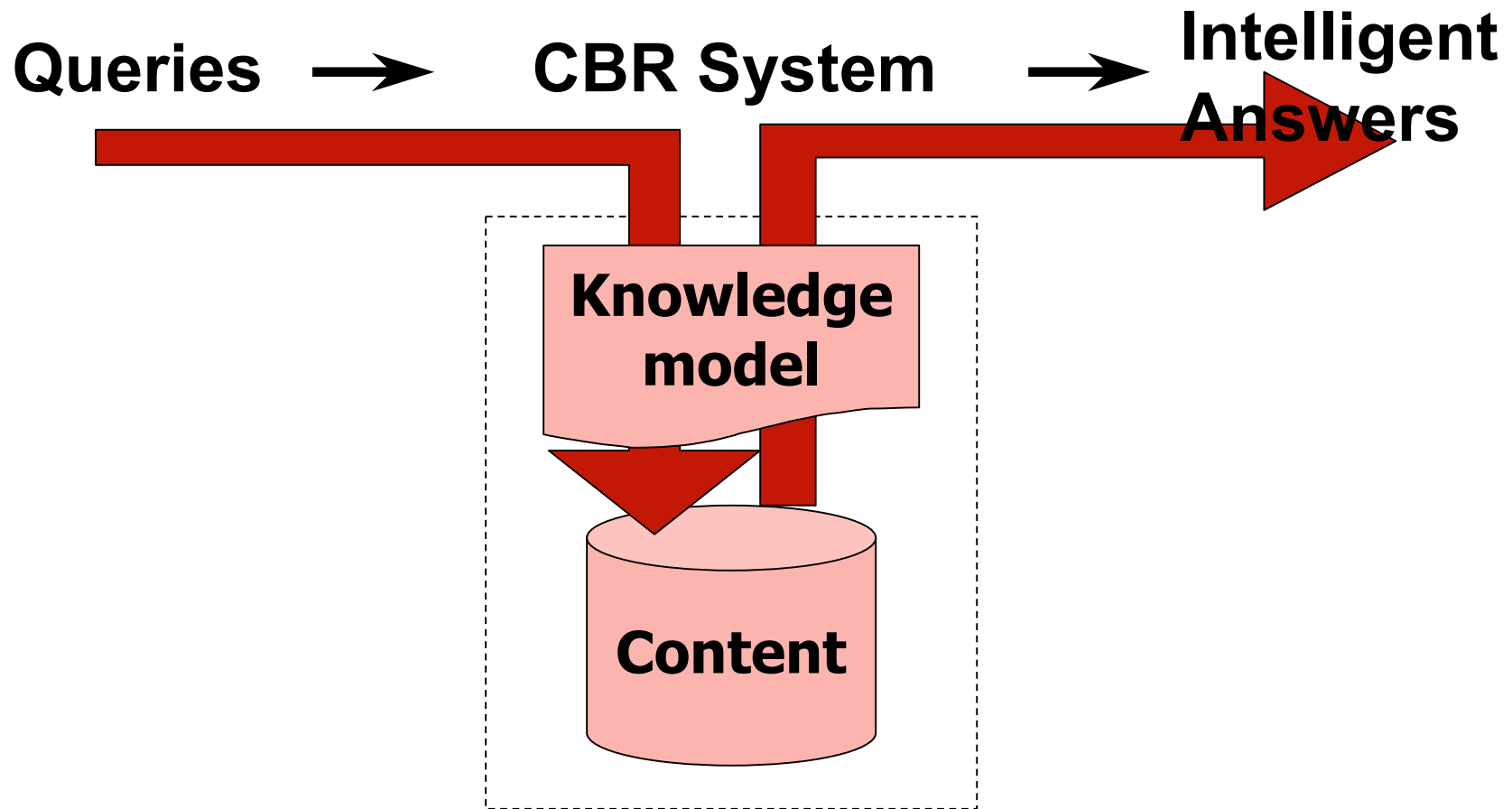


The Case Base



A Case Base is a collection of problem solving experience or a DB of solved cases

