Internet Search Engines: Past and Future

Jan Pedersen
Chief Scientist, Yahoo! Search
11 April 2005
• Compare and contrast
  – 2005 vs 1998
• Some underlying trends
• What’s New
Three major Players
- Google (35%)
- Yahoo (32%)
- MSN (16%)

$8+B in Paid Search Revenues

>400M searches daily

5-8B claimed index size

Excellent relevance

Source: Search Engine Watch
Search Landscape in 1998
Infoseek circa 1998

- IPO in 1996
  - Same year as Excite and Yahoo!
- 5th ranked destination site
- Market cap of $1B
- Competed as a portal
  - Content was king
- Ultimately sold to Disney
  - Go network
- Decommissioned in 2001
Infoseek Search Technology

• 1.5 Generation Search
  – Tuned for relevance
    • Proximity
    • Anchor text (ESP)
    • Inlink counting
  – Small but competent index
    • 60M pages
    • Alta Vista was 140M at that time
• Still exists as Ultraseek server
  – Sold to Inktomi in 2000, later resold to Verity
Infoseek UI

**Web search results**

1 - 10 of 308 results most relevant to +darter +habitat

- **Microhabitat Use in a Diverse Assemblage of Darters**
  Microhabitat Use In A Diverse Assemblage Of Darters In The Elk River Drainage, West Virginia Stuart A. Welsh, Ph.D. Sue A. Perry Rila Vilella 1996 - 1997 May 1997 National Biological Service, Leetown Science Center; W.V. Division of Natural Resources 1. Quantity microhabitat use for ... 92% Date: 9 Jan 1998, Size 3.9K, [http://www.caf.wvu.edu/coop/elkneck.html](http://www.caf.wvu.edu/coop/elkneck.html)

- **BAYOU DARTER**
  *Etheostoma* (Nothonotus) rubrum. U.S. Fish & Wildlife Service
  Source: FWS Region 4 -- As of 2/91 Percidae Threatened throughout its range, , September 22, 1975 A diminutive species, the Bayou darter reaches a maximum length of about 1.8 ... 91% Date: 13 Apr 1996, Size 5.1K, [http://www.fws.gov/r9endsp/pl/e/aad/13.html](http://www.fws.gov/r9endsp/pl/e/aad/13.html)

- **CWT White-faced Darter Biodiversity Action Plan (Leucorhyncha dubia (Van der Linden)).**

- **MDA Pesticide Information Sheet**
  Address Maryland Department of Agriculture Pesticide Regulation Section 50 Harry S. Truman Parkway Annapolis, MD 21401 Telephone: (410) 841-5710 Fax: (410) 841-2765 Send E-mail to Dennis Howard ... 83% Date: 15 Nov 1996, Size 8.1K, [http://www.mda.state.md.us/plant/species.htm](http://www.mda.state.md.us/plant/species.htm)

- **WRCF - Sand Darter**
  Photo Credit: Rob Criswell IDENTIFYING CHARACTERISTICS: The sand darter is a small member of the Perch Family, averaging 2.1/2 inches in length. Adults are pale yellow above and silvery below, with a row of green...
Comparison to State-of-the-art

Web search results

MICROHABITAT USE BY A DIVERSE ASSOCIATION OF DARTERS IN THE ELK RIVER DRAINAGE, WEST VIRGINIA: A STUDY TO DETERMINE THE EFFECTS OF HABITAT QUALITY ON REPRODUCTION. West Virginia University, 1998. 80 pages. Available online at http://www.wvu.edu/biology/faculty/williams/laboratory/microhabitat.html


What was missing?

- Business Model
  - Monetized via untargeted banner ads
  - Need for increased inventory
    - Portalitis
    - Clutter
- Lack of focus
  - Search was deprioritized
Some Underlying Trends
Moore’s Law

Formulations of Moore’s law

- The most popular formulation is of the doubling of the number of transistors on integrated circuits (a rough measure of computer processing power) every 18 months. At the end of the 1970s, Moore’s Law became known as the limit for the number of transistors on the most complex chips.

- It is also common to cite Moore’s law to refer to the rapidly continuing advance in computing power per dollar cost.

- A similar progression has held for hard disk storage available per dollar cost—in fact, the rate of progression in disk storage over the past 10 years or so has actually been faster than for semiconductors—although, largely because of production cost issues, hard drive performance increases have lagged significantly.

- Another version claims that RAM storage capacity increases at the same rate as processing power. However, memory speeds have not increased as fast as CPU speeds in recent years, leading to a heavy reliance on caching in current computer systems.

Historical analysis of Moore’s law has shown that its interpretations have qualitatively changed over the years and that it has not very accurately described developments in semiconductor technology. For example, CPU Monthly shows a month-by-month display of Top Processors from Intel and AMD which gives relatively little evidence that the law continues to operate as stated.

An industry driver
Index Size

- ~150M in 1998
- ~5B in 2005
  - 33x increase
  - Moore would predict 25x
- Monthly refresh in 1998
- Daily refresh in 2005
- What about 2010?
  - 40B?
- Where is the content?
  - Public Web?
  - Personal Web?

Source: Search Engine Watch and Search Engine Showdown
Online Advertising

- Internet accounts for 30+% of viewing time
  - Yet only 4% of spend
  - $370B overall
    - $10B online
- Fastest growing advertising segment
- Steady shift toward Online advertising

Source: The Economist
The Keyword Marketplace

- The great, unsung, search problem
  - Matching relevant ads to user intent
- Example of distributed authorship
  - Advertisers bid on keywords
  - Discounts for good performance (relevance)
What's New?
Verticals

Image Search

Product Search
French Butter Dish


www.alwaysbrilliant.com

French Butter Dish

Unique Products and Clever Solutions for your Kitchen, Home, Garden and Garbage. Large Selection of Innovative Household products and Organizers to make life easier at The Home Market Place.

www.thehomemarketplace.com

French Butter Dish


www.frenchbutterdish.com

Sorted by: Top Results

<table>
<thead>
<tr>
<th>Name</th>
<th>Rating</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chez TJ</td>
<td>★★★★★</td>
<td>2.85 mi</td>
</tr>
<tr>
<td>Le Papillon</td>
<td>★★★★★</td>
<td>9.49 mi</td>
</tr>
</tbody>
</table>

1. Chez TJ
   (550) 964-7466
   938 Villa St
   Mountain View, CA
   Map | Send to Phone

   ...The days of boring butter sauces and tried-but-tired French standbys are over... changing menus is distinct... menus is distinct and satisfying, but as the prices rise, so does the complexity of the... more

   Category: Restaurants - Californian Restaurants - Eclectic Restaurants - French Restaurants - American Restaurants
   www.chzetj.com/

2. Le Papillon
   (408) 296-3730
   410 Saratoga Ave
   San Jose, CA
   Map | Send to Phone

   Since 1977, Le Papillon has set the standard for innovative French cuisine in San Jose... Whether for lunch or dinner Le Papillon offers distinctive and unique dishes, beautifully presented, in a... more
Personal Search

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**Save the results you like**

Click on the "Save" link next to any search result to save it.

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**Block the ones you don't**

Find a site that you don't want in your search results? Just click "Block site" and anytime you do a search, that site will be hidden.

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- Save the results you like. [more]
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- Share what you've found. [more]
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