Patterns of Use

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Patterns of Use

- Users often find other patterns of use than the software designer's original intent
- Best practice: Release early and often; correct fixes and add features as needed

An Urban Legend

… says that the architects of the walking paths of Cornell University …

… let them evolve by themselves by observing how people walked between buildings and then finally paving those that were popular and functional.

What we are going to do today

Review the technologies in the past to the present:

- The search engine
- The scholarly paper
- The web browser

And project this to the future from the present:

- The mobile web browser
- The scholarly paper

About Google Jobs@Google

Enter your search terms...

Google Search I'm Feeling Lucky

...or browse web pages by category.


Google
Singapore
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Google.com.sg offered in: 中文(简体) Bahasa Malaysia தமிழ்

+You **Web** Images Maps News Translate Gmail More

Google

hurricane

- **hurricane**
- **hurricane irene**
- **hurricane katrina**
- **hurricane lyrics**

Advanced search

Search

Everything
Images
Maps
Videos
News
More

Singapore
Change location

The web
Pages from Singapore

Any time
Past hour
Past 24 hours
Past 2 days
Past week
Past month
Past year
Custom range...

All results
Sites with images
Timeline

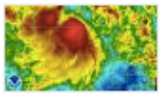
Tropical cyclone - Wikipedia, the free encyclopedia
en.wikipedia.org/wiki/Tropical_cyclone
Jump to **Hurricane** or typhoon: A **hurricane** or typhoon (sometimes simply referred to as a tropical cyclone, as opposed to a depression or storm) is a ...
Hurricane (disambiguation) - Scales - Tropical cyclones portal - Extratropical cyclone

Hurricane Katrina - Wikipedia, the free encyclopedia
en.wikipedia.org/wiki/**Hurricane**_Katrina
Hurricane Katrina of the 2005 Atlantic **hurricane** season was the costliest ...

Hurricane Irene (2011) - Wikipedia, the free encyclopedia
en.wikipedia.org/wiki/**Hurricane**_Irene_(2011)
Hurricane Irene was a large and powerful Atlantic **hurricane** that left ...

Show more results from wikipedia.org

Hurricane Jova Gains Strength in Eastern Pacific



CTV.ca

Fox News - 2 hours ago
AP The US National **Hurricane** Center in Miami said Sunday evening that Jova had maximum sustained winds of 90 mph and was centered about 305 miles southwest ...
733 related articles
Hurricane Jova strengthens off Mexico's west coast - Reuters
More news for **hurricane** »

Images for **hurricane** - Report images



What’s the difference?

