



UMD – HCIL - SOH Exploratory Search Interfaces

How good is Web Search & Does Clustering Help?

Abdur Chowdhury
America Online Inc.

Goal of Today's Talk

1. Present one view on the quality of ad-hoc Web Search
2. Present some initial work on the challenges of understanding the effectiveness of search utilities “clustering”

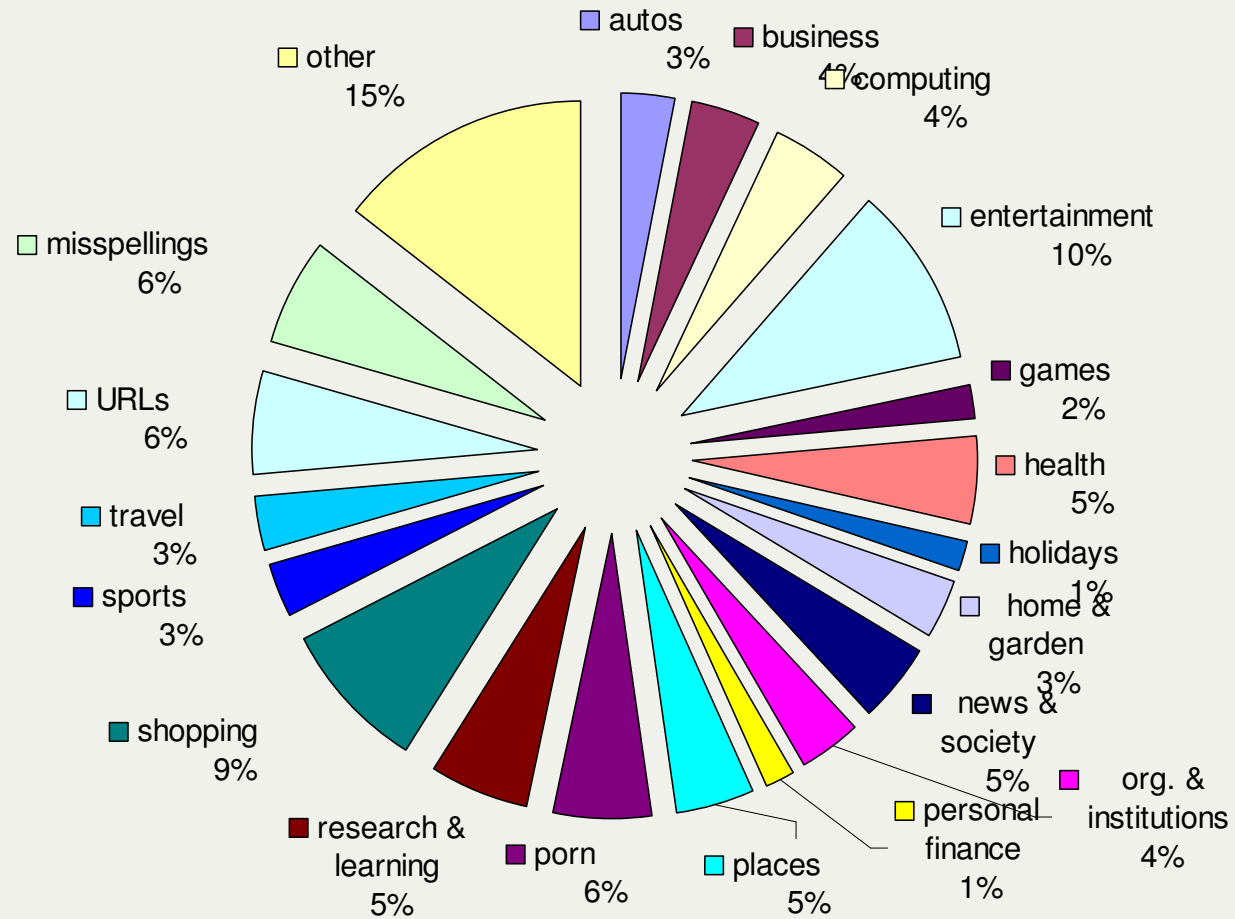
Outline

- 1. Quality of today's Search Systems*
2. Why still work on Search
3. Clustering Search Utilities
4. Evaluation of Clustering
5. Conclusions

Is Ad-Hoc Retrieval Good Enough?

