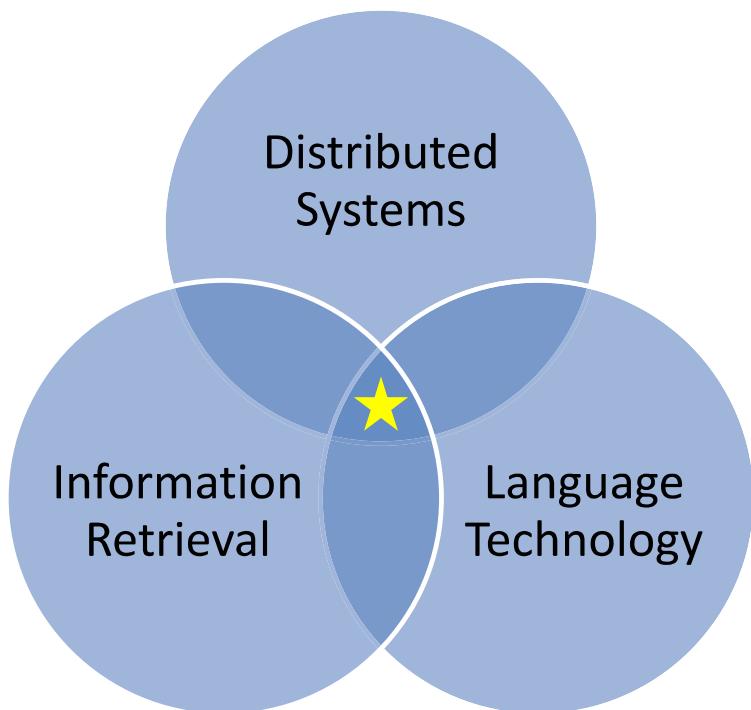


# The Sweetspot



# Web Search

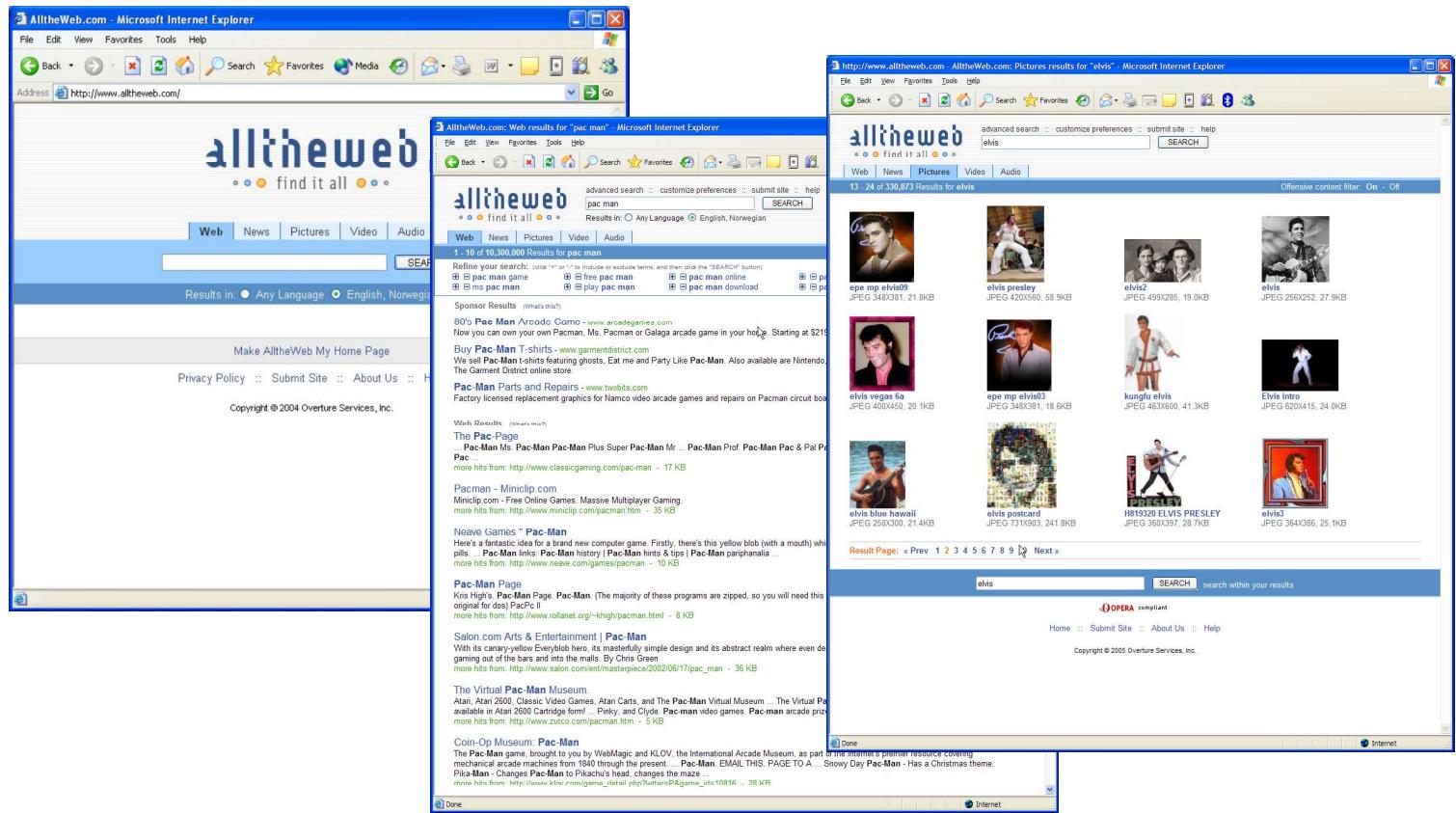
The image displays four separate web browser windows, likely from Internet Explorer, showing search results for different queries. The windows are arranged in a grid:

- Top Left Window:** Shows search results for "Plan 9 from Outer Space - Bing". It includes a sidebar with "PLAN 9 FROM OUTER SPACE" links and a "RELATED SEARCHES" section with links like "Vampira", "Ed Wood", and "Geraldine Chaplin".
- Top Right Window:** Shows search results for "lost - Yahoo! Search Results". It includes a sidebar with "Lost - Latest News" and a "Sponsored results" section for "ABC.com - Lost - Episode Guide".
- Bottom Left Window:** Shows search results for "elvis costello - Google Search". It includes a sidebar with "elvis costello" links and a "Related searches" section.
- Bottom Right Window:** Shows search results for "Elvis Costello Home Page - The Elvis Costello Home Page". It includes a sidebar with "Elvis Costello" links and a "Related searches" section.

