Whither Search?

Rakesh Agrawal
Technical Fellow
Search Labs, Microsoft Research – Silicon Valley
Current state of affair
Evolving search
Search labs projects
• Current state of affair
• Evolving Search
• Search Labs projects
Does Search Work?

Navigational Queries

Bing

Library of Congress Home

www.loc.gov/index.html

The Library of Congress. The Library of Congress is the national library, and it serves as the research arm of Congress. It includes Library Catalogs, Digital Collections, Researchers, and Visitors.

Customer service 202-707-5000

Images of library of congress

see more · large images · black & white

Library of Congress Online Catalog

Online access to the collections resident at the Library of Congress.

Pseudo-Navigational Queries

Bing

daniel defoe

Images of daniel defoe

see more · large images · black & white

Daniel Defoe - Wikipedia, the free encyclopedia

Daniel Defoe (c. 1659-1661 — 24 April 1731 [1]), born Daniel Foe, was an English journalist, and pamphleteer, who gained enduring fame for his novels, pamphlets, and the Anglo-Dutch wars. His works include Novels, The Life and Strange Surprising Adventures of Robinson Crusoe, and the novel Moll Flanders. Defoe died on 24 April 1731.

Daniel Defoe - Biography and Works

Defoe Biography of Daniel Defoe and a search for Daniel Defoe

Daniel Defoe

Provides an in-depth look at the author's life and his impact.
My Recent Searches

- Car GPS around $300
- Four day trip to Bhutan from Delhi to visit important Buddhist places
Holiday destination From Delhi - Team-BHP
10 posts - 7 authors - Last post: Dec 15, 2008
1) cannot extend beyond 4 days weekend included. ... The only places I know of where you
don't need a visa are Nepal and Bhutan. ...
www.team-bhp.com/.../50450-holiday-destination-delhi.html - Cached - Similar

Delhi To Pune Non Stop In My Wagon R & Return Solo - Page 2 ...
6 posts - 3 authors - Last post: Jan 30
1) I don't think in any case you gonna need 4 days to reach Delhi from Mumbai (Parvel/Khopoli)it's only 1400 KM on 4 lane highway ...
www.indiamike.com/india/india-travel/.../delhi/...2/ - Cached - Similar

Originally Posted by Kool_Kid
i wish to take my wife on a small weekend (since we have to postpone our honeymoon due to my new job)

1) cannot extend beyond 4 days weekend included.
2) place should not require visa (or visa on arrival)
3) start point and end point should be delhi
4) budget <= 1 lakh

Since you mention visas, I suppose you are looking at a foreign trip? The only places I know of where you don't need a visa are Nepal and Bhutan. I am sure there are flights directly to Kathmandu from Delhi. For Bhutan, you can go via Kolkata. Not sure of there is anything from Delhi.
Observations

- Search queries are not grammatically correct questions, but they are not bags of words either.
- Query terms are often more than strings of characters.
- Data often has structure or structure can be derived.
- Search can span multiple sessions over several days.
- Search often provides entry point for browsing and search and browsing are inter-mixed.
- Expectations from search are increasing.
Current state of affair
Evolving search
Search labs projects
Humanity’s greatest advances are not in its discoveries – but in how those discoveries are applied to reduce inequity.

Bill Gates
Humane Computing

“Is it right? Is it just?
Is it in the interest of mankind?”


Applications to benefit individuals and society
New Challenge: chronic conditions—illnesses and impairments expected to last a year or more, limit what one can do and may require ongoing care

In 2005, 133 million Americans lived with a chronic condition (up from 118 million in 1995)
Technology Trends

- Tremendous simplification in the technologies for *effortlessly* capturing useful personal information
- Dramatic reduction in the cost and form factor for personal storage
- Cloud Computing
Charts for appropriate demographics?

Optimum level for Asian Indians: 150 mg/dL (much lower than 200 mg/dL for Westerners) Due to elevated levels of lipoprotein(a)*

Distributed computation and selection across millions of nodes
Privacy and security

### India’s Education System: 1951-2002

<table>
<thead>
<tr>
<th></th>
<th>1951</th>
<th>1981</th>
<th>2002(*)</th>
</tr>
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<tbody>
<tr>
<td><strong>Literacy Percentage</strong></td>
<td>18.33%</td>
<td>43.57%</td>
<td>65.38%</td>
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<tr>
<td><strong>Educational Institutions</strong></td>
<td></td>
<td></td>
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<tr>
<td>Primary</td>
<td>209671</td>
<td>494503</td>
<td>664041</td>
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<tr>
<td>Upper Primary</td>
<td>13596</td>
<td>118555</td>
<td>219626</td>
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<tr>
<td>High/HR. Secondary &amp; Inter &amp; Pre Junior College</td>
<td>7416</td>
<td>51573</td>
<td>133492</td>
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<tr>
<td><strong>Enrolments (in millions)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>19.2</td>
<td>73.8</td>
<td>113.9</td>
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<tr>
<td>Upper Primary</td>
<td>3.1</td>
<td>20.7</td>
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<tr>
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<td>1.5</td>
<td>11</td>
<td>30.5</td>
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<tr>
<td><strong>Dropout Rates (%)</strong></td>
<td>NA</td>
<td>82.5</td>
<td>66</td>
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<tr>
<td><strong>Teachers (in '000)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>538</td>
<td>1363</td>
<td>1928</td>
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<tr>
<td>Upper Primary</td>
<td>86</td>
<td>669</td>
<td>1157</td>
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<tr>
<td>High/HR. Secondary &amp; Inter &amp; Pre Junior College</td>
<td>127</td>
<td>926</td>
<td>1777</td>
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<tr>
<td><strong>Pupil Teacher Ratio</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Primary</td>
<td>20</td>
<td>38</td>
<td>43</td>
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<tr>
<td>Upper Primary</td>
<td>20</td>
<td>33</td>
<td>34</td>
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<tr>
<td>High/HR. Secondary &amp; Inter &amp; Pre Junior College</td>
<td>21</td>
<td>27</td>
<td>34</td>
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<tr>
<td><strong>Public Expenditure (% of GDP)</strong></td>
<td>0.64%</td>
<td>2.92%</td>
<td>4.02%</td>
</tr>
</tbody>
</table>

