

Automated Reference Assistance: Reference for a New Generation



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CNI Meeting – April 2002

What is the ARA?

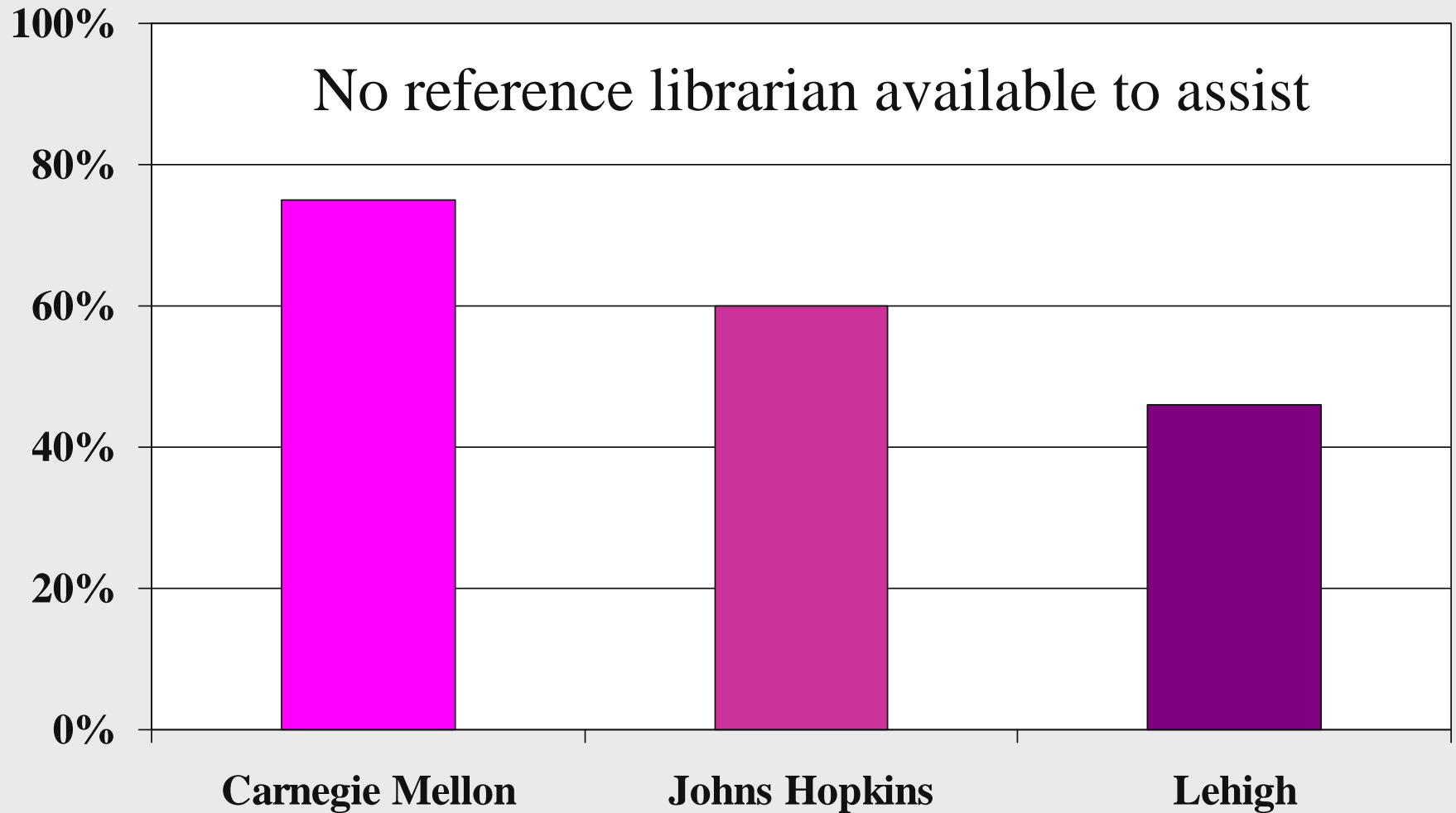
- Software designed to
 - Enhance, not replace traditional reference service
 - Elicit information about users & what they need
 - Suggest appropriate resources
 - Operate 24 x 7