All windows show a standard search interface with tabs for "Web", "Images", "Videos", etc., and a search bar at the top. The results pages feature various links, images, and snippets of text from the web pages found for each query.

# alltheweb.com

## 1999-2003



# Enterprise Search

## Much more than intranets

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**SCIRUS** for scientific information only

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Searched for: All of the words einstein AND big AND bang

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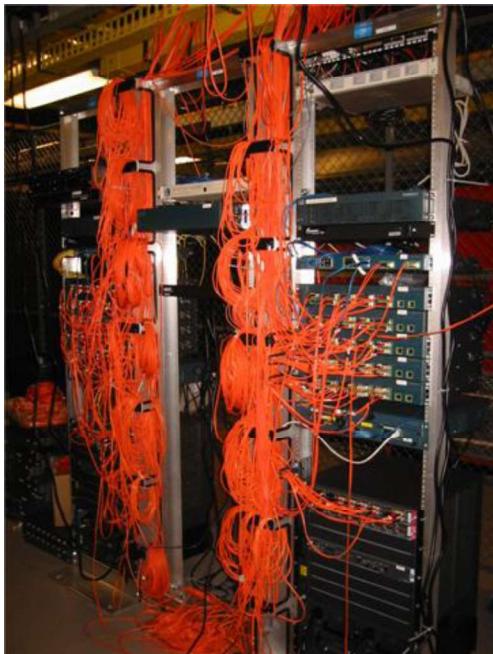
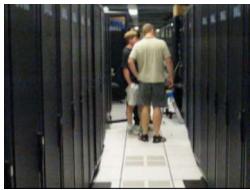
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# Data Centers

alltheweb.com 2000



# Data Centers

## Microsoft 2010



11:58:14 PM 10/29/2008

A screenshot of a YouTube search results page. The search bar at the top contains the query "microsoft data centers". Below the search bar, there are navigation links for "Home", "Videos", and "Channels". A "Search options" button is also visible. The main content area displays two video thumbnails. The first video is titled "Microsoft Data Centers" and has a thumbnail showing a server rack. The second video is titled "Microsoft OS Cloud Windows Azure Data Center - Google and Amazon" and has a thumbnail showing a person in a suit. Both videos have a rating of 4 stars and were uploaded 1 year ago.

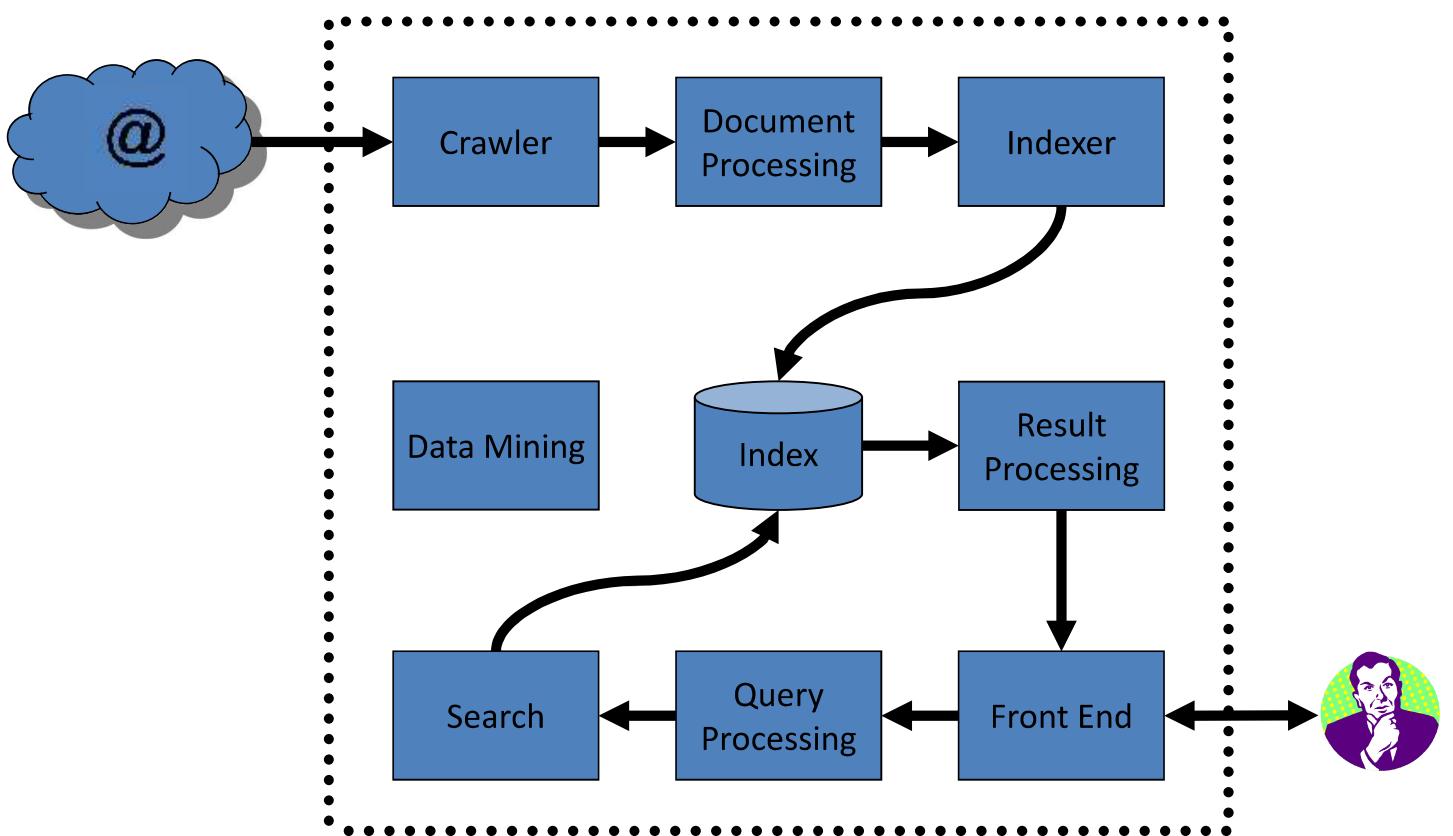
<http://www.youtube.com/watch?v=K3b5Ca6lzqE>