CBR System



Case Based Reasoning

- Advantages:
 - Semantic fuzzy search with queries in natural speech
 - There will always be one – the closest – solution
 - Automatic query dialogs
 - Quick solution of routine problems
 - Statistical reports about the queries and their results
- Disadvantage:
 - Effort for modeling
- But:
 - Do or Die situation – just start small



“Reachable Knowledge” – Topic Maps

- ISO standard for collecting explicit knowledge
- New paradigm for the organization, maintenance, and navigation of information
- Advancement of the semantic webs
- Information is delivered in reasonable context
 - GPS of the information universe
- Simple presentation of complex facts
 - Visualization allows intuitive access
- Topic Map grows with the document assets
 - Small initial investment



Topic Maps

- Application in the self service:
 - Search in Topic Map instead of in documents.
Much more precise and shows all information which is related to the topic (= subject)
 - Different knowledge sets for different user groups
 - Appropriate visualizations raise interest
 - Explorative – playful – the knowledge experience

What's the outcome? A case study

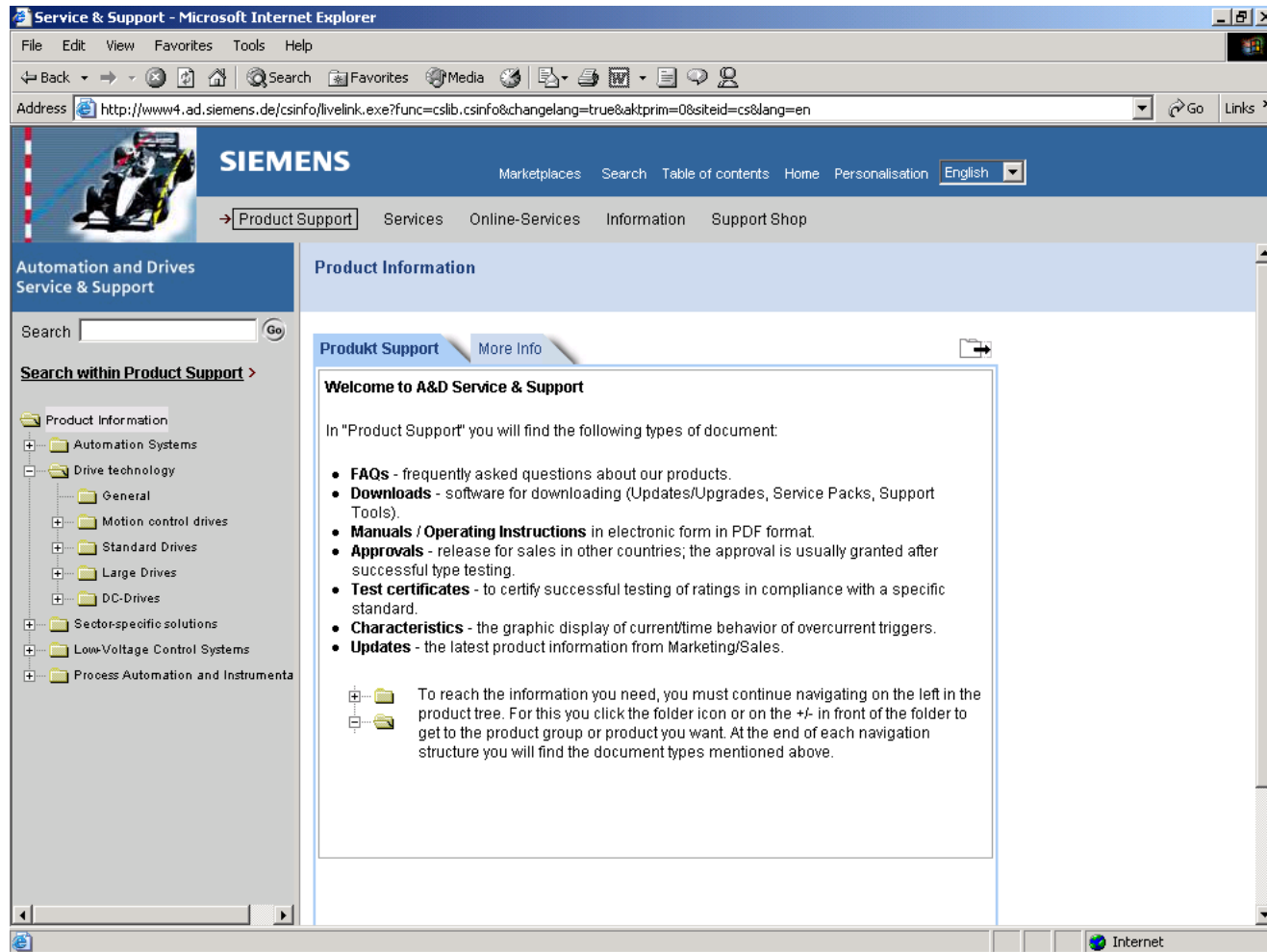
Siemens A&D ...



