From Personal Digital Libraries to Knowledge Management

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Project Partners

- Aalborg University Esbjerg, Denmark
- Research Institute for Applied Knowledge Processing (FAW), Germany
- Know-Center, Austria

Overview

- Evolving Information World
- Personalization in Digital Libraries
- Knowledge Management in Digital Library Environments
- Conclusion

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Information World Trends

- Information is increasingly:
  - diverse
  - distributed
- Technological factors:
  - advances in storage technologies
  - evolving network infrastructures
- Important implications for:
  - individual knowledge workers
  - organizations in which they work

Implications for Knowledge Workers

- Must increasingly look to digital sources for information needs
- Remote information sources distributed across networks increasing relevant and important
- More challenging to support important capabilities for knowledge workers
  - e.g. information personalization

Implications for Organizations

- Knowledge management is:
  - more important now than ever
  - more complex as use of organizational memories increases
    - number of knowledge objects can grow rapidly
    - knowledge objects become increasingly interrelated
- Can a personalization environment help?

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Support for Information Personalization

- Personalization:
  - ability for user or group to customize information objects to facilitate performance of a task...
- Important capability, but challenging in today's information world
- Centralized approach not necessarily feasible
  - very difficult when user base is large
  - not supported by most current systems
- Alternative strategy is needed....

Personalization for whom?

- Knowledge workers in a distributed digital library setting
- Characteristics of the user base:
  - work for company or organization
    - occasionally collaborate
  - routinely require access to:
    - diverse types of information items
    - resources managed by range of different information systems
      - physically distributed systems
      - may not own information

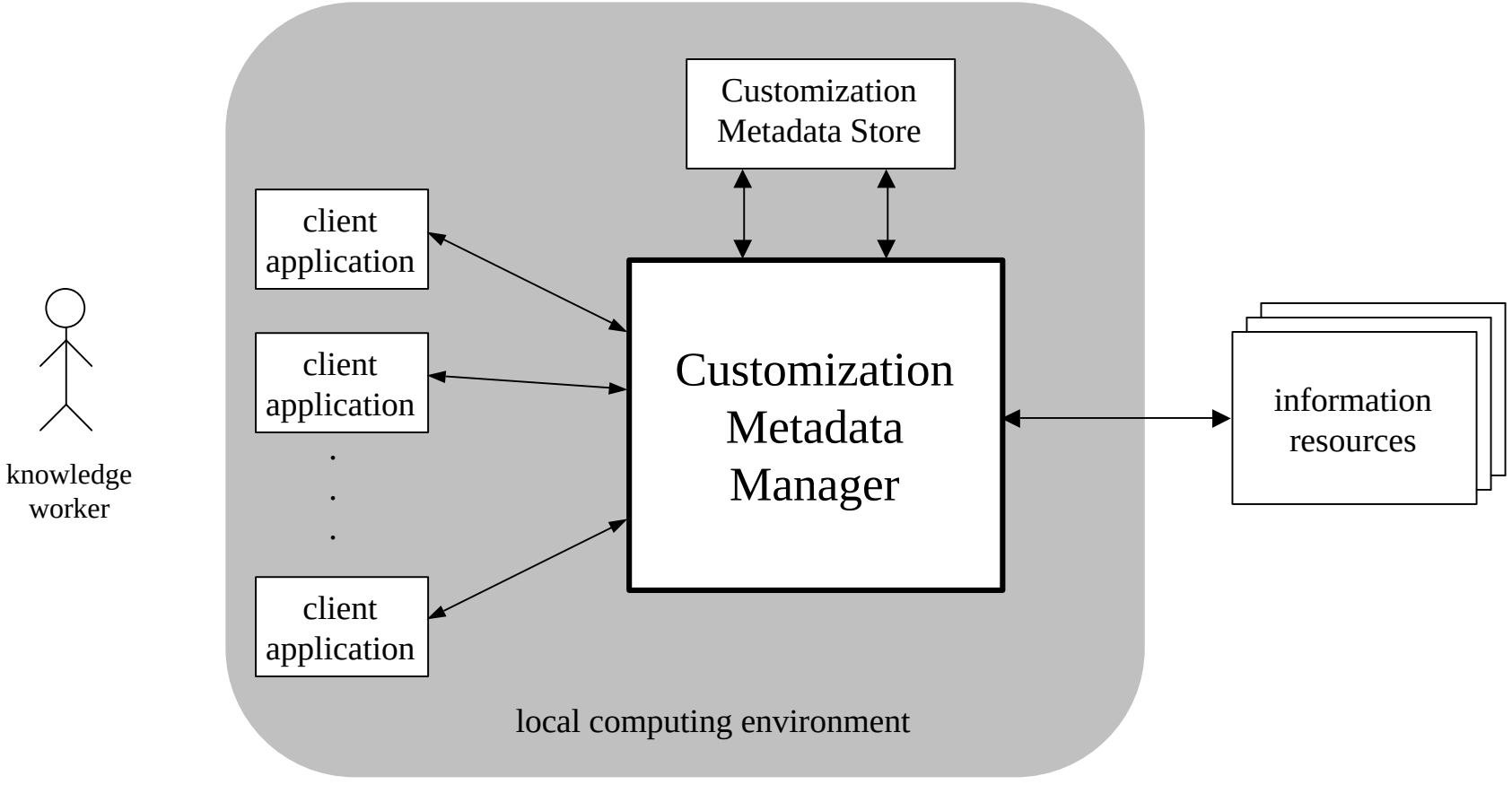
Personal ADaptable Digital Library Environment (PADDLE)

