

Complex Search

From Lookup to Understanding

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Keynote at Datasys and Softnet 2011,
Barcelona
2011/10/24



European Union
European Social Fund



Investing in your future



Where am I from?

USA (live)

Germany (born)

Estonia (tele-work)



maps taken from wikipedia

Kazakhstan (future)



W



Tartu (research)

Aachen (PhD)



Ulrich Norbisa
University of Tartu

Research Background

- PhD in Software Engineering
- Still teaching in SE – currently writing textbook on story driven modeling
- Leader of two research groups at UT:
 - Ubiquitous Systems (p2p systems, mobile computing, biometry)
 - Information Management
 - Measurement of complex search
 - Graph-based storage of personal information
 - Graph-based information visualization



My research groups

- Information Management
 - 3 PhD students, 2 Master students
 - 1 PhD Student here:
 - Tonu Tamme (IMMM4)
 - “Impr. Email Management”
- Ubiquitous Systems
 - 1 PhD student, 3 Master, 4 Bachelor students
 - 1 of them here:
 - Artjom Lind (Mobility4)
 - “Mobile F2F”
 - go to their talks!



Content

- Search today – complex search identified
- Current Search research
- Measuring Complex Search (Search-Logger)
- Ways to better understanding?



Search Means – What do you use? (in class)

- Internet
 - Google, Google Scholar, webcrawler
 - baidu
 - wikipedia
 - facebook
- Other means
 - library, newspapers

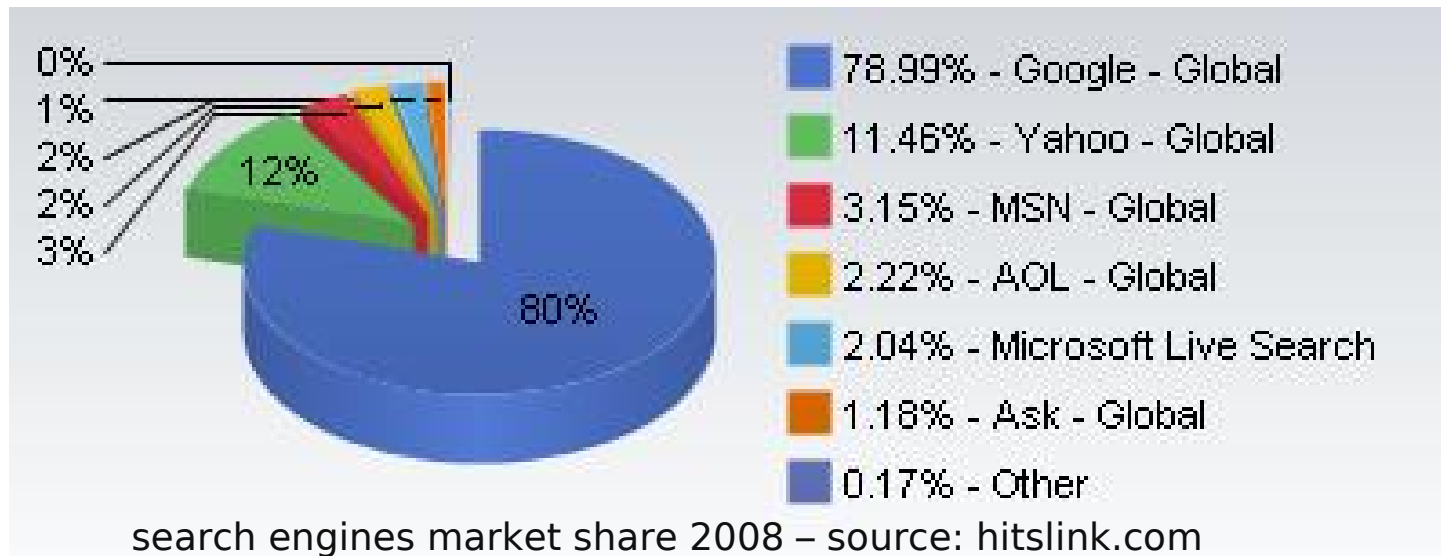


Search Means – what is used

- Internet
 - Google (search, maps, etc.)/Yahoo/Bing
 - Craigslist/Amazon/Ebay/Kayak/Facebook/Ask
 - PubMed/IEEE
 - Wikipedia
 - Wolfram Alpha
- Other means
 - Library (also Internet)
 - Newspaper (news and classifieds)
 - Bulletin Board (in supermarket)
 - Ask human/expert



Market Share of the Search Titans



Do you search? How and why?

- Who of you searches a lot?
- Who of you uses for search the Internet?
(Who not? Who still uses anything else?)
- Who is sometimes unhappy with their search experience?
- Why, in which cases?



Search Cases

Personal Motivation

- Find a list of still open shops, where you can buy dance shoes (ballroom dance shoes, sneakers) near Courthouse or Clarendon, Arlington, Virginia, USA
- Is there a video pcmcia expresscard with Nvidia chipset? (List of them)
- Document, how you can make "Immutable Pages" in the moin moin wiki editable?



Search Cases

Your daughter Anna is to graduate from high-school and wants to study abroad in the field of either political sciences or architecture. You can support her with 2000 Euro per month. Which universities can you recommend that are affordable and will offer the best career perspectives after graduating? Please compile a list of 10 universities.



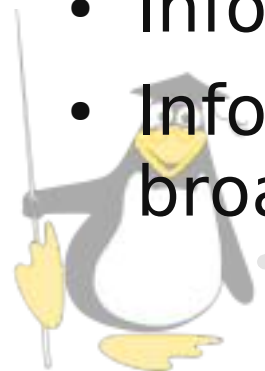
Search Cases

You have been offered the job as rector of a Goethe institute (coordinating regional German language education abroad). It is very likely that you will be sent to Astana, Kazakhstan. Collect one page of comprehensive facts about the political situation and quality of life in Astana.



Problems in Today's Search

- Information outdated
- Information need not specifiable
- Search only query/answer
- Context important (and not specifiable)
- Choice of websites too diverse
- All parts of pages indexed → unreasonable combinations
- Information scattered via multiple web-pages, cannot be directly found
- Information need hard to aggregate
- Information from query is dropped (try to google: broadcom BCM4727 linux module)

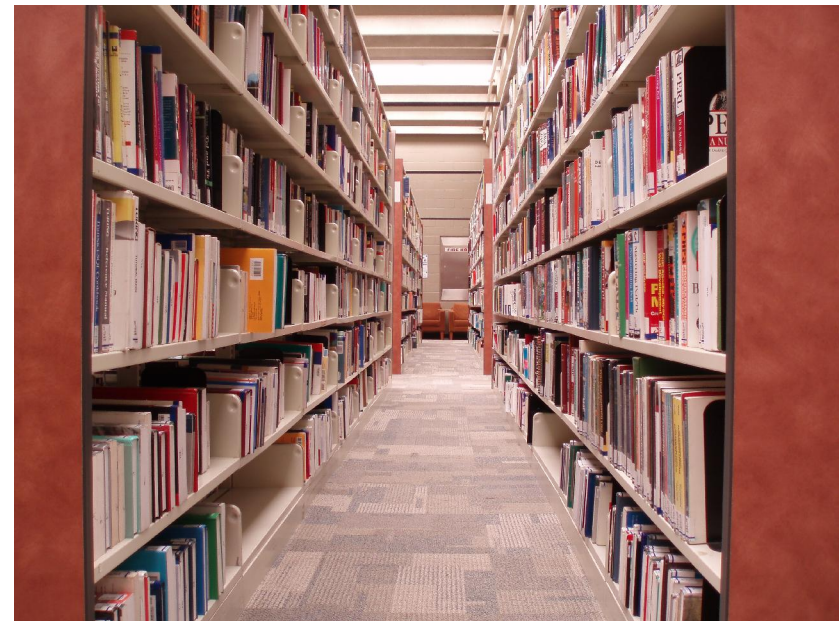
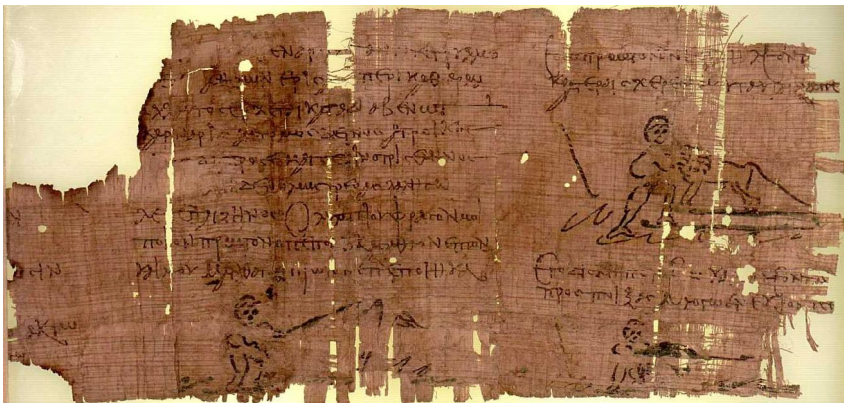
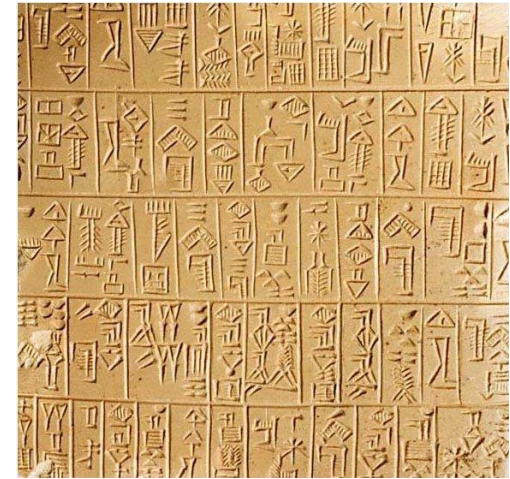


What's wrong?

