Automatic Subject Classification and Topic Specific Search Engines -- Research at KnowLib

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KnowLib: Knowledge Discovery and Digital Library Research Group

Goals

- information systems
- digital library services
- knowledge discovery
- distributed knowledge organization technologies
  - usability of knowledge organization systems (thesauri, classifications, subject headings systems, ontologies…)
  - user interfaces

KnowLib Members

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KnowLib Projects: Log Analysis -- Renardus

- overall purpose: improve Renardus
- browsing and searching behaviour of users
- why log analysis?
  - catch unsupervised usage
  - evaluate the potential of thorough log analysis
    - own software developed

http://www.it.lth.se/knowlib/renardus-log/log-analysis.html

Goals

- detailed usage patterns
- balance between browsing and searching and mixed activities

- hierarchical classification browsing behavior
  - usage degree of browsing support features

Renardus Home Page: www.renardus.org

Main Navigation Features

- simple search
- advanced search
- subject browsing: DDC
  - intellectual mapping of classification systems used by the distributed subject gateways

Subject Browsing Support Features

- graphical fish-eye presentation of the classification hierarchy (Graph. Browse)
  - text version (Text Browse)
- search entry into the browsing structure (Search Browse)
- merging of results from individual subject gateways (Merge Browse)

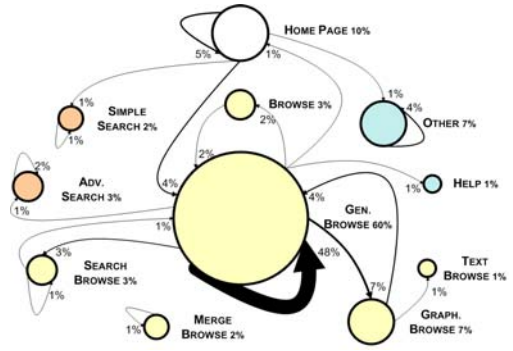
First Step: Preparing the Log Files

• appx. 2 300 000 entries boiled down to 630 000 entries (appx. 165 000 sessions)

Entries removed	*Reason*
1 107 378	images or style sheets
516 269	robots
17 586	HTTP code 301 (redirections)
12 647	malicious attacks
9 000	local IP-numbers
4 690	MS favicon.ico
408	HTTP code 408 and other errors

Major Absolute Transitions (up to 1%)

Circle sizes reflect a share in activities and arrow sizes a share in transitions.



Dominance of Browsing Activities

- more than 80% of sessions are dominated by browsing
- among users starting at home page (21%), still 57% browse and only 12.5% search
- possible reasons:
  - indexing of browse pages by search engines
    - 71% start using Renardus at browsing pages
    - homepage design strongly "invites" for browsing

Major Conclusions

- clear dominance of browsing activities
- tendency to stay in the same group of activities
- good usage of the browsing support features, esp. graphical fish-eye browsing
- surprisingly low share of search activities needs to be further investigated
- log analysis can provide valuable insights

http://www.it.lth.se/knowlib/renardus-log/log-analysis.html

KnowLib Projects: KLIC-DDL…

- **KLIC-DDL : KnowLib's Intelligent Components of a Distributed Digital Library**
  - architecture for a distributed digital library
  - implementation of information services using intelligent components
    - automated subject classification, text categorization
    - semi-intelligent information search agent with Web harvesting
    - subject specific search engines etc.

http://www.it.lth.se/knowlib/klic.htm

KLIC-DDL: Automated Subject Classification…

- full-text Web-based documents
- established controlled vocabularies – browsing: DDC, FAST, Ei
- home-produced vocabularies: Materials Science, Carnivorous Plants
- machine learning: text categorization (TC)
- information retrieval: document clustering

…KLIC-DDL: Automated Subject Classification

- explore heuristics
  - e.g. importance of metadata vs. title vs. anchor text
- compare results of "All Engineering" with a TC algorithm
- compare browsing controlled vocabulary versus automatically clustered vocabulary
  - advantages and disadvantages of each approach
- explore SOMs as a browsing interface

KLIC-DDL: Demonstrators

- **Automatic subject classification of Web pages**
- **Multi-search demonstrator**
  - the system analyses the query and dynamically generates indications based on which the user can modify his/her query
- **Subject browsing of a harvest database**
- **Materials.dk** http://materials.dk/

http://www.it.lth.se/knowlib/demos.htm