Personalization of the Digital Library Experience: Progress and Prospects

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Focus of this Talk

- Individuals’ interactions with information and with information systems
- How to make such interactions effective and pleasurable
- Primarily concerned today with information seeking and searching interactions
Personalization

• Tailoring the interaction with information to the person’s
  – Goals, tasks
  – Context
  – Situation
  – Individual characteristics
Goals, Tasks

• What leads the person to engage in interaction with information
  – (Life) goal
  – Task to accomplish
  – Problematic situation

• Goals and tasks associated with information seeking and searching
Context

- Physical environment, e.g.
  - Spatial
  - Temporal
- Personal environment, e.g.
  - Current and previous behaviors
  - Affect
- Social environment, e.g.
  - Communication
  - Collaboration
  - Community
Individual Characteristics

• Knowledge, e.g.
  – Of task
  – Of topic

• Cognitive abilities, e.g.
  – Verbal
  – Spatial
  – Memory

• Preferences, e.g.
  – Learning style
  – Interaction style
Situation

- The particulars of goals, tasks, context, individual characteristics, at any one time

A Familiar Reference


• Taylor’s five filters are an example of personalization, as accomplished by people.

• This represents the ideal of “intelligent” support for information interaction.
Workshop on *Intelligent Access to Digital Libraries*

- First (?) scholarly meeting with “Digital Libraries” in title
- Indication of early recognition in the DL community of the users of DLs
- But, most early research, and practice, in DLs concerned with technical issues
“Access”/Total Titles

- ACM DL 1996 5/42
- ACM DL 1997 8/46
- ACM DL 1998 8/49
- ACM DL 1999 10/58
- ACM DL 2000 11/46
- JCDL 2001 15/117
Initial Steps toward Personalization

• “Novice” and “Expert” interaction
  – Followed 2nd generation OPAC ideas
  – Effectively, “easy” and “advanced” search

• Self-tailoring of results
  – Beyond simple linear ordering
  – e. g., ENVISION project
ENVISION Interface
Self-Tailoring of Object Characteristics

• “Faceted” search
• Support for rapid integration of search modification and results, e.g. mSpace


Stuff I’ve Seen
Britain in Brittany (Unsegmented)

INN, 19.10.1960
Travelogue from northern Brittany which looks at the region's links - ancient and modern - with Britain.

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Automatic Personalization

• Based on evidence about the person’s:
  – goals, task;
  – context
  – situation
  – individual characteristics

• Evidence obtained:
  – Explicitly
  – Implicitly
Explicit Evidence for Personalization

• Explicit relevance feedback
  – The information system “learns” about the person’s information problem and reacts accordingly (Rocchio, 1971)

• Assumes an “ideal” query, representing a static information problem

• People seem unwilling to provide this explicit evidence
Implicit Evidence for Personalization

• Inferring rather than eliciting
• Evidence lies in the person’s
  – Current behaviors
  – Previous behaviors
• Evidence lies in behaviors of people “like” the person
  – The most common type of personalization in operational systems
Operational Examples of Personalization

• Search engine query completion
  – Based on your previous behavior
  – Based on others’ previous behaviors

• Recommendation of things you might like
  – Netflix: What you liked before
  – Amazon: What others who liked “this” also liked
“Reading” Behavior: 1

• Based on “dwell time”
  – The longer one looks at a page, the more likely it is to be relevant/useful
  – But, to be accurately interpreted, must take into account other aspects
Reading Behavior: 2

• Based on “click-through”
  – If a person “clicks” on a link, the object linked to is likely to be of interest

• But “click-through” can mean many things, and is an unreliable indicator on its own
Previous Use Behavior

• What a person has used or produced before can indicate what will be useful in the future

• Use what’s on the desktop for implicit relevance feedback

Non-Relevance Feedback Personalization

• What a person already knows about a topic will affect what will be useful

• The task that a person is engaged in will affect what will be useful
“Helpful” Personalization

• Prediction of when a person needs help in information interaction, and what type of help would be useful

Multi-Faceted Personalization

• Many factors affect what information a person would like to interact with
• These factors interact with one-another
• Accurate personalization will require multiple sources of implicit evidence of a variety of facets of personalization
The PoODLE Project

• Investigates behavioral evidence of:
  – knowledge of topic
  – type of task
  – stage of task completion
  – cognitive abilities

• Integrates this evidence with dwell time, previous use, to predict usefulness of information objects
Problems in Personalization for Digital Libraries

• Most personalization research is taking place in the information retrieval community
• There is a conflict between server-side and client-side personalization
• Some aspects of personalization remain to be considered (e.g. affect)
Prospects for Personalization in Digital Libraries

• Lots of interest in personalization of information interaction in general
• More research needed within the explicit domain of digital libraries
• Good prospects for integration of evidence from both server and client
Acknowledgements

• Much help from the PoODLE team
  http://scils.rutgers.edu/imls/poodle

• Funding for this research comes from the U.S. Institute of Museum and Library Services