- These cases are special.
- Why?
 - Much more than query/answer
 - Some kind of iteration/interaction, multiple search windows/tabs
 - Take a long time (complex)
 - Require critical thinking
 - Part of the search is happening outside of the browser (maybe in users head)



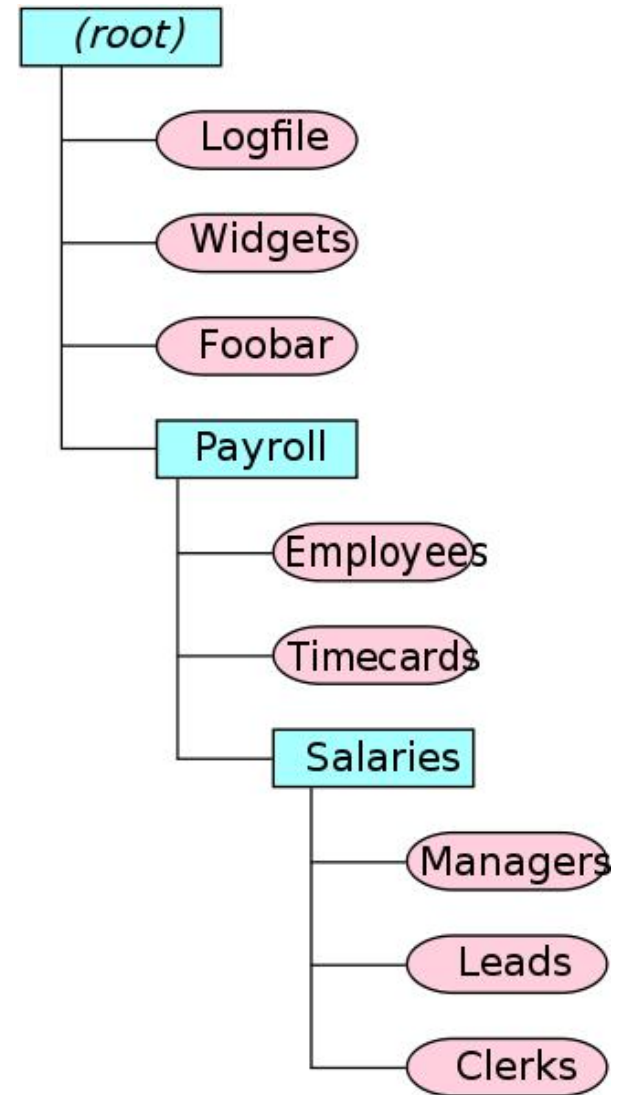
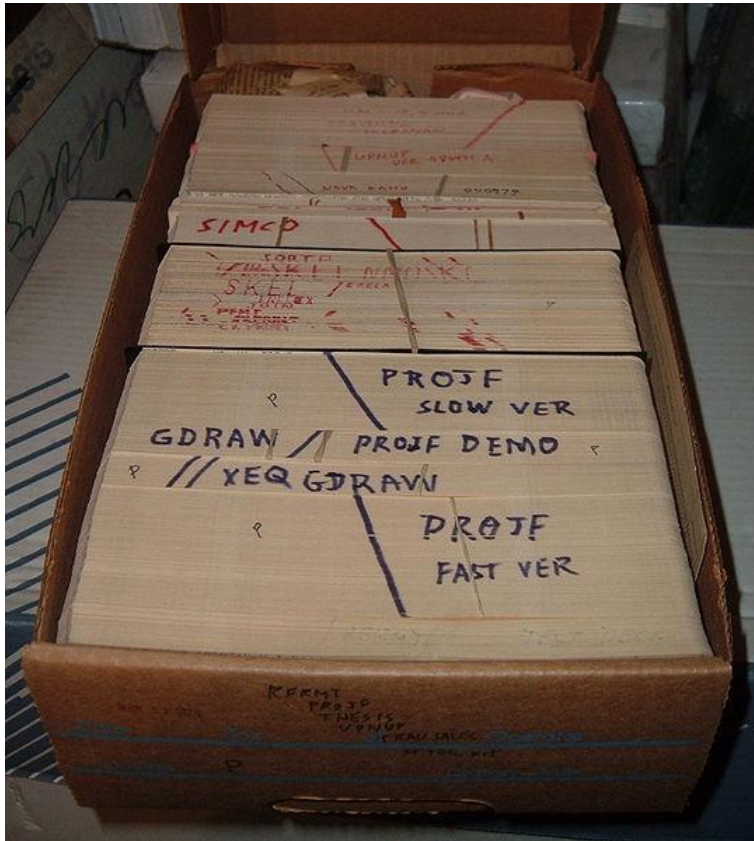
How do we store information?



picture source: wikipedia



In Documents/Files and Folders



picture source: wikipedia



What Information is Retrieved?

- Still documents
- Today's search research:
 - Retrieving single documents
 - Optimize precision
 - Optimize ranking in first 10 hits
 - Improve display of the 10 results



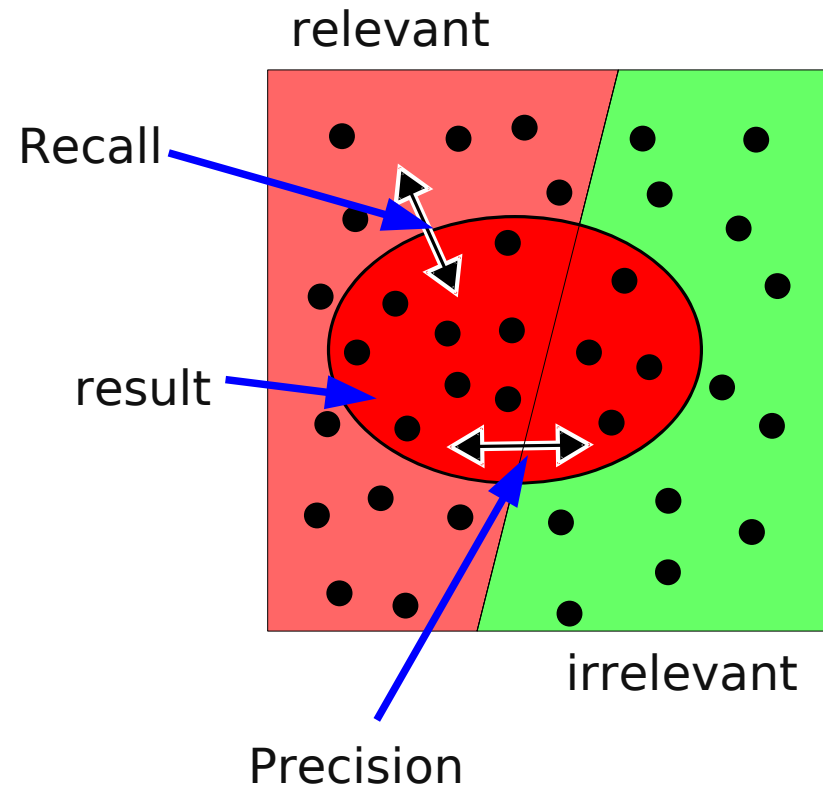
Search Measurement

- Precision

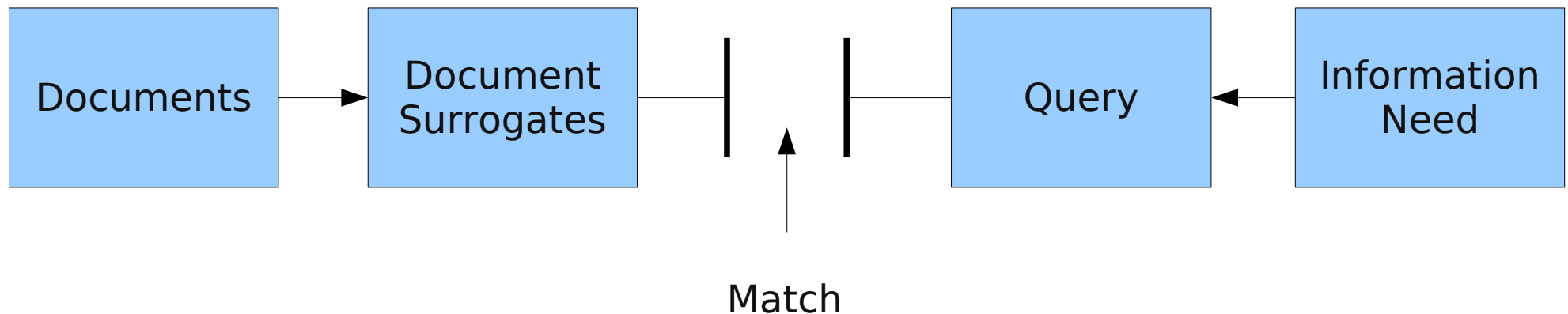
- Ratio of retrieved relevant documents to total number retrieved in a search.

- Recall

- Ratio of retrieved relevant documents to total number of relevant documents.



