

Automated Reference Assistance: Reference for a New Generation



Denise Troll Covey
Associate University Librarian
Carnegie Mellon
CNI Meeting – April 2002

What is the ARA?

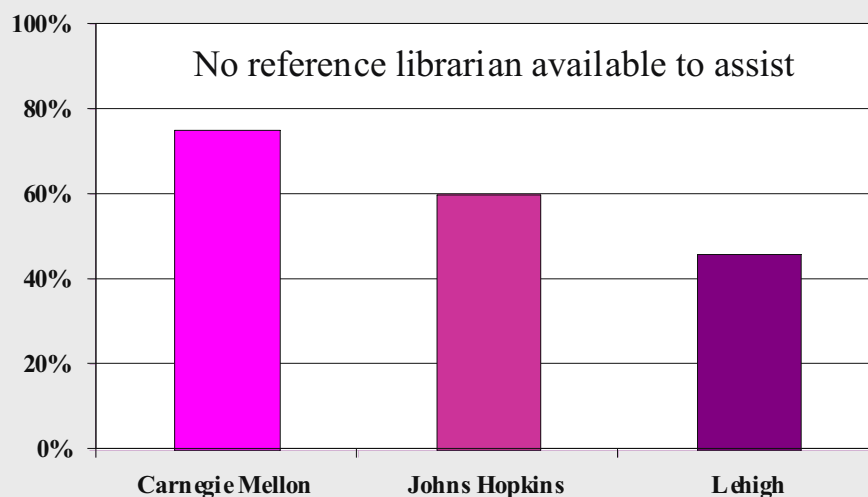
- Software designed to
 - Enhance, not replace traditional reference service
 - Elicit information about users & what they need
 - Suggest appropriate resources
 - Operate 24 x 7

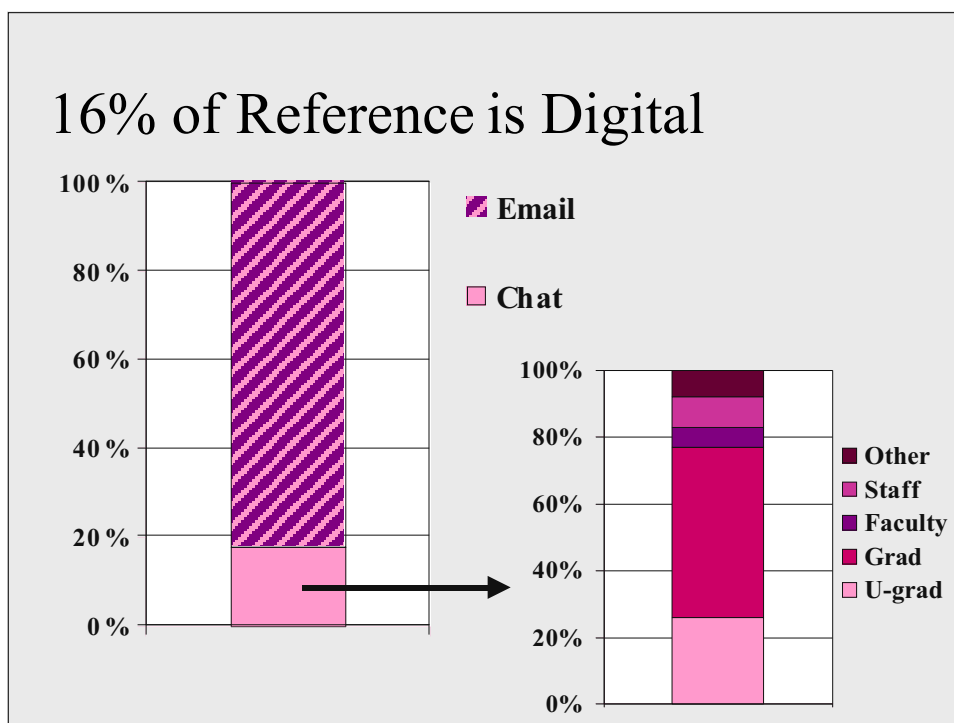
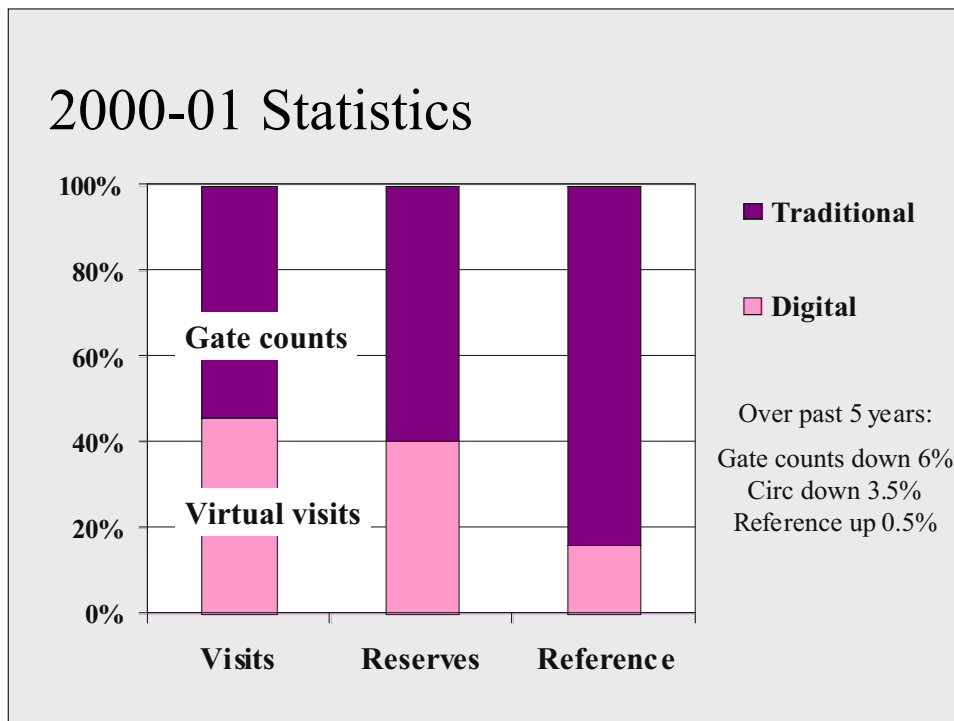
Why is the ARA?

