From Personal Digital Libraries to Knowledge Management

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Project Partners

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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

Customization Metadata Store

Client application

Metadata Manager

local computing environment

knowledge worker

information resources
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

- Individual context
- Departmental context
- Corporate context

User view

objects:
- object A
- object B
- object C
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

Corporate Knowledge

Profile Explorer

Active Profile: Climate Change and Kyoto Protocol\Climate Change

- Climate Change and Kyoto Protocol
  - CO2 Emission
  - Temperature
  - Water use
  - Kyoto Protocol
- Climate
  - Climate Change 1900-2000
  - Kyoto Protocol
  - Policy agenda
- Mobility and Transport
- Fresh Waters
- Europe’s Environmental Problems

Achtung: Applet-Fenster
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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