Fundamental Problem



- Only query/answer paradigm
- No intuitive translations
 - Need → query
 - Document list → need
- Only looking up documents supported (lookup)

source: Traditional IR Model, Bates, 1989



Current Trends

Personalized Ranking

[Advanced Search](#)

Web [+ Show options...](#)

Results **1 - 10** of about **302,000** for **[dance shoes virginia](#)**. (0.47 seconds)

[Dance Supplies Directory of Virginia](#)

Dance Supplies Directory of **Virginia**, Find or Locate **Dance** Supplies, **shoes**, **dance**, capezio, bloch, ballet, tap, wear, pointe, jazz, bags, tights, leotards, ...

virginia.uscity.net/Dance/Supplies/index.html - [Cached](#) - [Similar](#) -   

[Costumes, Ballet shoes, Dance wear, Chantilly, Va - Prima Dance ...](#)

Pointe **Shoes**; Ballet **Shoes**; Jazz **Shoes**; **Dance** Sneakers; Tap **Shoes**; Character **Shoes**; Lyrical **Shoes** ... Classes are located in Chantilly, **Virginia**. ...

www.primadancesuppliesandcostume.com/ - [Cached](#) - [Similar](#) -   

[Athletic & Dance Shoes Retail in VA Yellow Pages by Superpages](#)

Select a **Virginia** City to view Athletic & **Dance Shoes** Retail Listing. Athletic & **Dance Shoes** Retail · Aldie Athletic & **Dance Shoes** Retail ...

www.superpages.com/yellowpages/...Dance+Shoes.../S-VA/ - [Cached](#) - [Similar](#) -   

Promote



Current Trends

Suggestions/Discovery



horoscope love |

horoscope love **compatibility**

horoscope love **match**

horoscope love **matches**

horoscope love **compatibility chart**

horoscope love **calculator**

horoscope love **match compatibility**

horoscope love **signs**

horoscope love **2009**

horoscope love **test**

horoscope love **meter**

Google Search I'm Feeling Lucky

[Advanced Search](#)
[Language Tools](#)



Google Universal Search

news

Web [+ Show options...](#)Results 1 - 10 of about 8,500,000 for **angela merkel**. (0.14 seconds)

News results for **angela merkel**



Germany's **Merkel**: [advocate of strong US ties](#) - 1 hour ago
 BERLIN — **Angela Merkel**, the first leader of reunited Germany to grow up under communist rule, has worked as chancellor to warm up ties with the United ...

[The Associated Press](#) - [1010 related articles »](#)

Angela Merkel: [From shy physicist to two-term chancellor](#) -

[Deutsche Welle](#) - [436 related articles »](#)

Merkel and Sarkozy scupper Blair's presidential hopes -

[Deutsche Welle](#) - [203 related articles »](#)

Angela Merkel - Wikipedia, the free encyclopedia

On 25 September 2007, Chancellor **Angela Merkel** met the Dalai Lama for "private and informal talks" in Berlin in the Chancellery amid protest from China. ...

[Early life](#) - [Member of Bundestag and ...](#) - [Leader of the Opposition](#)

en.wikipedia.org/wiki/Angela_Merkel - [Cached](#) - [Similar](#) - [🗨](#) [📄](#) [🗪](#)

#1 **Angela Merkel** - Forbes.com

Seeking second term in national general election at the end of September; plans to form new coalition with the liberal Free Democrats and ditch her current ...

www.forbes.com/.../power-women-09_Angela-Merkel_34AH.html -

[Cached](#) - [Similar](#) - [🗨](#) [📄](#) [🗪](#)

Angela Merkel Lingerie Ad Shocks Germany

May 1, 2009 ... The AFP reports that German Chancellor **Angela Merkel** appears in a lingerie ad wearing nothing more than a purple matching bra and panties ...

www.huffingtonpost.com/.../angela-merkel-lingerie-ad_n_194766.html -

[Cached](#) - [Similar](#) - [🗨](#) [📄](#) [🗪](#)

Image results for **angela merkel** - [Report images](#)



generic search results

images

Angela Merkel's quiet revolution. - By Anne Applebaum - Slate Magazine

Nov 2, 2009 ... Did you know that there were German elections in late September? Were you aware that the German socialists were soundly defeated?

www.slate.com/id/2234337/ - [Similar](#) - [🗨](#) [📄](#) [🗪](#)

How **Angela Merkel** quietly sank Tony Blair's bid to become EU ...

Oct 29, 2009 ... German chancellor is thought to have convinced Nicolas Sarkozy to change his mind on backing former British prime minister.

www.guardian.co.uk/world/2009/.../merkel-sank-blair-eu-bid - [Cached](#) - [Similar](#) - [🗨](#) [📄](#) [🗪](#)



Bing tidier?

AACHEN[News](#)[Aachen Map](#)[Aachen Tourism](#)[Aachen Restaurants](#)[Aachen Newspaper](#)[Aachen Airport](#)[Images](#)

RELATED SEARCHES

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SEARCH HISTORY

[aachen](#)[cancer](#)[paracetamol](#)[angela merkel](#)[See all](#)[Clear all](#) | [Turn off](#)

ALL RESULTS

1-20 of 32,700,000 results · [Advanced](#)**[News about aachen](#)**

- German trial of former SS member starts in **Aachen**

AACHEN, Germany - The trial of 88-year-old former SS soldier Heinrich Boere, who has confessed to killing three Dutch civilians... [CNBC](#) 6 days ago

- RWTH University of **Aachen** Takes Delivery of Nanolnk's DPN... [Azom.com](#) 7 days ago

[See today's top stories](#) · [Create news alert](#)**[Aachen - Wikipedia, the free encyclopedia](#)**

Aachen (German pronunciation: ; French, and, historically, English: Aix-la-Chapelle, Ripuarian: Oche, Dutch: Aken) is a historic spa city in North Rhine-Westphalia, Germany.

[History](#) · [Main sights](#) · [Economy](#) · [Transport](#)en.wikipedia.org/wiki/Aachen · [Enhanced view](#)**[RWTH Aachen University - Home](#)**

Imprint

www.rwth-aachen.de/go/id/bdz · [Cached page](#)**[Aachen Cathedral - Wikipedia, the free encyclopedia](#)**

Aachen Cathedral, frequently referred to as the "Imperial Cathedral" (in German: Kaiserdom), is a Roman Catholic church in **Aachen**, Germany. The church is the oldest cathedral in ...

en.wikipedia.org/wiki/Aachen_Cathedral · [Enhanced view](#)**[aachen Stock Photo Stock Image by 3quarks](#)**

Have questions? Click here to contact us for help or questions with this product seven days a week.

www.the3dstudio.com/product_details.aspx?id_product=182048 · 5 hours ago**[About the City of Aachen](#)**

also known as Aix-la-Chapelle ... Aken ... Aquis Grana ... Aquis Grán ... In every respect, **Aachen** is a town which distinguishes itself by a wide variety: historical ...

www-i5.informatik.rwth-aachen.de/mjf/stadt-aachen.html · [Cached page](#)[See more results](#)**[Aachen Map »](#)****[Map of Aachen](#)**Map of **Aachen** and travel information about **Aachen** brought to you by Lonely Planet.www.lonelyplanet.com/maps/europe/germany/aachen/

Wolfram Alpha



weather



Assuming "weather" is a weather query | Use as a [word](#) instead

Input interpretation:

weather

Latest recorded weather for Washington, District of Columbia: [Show metric](#) | [More](#)

temperature	64 °F
conditions	cloudy
relative humidity	34% (dew point: 36 °F)
wind speed	10 mph

(25 minutes ago)

[Units >](#)

Weather history & forecast:

[Current week](#) | [Show metric](#) | [More](#)

Temperature:

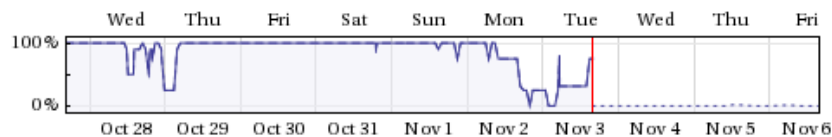


minimum: 45 °F
Tue, Nov 3, 6:45am, ...

average: 58 °F

maximum: 72 °F
Wed, Oct 28, 2:15pm, ...

Cloud cover:



\$859 in EUR



Input interpretation:

convert \$859 (US dollars) to euros

Result:

€578.89 (euros) (at current quoted rate)

Exchange history for \$ 859 (US dollars):

[Last year](#)



1-year minimum €571.69 (October 23, 2009 | 12 days ago)

1-year maximum €686.52 (November 11, 2008 | 12 months ago)

[Units >](#)

Additional currency conversions for \$ 859 (US dollars):

[World currencies](#)

JPY	¥77740 (japanese yen)
GBP	£520.33 (British pounds)
CNY	¥5864 (Chinese yuan)
CAD	C\$915.09 (Canadian dollars)
MXN	\$11410 (Mexican pesos)

Classic Query Types

(Broder, 2002)

- Informational

- Looking for information on a certain topic
- User wants to view a few relevant pages

- Navigational

- Looking for a (known) homepage
- User wants to navigate to this homepage, only one relevant result

- Transactional

- Looking for a website to complete a transaction
- One or more relevant results
- Transaction can be purchasing a product or downloading a file



Facts from User Tests

(Lewandowski, 2006)

- More than 40% of searches are navigational
- Queries
 - Average length: < 2 words
 - ~50% of queries just one word
- Search engine results pages (answer)
 - 80% of users no more than first results page
 - Users normally only view the first few results
 - Users only view up to five results per session
 - Session length is less than 15 minutes
- Users are usually satisfied with the results



More Innovation in Search (especially fulfilling transact. lookups)

- Vertical (domain specific) search, search 3.0:
 - Channeled information for particular area
 - Spiders instead of crawlers
 - Spiders scrape the content of pages
- Examples:
 - Travel search sites
 - Professional hardware search sites (for doctors, machine engineers)
 - Media related sites (video, music, books)
 - Domain libraries (CS library, Math library)



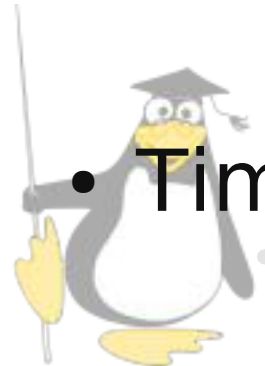
Our Definition of Search

- *Search* is the **process** to satisfy an information need.
- Search is *successful*, if need is satisfied.
- *Search task* is the **description** of the Search. If the search takes long, it is possible that the search tasks changes.