Significant achievements, but problems remain …
Problems of School Level Education in India

**Poor performance**
- 39% dropouts in primary, additional 15.6% in secondary, additional 11.7% in higher secondary
- Pass out ratio is 50% at Class X and majority of them pass in 3rd division
- Less than 8% finish all schooling to qualify for a college education

**Poorly trained teachers**
- 51% of primary teachers are higher secondary or below
- Only 44% have received in-service training
- Absence of learning material for teachers to update their knowledge

**Poor teacher-student ratios**
- Ratio in primary is 1:43, secondary and Higher secondary is 1:34. About 9% of primary schools have a teacher-student ratio > 1:100
- 1.4% of primary schools have no teachers, 19% have only one teacher for all classes

**Poor quality of material**
- Poor quality of textbooks, out-dated curriculum

Source: IBM Report on Improving India’s Education System through Information Technology, 2005
1. Define goal.
2. Find the highest-leverage approach.
3. Discover the ideal technology for that approach.
4. In the meantime, make the smartest application of the technology on-hand.

1. Quality education to all.
2. New pedagogy.
3. Individualized learning with teacher as a discussant.
4. Internet-based mass collaboration to help teachers teach better and improve the educational infrastructure.

Education Web

• Participation of experts, teachers, parents and students in the development and revisions of curricula

• Sharing and collaborative development of lectures, assignments, tests, etc.

• Tools for capturing feedback on textbooks (errors, better explanations, supplementary readings)

• Collaborative translation and localization of educational material
Outline

- Current state of affair
- Evolving search
- Search labs projects
Lincoln: Experimental Commerce Search Engine

- Best car GPS around $300

Query

Identification of Commercial Intent

Query Analysis & Annotation

Query Translation

Product Catalog

Category = “Auto GPS”
Price = approx(300)
Order By ReviewRank

✓ Structure and Semantics in Data and Queries
✓ Insights on user behavior from massive data mining
✓ From ranking to decision making
✓ Task-orientation

Query Result

Offer Feeds

Synthesizing Products From Offers

Offer Categorization

Product-Offer Matching
Enable non-developers to create and monetize custom search applications that combine their data and knowledge with Search services.
Tools for creating and updating content (Wikipedia++)

Trust and authoritativeness of content

Personalization of search to find the material suitable for one’s own style of teaching

Bootstrapping and incentives
Concluding Remarks

- Search is becoming an essential “utility”
- Need to develop new foundations and abstractions to take search to next level
- Academia can (and must) play a leading role
Search Labs’ mission is to invent next in Internet search and applications
What I Ended up Buying?

Garmin Nuvi 755T Portable GPS Navigation System w/4.3" Widescreen Display (0100071630)

Garmin continues to build up its nuvi 7xx series portable GPS navigators with its nuvi 755T which adds a number of handy routing and communication features to an already impressive list of specs including a 4.3-inch widescreen display, text-to-speech capabilities, media player and FM transmitter for transmitting audio including directions and MP3 music and audiobooks from the device to your car radio.

<table>
<thead>
<tr>
<th>Stores</th>
<th>Free Shipping</th>
<th>Store Price</th>
<th>cashback</th>
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<tbody>
<tr>
<td>COMP-U-PLUS</td>
<td>No</td>
<td>$327.95</td>
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<td>$329.00</td>
<td>2.00%</td>
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<td>PCNation</td>
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<td>$334.00</td>
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<td>PC RUSH</td>
<td>No</td>
<td>$339.27</td>
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<td>ABE'S OF MAINE</td>
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<td>$339.00</td>
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<td>$359.99</td>
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** MORE ABOUT ELECTRONICA DIRECT **
Electronica Direct offers the latest computer software and household goods all at guaranteed savings! We are committed to excellence in both product quality and customer service. We are pleased to know that you have selected us for your cashback needs.

** cashback summary **

- **Pending:** $29.20
- **Available:** $0.00
- **In process:** $0.00
- **Rewarded:** $0.00

** Total cashback:** $29.20

Date of activity: February 5, 2009

Don't see all your cashback rewards? Find out what you're missing.

Search, shop and save. Use Live Search cashback to find know and trust. And get cashback.
Search for bhutan on Bing. Result shows images of Bhutan, Wikipedia entry on Bhutan, Kingdom of Bhutan, and Culture of Bhutan. Related searches include MSN Bhutan, Bhutan Travel, Bhutanese Songs, Capital Bhutan, Bhutan Homes, and search history options.
How About Travel Sites?

Search Results
30 matching results (for bhutan)

Macleay Serviced Apartments, Potts Point hotels, NSW, Australia
This Sydney property is within 1 km of Elizabeth Bay House, Royal Botanic Gardens, and Art Gallery of New South Wales. Sydney Tower is also within 10 km of the property.
http://www.expedia.com/pub/agent.dll/qscrv=dspv/htid=40898/crti=0/rdct=1

Application
Adesh Barbados Belarus Belgium Belize Benin Bermuda Bhutan Bolivia Bosnia And Herzegovina Botswana Bouvet... Adesh Barbados Belarus Belgium Belize Benin Bermuda Bhutan Bolivia Bosnia And Herzegovina Botswana Bouvet...

We could not find any vacation packages in 'Bhutan (all)' that match your search criteria.