- Users
 - Users expressing their needs as they see fit and expecting help
- Providers
 - Tools to find information:
 - Traditional ranked results, Spelling, clustering, suggested queries, answers, maps, etc...
- Questions
 - Are the users getting what they need
 - Are the providers making this process easier

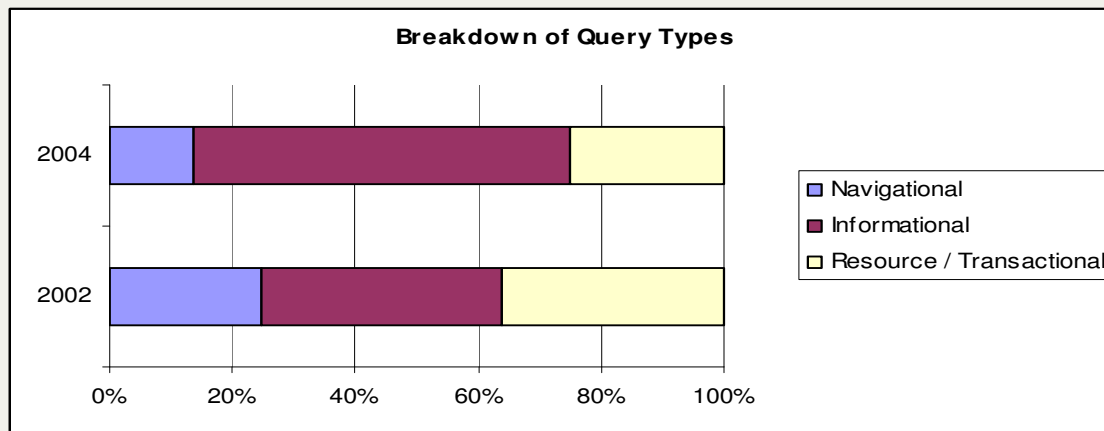
Query Breakdown by Category



Chowdhury 2004

User Search Tasks

- User tasks have been categorized into three basic classes: (Broder 2002, Rose 2004)
 - Navigational (ebay, 1040 ez form, etc...)
 - Informational (black bears, rock climbing, etc...)
 - Resource / Transactional (plan ticket to atlanta, buy books, etc...)



Traditional Metrics of Effectiveness

Mean Scores over 896 Manually Evaluated Web Queries

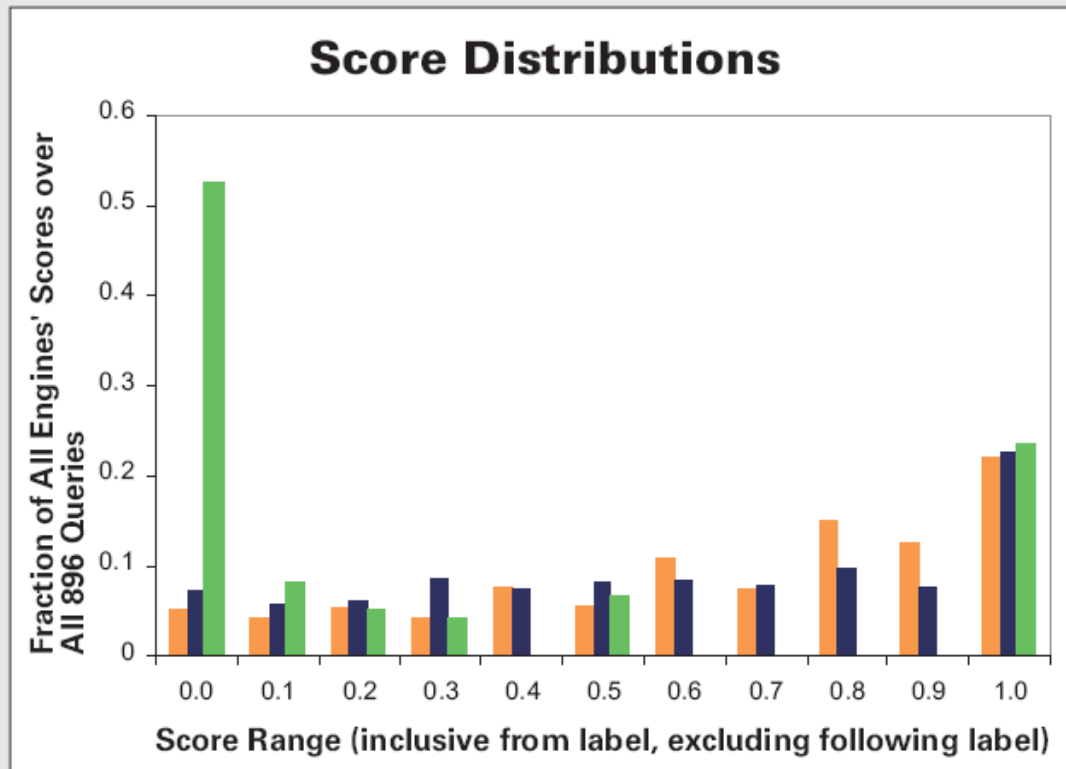
	AvgP	P@10	MRR
E1	0.632	0.690	0.359
E2	0.620	0.681	0.338
E3	0.611	0.676	0.312
E5	0.607	0.672	0.311
E4	0.600	0.667	0.283
E7	0.585	0.657	0.300
E10	0.573	0.634	0.313
E6	0.572	0.625	0.291
E9	0.568	0.635	0.241
E8	0.562	0.634	0.282