Information Need

- Why do you search the Internet (reasons, what do you want to achieve)?
- Pair up with your neighbor
- Write down 5 points (abstract terms, why you search)
- Think,
 - which of these can be easily fulfilled by the traditional lookup offered in the net,
 - which require thinking and iteration.
- Time: 5 minutes

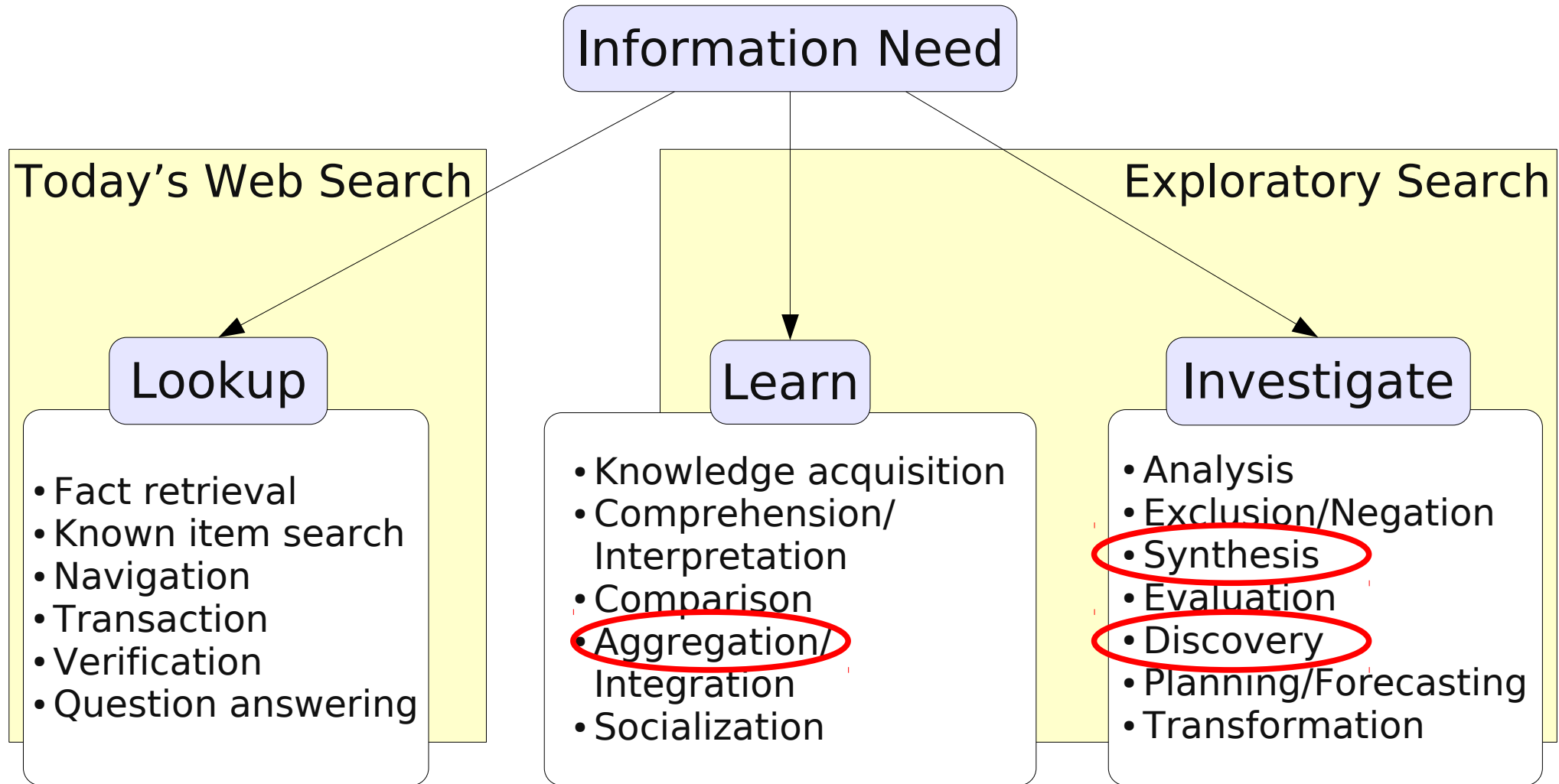


Information Need (in class)

- relation between different fields, mapping
- routing, navigation, a way
- accuracy, ensuring it, credibility
- reputation about projects, people, products



Exploratory Search



source Marchionini, 2006



Complex Search

- Involvement of multiple steps
- Time consuming
- At least one of Discovery, Aggregation, Synthesis strongly present



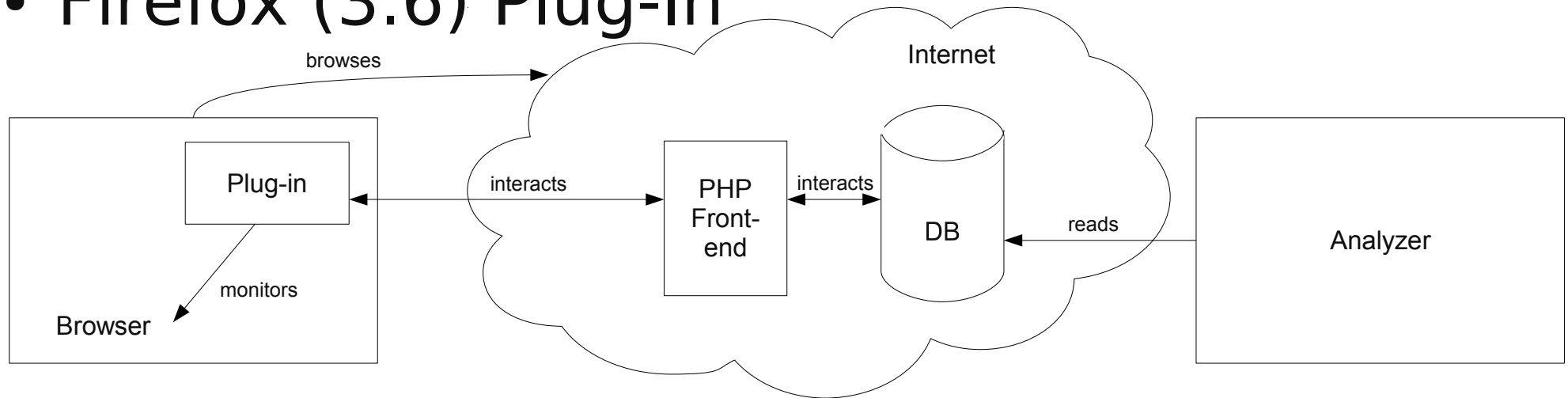
How could we measure complex search?

- Classic measures for single queries
- User behavior
- Demographics
- Whole search spanning multiple queries and information aggregation and synthesis
- Evaluate aggregation information (clipboard, bookmarks)
- User feedback