<http://www.youtube.com/watch?v=PPnoKb9fTkA>

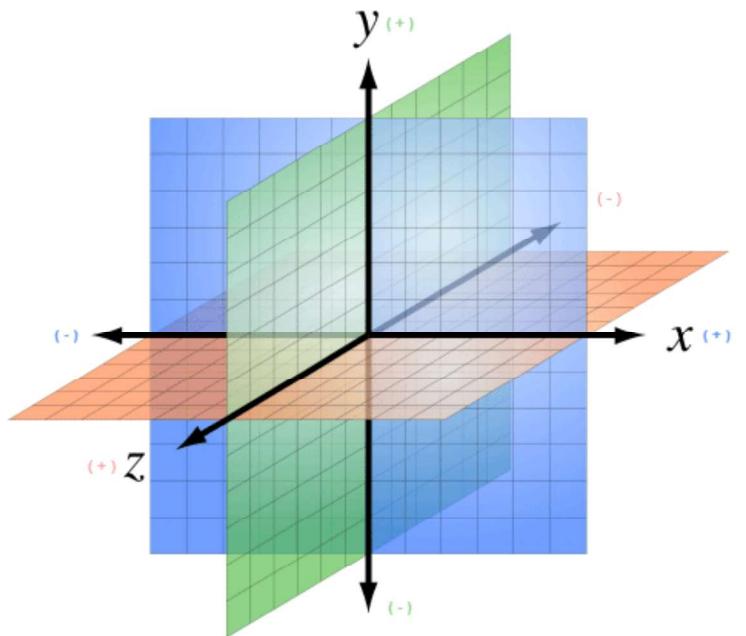
# Search Platform Anatomy

## The 50,000 Foot View

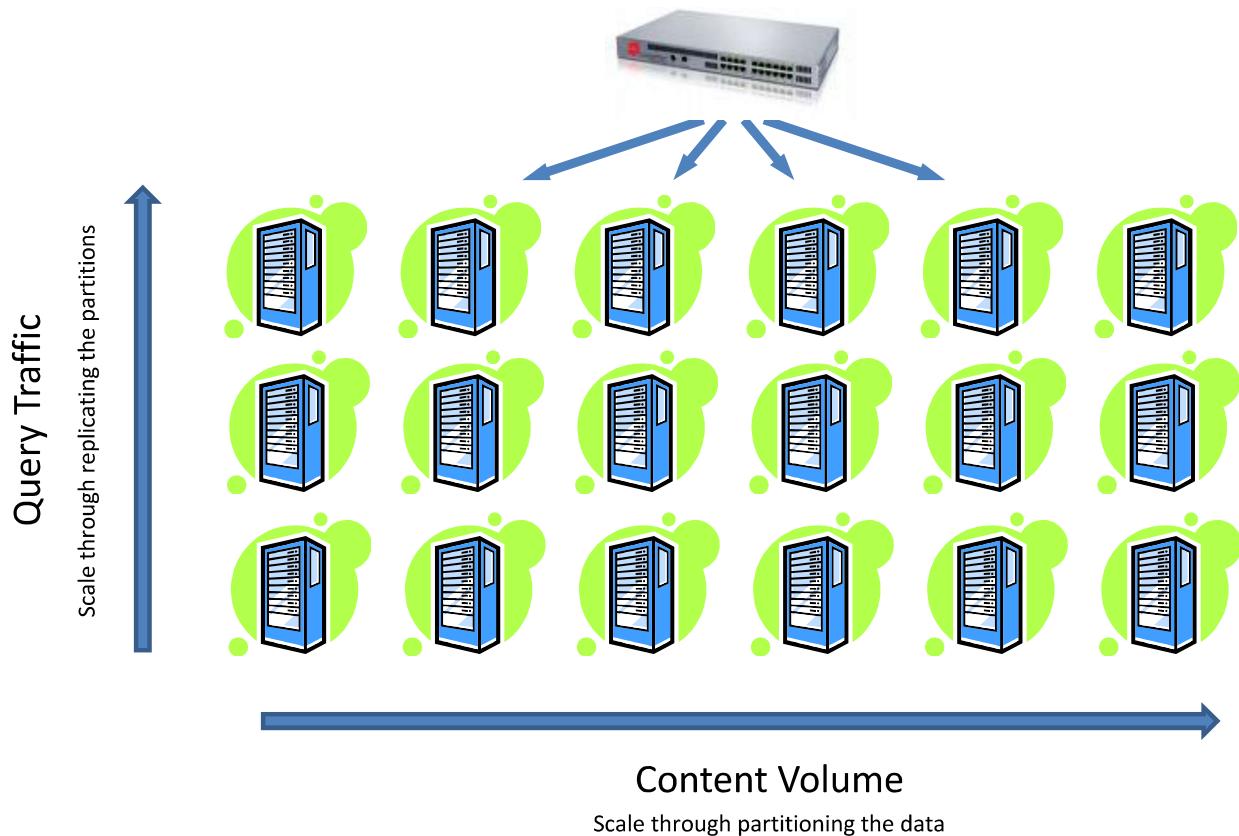


# Scaling

- **Content Volume**
  - How many documents are there?
  - How large are the documents?
- **Content Complexity**
  - How many fields does each document have?
  - How complex are the field structures?
- **Query Traffic**
  - How many queries per second are there?
  - What is the latency per query?
- **Update Frequency**
  - How often does the content change?
- **Indexing Latency**
  - How quickly must new data become searchable?
- **Query Complexity**
  - How many query terms are there?
  - What is the type and structure of the query terms?