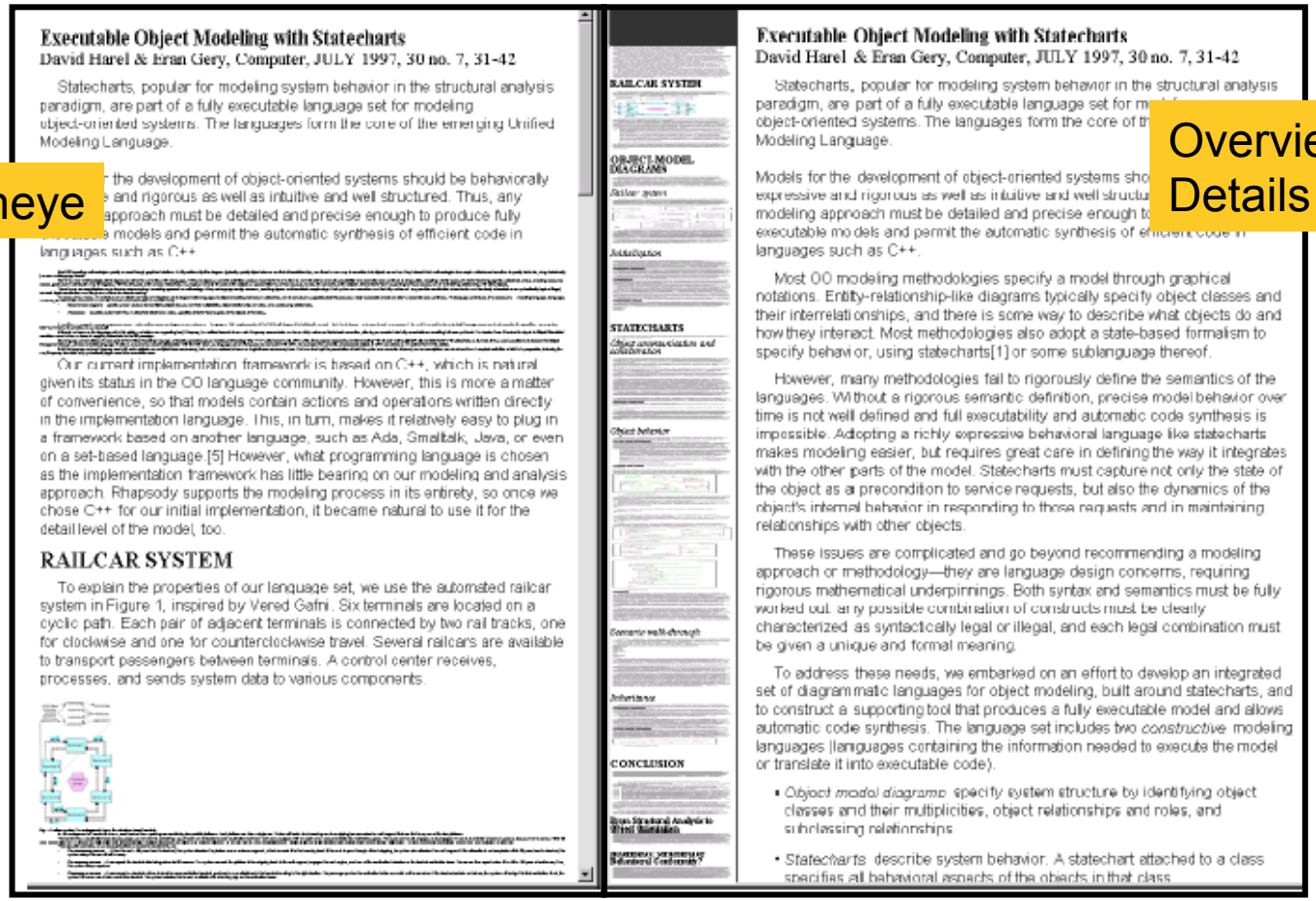
What's the difference?

- Regional
- Auto suggest / Query Suggest
- Auto search
- Page Previews
- Universal Search
- Contextual Advertising

Patterns of use in scientific articles

"What better contribution could a scholar make than an article which could … provide a clear, but vivid argument to the [secondary school student] but which, if unraveled, could provide the rigor demanded by the most crusty specialist?" Crane (of the Perseus DL)

- Question: How do DL designers support this in terms of HCI?
- Answer: Creating different document layers.
  Allow users to "fold" the document to see the only the relevant portions.



- Overview + Details shown as best (Hornbaek & Frokjaer 01)
  - Fisheye distortion unsatisfactory
  - Shown better for QA but not for whole document understanding

The scientific article

How ***do*** we use articles?

Answer these in groups:

- Do we use scientific articles as a whole? Or specific *components*?

- How do *you* (personally) determine the relevance of an article?
- When do you decide to read an article?
- (Harder) What parts of an article do you use, and for what purpose / task?
- How do you categorize or label the articles that you read?

Typical critical reading patterns:

1. Read the title and the abstract
   If you still don't know what this paper is about, then this is a poorly-written paper.
2. Read the conclusion
   Are you now sure you know what this paper is about? If not, throw it away.
3. Read the introduction
4. Read the section headings
5. Read tables and graphs and captions

Usage lifecycle of an article

- Being found as relevant
- Assessing relevance
- Document surrogate
- "Information finding"
  - Browsing for exploration
  - Searching for specific bits
- Conveying knowledge not easily rendered in words

Being found as relevant

- Advanced features of search not often used
  - "Just to be safe", use full text
  - Common and well-understood UI (legacy effect)
  - When features failed, users often don't try them again
  - Features thus need:
    - To be properly introduced / understood (scaffolding)
    - To have well-understood error messages

Searching for specific bits

One-shot queries rare:

- Tip of the larger iceberg of an information seeking pattern

- I look for specific surface tensions, experimental measurements
- Looking for best efficiency of electric motors.
  - Ended up reading tons of documents for electric motor
- I sometimes want to look specifically at other's methods and theories
- I often need multiple copies of a specific piece, like a table, for class
- I need to keep up to date on my research area

Browsing

- Why do people browse?
  - Semi-directed / Undirected learning
  - Initial Exploration

- Collection Evaluation
  - What's in this collection? Is it relevant to my objectives?
- Subject Exploration
  - How well does this collection cover my area of interest?
- Query Exploration
  - What kind of queries will succeed in this area? How can I access this collection?

Using the article

- Reading has different purposes too:
  - General Learning
  - Identification
  - Skimming
  - Answer questions
  - Defend position
  - Cross-Reference
  - Editing or critical review

Using the article (2)

- Biased to particular user and task
  - Current researcher's work as "lens" to view the work
  - Different workflow for different users
    - Beginning researchers
    - Seasoned veterans
    - E.g., when to do annotation? Read references?
- Writing goes hand in hand with reading:
  - Three levels: Creating, note-taking and annotation
  - Annotation serves not so much to add to an article:
    - But to extract / filter important nuggets from an article (e.g., highlighting)
    - Adding a "document layer" to be used to view the document
    - Also inter-document annotation (e.g., labeling)

Patterns of use of the web browser

- How do people use query the web?
- How do they use the web browser?
- How can we build a better web browser?

Web query types (revisited)

What features are best for differentiating web search intent?

- Discriminate using *mutual information* for 2+ word queries
  P(x,y) / P(x) P(y) – collocation corrected for chance
  High MI corresponds to navigational task

- Navigational (Known item, Home page finding)
  - Relevant pages are mostly entry (root) pages
  - Anchor text and URL information

- Informational (Topic relevance)
  - Relevant pages are mostly nested pages
  - Content information (e.g., TF × IDF)