Outline

1. Quality of today's Search Systems
- 2. *Why still work on Search***
3. Clustering Search Utilities
4. Evaluation of Clustering
5. Conclusions

Who is average?

Legend Precision at 10 Average Precision Reciprocal Rank



- High % of queries
 - don't find the best page
 - have very low precision
- Results are not repeatable with smaller sets of queries (<650)

Usage

- Usage:
 - ~85% of our daily search traffic is produced by unique users issuing ≤ 3 queries
 - It is unlikely that these searches represent more than one or two search needs
 - 20-30% of queries are in some reformulation phase
 - ~25% of the queries users go to next pages
- The more successful a system is in finding information for a user, that unique user usage could
 - Decrease
 - Increase
- User workload
 - If users find their information with less effort, one could hypothesize that the system aided their search task

Review

1. Traditional metrics demonstrate the effectiveness of search engines as high
2. Examination of the distribution of retrieval effectiveness shows some queries do well while others do not
3. Examining usage of users there seems to be only a few needs that take a few queries
 - Points 2 & 3 provide evidence that Web search has room to improve

Outline

1. Quality of today's Search Systems
2. Why still work on Search
- 3. *Clustering Search Utilities***
4. Evaluation of Clustering
5. Conclusions

Clustering

- Search engine “salient phrase” extraction
 - Number of approaches
 - Related Searches
 - “Salient phrase” extraction
 - Clustering → “cluster naming”
- All approaches provide an automatic means of presenting query variations with the goal of getting the user to their need faster
- Clustering provides an additional feature in that it grounds the user in the information space, e.g. related concepts
 - Allows them to brose the information space in a different way

Clustering

The screenshot shows the AOL Search interface. At the top, the AOL logo is on the left, and a search bar contains the text "Re" followed by a green "Search" button. Below the search bar, the search term "plumber" is entered, and a dropdown menu titled "Smartbox™ Suggestions" is open. The suggestions are:

- Search the web for "plumber"
- Search locally for "plumber"

To the right of the suggestions is a link that says "What is this?". Below the search bar, the text "Web Matches for: plum" is visible. On the left side of the page, there is a vertical navigation menu with the following items:

- Web Matches
- ▶ Plumbing
- ▶ Games
- ▶ Master Plumber
- ▶ Job
- ▶ Friend
- ▶ Leaks
- ▶ Software, Daily Upda
- ▶ Building
- ▶ Answer

Below the navigation menu, the "Sponsored Links" section is displayed. It includes the text "Learn more about Sponsored Links | Provided by a third party" and four sponsored links:

- ◆ **Find Your Plumber Here** - Our plumbers are rated by you. Find the right **plumber** for yo
www.findaplumber.com
- ◆ **Become a Plumber** - Special offer - save £50. Flexible training to NVQ level.
www.olciplumbing.info
- ◆ **Mr. Rooter Plumbing** - Expert Plumbing Drain Sewer Service 877-766-8375
www.mrrooter.com
- ◆ **Plumber** - Complete Plumbing & Drain Cleaning Services - Learn More & Get Quotes