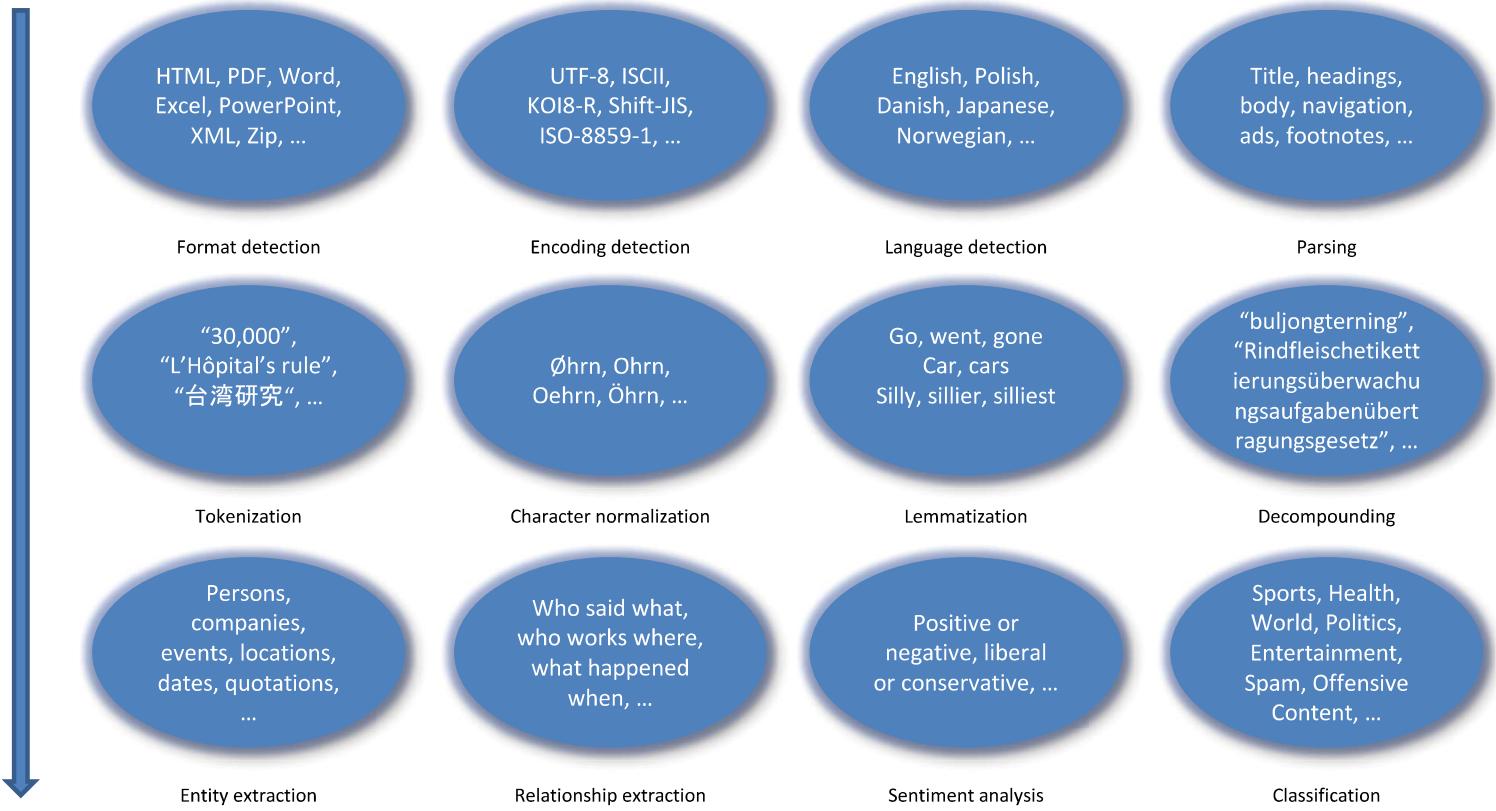
# Scaling



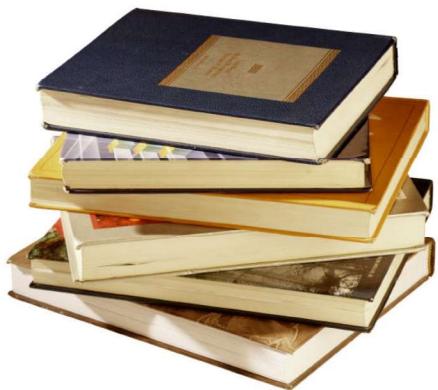
# Crawling The Web



# Processing The Content

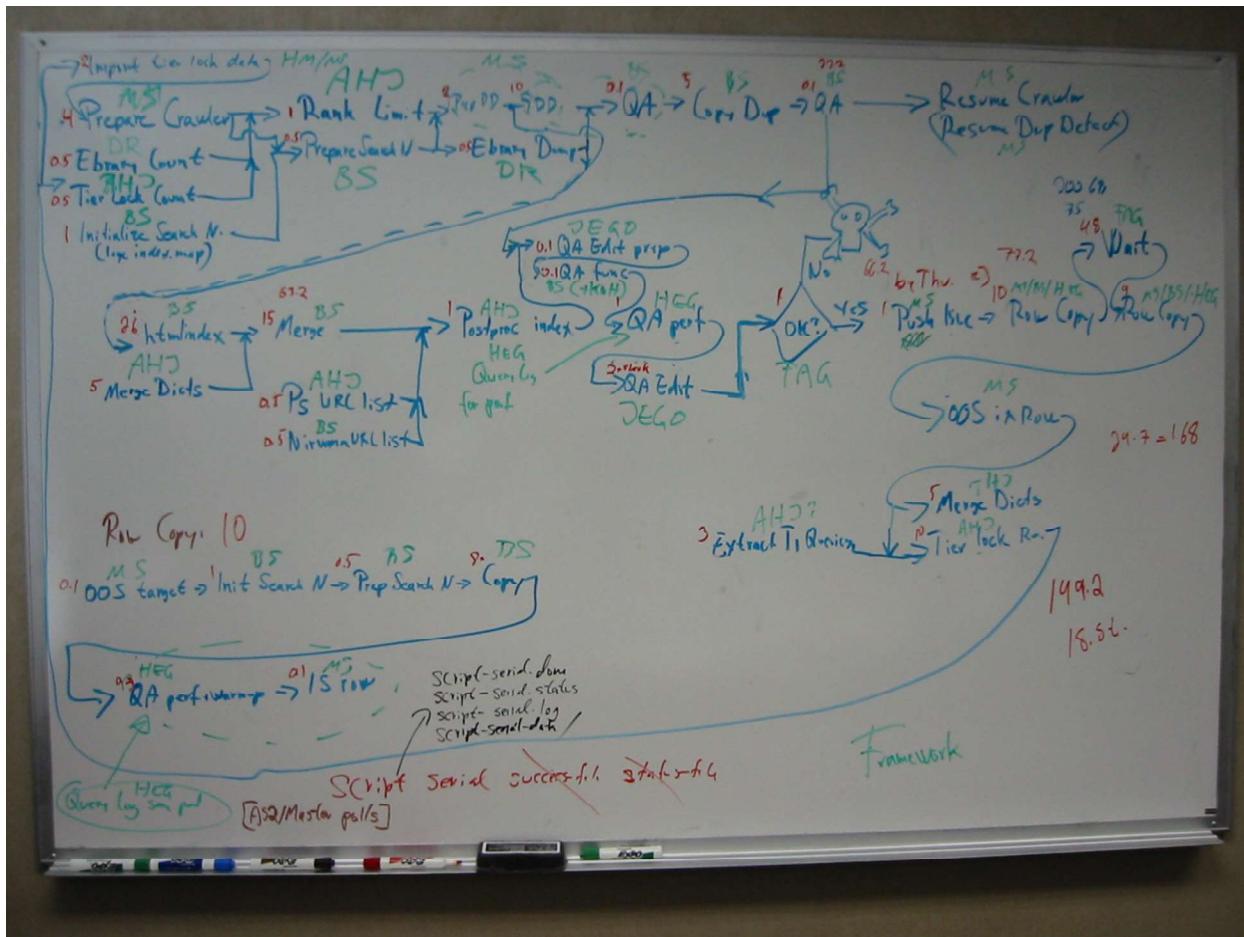


# Creating The Index

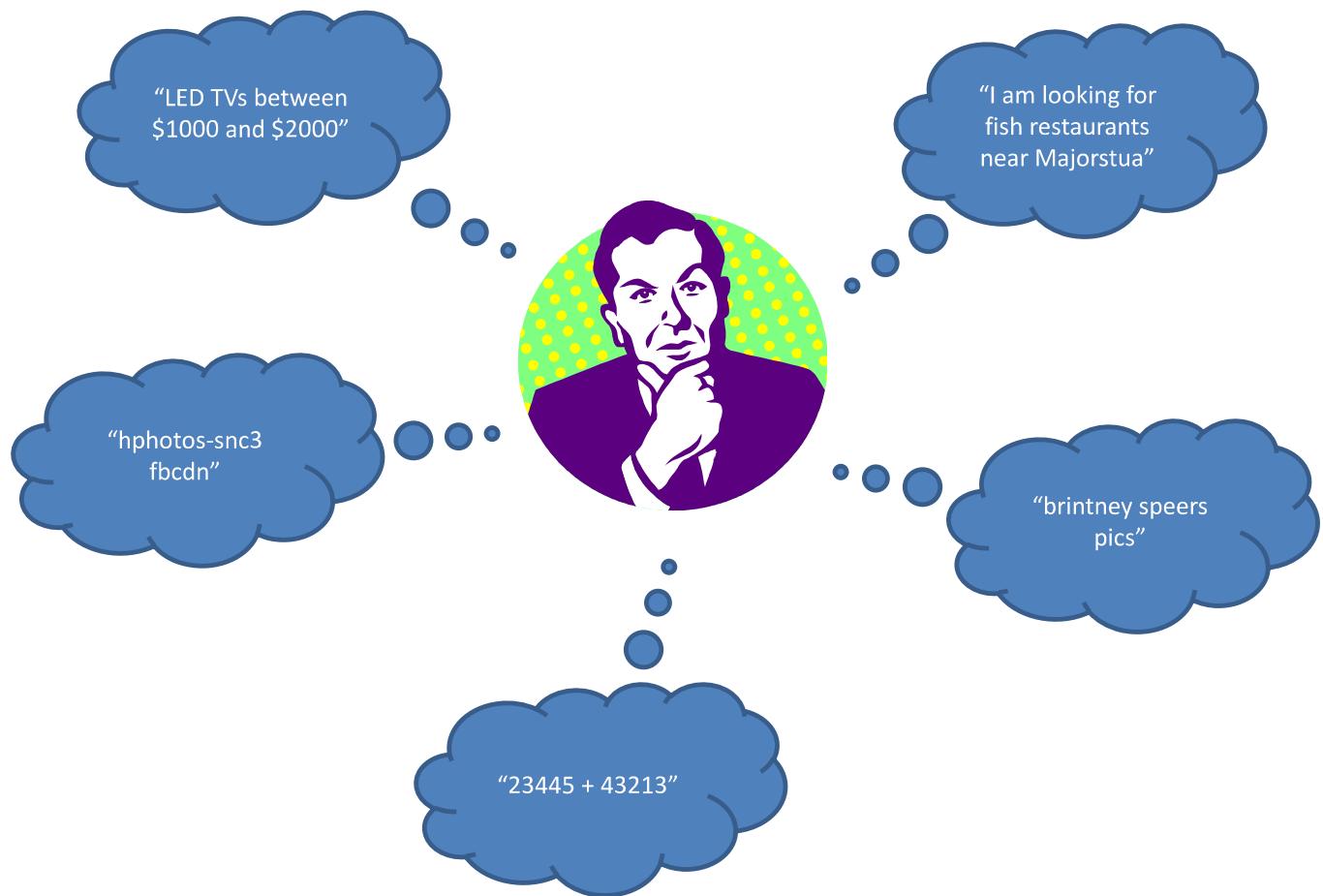


Word	Document	Position
tea	4	22
	4	32
	4	76
	8	3
teacart	8	7
teach	2	102
	2	233
	8	77
teacher	2	57

# Deploying The Index



# Processing The Query

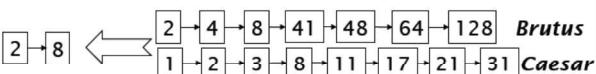


# Searching The Content

Introduction to Information Retrieval | Sec. 2.3

## Recall basic merge

- Walk through the two postings simultaneously, in time linear in the total number of postings entries

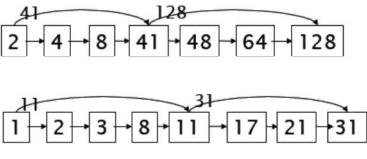


If the list lengths are  $m$  and  $n$ , the merge takes  $O(m+n)$  operations.

Can we do better?  
Yes (if index isn't changing too fast).