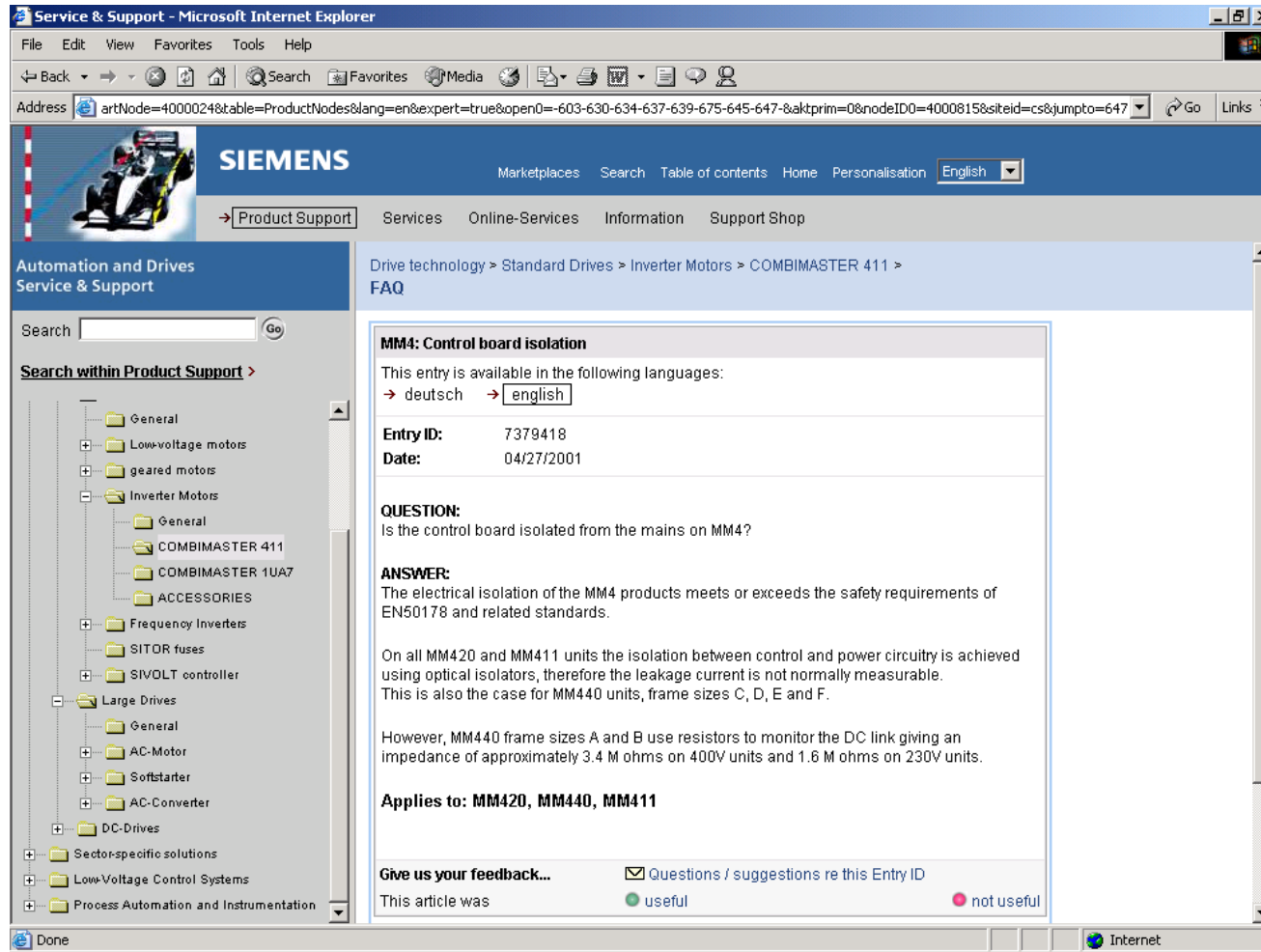
Siemens Automation & Drives

- Problem:
 - Growing customer base and increased product complexity caused extreme costs for support tasks
- Solution SIMATIC Knowledge Manager (SKM):
 - Self Service in the Internet
 - Customers and call center employees get answers for technical requests
- Based on
 - CBR + knowledge model + FAQ documents
 - Dialog and feedback