- Designed to support knowledge workers
  - especially those with distributed information needs
- Intended to accommodate personalization of wide range of information types
- Two primary characteristics:
  - decentralized
  - metadata based

Architectural Characteristics

- Decentralized
  - personalization not done by centralized information systems
  - done locally with respect to the user
- Metadata based
  - metadata used to define and track personalizations
  - unconventional use of metadata

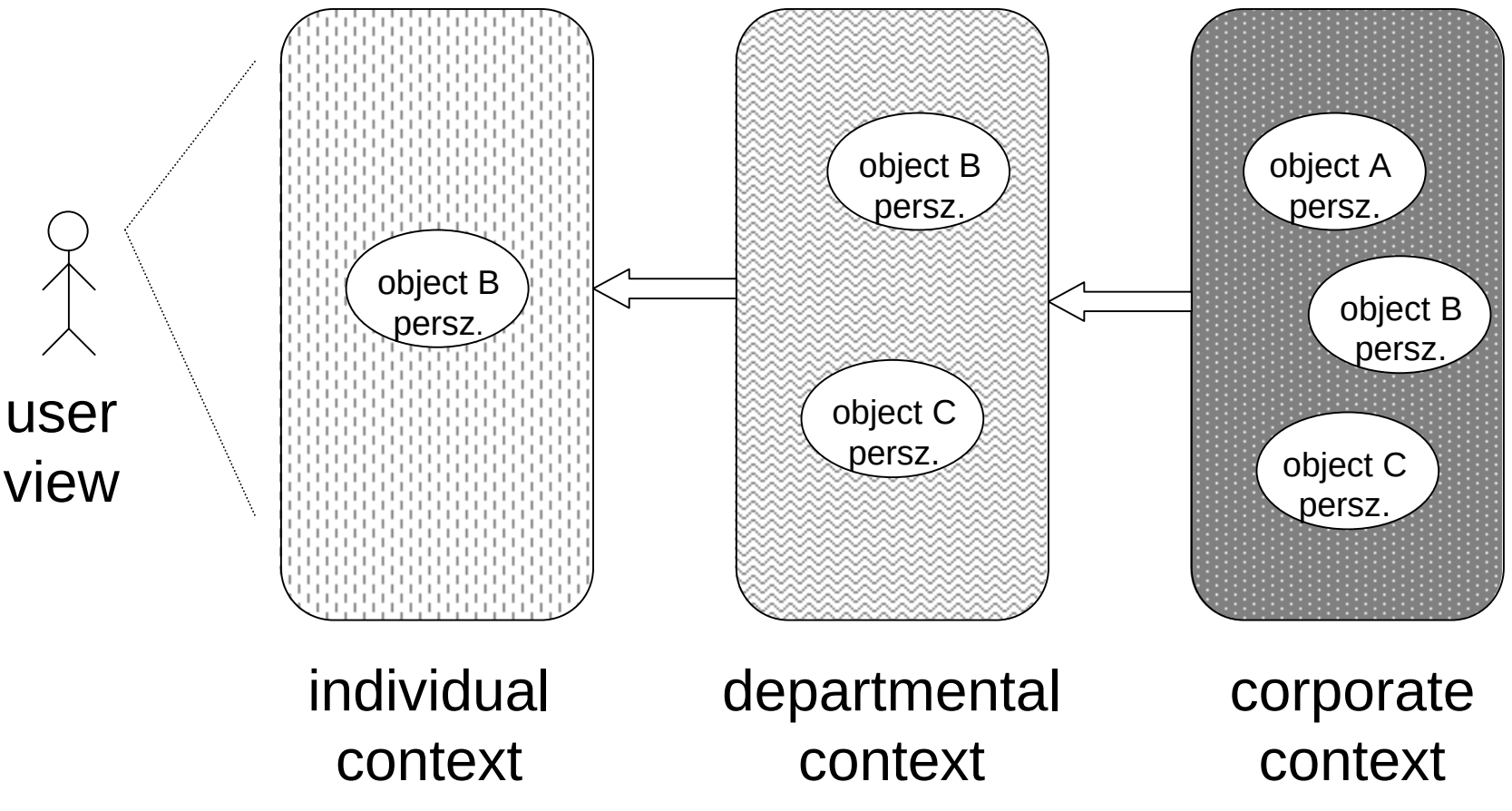
Overview of PADDLE Architecture



Contexts

- Provide mechanism to group logically related set of personalizations
- Users can have multiple contexts
- Contexts can be shared
  - serve as a collaboration tool
- Can be layered as a way to hierarchically relate sets of personalizations

Context Layering



Prototype Implementation

- Implementation environment:
  - Java, Netscape Fasttrack web server, relational DBMS, standard communication protocols
- Includes client application
- 3 information systems integrated so far
  - customization metadata manager supports personalization of information the systems contain

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Knowledge Management in PADDLE Environment

- Currently focused on specific facet of knowledge management:
  - enable knowledge workers to create, use, and extend corporate knowledge base
  - allow them to tailor knowledge base to their needs
- Requires user paradigm shift
  - from “passive users” of information to more active participants in creation and adaptation of knowledge bases
- PADDLE capabilities were effective to facilitate use of knowledge base
  - e.g., accessing knowledge objects, personalization capabilities
- Additional development required to support creation and extension of knowledge base