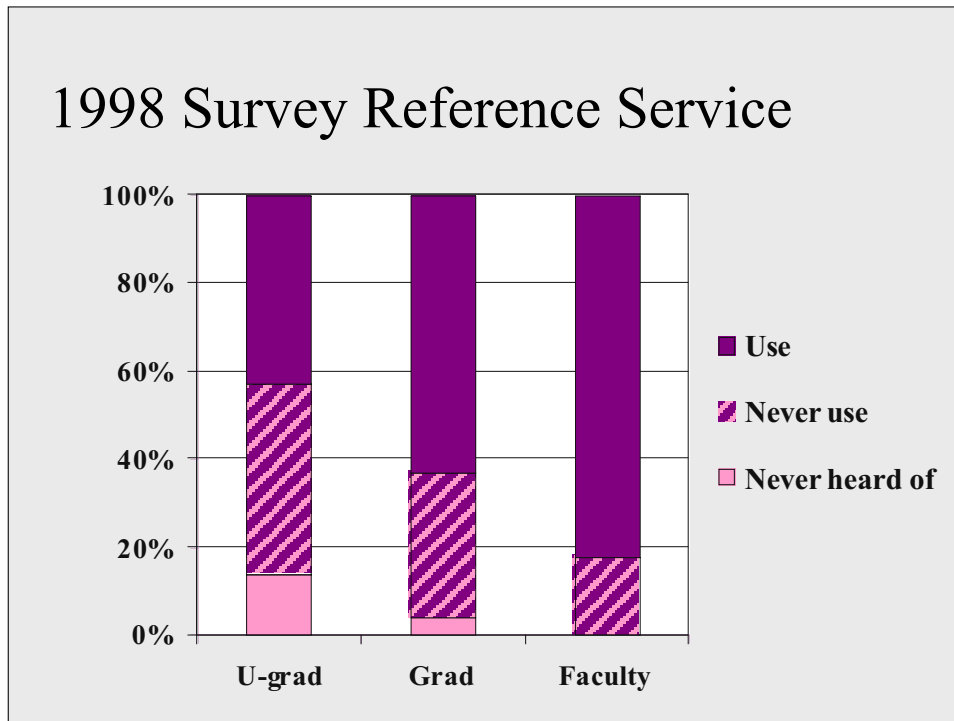
- Users value convenience, speed, ease-of-use
 - Prefer remote access, e-resources, & independence
 - U-grad students use inappropriate e-resources
 - Less than 6% of surface Web is scholarly content
 - No single Web search engine indexes more than 16%
 - Web magnifies problems with poor search strategies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

