Automated Reference Assistance: Reference for a New Generation

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What is the ARA?

- Software designed to
  - Enhance, not replace traditional reference service
  - Elicit information about users & what they need
  - Suggest appropriate resources
  - Operate 24 x 7
Why is the ARA?

• Users value convenience, speed, ease-of-use
  – Prefer remote access, e-resources, & independence
  – U-grad students use inappropriate e-resources
    • Less than 6% of surface Web is scholarly content
    • No single Web search engine indexes more than 16%
    • Web magnifies problems with poor search strategies

• The number, names, & content of e-resources overwhelm & confuse both users & librarians

1999 Remote Use of E-Resources
2000-01 Statistics

Over past 5 years:
Gate counts down 6%
Circ down 3.5%
Reference up 0.5%

16% of Reference is Digital

Visits
Reserves
Reference

Gate counts
Virtual visits

Email
Chat

Email
Other
Staff
Faculty
Grad
U-grad
Goals of the ARA

- Intervene & guide
- Facilitate learning & independence
- Match preferences & lifestyles
- Begin to close the gap between perceived ease of using the Web & perceived cumbersomeness of using the library
What the ARA Does

- Interviews users
- Limits the number of resources to choose from
- Dynamically groups the resources available
- Provides information about the resources
- Provides links to resources
- Submits queries to resources

ARA Architecture

- Web Browser
- Application Server
- Relational Databases
- XML Files
- Inference Engine
  - Reference Interview
  - Resource Database
  - Journal Information
ARA Web User Interface

Tell me what you're looking for:

- You're looking for a **book** about [fields]
- You're looking for an **article** in the journal [name] [fields]
- You're looking for information about [fields]

Submit

ARA Inference Engine

- Interviews user to focus the information need
- Converts user’s information need into a query of the Resource database & Reference Interview database
- Transforms the results of the query into useful reference advice, a list of suggested resources, & follow-up questions
**ARA Reference Interview Database**

- Set of questions a librarian might ask a user
- Information about when it’s appropriate to ask each question
- Actions associated with each answer
  - To update the facts the ARA “knows” about what the user is looking for

**ARA Resource Database**

- Contains facts about every resource the ARA “knows”
  - Resource name
  - Resource level
  - Dates of coverage
  - Item types
  - Subject areas
  - Dewey Decimal ranges
  - Full text availability
  - Internet address
  - Full descriptions
  - Brief descriptions
  - Other facts
  - Atlas = maps & geography
  - Encyclopedia = general information
  - Poems = can be located through concordances & indexes of first lines
**ARA Journal Information Database**

- Identify databases that index a journal
- Identify databases with full-text
- Disambiguate journal titles
- Incorporated from JAKE

**ARA Action**

User answers questions & submits a request

Inference Engine
Converting user information need into a query

Reference Interview database
Algorithm determines which follow-up questions are valid for which user-provided facts

Resource database
Algorithm determines which resources are appropriate to user need

Advice, a ranked list of resources & follow-up questions
Automated Reference Assistance (ARA): Reference for a New Generation

Resource Database Example

**ARA ARTICLE Search**

If you are looking for a particular article from 'Nature', it may be available online. Would you like to see which databases carry the journal 'Nature'? Here are 8 basic resources:

- **ArticlesFirst**
- **CAMEO** CMU's online library catalog
- **CMU Journal List** searchable database of all CMU owned journals
- **CMU's Full-text Journals List** CMU journals alphabetical list of full-text journals
- **CQ Library** search analysis reporting on the most current and controversial issues of the day
- **Expanded Academic ASAP** Scholarly journals, news magazines, and newspapers - many with full text and images
- **Lexis-Nexis Academic Universe** wide range of news, business, legal, medical, and reference information
- **PITTCAT** University of Pittsburgh's Library Catalog

Tell me more about what you're looking for

Reference assistance

List of most relevant resources

Reference Interview Example

**ARA INFO Search**

You can look up 'particle physics' in the dictionary or in the encyclopedias. You can search the library catalog for 'particle physics' or browse with 'particle physics' in the title.

- **Britannica Online**
- **Lexis-Nexis Academic Universe**
- **Merriam-Webster Collegiate Online Dictionary**
- **Wilson Biographies**
- **World Almanac**

Tell me more about what you're looking for

Reference Interview follow-up questions
ARA Technology

- Inference & resource information stored in XML
- Oracle 8i relational database technology
- Information retrieved by Java Beans
- Interface constructed using Java Server Pages
- Easy to add, remove, or modify resources
- Easy to customize

ARA Schedule

- Spring 2002
  - Index all e-resources in the Resource Database
  - Conduct user study & revise interface
  - Submit grant proposal
- Summer 2002 – release prototype
- Fall 2002
  - Market the ARA on campus
  - Monitor & study usage
**ARA 2002-2004**

- Improve the Inference Engine & Interview model
- Improve interface design & functionality
- Index print resources in the Resource Database
- Integrate chat software
  - No evidence that simply using appropriate resources will improve student work

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**ARA Dreams**

- Enable spoken dialog between users & librarians
- Enable users to select a reference personality
  - Implement multiple virtual reality agents
    - African American ✔️ Male
    - Asian ✔️ Female
    - Hispanic ✔️ Young
    - Punk ✔️ Old
- Commercialize & offer ARA versions adapted for different kinds of libraries
Thank you!

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