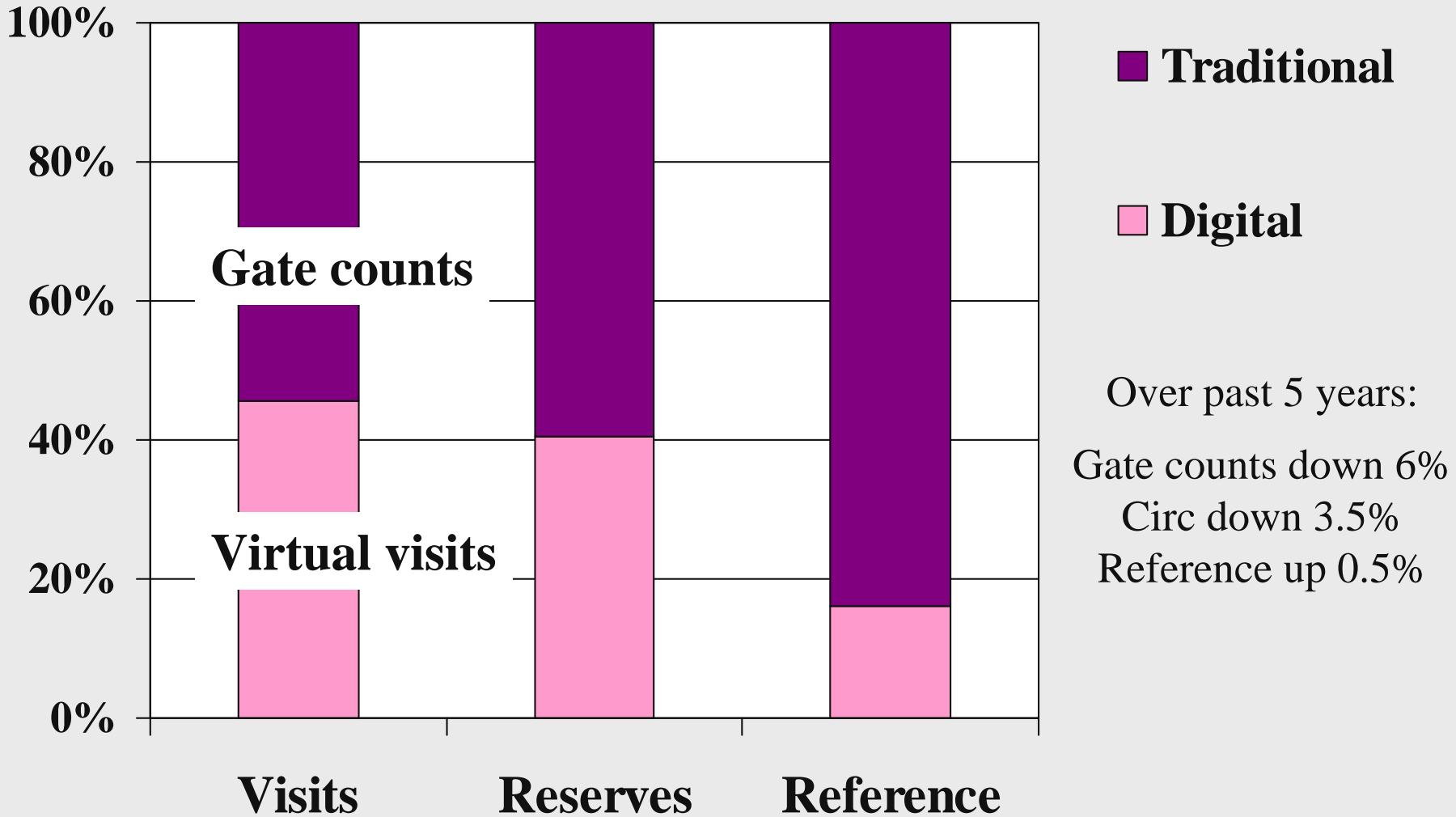
Why is the ARA?