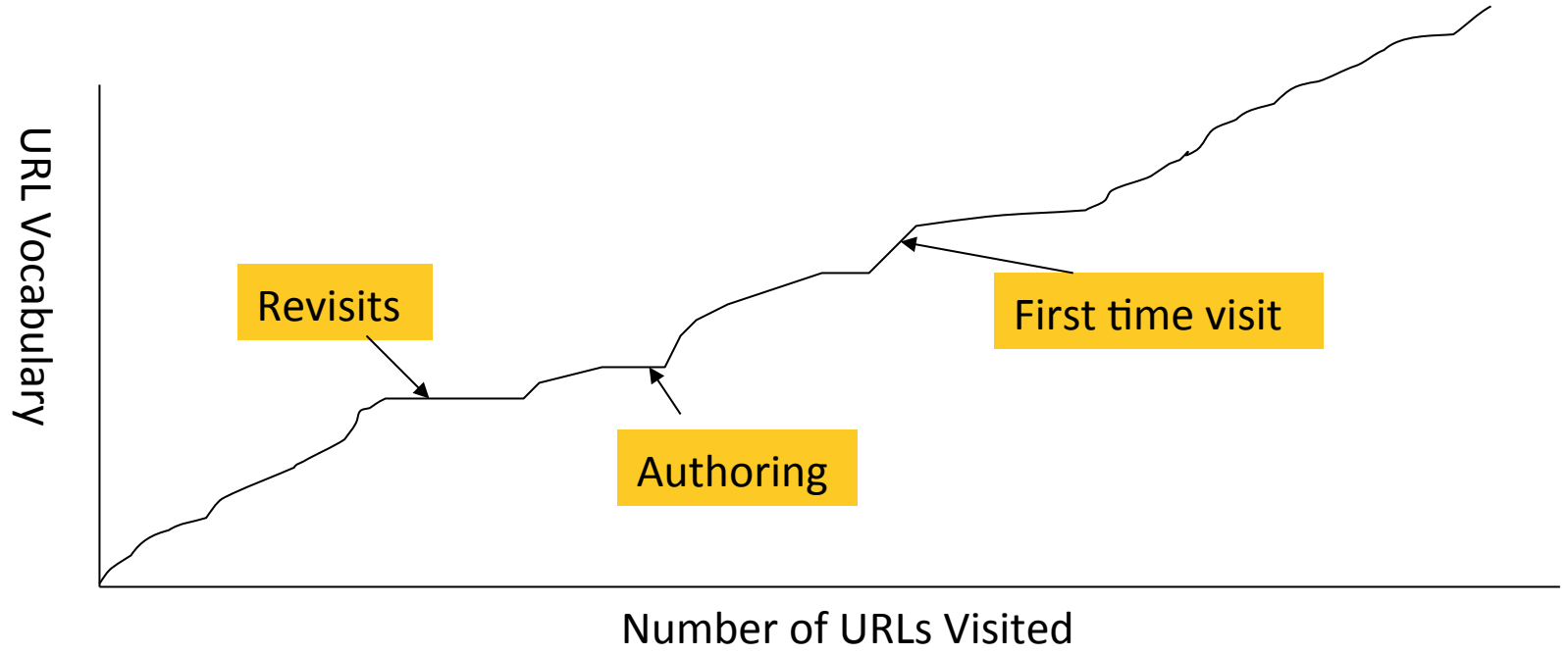
User behavior

- Users tend not to use monitoring steps
  - Sign up for email alerts, RSS, create a channel
- Even in a formal search mode
  - Users use simple keyword search, not advanced
  - Don't revise their queries often (75% of all searches)
  - Don't access help
- Users don't seem to have strongly repetitive patterns within a cluster of pages
  - No consistent paths
  - Longest repeated sequence analysis fails
- Larger volume of queries
  - Higher percentage of repetition
  - Caching is a good strategy

Page navigation types

- ~40% by following hyperlinks
- ~20-50% by back button navigation
- 11% new window
- 10% other (pop-ups count here)
  - Should be counted in hyperlink following
- 2.5% by bookmarks
- 0.8% by history

URL Vocabulary



- Observed linear growth, not power law
  - Why?

Modes of web browsing

Tauscher and Greenberg (1997):

- *First time visit*: new URLs observed
- *Revisits*: reading in depth (e.g., course notes), flicking to previous page(s)
- *Authoring of pages*: `reload` heavily used
- *Using web-based applications*: form submissions
- *Hub-and-spoke*: central page ⇒ specific page and back
- *Guided Tour*: Viewing a many-page article

Scenario

- You went to a website this afternoon to do some fact-finding for a project that you're working on.

  After going through many sites, some reading you're currently doing reminds of a link that would be useful to visit on a page that you visited sometime in the last hour or two.

  How would you go about finding it?

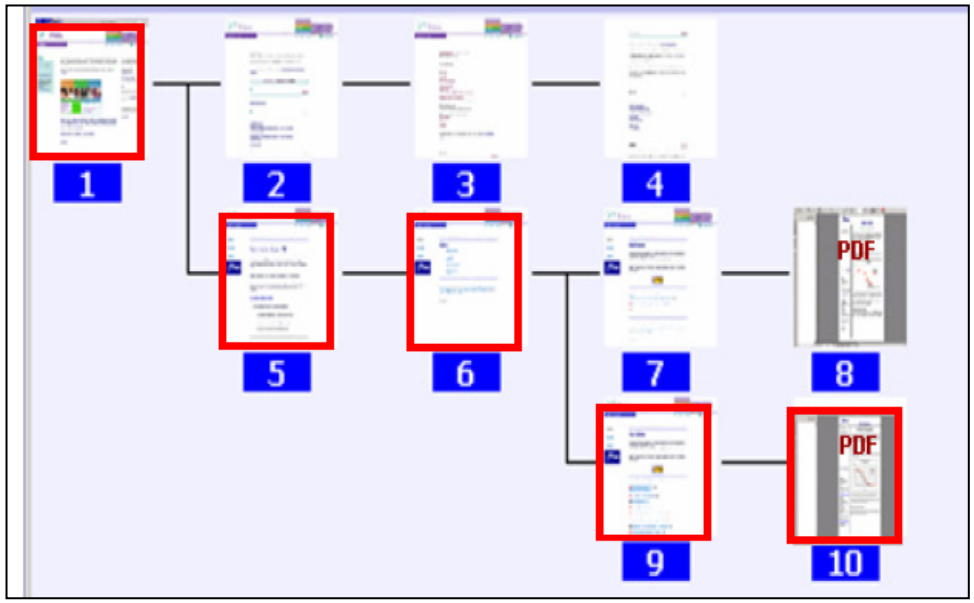
  Your answers:

The Back Button

- Takes you to the previous page
  - With a reverse-order of chronological pages; i.e. a stack
  - Extremely simple and easy to use
- How would you improve upon this?
- A UI feature of web browsers that have made it into operating systems

Temporal model of revisiting

- Promote a previously visited page to the top of the stack if:
  - I go back to visit it and
  - I take a different hyperlink from there



The navigation hub

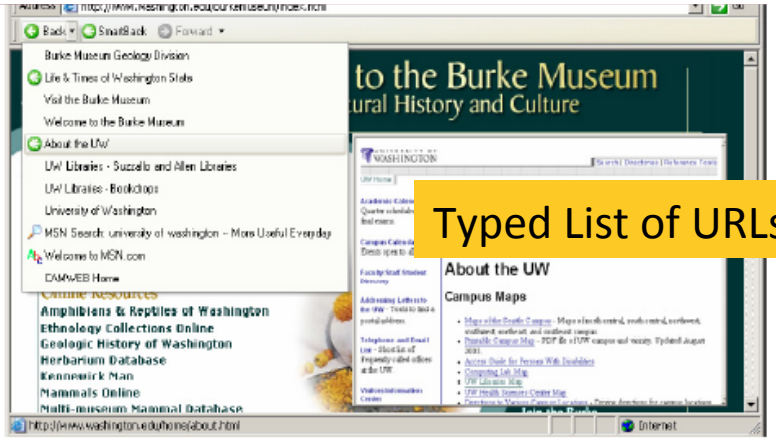
- Hub: a page that was promoted in the previous algorithm
- Study shows hubs revisited 1.8 times

- Ideally, predict which pages would be revisited

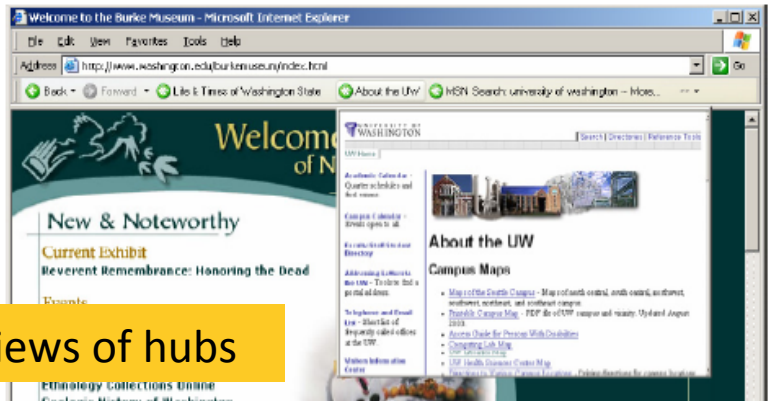
Algorithm for finding hubs

- Safari Browser: Search Engine and typed URLs as hubs
- Previous revisit of a page indicates hub
  - Even across sessions ("new window" commands)
  - Points to per-user customization

- SmartBack



Typed List of URLs



Previews of hubs

Where does this lead us to?

What are the usage patterns of mobile web browsers? What tasks do they need to support?

What are the device characteristics and the characteristics of the environment?

Mobile Web Browsers (ca. 2011)

- Geospatial, temporally aspects of search
- I/O difficult. Small screen, keyboard, leading to the possibility of NUI
- Bandwidth limited, power-draining websites, scripting

Environment

- Introduction of HTML 5 for desktops
- One of many (proliferating) apps on mobile devices
- The playing field is still being defined

Your thoughts?

Conclusions

- Patterns of use collaborate with the user interface of a system
  - And also with Web 2.0, with the authoring (mobile web site design)
- Now at a crux where much improvement coming due to changes in devices
- Look back and check your predictions 5 years from now