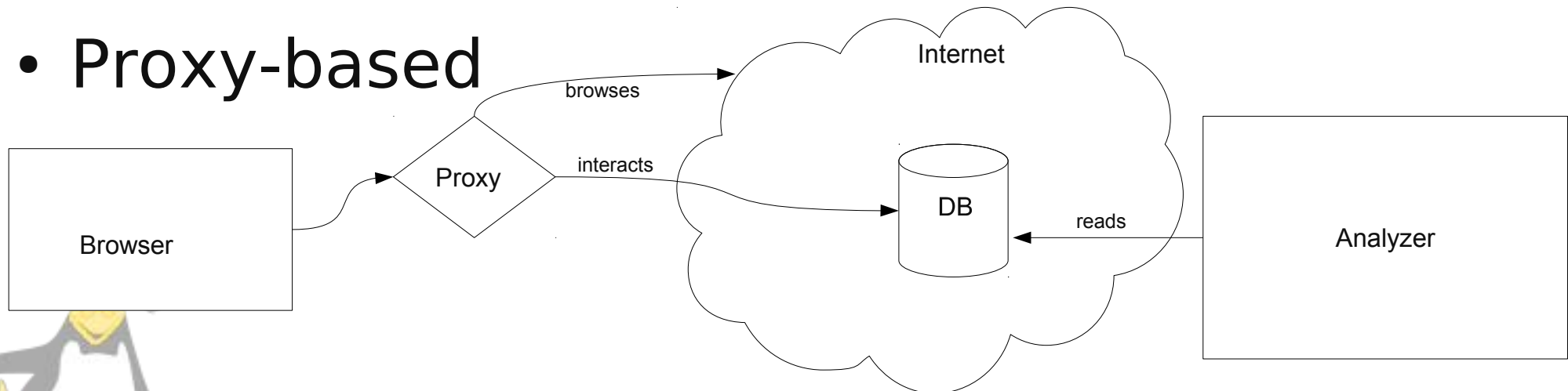


Research Project: Search-Logger

- Firefox (3.6) Plug-In



- Proxy-based



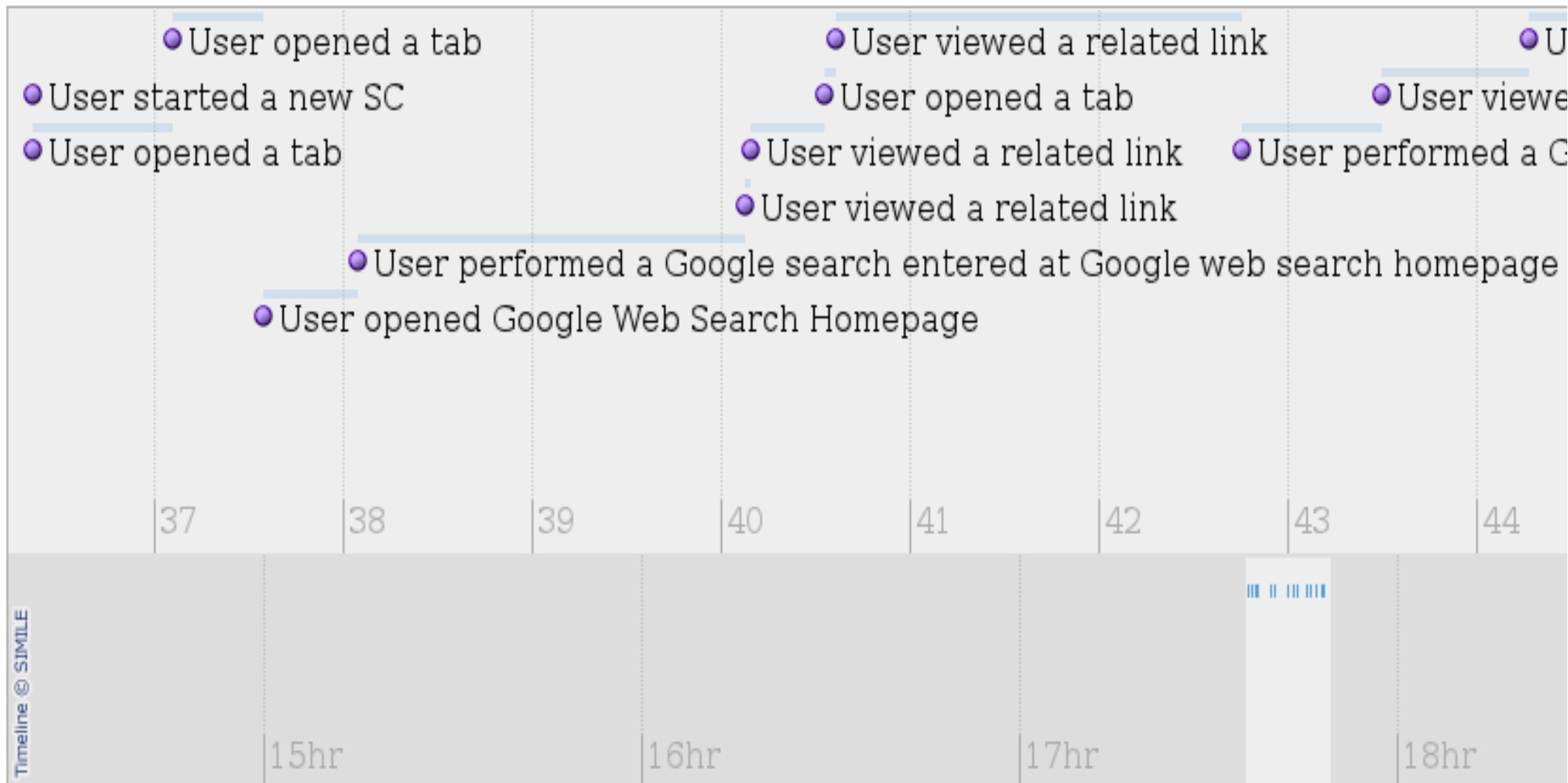
Search-Logger User Study Data

	B	C	D	G	J	N
	User	User Action	Action Description	Timestamp	Task number	Google Searches
231	24	User started a new SC	Displaying pre-SC form for SC index 9;;	09/08/2011 12:06:04	10_Religion_(KERNAU	0
232	24	User opened a tab	User opened a tab;;	09/08/2011 12:06:04	10_Religion_(KERNAU	0
233	24	User submitted pre-SC form	(a=(5))(b=(1))(c=(1))(d=(1))(formID=(search_case_10))	09/08/2011 12:06:16	10_Religion_(KERNAU	0
234	24	User closed a tab	User closed a tab;;	09/08/2011 12:06:19	10_Religion_(KERNAU	0
235	24	User performed a Google WEB search	http://www.google.de/search?q=Religionsunterschied+Deu	09/08/2011 12:07:03	10_Religion_(KERNAU	Religionsunterschied Deutschlaand Schweiz Österrech
236	24	User clicked on Spell checked Query suggested by Google	">http://www.google.de/search?hl=de&client=firefox-a&hs=>	09/08/2011 12:07:09	10_Religion_(KERNAU	Religionsunterschied Deutschland Schweiz Österreich
237	24	User performed a Google WEB search	">http://www.google.de/search?hl=de&client=firefox-a&hs=>	09/08/2011 12:07:36	10_Religion_(KERNAU	Religionsverteilung Deutschland Schweiz Österreich
238	24	User viewed a related link	http://de.wikipedia.org/wiki/Trennung_von_Religion_und_Sta	09/08/2011 12:07:44	10_Religion_(KERNAU	0
239	24	User performed a Google WEB search	">http://www.google.de/search?q=religionszugehörigkeit&ie=>	09/08/2011 12:09:15	10_Religion_(KERNAU	religionszugehörigkeit
240	24	User viewed a related link	http://fowid.de/fileadmin/datenarchiv/Religionszugehoerigke	09/08/2011 12:09:27	10_Religion_(KERNAU	0
241	24	User closed a tab	User closed a tab;;	09/08/2011 12:10:30	10_Religion_(KERNAU	0
242	24	User performed a Google WEB search	">http://www.google.de/search?hl=de&client=firefox-a&hs=>	09/08/2011 12:12:24	10_Religion_(KERNAU	religionszugehörigkeit schweiz

	O	Q	R	S	T	U	V	W
	Query length	Bing Searches	Yahoo Searches	Wikipedia Searches	Ask Searches fr	Direct Ask Search	Ecosia/Forestle	YASNI
231	0	0			0	0	0	
232	0	0			0	0	0	
233	0	0			0	0	0	
234	0	0			0	0	0	0
235	4	0			0	0	0	
236	4	0			0	0	0	
237	4	0			0	0	0	
238	0	0			0	0	0	
239	1	0			0	0	0	
240	0	0			0	0	0	



Search-Logger User Study Data Timeline



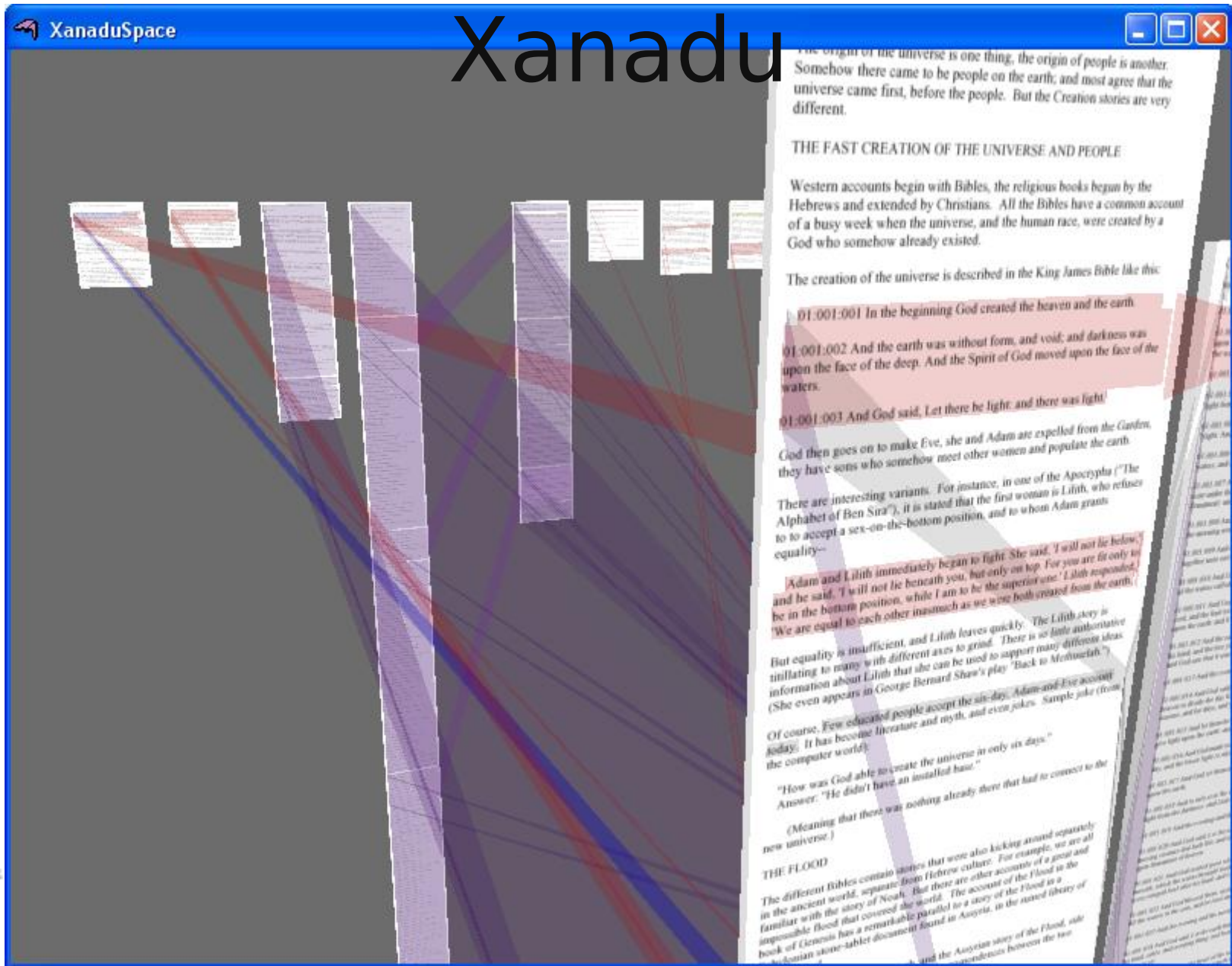
How to overcome or extend query response?