- 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

1999 Remote Use of E-Resources

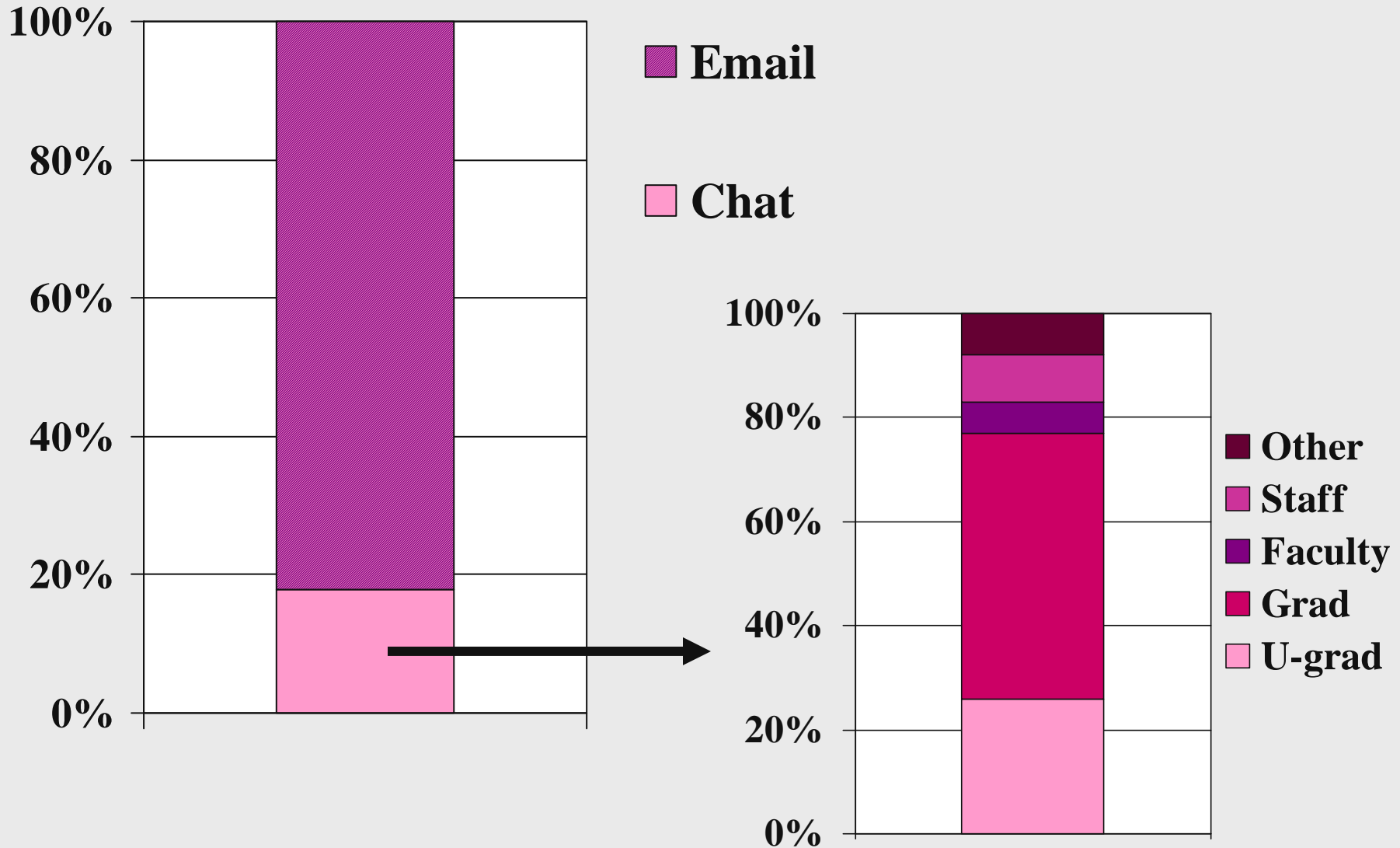


2000-01 Statistics

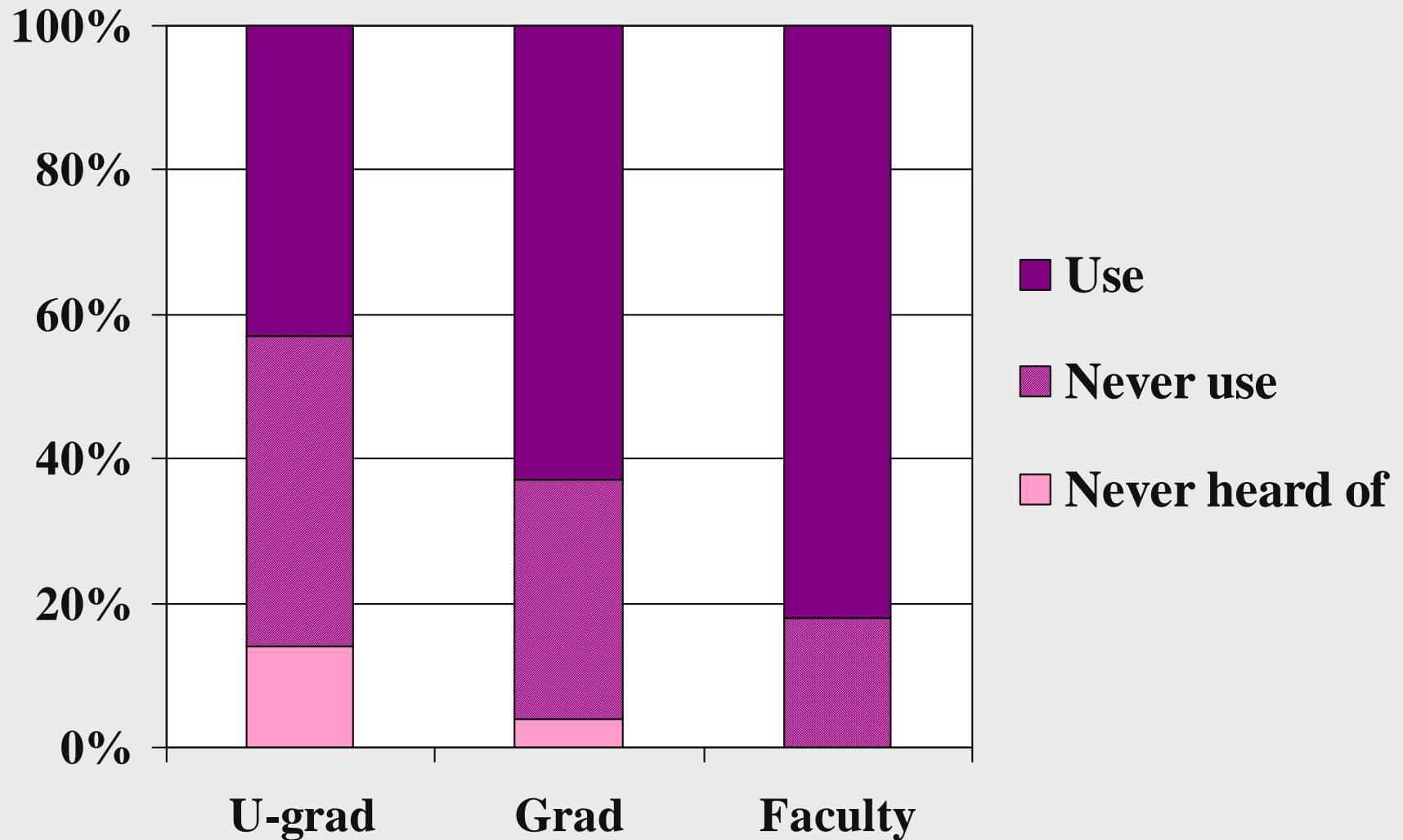




16% of Reference is Digital

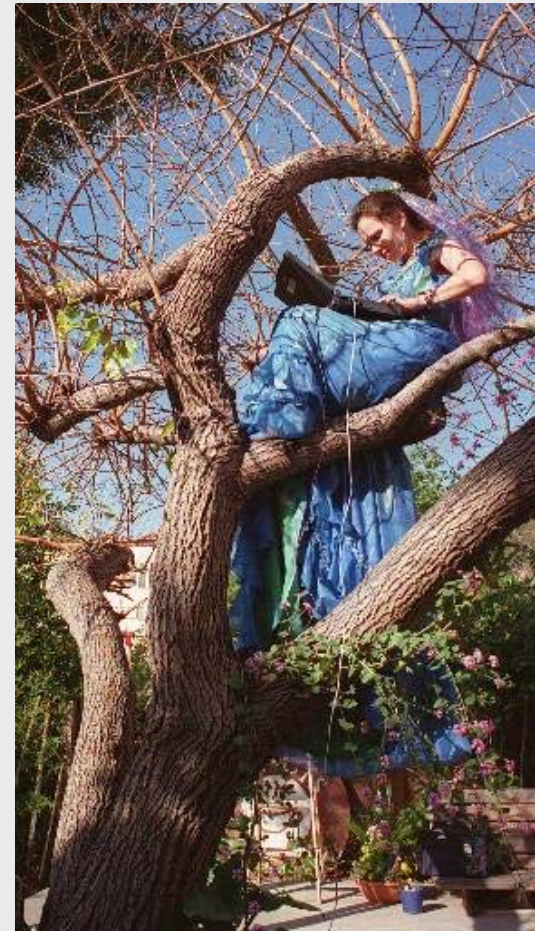


1998 Survey Reference Service



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