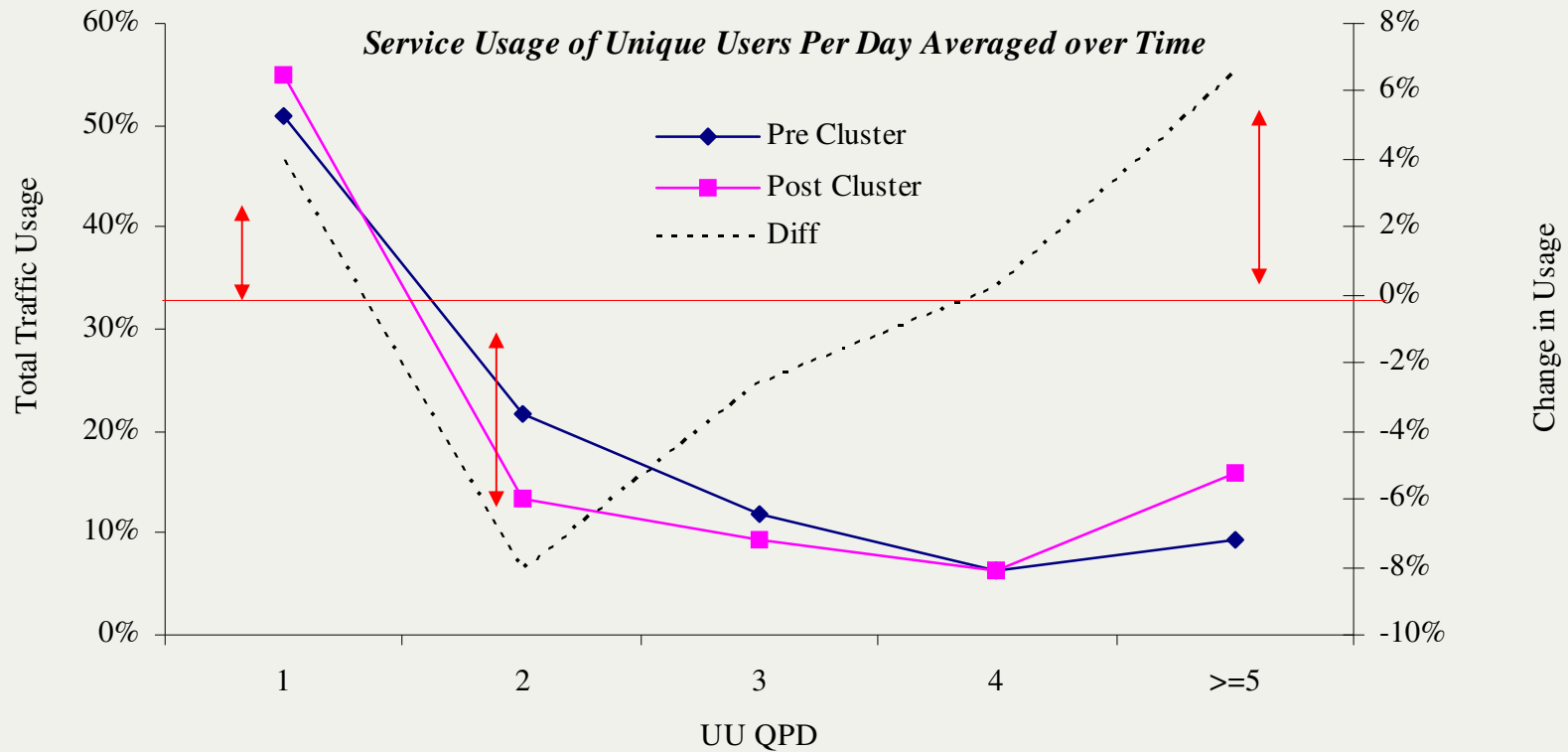
Outline

1. Quality of today's Search Systems
2. Why still work on Search
3. Clustering Search Utilities
- 4. *Evaluation of Clustering***
5. Conclusions