Siemens Automation & Drives



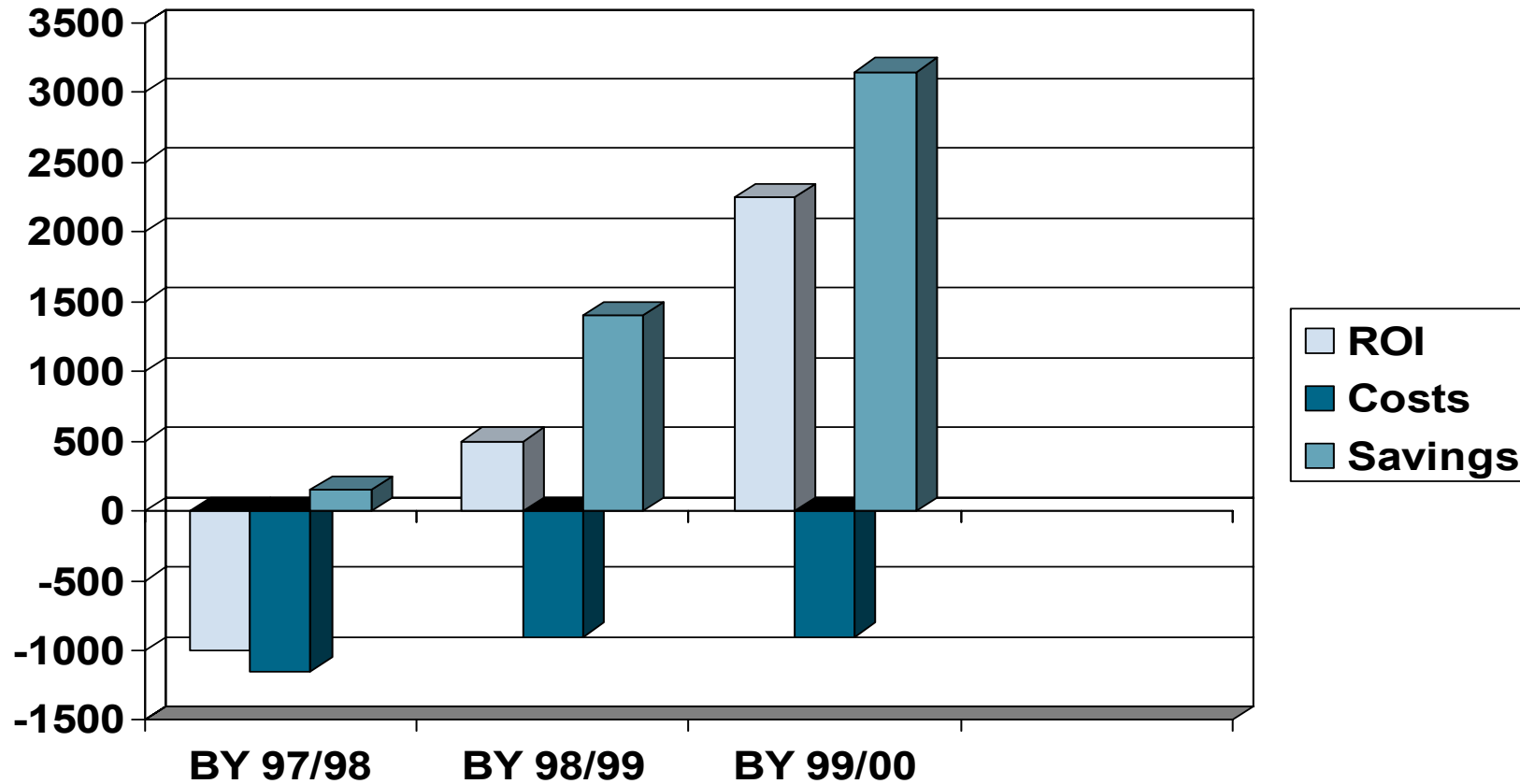
Siemens Automation & Drives



The screenshot shows a Microsoft Internet Explorer browser window displaying the Siemens website. The address bar contains a long URL: `artNode=4000024&table=ProductNodes&lang=en&expert=true&open0=603-630-634-637-639-675-645-647-&aktprim=0&nodeID0=4000815&siteid=cs&jumpto=647`. The page header features the Siemens logo and navigation links: [Marketplaces](#), [Search](#), [Table of contents](#), [Home](#), [Personalisation](#), and a language dropdown set to **English**. Below the header, there are tabs for **Product Support**, **Services**, **Online-Services**, **Information**, and **Support Shop**. The main content area is titled "Automation and Drives Service & Support" and includes a search bar and a breadcrumb trail: [Drive technology](#) > [Standard Drives](#) > [Inverter Motors](#) > [COMBIMASTER 411](#) > **FAQ**. A search bar is also present with the text "Search within Product Support". A left-hand navigation tree lists various product categories such as "General", "Low-voltage motors", "geared motors", "Inverter Motors", "Frequency Inverters", "SITDR fuses", "SIVOLT controller", "Large Drives", "Sector-specific solutions", "Low-Voltage Control Systems", and "Process Automation and Instrumentation". The main content area displays a FAQ entry titled "MM4: Control board isolation". The entry text is as follows: "This entry is available in the following languages: → deutsch → english". It includes an "Entry ID: 7379418" and a "Date: 04/27/2001". The "QUESTION:" is "Is the control board isolated from the mains on MM4?". The "ANSWER:" states: "The electrical isolation of the MM4 products meets or exceeds the safety requirements of EN50178 and related standards. On all MM420 and MM411 units the isolation between control and power circuitry is achieved