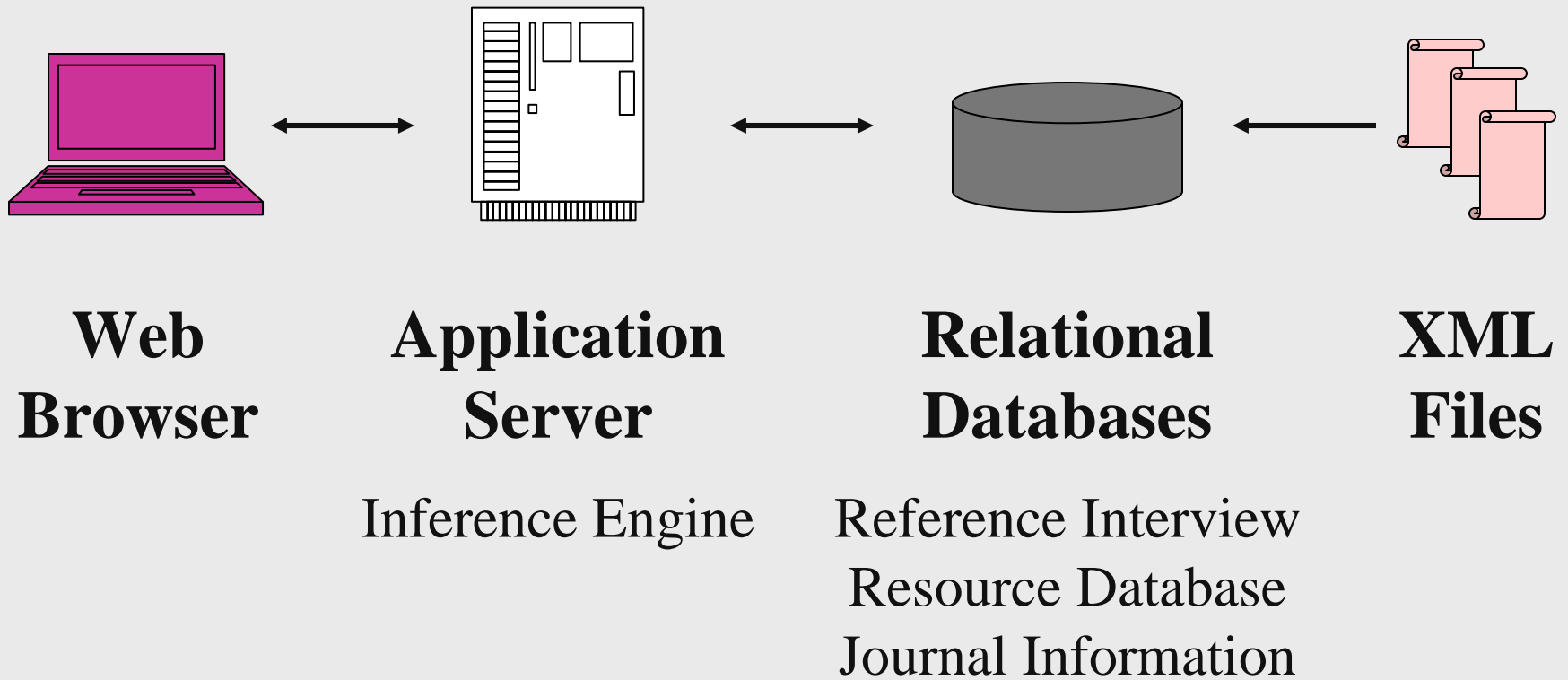
What the ARA Does

- 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

ARA

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

Welcome to the ARA, CMU's Automated Reference Assistant.

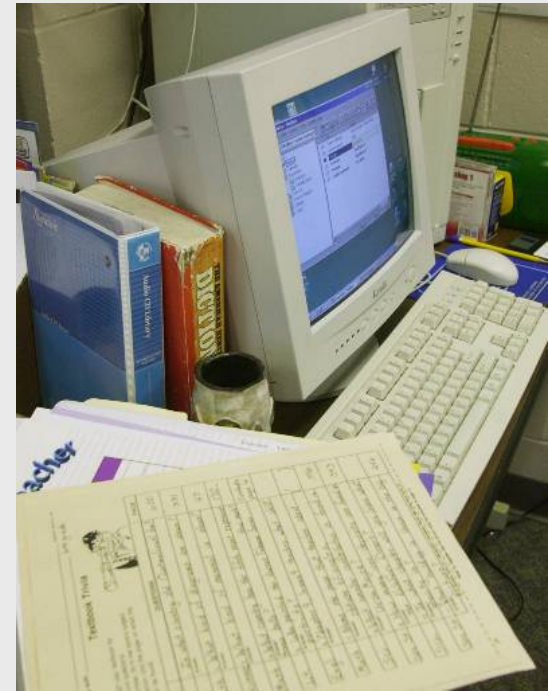
I can help you find books, journals, articles and other resources. Currently, I know of 63 sources of information that might be useful for you.

Tell me what you're looking for :

You're looking for a book	about	<input type="text"/>	<input type="button" value="Submit"/>
	called	<input type="text"/>	<input type="button" value="Submit"/>
	written by	<input type="text"/>	<input type="button" value="Submit"/>
<hr/>			
You're looking for an article	in the journal named	<input type="text"/>	<input type="button" value="Submit"/>
	in the subject area	<input type="text" value="Arts"/>	<input type="button" value="Submit"/>
<hr/>			
You're looking for information about		<input type="text"/>	<input type="button" value="Submit"/>
	in the subject area	<input type="text" value="Art and Architecture"/>	<input type="button" value="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