- User interface
 - Different result visualization (not only list of documents)
 - New interaction patterns (not only keywords/tags or hierarchies)
- Avoid information duplication (blogs do the opposite)
- Use categorization techniques to relate documents or part of documents
- Move from document to graph of objects



Ted Nelson's vision (1970)

Xanadu



The screenshot shows a window titled "XanaduSpace" with a blue header. The main content area displays a document with a complex network of links and text. The text includes:

The origin of the universe is one thing, the origin of people is another. Somehow there came to be people on the earth, and most agree that the universe came first, before the people. But the Creation stories are very different.

THE FAST CREATION OF THE UNIVERSE AND PEOPLE

Western accounts begin with Bibles, the religious books begun by the Hebrews and extended by Christians. All the Bibles have a common account of a busy week when the universe, and the human race, were created by a God who somehow already existed.

The creation of the universe is described in the King James Bible like this:

01:001:001 In the beginning God created the heaven and the earth.

01:001:002 And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.

01:001:003 And God said, Let there be light: and there was light!

God then goes on to make Eve, she and Adam are expelled from the Garden, they have sons who somehow meet other women and populate the earth.

There are interesting variants. For instance, in one of the Apocrypha ("The Alphabet of Ben Sira"), it is stated that the first woman is Lilith, who refuses to accept a sex-on-the-bottom position, and to whom Adam grants equality--

Adam and Lilith immediately began to fight. She said, "I will not lie below," and he said, "I will not lie beneath you, but only on top. For you are fit only to be in the bottom position, while I am to be the superior one." Lilith responded, "We are equal to each other inasmuch as we were both created from the earth."

But equality is insufficient, and Lilith leaves quickly. The Lilith story is tantalizing to many with different axes to grind. There is so little authoritative information about Lilith that she can be used to support many different ideas. (She even appears in George Bernard Shaw's play "Back to Methuselah.")

Of course, few educated people accept the six-day, Adam-and-Eve account of the Flood. It has become literature and myth, and even jokes. Sample joke (from the computer world):

"How was God able to create the universe in only six days?"
Answer: "He didn't have an installed base."
(Meaning that there was nothing already there that had to connect to the new universe.)

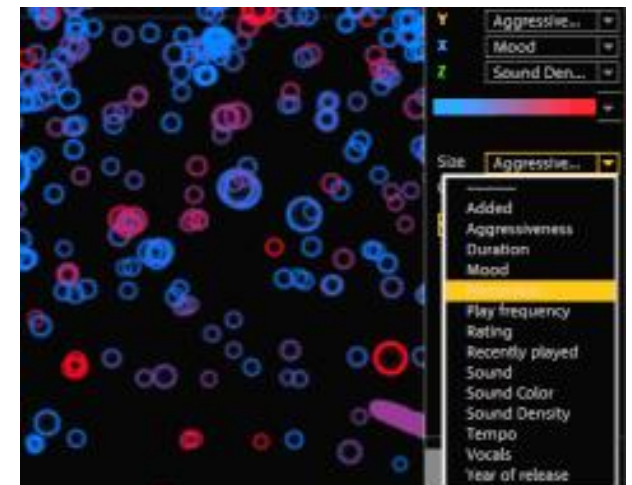
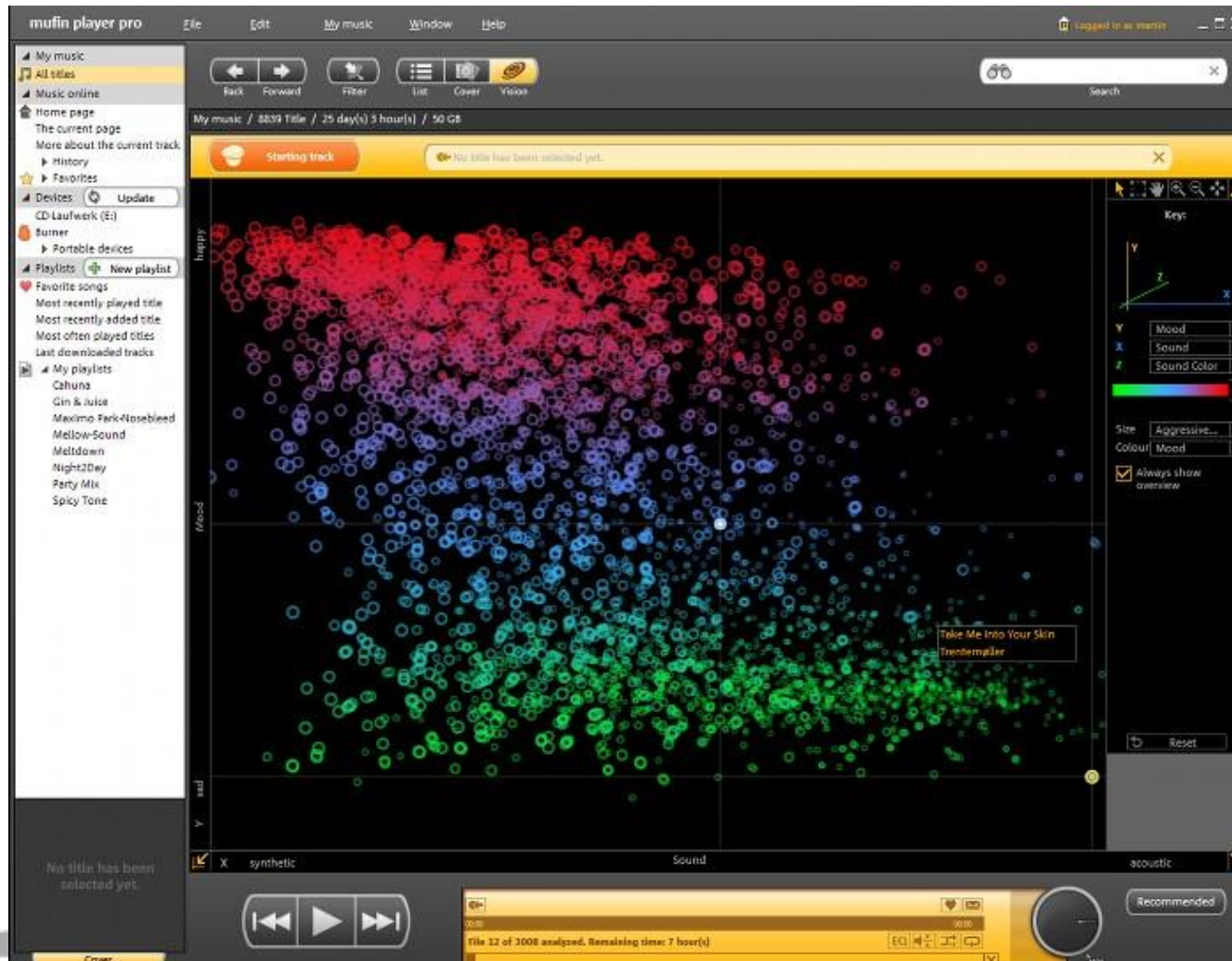
THE FLOOD

The different bibles contain stories that were also kicking around separately in the ancient world, separate from Hebrew culture. For example, we are all familiar with the story of Noah. But there are other accounts of a great and impossible flood that covered the world. The account of the Flood in the book of Genesis has a remarkable parallel to a story of the Flood in the Babylonian stone-tablet document found in Assyria, in the noted library of Nineveh. And the Assyrian story of the Flood, with its correspondences between the two

In the bottom left corner, there is a cartoon penguin wearing a graduation cap and holding a pointer.

Examples of Information Visualization

Mufin Player



Examples of Information Visualization

TheBrain (thebrain.com)