Are Clustering Approaches Useful

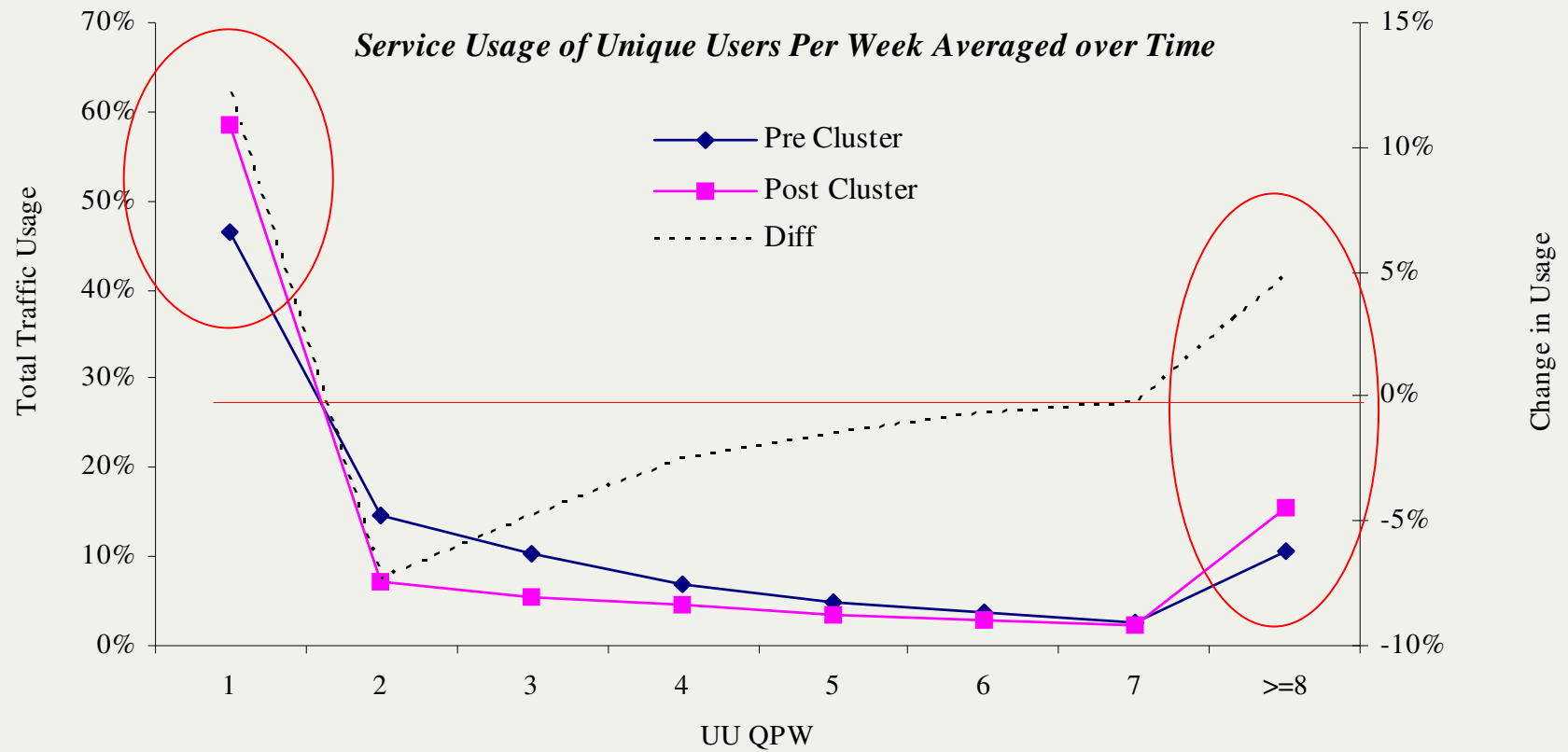
- Traditional Metrics (may not be appropriate)
 - Precision
- Implicit Metrics (need to be explored)
 - Session time
 - Usage
 - **Session lengths**
 - Others?

User Daily Usage Changes



	Day	Post - Day	Diff
1	51%	55%	4%
2	22%	13%	-8%
3	12%	9%	-3%

User Weekly Usage Changes



Outline

1. Quality of today's Search Systems
2. Why still work on Search
3. Clustering Search Utilities
4. Evaluation of Clustering
- 5. *Conclusions***

Conclusions

- Current ad-hoc retrieval is good by traditional metrics, but unlikely to be the end of searchers needs
- Clustering UI's seem to have changed user behavior
- Implicit metrics of understanding these UI's leaves many questions