Introduction to Information Retrieval | Sec. 2.3

## Augment postings with skip pointers (at indexing time)



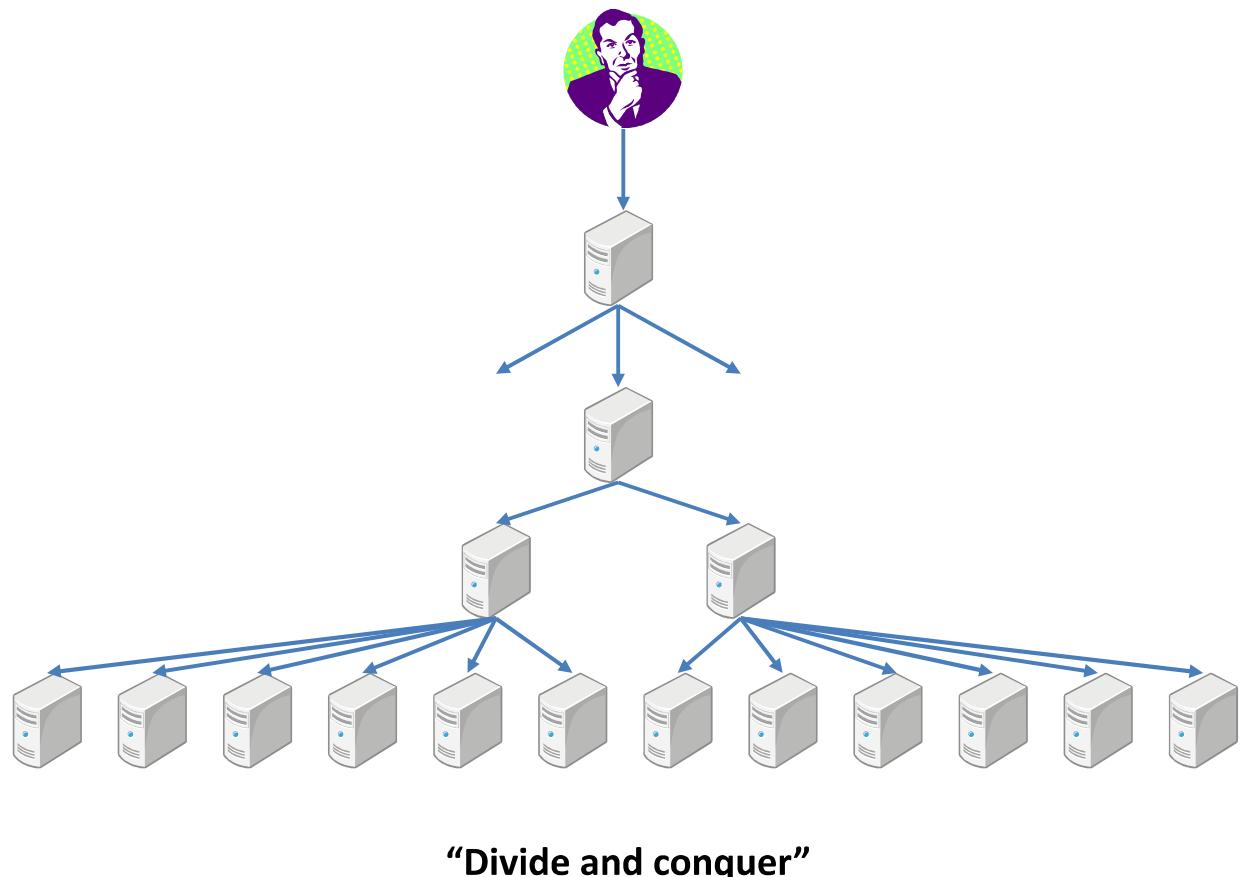
- Why?
- To skip postings that will not figure in the search results.
- How?
- Where do we place skip pointers?