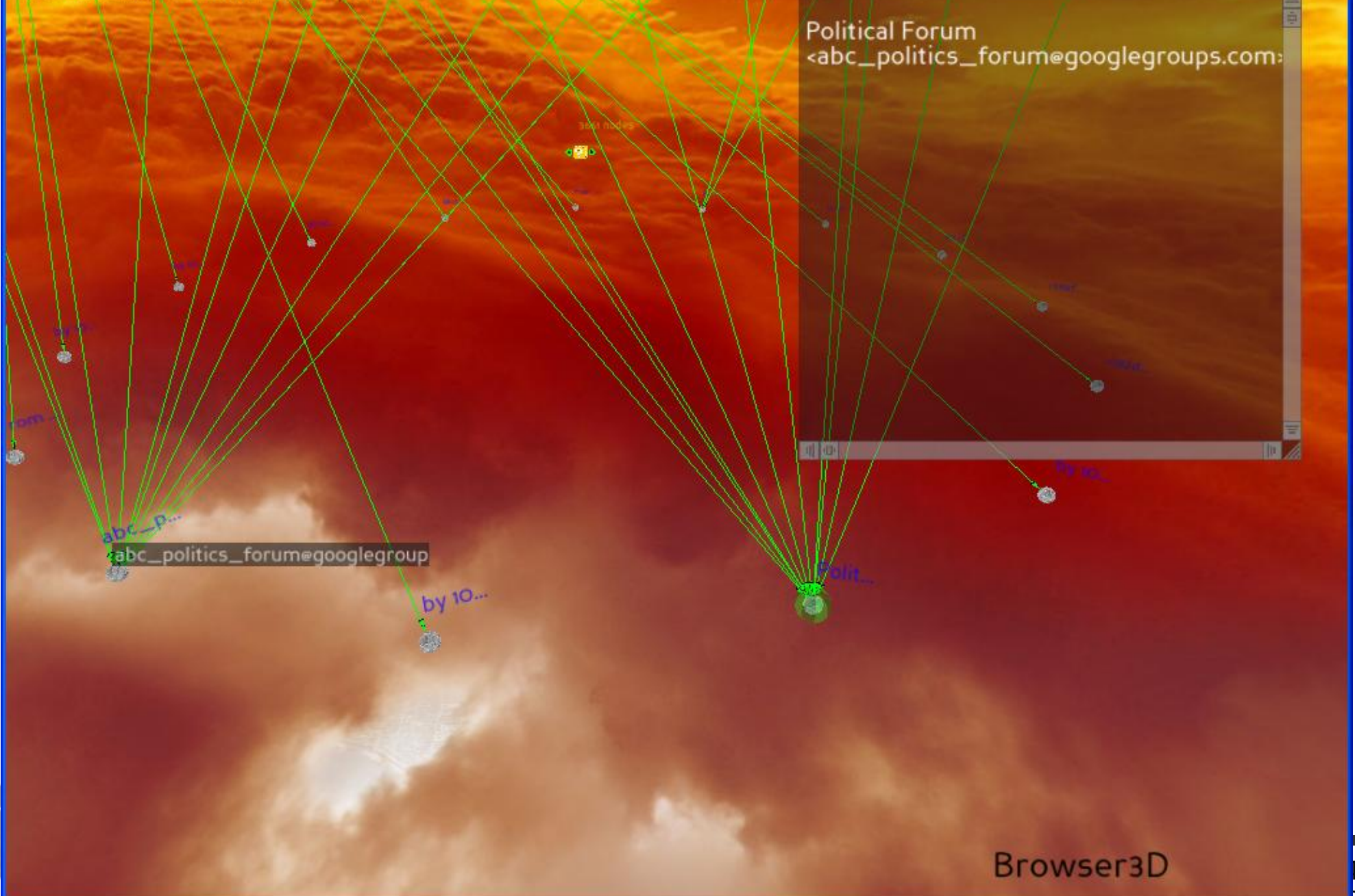


- Nice (but slow) user interface
- No kick start

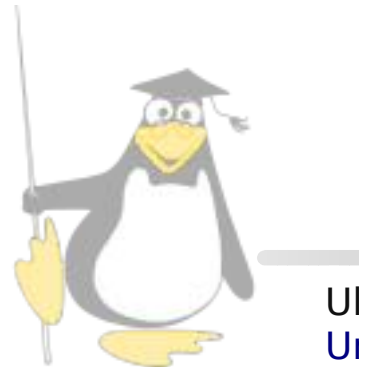
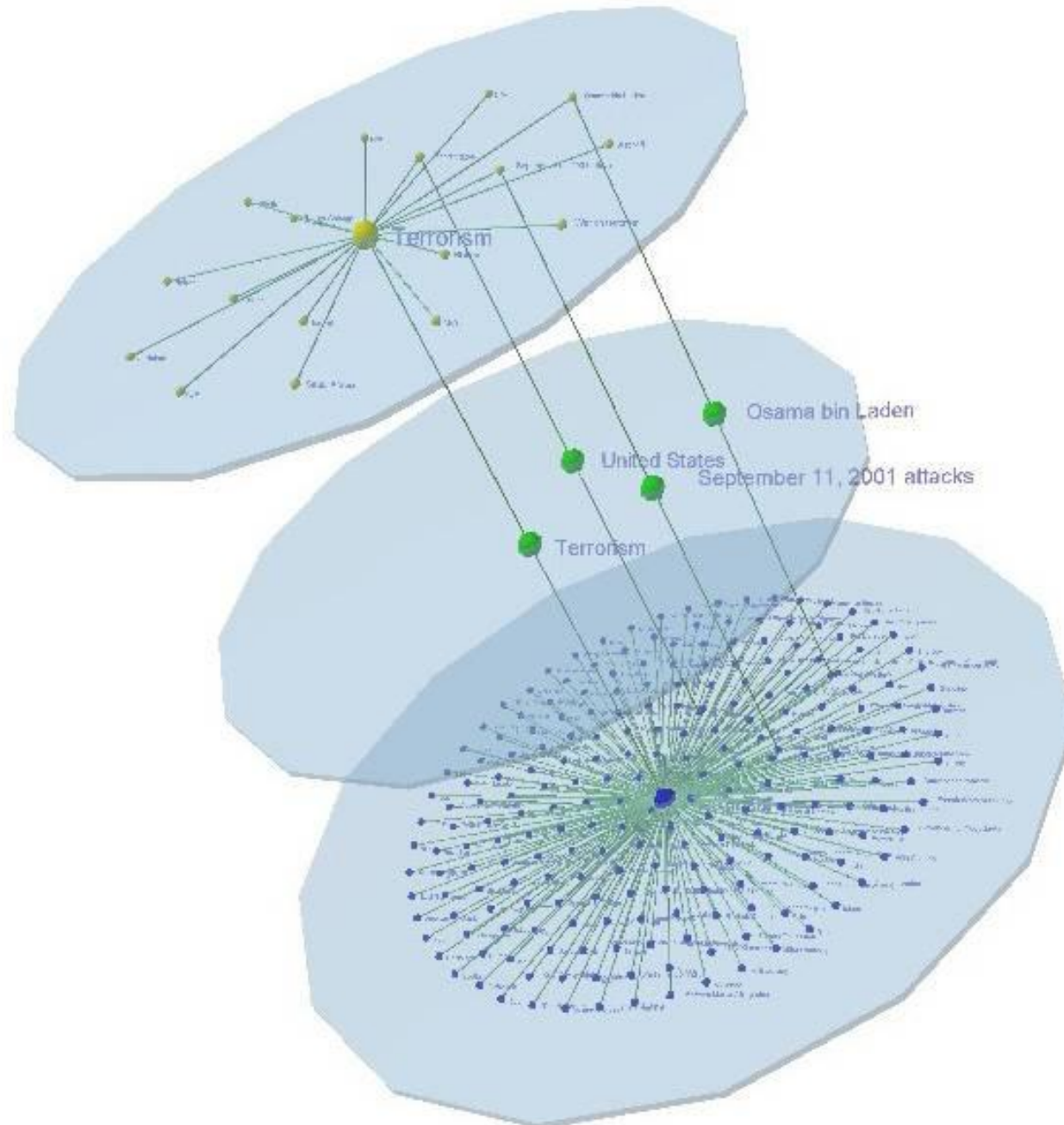


3D Discovery Tool

c: Camera to root
 p: Turn path traveler on/off
 o: Move orbits
 m: Turn mouse Orientation On/Off



2.5D layout



A Typical Mailbox?

The screenshot shows the Thunderbird email client interface. The window title is "All Mail for uln...@o.net - Thunderbird". The menu bar includes File, Edit, View, Go, Message, OpenPGP, Tools, and Help. The toolbar contains various icons for email actions like compose, delete, and search. A search bar on the right contains the text "Expression".

The left sidebar shows "Favorite Folders" and "All Folders". Under "Favorite Folders", there is "Inbox (1)", "All Mail (6437)", "family", "friend", and "Sent Mail". Under "All Folders", there is a list of folders including "dance", "family", "free", "friend", "fun", "[Google Mail]", "jobsearch", "list", "mychats", "Queue", "research", "Sent", "shopping", and "sing".

The main pane displays a list of emails with columns for Subject, Tag, Sender, and Date. The selected email is:

- Subject:** The Reality of Robotic Surrogates
- From:** IEEE Spectrum Tech Alert <techalert@ieee.org>
- Sender:** IEEE Spectrum Tech Alert <techalert@ieee.mmsend.com>
- Date:** 09/24/2009 04:20 PM
- To:** [Redacted]

Below the email header, there is a link to read the newsletter on the web: <http://www.mmsend9.com/ls.cfm?tid=4080460041&trk=yes&r=169702981&sid=7501484&m=825928&u=IEEENY&s=1>. Below that is a "Sponsor's Message" section.

At the bottom right of the window, a red box highlights the status bar showing "Unread: 6437" and "Total: 63299".

A better future?

Smantica™ Search Mail Search the Web Show search options Create a filter

Compose Mail

Inbox
 Starred ☆
 Sent Mail
 Outbox
 Drafts

Edicy Müük Tööotsing Tugi (265) 9 more▼

Contacts Tasks

+ Tõnu Runnel
 Search, add, or invite

Active lately

- 67 Edicy business plan
- 94 MindNet project
- 5 Talks w Georg, Ulrich, J
- 47 Fraktal Sales leading
- 5 Talks w Jim, Robert, Ga
- 85 EAS detailed plan
- + 25 more

Kuu lõpuks raha otsas? - www.seb.ee/perepakett - Liitu SEB Perepaketiga Hoia kokku Sponsored Link