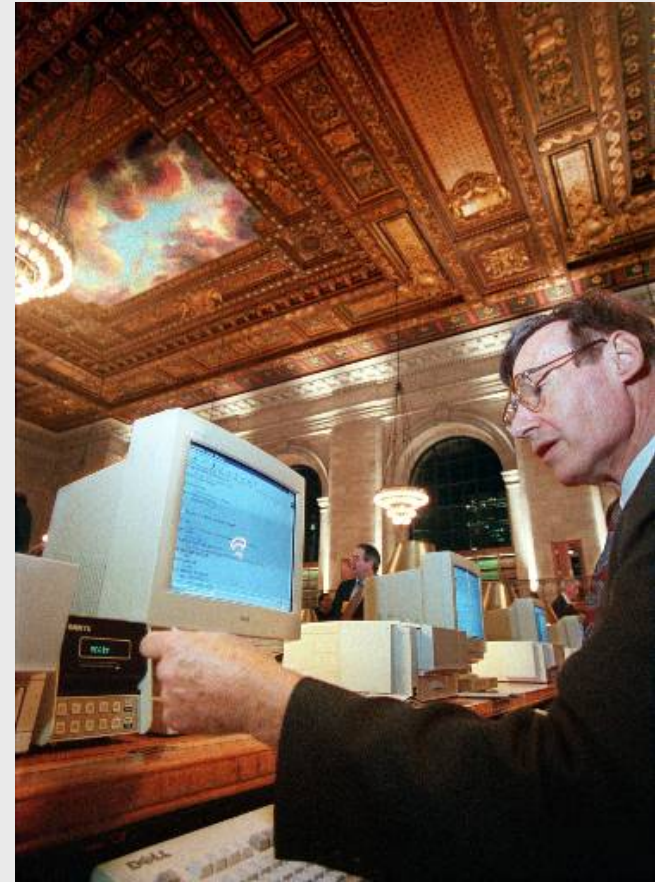


ARA Resource Database

- 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



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 [\(more...\)](#)

Reference
assistance

List
of most
relevant
resources

Tell me more about what you're looking for

Searching for:

query='nature' [\[remove\]](#)

querytype='title' [\[remove\]](#)

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 Almanacs - fundamental reference resources ([more...](#))

Tell me more about what you're looking for

Limit to subject area:

Look for

Change search type:

Show additional results:

Search for:

Search results: 1

Reference Interview follow-up questions

ARA Technology

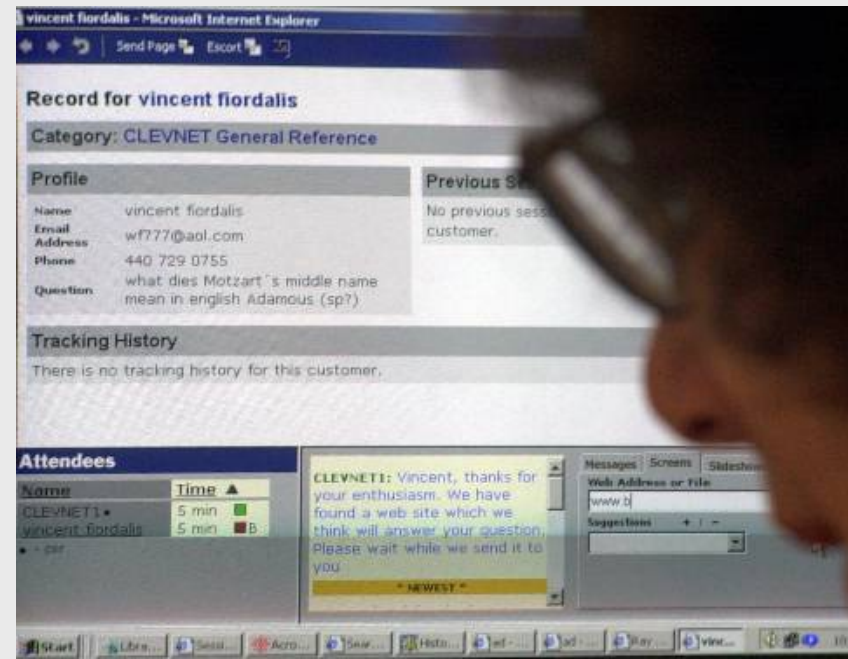
- Inference & resource information stored in XML
- Oracle 8i relational database technology
- Information retrieved by Java Beans
- Interface constructed using Java Server Pages
- Easy to add, remove, or modify resources
- Easy to customize

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
 - ✓ Asian
 - ✓ Hispanic
 - ✓ Punk
 - ✓ Male
 - ✓ Female
 - ✓ Young
 - ✓ Old
- Commercialize & offer ARA versions adapted for different kinds of libraries



Thank you!

- Photos from Associated Press Photo Archives
- Denise Troll Covey
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