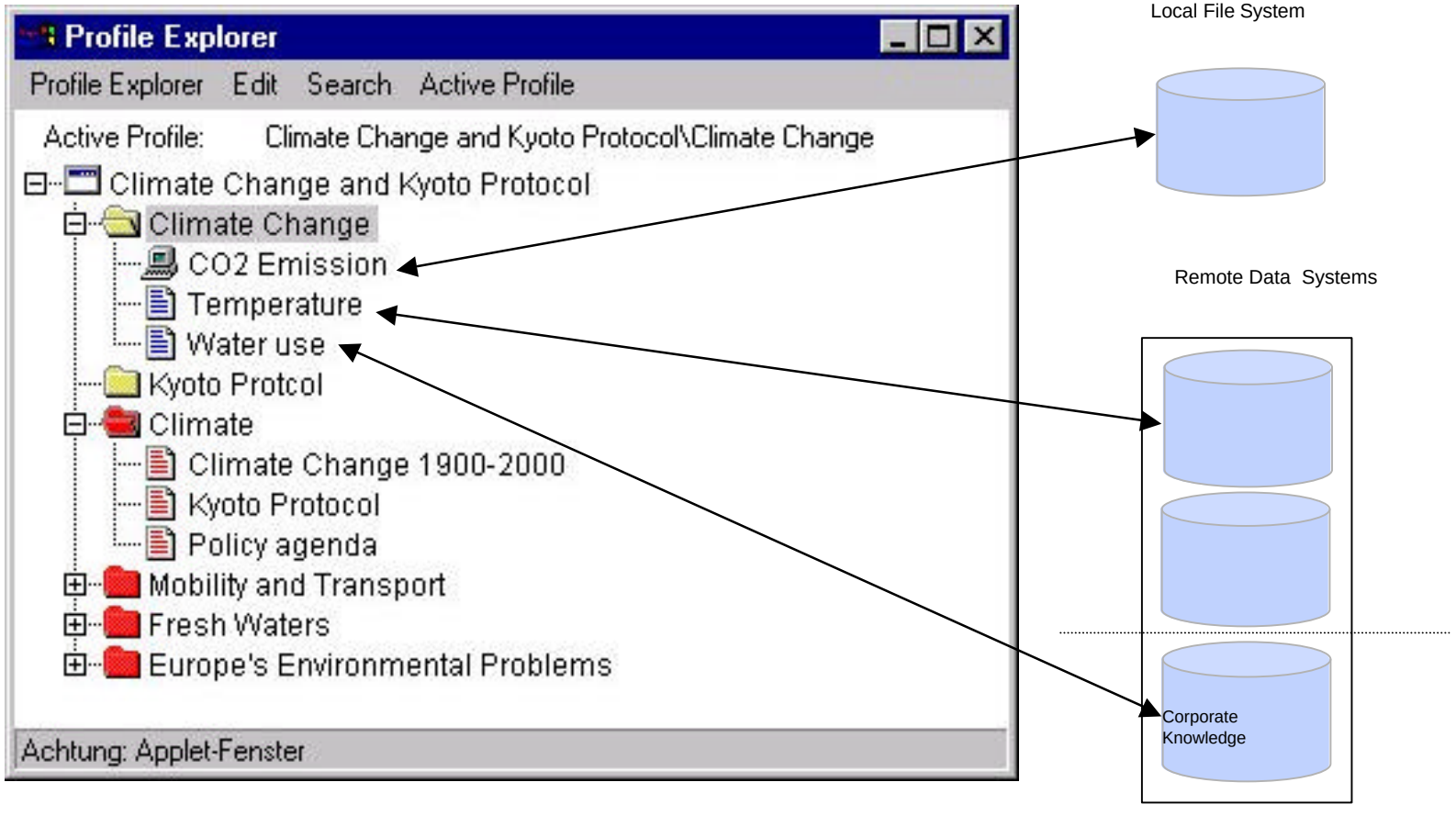
Establishing and Adding to a Knowledge Base in PADDLE Environment

- Structured approach
- Primary steps required:
  - categorize user groups
    - what individual or group views of knowledge base are required
  - determine what objects to include in knowledge base
    - e.g., reports, product descriptions, meeting minutes, project reports, etc.
  - define process for preparing new items for knowledge base
    - forms for user interaction, etc.