<http://www.stanford.edu/class/cs276/handouts/lecture2-dictionary.pdf>



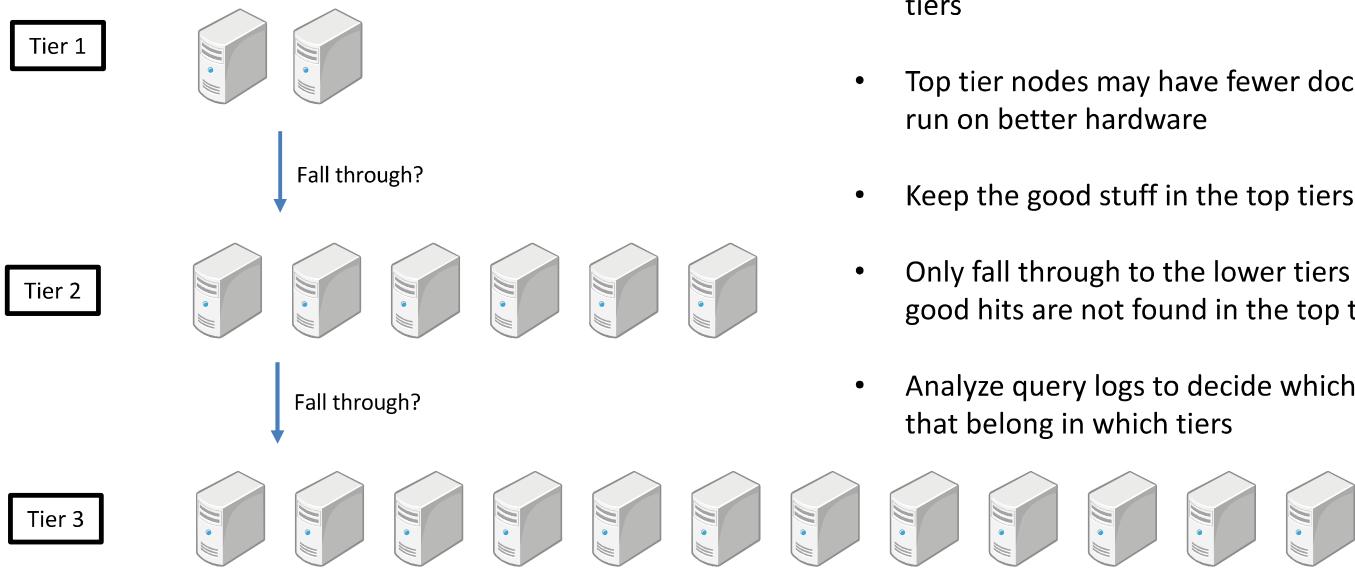
Assess relevancy as we go along

# Searching The Content



# Searching The Content

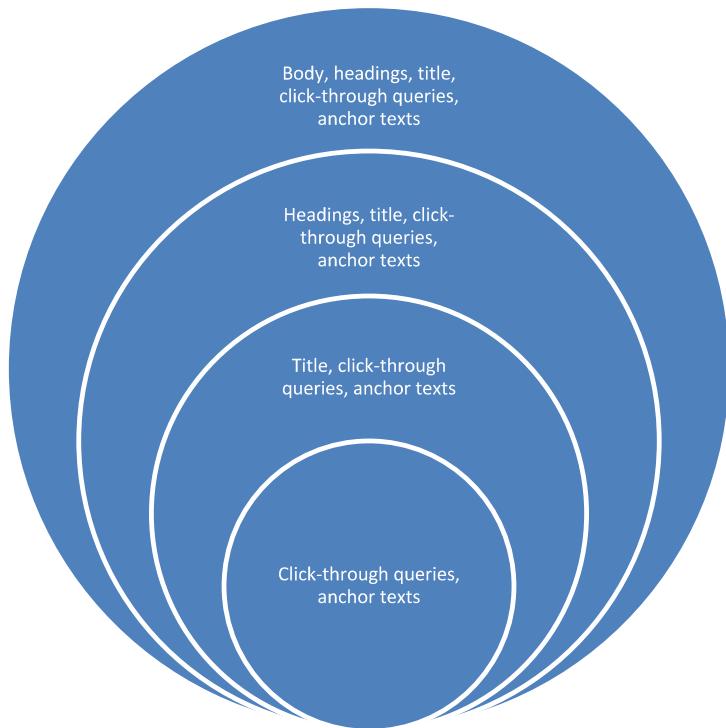
## Tiering



**"All search nodes are equal, but some are more equal than others"**

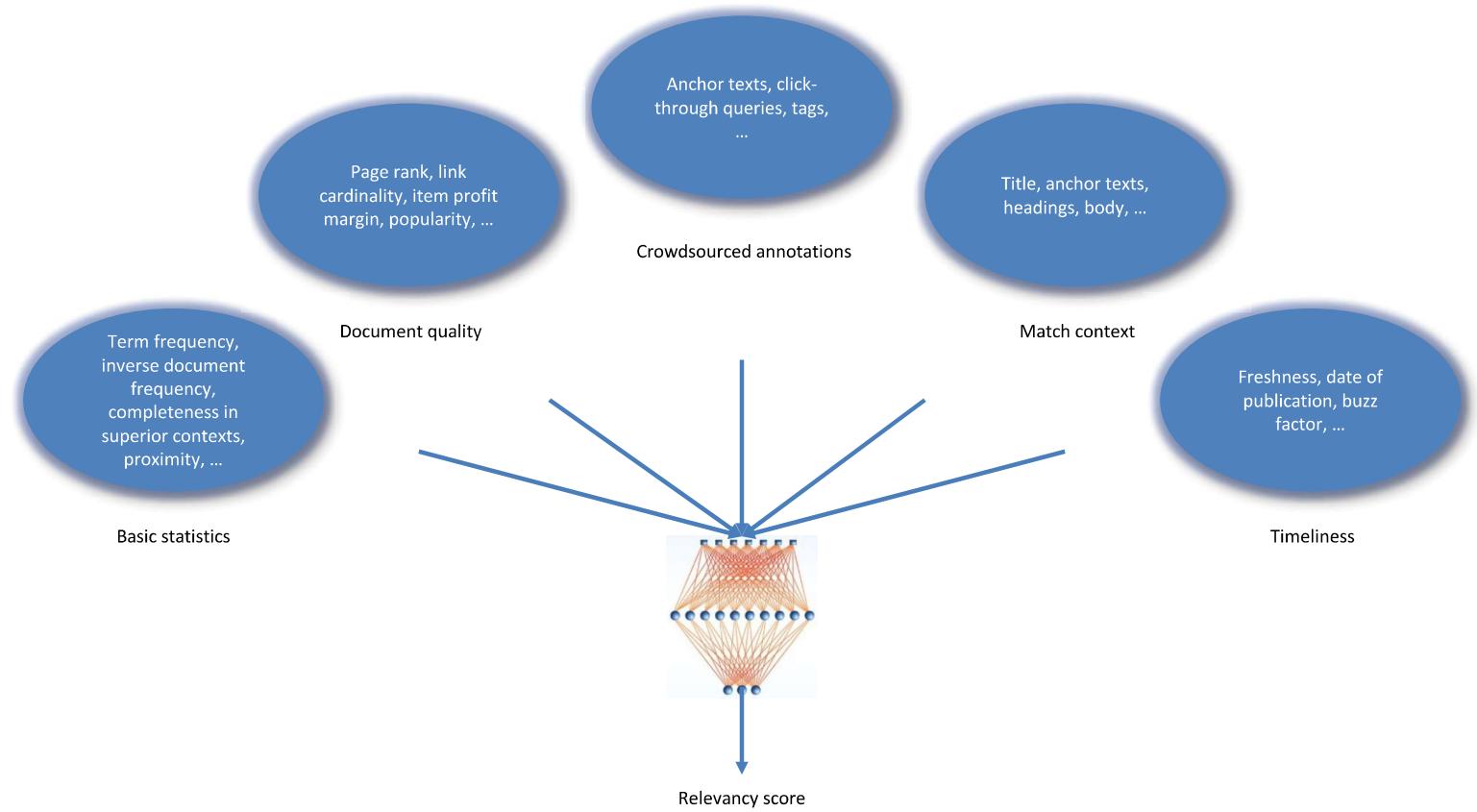
# Searching The Content

## Context Drilling



**"If the result set is too large, only consider the superior contexts"**

# Relevancy



**“Maximize the normalized discounted cumulative gain (NDCG)”**

# Processing The Results

## • Faceted browsing

- What are the distributions of data across the various document fields?
- “Local” versus “global” meta data

## • Result arbitration

- Which results from which sources should be displayed in a federation setting?
- How should the SERP layout be rendered?

## • Unsupervised clustering

- Can we automatically organize the results set by grouping similar items together?

## • Last-minute security trimming

- Does the user still have access to each result?