using optical isolators, therefore the leakage current is not normally measurable. This is also the case for MM440 units, frame sizes C, D, E and F. However, MM440 frame sizes A and B use resistors to monitor the DC link giving an impedance of approximately 3.4 M ohms on 400V units and 1.6 M ohms on 230V units." The entry also specifies "Applies to: MM420, MM440, MM411". At the bottom of the entry, there is a "Give us your feedback..." section with a checked checkbox for "Questions / suggestions re this Entry ID" and two radio buttons for "useful" (selected) and "not useful". The browser's status bar at the bottom shows "Done" and "Internet".



Siemens Automation & Drives



Siemens Automation & Drives

- 75% of the customers and 65% of the employees rate the SKM as “good” or “very good”
- By avoiding calls, Siemens saved 6 million DM (= 3 million US \$) within twelve months
- Return on Investment already within one year
- Don't forget:
 - Knowledge model must be updated permanently (costs approx. 1/5 man year)



What's next?

The future ...



Prognosis

- Self learning systems will penetrate the call centers
 - Stores all “transactions”
 - Knows the status quo of every piece of information
 - Uses past experiences

=> Personalized self service

- Virtual advisors simulate employees of the call center and communicate via voice entry and voice response
- Mobile access to self service with PDA via UMTS
- News will be delivered directly by push technology



Are these only future dreams? Not quite!

- Many technologies – nearly mature – are waiting to be applied
- Trendsetting plans are ready and partly realized
- The call center of today could be the **Customer Interaction Center** of tomorrow
- XML, Topic Maps and other standards will play a crucial role for fast expansion



</The End>

Thank you!

Any questions?



Transforming Information into Value

