

# **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

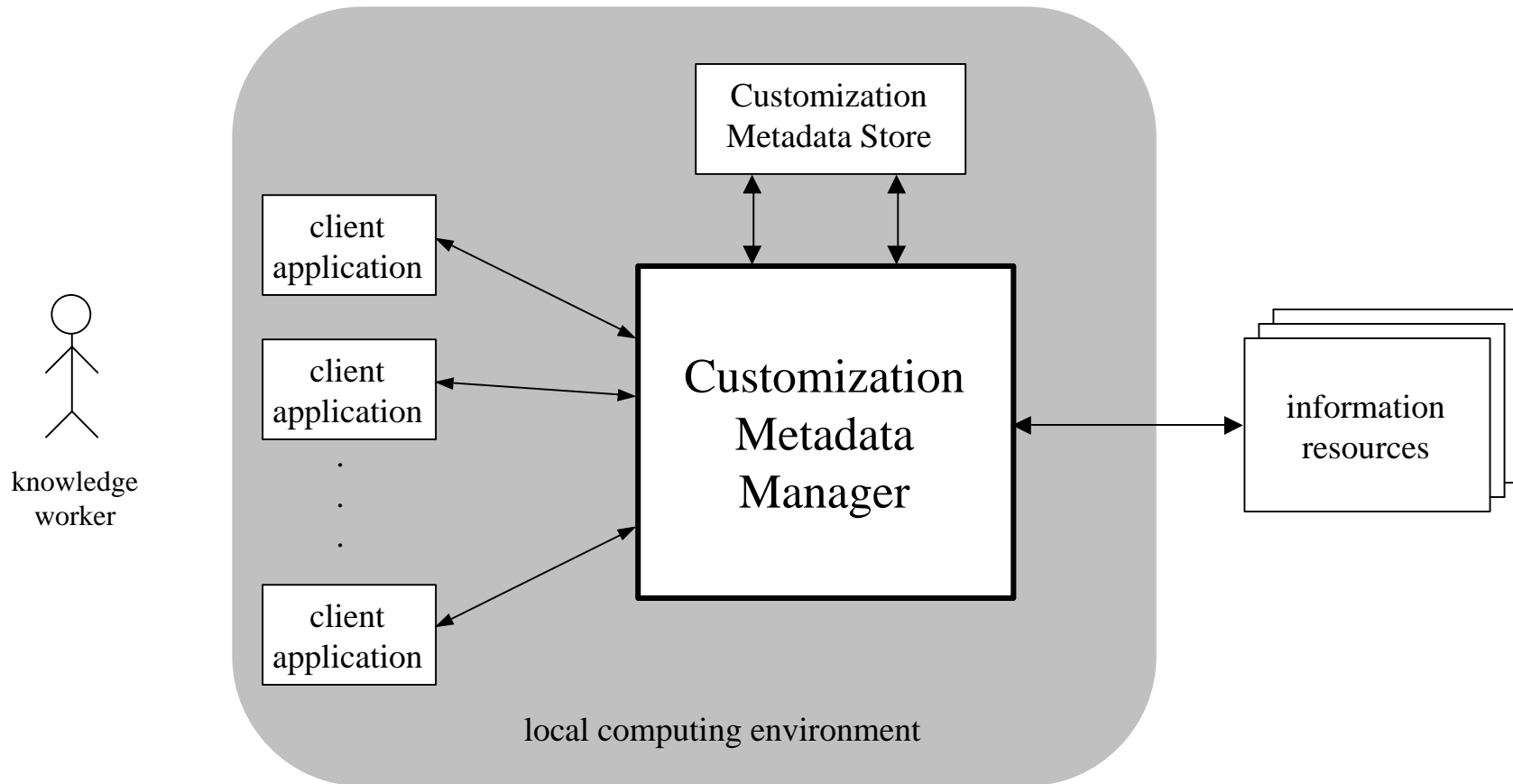
# Personal Adaptable Digital Library Environment (PADDLE)