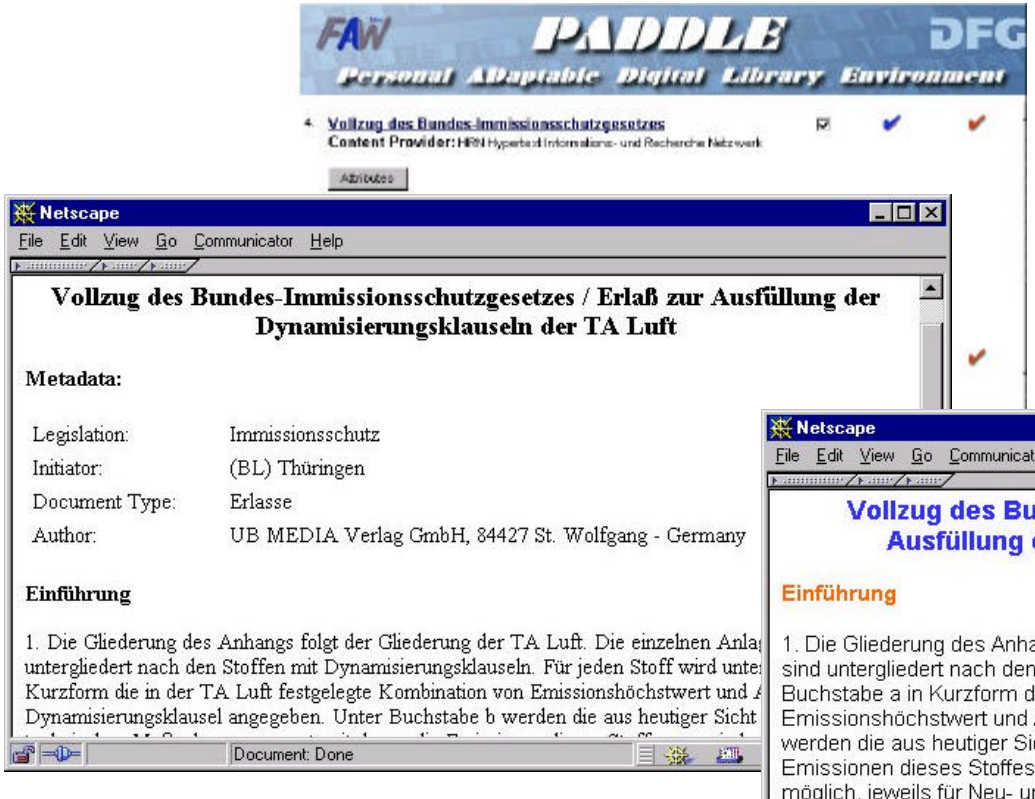
PADDLE Profiles

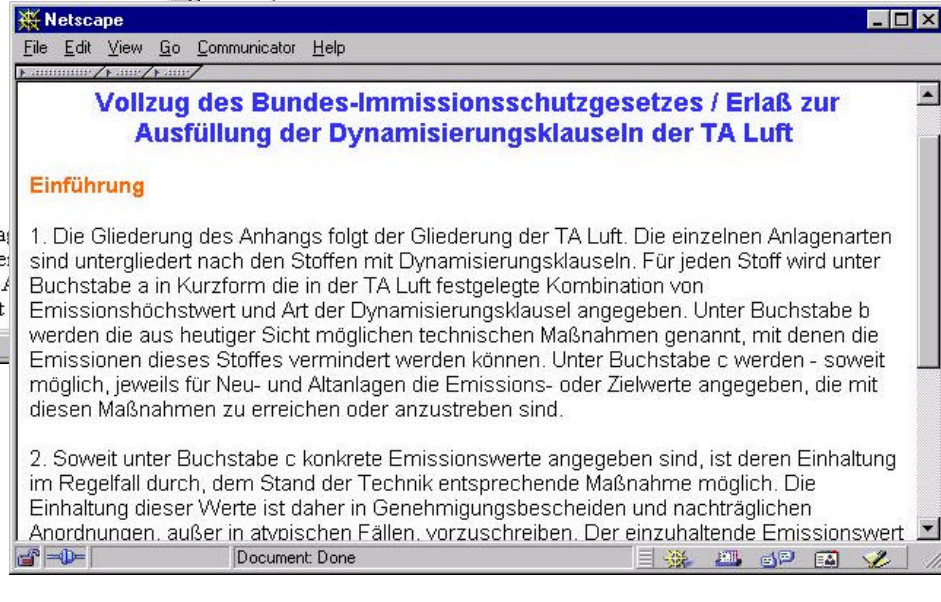
- Tool to logically group knowledge base items according to various criteria:
  - topic area, task being performed, etc.
- Helps cope with rapidly growing knowledge base
  - enables users to place new items within context of existing ones
- Built upon PADDLE context mechanism
- Two types:
  - public profiles
  - private profiles
    - can contain knowledge base items along with items from local sources, e.g., local filesystem

PADDLE Profile Explorer



Example Knowledge Object Personalization





Knowledge Base Quality Control

- Direct influence on acceptance and use of knowledge base
- Linear workflow approach used to assure two levels of quality:
  - validness of new information
    - based on data type
  - plausibility of new information
    - based on inspection of content
- Certificates control distribution of new items:
  - public quality certificate
  - restricted quality certificate

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- Substantial synergy effects possible between digital libraries and knowledge management
- Many underlying technologies involved in fields are similar, facilitating integration
- Effective knowledge management requires consideration of *individual knowledge workers* as well as organizations
  - personalization is important in knowledge management (just as with other areas)
  - personal digital libraries can be especially useful for knowledge management

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