Carnegie Mellon
UNIVERSITY LIBRARIES

1999 Remote Use of E-Resources







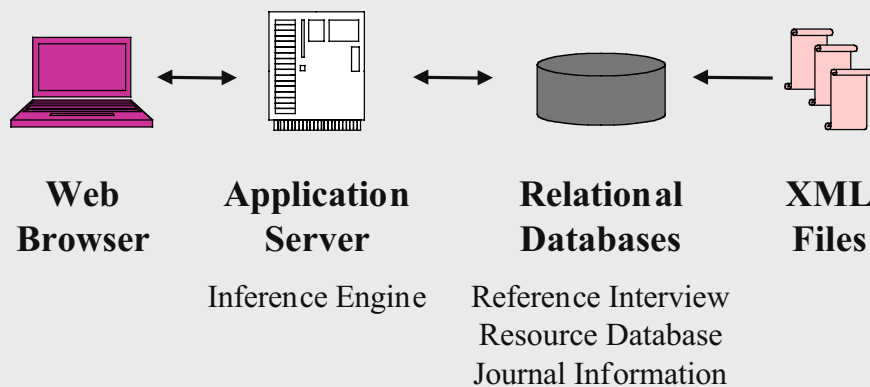
Goals of the ARA

- 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



ARA Web User Interface

The screenshot displays the ARA web interface. At the top left is the 'ARA' logo. To the right are navigation links: 'CMU Libraries / ARA Home / Search History / Help'. Below the logo is a welcome message: 'Welcome to the ARA, CMU's Automated Reference Assistant. I can help you find books, journals, articles and other resources. Currently, I know of 63 sources of information that might be useful for you.' The main section is titled 'Tell me what you're looking for :'. It contains three search categories, each with a pink background and a 'Submit' button. The first category is 'You're looking for a **book**', with options: 'about' (text input), 'called' (text input), and 'written by' (text input). The second category is 'You're looking for an **article**', with options: 'in the journal named' (text input) and 'in the subject area' (dropdown menu showing 'Arts'). The third category is 'You're looking for **information** about', with options: a text input field and 'in the subject area' (dropdown menu showing 'Art and Architecture').

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



Advice, a ranked list
of resources &
follow-up questions

Inference Engine

Converts 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

Resource Database Example

ARA ARTICLE Search [CMU Libraries / ARA Home / Search History / Help](#)

CAMEO (the library catalog) has a complete list of all journals which the library possesses.
[Search CAMEO for the journal 'nature'](#)

If you are looking for a particular article from 'nature', it may be available online.
 I know of the contents of many databases. Would you like to [see which databases contain the journal 'nature'](#)?
 I know of **8 basic resources** for *article in 'nature'*:

- **ArticleFirst**
OCLC index of articles from the contents pages of journals [\(more...\)](#)
- **CAMEO**
CMU's online library catalog [\(more...\)](#)
- **CMU journal list**
Searchable database of all CMU-owned journals [\(more...\)](#)
- **CMU's Full-text Journals List**
CMU Libraries alphabetical list of full-text journals [\(more...\)](#)
- **CQ Library**
In-depth analysis reporting on the most current and controversial issues of the day. [\(more...\)](#)
- **Expanded Academic ASAP**
Scholarly journals, news magazines, and newspapers - many with full text and images. [\(more...\)](#)
- **Lexis-Nexis Academic Universe**
A wide range of news, business, legal, medical, and reference information [\(more...\)](#)
- **PITTCAT**
University of Pittsburgh's Library Catalog [\(more...\)](#)

Tell me more about what you're looking for Searching for:
 query='nature' [\(more...\)](#)
 querytype='title' [\(more...\)](#)

Reference assistance

List of most relevant resources

Reference Interview Example

ARA INFO Search [CMU Libraries / ARA Home / Search History / Help](#)

You can look up 'particle physics' in [the dictionary](#) or in [the encyclopedia](#).

The library catalog, CAMEO, may also have books, journals, videos, or other information about 'particle physics'. You can search the library catalog for [subject='particle physics'](#) or [items with 'particle physics' in the title](#).
 I can also help you locate [articles](#), [dissertations](#), [statistics](#), or [standards](#) about 'particle physics'.
 I know of **5 basic resources** for *info about 'particle physics'*:

- **Britannica Online** [\(lookup 'particle physics'\)](#)
The complete encyclopaedia, with related Internet sites and more [\(more...\)](#)
- **Lexis-Nexis Academic Universe**
A wide range of news, business, legal, medical, and reference information [\(more...\)](#)
- **Merriam-Webster Collegiate OnLine Dictionary** [\(lookup 'particle physics'\)](#)
Merriam-Webster Collegiate OnLine Dictionary [\(more...\)](#)
- **Wilson Biographies**
The full text of the biographies from more than 100 print volumes of biographical reference books [\(more...\)](#)
- **World Almanac**
The World Almanac - fundamental reference resources [\(more...\)](#)

Tell me more about what you're looking for Searching for:
 que

Limit to subject area:

Look for:

Change search criteria: articles books dissertations and theses information journals standards statistics

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

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!

- Denise Troll Covey

Associate University Librarian for Arts, Archives, & Technology

Carnegie Mellon University Libraries

4909 Frew St., Hunt Library

Pittsburgh, PA 15213

troll@andrew.cmu.edu

412-268-8599