- 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

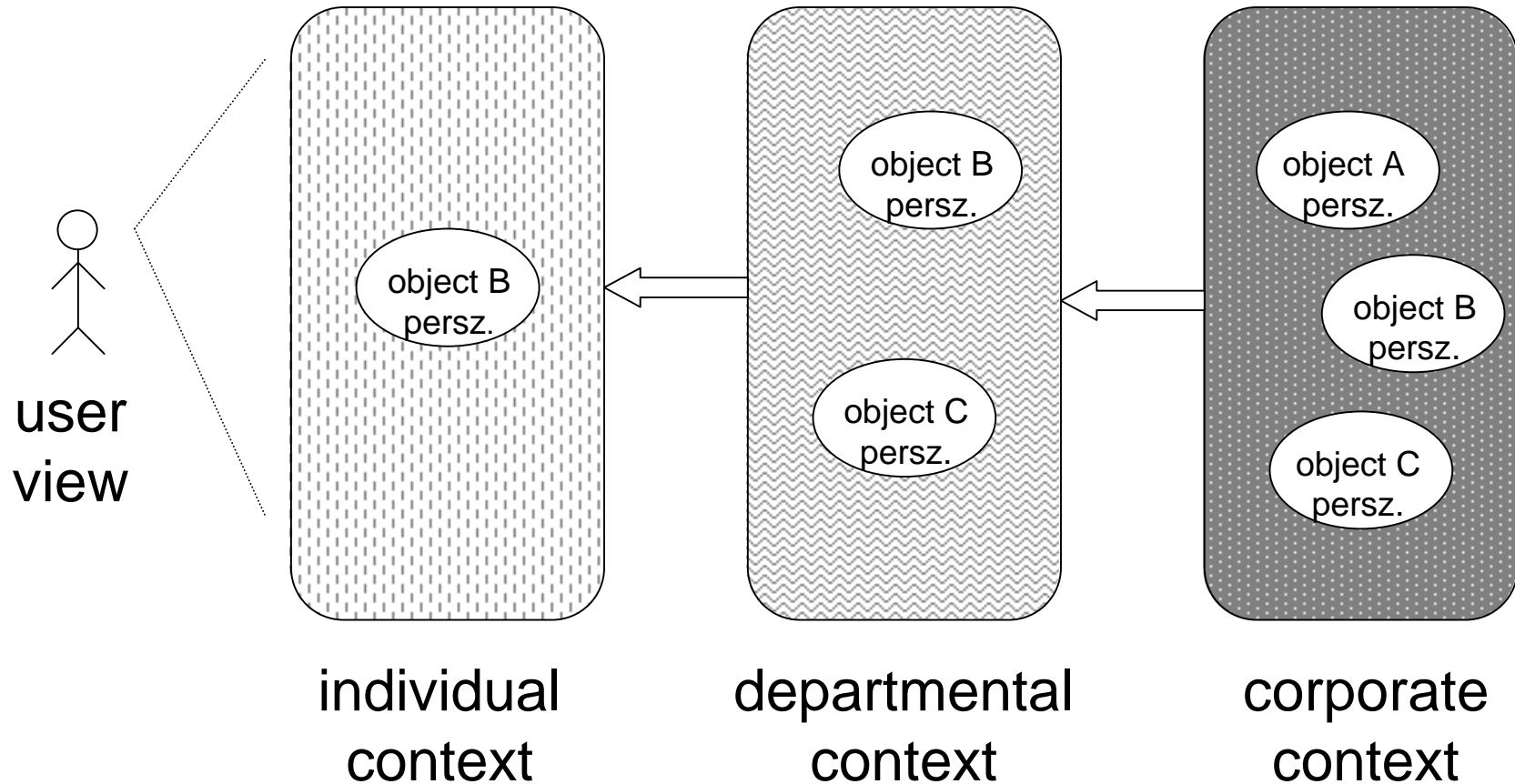
# Overview of PADDLE Architecture



# 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

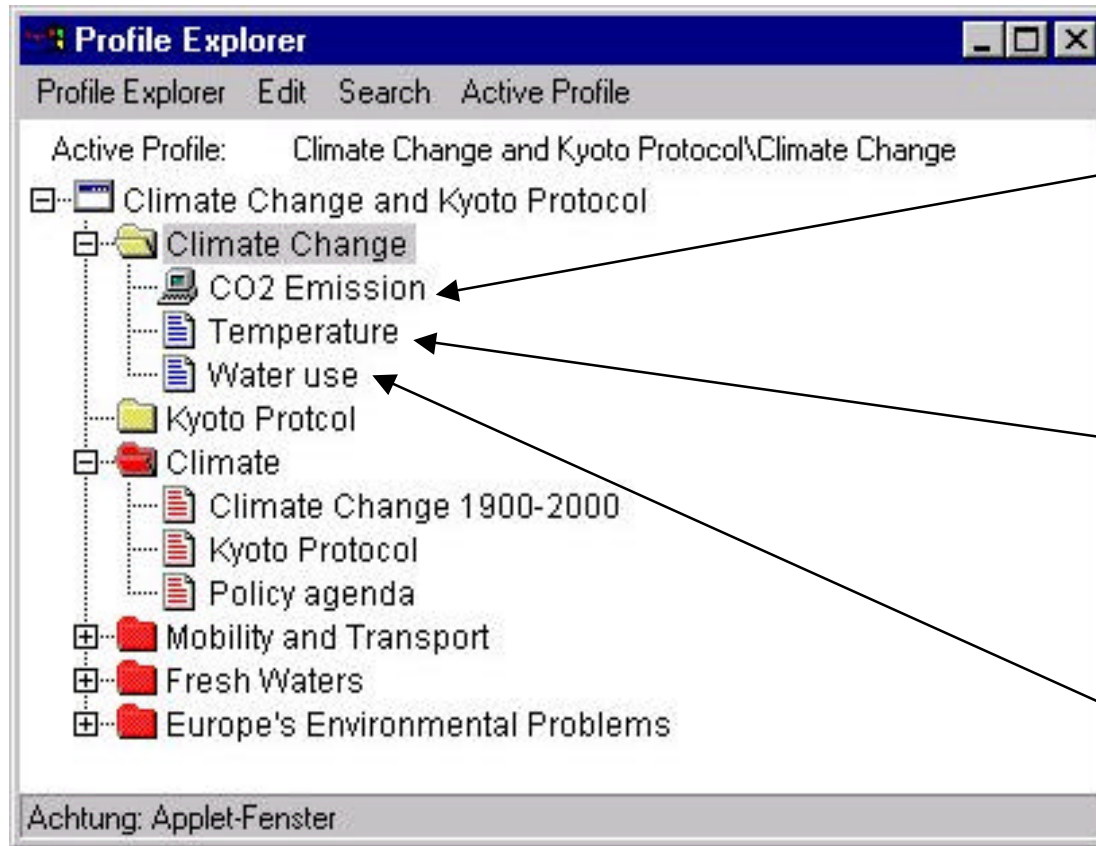
# Establishing and Adding to a Knowledge Base in PADDLE Environment

- 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.

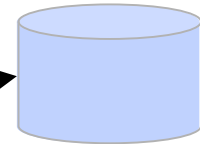
# PADDLE Profiles

- 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

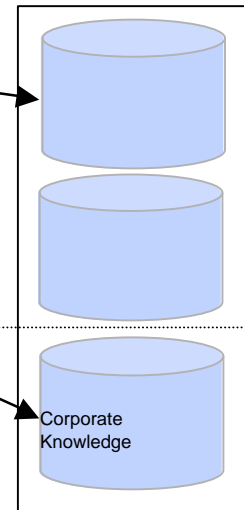
# PADDLE Profile Explorer



Local File System



Remote Data Systems



# Example Knowledge Object Personalization

The image displays a web browser window (Netscape) showing a document titled "Vollzug des Bundes-Immissionsschutzgesetzes / Erlaß zur Ausfüllung der Dynamisierungsklauseln der TA Luft". The document is part of the PADDLE (Personal ADaptable Digital Library Environment) system, which is associated with the FAW and DFG logos. The document is displayed in two versions: a standard version and a personalized version.

**Standard Version (Left Window):**

**Metadata:**

Legislation:	Immissionsschutz
Initiator:	(BL) Thüringen
Document Type:	Erlasse
Author:	UB MEDIA Verlag GmbH, 84427 St. Wolfgang - Germany

**Einführung**

1. Die Gliederung des Anhangs folgt der Gliederung der TA Luft. Die einzelnen Anlagen untergliedert nach den Stoffen mit Dynamisierungsklauseln. Für jeden Stoff wird unter Buchstabe a in Kurzform die in der TA Luft festgelegte Kombination von Emissionshöchstwert und Art der Dynamisierungsklausel angegeben. Unter Buchstabe b werden die aus heutiger Sicht

**Personalized Version (Right Window):**

**Einführung**

1. Die Gliederung des Anhangs folgt der Gliederung der TA Luft. Die einzelnen Anlagenarten sind untergliedert nach den Stoffen mit Dynamisierungsklauseln. Für jeden Stoff wird unter Buchstabe a in Kurzform die in der TA Luft festgelegte Kombination von Emissionshöchstwert und Art der Dynamisierungsklausel angegeben. Unter Buchstabe b werden die aus heutiger Sicht möglichen technischen Maßnahmen genannt, mit denen die Emissionen dieses Stoffes vermindert werden können. Unter Buchstabe c werden - soweit möglich, jeweils für Neu- und Altanlagen die Emissions- oder Zielwerte angegeben, die mit diesen Maßnahmen zu erreichen oder anzustreben sind.

2. Soweit unter Buchstabe c konkrete Emissionswerte angegeben sind, ist deren Einhaltung im Regelfall durch, dem Stand der Technik entsprechende Maßnahme möglich. Die Einhaltung dieser Werte ist daher in Genehmigungsbescheiden und nachträglichen Anordnungen, außer in atvischen Fällen, vorzuschreiben. Der einzuhaltende Emissionswert

# 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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# Conclusion

- 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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