Archive Report spam Delete Move to Labels More actions Refresh

Select: All, None, Read, Unread, Starred, Unstarred

<input type="checkbox"/>	☆ Andrus, Märt, me (3)	» Tööotsing	tööotsing - Tere Andrus Aitäh h oma portfolio	12/17/07
<input type="checkbox"/>	☆ me, Priit (3)	»	Tõnu õpib mäkki, palun aita - 1. Kas soovintMate või Cod	12/16/07
<input type="checkbox"/>	☆ Katre Ligi	» Isiklik	[klann] jõul - Hea Klann, kõik, kelle võivad, kui os	12/16/07
<input type="checkbox"/>	☆ Martin Voltri	»	cs3 ja mac - ära pira-cs3'e installi, kui tahad a. cs3'e ...	12/16/07
<input type="checkbox"/>	☆ Katre, me (2)	»	postskriptum - Sina küll sellist asja üksi poe ommi kampa l	12/16/07
<input checked="" type="checkbox"/>	☆ noreply, Tanel, Tõnis (3)	» Tugi	[EST] Kiri Edicy klientidele - Aitümel Jakobsoo <t: 6:20 pm	6:20 pm
<input type="checkbox"/>	☆ me	»	Esimene kiri Mäki pealt - Muud tarka polegõnu	12/14/07
<input type="checkbox"/>	☆ Triin, Jaan (2)	»	[Krabi Projekt] Re: Esilehe kujundus - A no NO NOT REPLY	12/14/07
<input type="checkbox"/>	☆ Keiu Heinpalu	»	FW: Hansa liising - Tere Timo! Garantilepimis on kõnesc	12/13/07
<input type="checkbox"/>	☆ Zebra Infosüsteemid AS	»	Legendaarsed ThinkPad sülearvutid aastan nel, Legenda	12/13/07
<input type="checkbox"/>	☆ Ann Rosenthal	» Isiklik	[klann] soolaleib - Hei! Henn vist h sus laupäevak:	12/13/07
<input type="checkbox"/>	☆ Signe, me (3)	»	HTMi veeb, tekstide värvikoodid - Täna v aga ühendust s	12/13/07
<input type="checkbox"/>	☆ Märt Loite	»	[dRusBa] täna Tartus kontsert - MHG sega oimub Tartu Üli	12/13/07
<input type="checkbox"/>	☆ Katre, me (6)	»	HANN - Loen just ühte väga head raamatufefektiivselt) töö	12/13/07
<input type="checkbox"/>	☆ Comodo, me (2)	»	ORDER #6356094 - Domain Control Validmaster Forward	12/13/07
<input type="checkbox"/>	☆ Kersti, me (2)	» Edicy	liisingulepingu pro-forma arve - Pro roovin garantii	12/13/07
<input type="checkbox"/>	☆ Doris .. Kristel (5)	»	[dRusBa] Jõul - Nii. Mõeldud-tehtud. Reed suurem laud ki	12/13/07
<input type="checkbox"/>	☆ Tajo Oja	» Edicy	fraktal - imesin pastakast mõtteid: hemat. "Veebir	12/13/07
<input type="checkbox"/>	☆ billing	»	Failure Superb Internet Automated Payme declined: DECLIN	Sep 21
<input type="checkbox"/>	☆ EggDrop IRC bot	»	[EER IT.Toimkond:1126] Mon Sep 21 05:0 amm... - Bewar	Sep 21
<input type="checkbox"/>	☆ noreply (6)	»	[ENG] Affiliate form - E-mail elpro200920 do lo que quiera	Sep 21
<input type="checkbox"/>	☆ Katrin, Edicy, Priit (7)	» Tugi	Re: Sinu uus Edicy parool - Hei, pa in forwarded m	Sep 20

Select: All, None, Read, Unread, Starred, Unstarred

Archive Report spam Delete Move to Labels More actions Refresh 1 - 100 of 7610 Older Oldest

Involved people

Tõnis Üllerson
 tonis@yllerson.com
 52 219 421
[Email](#) [Schedule](#) [History](#) [Leads](#)

Daniel Mc Scheize
 daniel@gmail.com
 +1 863 533 436
[Email](#) [Schedule](#) [History](#) [Leads](#)

Involved topics

[Support](#) [Edicy](#) [Server failure](#)
[Happy customer](#) [Thankyou](#) [Opera](#)
[More >](#)

Involved files

Click file for details, versions, people

- Server failure screenshot
- Happy customer presentation
- Excel for poor kids
- Client policy manual
- +2 more

Internet research

Daniel works at Microsoft, has gained no negative publicity, is respected co-author at RyanAir Forums.
 More: [LinkedIn](#), [Facebook](#), [Twitter](#)
 No public info for Tõnis.

Summary

- What is search and an information need?
- Has today's search reached its limits? - No!
- Google, Bing & CO great for lookup.
- Support of discovery, aggregations, synthesis seems possible
- Documents → graph?
- Still a lot to do!
→ better understanding?



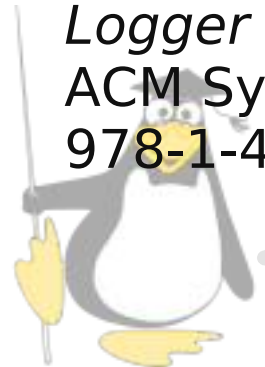
Interested? Contact us!

- <http://contact.ulno.net>
- <http://search-logger.com>



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- G. Singer, U. Norbistrath, E. Vainikko, D. Lewandowski, H. Kikkas: *Search-Logger — Analyzing Exploratory Search Tasks*. Proceedings of the 2011 ACM Symposium on Applied Computing, ACM New York, NY, USA, ISBN: 978-1-4503-0113-8, March 21-25, 2011, TaiChung, Taiwan.



Information Overload

- Neither information nor overload easily definable
- Bound to the belief in the “information age”
- Conflicting and vague definitions available

- So does it even exist?



How much time do you spend on Facebook?

Facebook | Home - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.facebook.com/home.php#/1

Facebook | Home

interesting movie, check out the description from IMDB: Loose portrait of João Francisco dos Santos, also known as Madame Satã, a sometime chef, transvestite, lover, father, hero and convict from Rio de Janeiro.

A nice choice is Central Station, one of our first movies to make success outside Brazil, and started the new wave of Brazilian quality movies.

Hugs
7 hours ago

Write a comment...

Errol Glazer
Tiny Adventures Perfect Adventure
In an amazing display of cunning, might and celerity, Errol Glazer's hero, BA Baracus , has completed the adventure, Mystery of the Moaning Mine, in Dungeons a& Dragons: Tiny Adventures with 100% success rate! They didn't fail a single encounter!
7 hours ago via Dungeons & Dragons: Tiny Adventures · Comment · Like · Play Tiny Adventures

Johanna Parker Dia de los muertos procession in the Mission. Amazing! It will definitely become a yearly tradition. Gorgeous photos by a very talented friend.

dia de los muertos
Source: www.flickr.com
lupe.gervas' dia de los muertos set

flickr

10 hours ago · Comment · Like · Share

Sarah Guth fabulous photos!!
10 hours ago

Hugo Alexander Silva López Que buenas están esas fotos... gracias por compartirlas. ¡Saludos!
3 hours ago

Write a comment...

Baldur Kubo when do participants realise that a transformation is happening?
<http://www.nytimes.com/2009/11/03/opinion/03herbert.html>
Op-Ed Columnist - A Glimpse of the Future? - NYTimes.com
Source: www.nytimes.com
President Obama gave a stirring speech on the crucial issue of energy last week, but it lacked the excitement that should accompany an important national mission.
8 hours ago · Comment · Like · Share

Chat (8)

http://www.facebook.com/home.php?ref=logo

Facebook | Inbox - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.facebook.com/home.php#/1

facebook Home Profile Friends Inbox 2 Ulrich Norbistrath Settings Logout

Search Inbox [] + Compose Mark as Unread Report Spam Delete

Messages 2 Updates 1 Sent

Select: All, Read, None

<input type="checkbox"/>		Game/Movie Night?? November 3 at 12:23pm	movie substitutes I'm thinking Young Franklienstien and Spaced Invader
<input type="checkbox"/>		Game/Movie Night?? November 3 at 1:10am	Change of plans The original purpose of the Sci/Fi double feature was ...
<input type="checkbox"/>		Evelis Kurs September 30 at 11:18am	Salsa? The other person I mentioned before does not need t ...
<input type="checkbox"/>		Jennifer Uhler September 9 at 12:27am	Labor Day Weekend
<input type="checkbox"/>		Tiago Barbosa September 4 at 1:04pm	authentication Yes, I was just outside with you, Carla and Charles ..
<input type="checkbox"/>		Loony Luau Party Deux August 27 at 6:13am	Password for those of who RSVP'd the pass word is 214
<input type="checkbox"/>		Elise, Errol August 23 at 4:25pm	Next Friday is almost here no worries, hope all is well with you otherwise, did y
<input type="checkbox"/>		Loony Luau Party Deux August 15 at 1:07am	The trailer [Psycho Beach Party] In case you needed to convincing (one way or the oth
<input checked="" type="checkbox"/>		Errol Glazer July 27 at 3:30am	package pickup favor thx!!!
<input type="checkbox"/>		Janell Uhler July 23 at 10:11pm	Happy Birthday! Hope you had a wonderful day! Thinking of you, Jan
<input type="checkbox"/>		Jennifer Uhler June 25 at 3:43pm	Visiting Jenn in DC Missing you...
<input type="checkbox"/>		Anniina Ljokkoi April 20 at 8:33am	(no subject) The weekend was really nice! I'll put photos to fb ver
<input type="checkbox"/>		Andy Borovik April 12 at 8:37pm	friend request No, we are not met before. You send me message an my fr...
<input type="checkbox"/>		Errol Glazer January 18 at 5:20am	A do not miss swing event I guess I should have included the date Saturday, Ma
<input type="checkbox"/>		Jennifer Uhler October 27, 2008	Random DC Swing Great dance face

Chat (8)

Done

- Automatic categorization, tagging
- Manual categorization, tagging
- Summarization



Personal Information Management

Personal information management (PIM) refers to the practice and the study of the activities a person performs in order to acquire or **create, store, organize, maintain, retrieve, use, and distribute** the information needed to **meet life's many goals** (everyday and long-term, work-related and not) and to fulfill life's many roles and responsibilities (as parent, spouse, friend, employee, member of community, etc.). PIM activities are an effort to establish, use, and **maintain** a mapping between information and need.

Personal Information Management (PIM) – William Jones