The screenshot displays a search interface with several key components:

- Facets (left sidebar):** Shows filters for "Source Title" (Journal of Health Psychology, American Journal of Cardiology, Computers and Structure), "Author Name" (Ku, D.N., Tang, D., Yang, C.), "Year" (2004, 2003, 2002), "Document Type" (Article, Review, Conference Paper), and "Index Terms" (heart infarction, risk assessment).
- Search Bar:** Contains the query "deer".
- Results Summary:** Shows 1-10 of 36,000,000 results.
- Result Preview:** Includes a snippet for "Consumer Products Inc. (US DEER) NASDAQ: DEER" with a graph showing price performance.
- Related Searches:** Lists terms like "albert einstein", "theory of relativity", "general theory of relativity", "bose einstein condensation", "physicists", "photoelectric effect", "special theory of relativity", "condensation", "speed of light".
- Social Sharing:** Buttons for clusters, sources, sites, and remix.
- Clustering:** A sidebar on the right shows clusters for "Fish and Wildlife" (White-tailed, Other Topics, Feeding, Regulations, Department Of Wildlife, Tennessee Wildlife Resources Agency, Canada, UK Columbia, Other Topics, Management, Park, Animals, Red Deer, Control, Odocoleus virginianus), "Deer Hunting" (Mule, Hunts, Family, Wildlife), and "Moose" (Family, Wildlife).

# Data Mining

## MapReduce: Simplified Data Processing on Large Clusters

Jeffrey Dean and Sanjay Ghemawat

jef@google.com, sanjay@google.com

Google, Inc.

### Abstract

MapReduce is a programming model and an associated implementation for processing and generating large data sets. Users specify a *map* function that processes a key/value pair to generate a set of intermediate key/value pairs, and a *reduce* function that merges all intermediate values associated with the same intermediate key. Many real world tasks expressible in this model, such as those listed in the paper.

Programs written in this functional style are automatically parallelized and executed on a large cluster of commodity machines. The run-time system takes care of the details of partitioning the input data, scheduling the program's execution across a set of machines, handling machine failures, and managing the required inter-machine communication. This allows programmers without any experience with parallel and distributed systems to easily utilize the resources of a large distributed system.

Our implementation of MapReduce runs on a large cluster of commodity machines and is highly scalable: a typical MapReduce computation processes many terabytes of data on thousands of machines. Programmers find the system easy to use: hundreds of MapReduce programs have been implemented and upwards of one thousand MapReduce jobs are executed on Google's clusters every day.

### 1 Introduction

Over the past five years, the authors and many others at Google have implemented hundreds of special-purpose computations that process large amounts of raw data, such as crawled documents, web request logs, etc., to compute various kinds of derived data, such as inverted indices, various representations of the graph structure of web documents, summaries of the number of pages crawled per host, the set of most frequent queries in a

given day, etc. Most such computations are conceptually straightforward. However, the input data is usually large and the computations have to be distributed across hundreds or thousands of machines in order to finish in a reasonable amount of time. The issues of how to parallelize the computation, distribute the data, and handle failures conspire to obscure the original computation with large amounts of complexity.

As a reaction to this complexity, we developed a programming abstraction that allows users to ignore the details of parallelization, load balancing, and fault recovery. It is inspired by the *map* and *reduce* functions used in many other functional languages, and by the *map* and *reduce* operation to each logical step of a computation. A user specifies a *map* function that computes a set of intermediate key/value pairs, and a *reduce* function that merges all intermediate values associated with the same intermediate key. Many real world tasks expressible in this model, such as those listed in the paper.

The major contribution of this paper is a powerful interface that makes it easy to parallelize distributed computations with an implementation that achieves high performance.

Section 2 describes the MapReduce interface and gives several examples of its use. Section 3 discusses the implementation of the MapReduce interface, tailored to our cluster-based computing environment. Section 4 describes several refinements of the programming model that we have found useful. Section 5 has performance measurements of our implementation for a variety of tasks. Section 6 explores the use of MapReduce within Google including our experiences in using it as the basis

## SCOPE: Easy and Efficient Parallel Processing of Massive Data Sets

Ronnie Chaiken, Bob Jenkins, Per-Ake Larson, Bill Ramsey,

Daren Shakib, Simon Weaver, Jingren Zhou

Microsoft Corporation

{rchaiken, bobjen, palarson, brams, darrrens, sweaver, jzhou}@microsoft.com

### ABSTRACT

As providing cloud-scale services have an increasing demand, there is a need to analyze massive data sets such as search logs, sensor data, and financial transaction logs. For cost and performance reasons, processing is done on large clusters of commodity machines connected via high-bandwidth network. It is challenging to design a programming system that provides flexibility and efficiency to meet a variety of needs.

SCOPE is a declarative language and optimizer designed for massive data sets. Optimized for massive data sets, SCOPE provides a good abstraction of group-by-aggregation operations over a cluster of machines. The programming model provides a good performance, ease of use, and reduce function that performs aggregation. The underlying run-time system achieves parallelism by partitioning the data and processing different partitions concurrently using multiple machines.

However, this model has its own set of limitations. Users are forced to map their applications to the map-reduce model in order to achieve parallelism. For some applications this mapping is very unnatural. Users have to provide implementations for the map and reduce functions that may force them to perform mapping and selection. Such custom code is error-prone and hard-to-reuse.

Moreover, for complex applications that require multiple stages of map-reduce, there are often many valid evaluation strategies and execution orders. Having users implement all potentially valid execution plans is impractical. In addition, users must specify physical execution plan directly in database systems; the user plans may be suboptimal and lead to performance degradation by orders of magnitude.

In this paper, we present a new scripting language, SCOPE (Structured Computer Optimization for Parallel Execution), designed for large-scale data sets that can be processed on commodity hardware. Many users are familiar with relational data and SQL. SCOPE intentionally builds on this knowledge but with simplifications designed for the new evaluation environments. Users familiar with SQL relations will find it natural to use SCOPE. Like SQL, data is modeled as sets of rows composed of typed columns.

Every rowset has a well-defined schema. The SCOPE runtime provides implementation of standard algebraic operators, leaving users free from implementing similar functionality manually.

SCOPE is being used daily for a variety of data analysis and data mining applications inside Microsoft.

SCOPE is a declarative language. It allows users to focus on the data transformations required to solve the problem at hand and the complexity of the solution is hidden in the compiler and implementation detail. The SCOPE compiler and optimizer are responsible for generating an efficient execution plan and the runtime for executing the plan with minimal overhead.

To appear in OSDI 2004

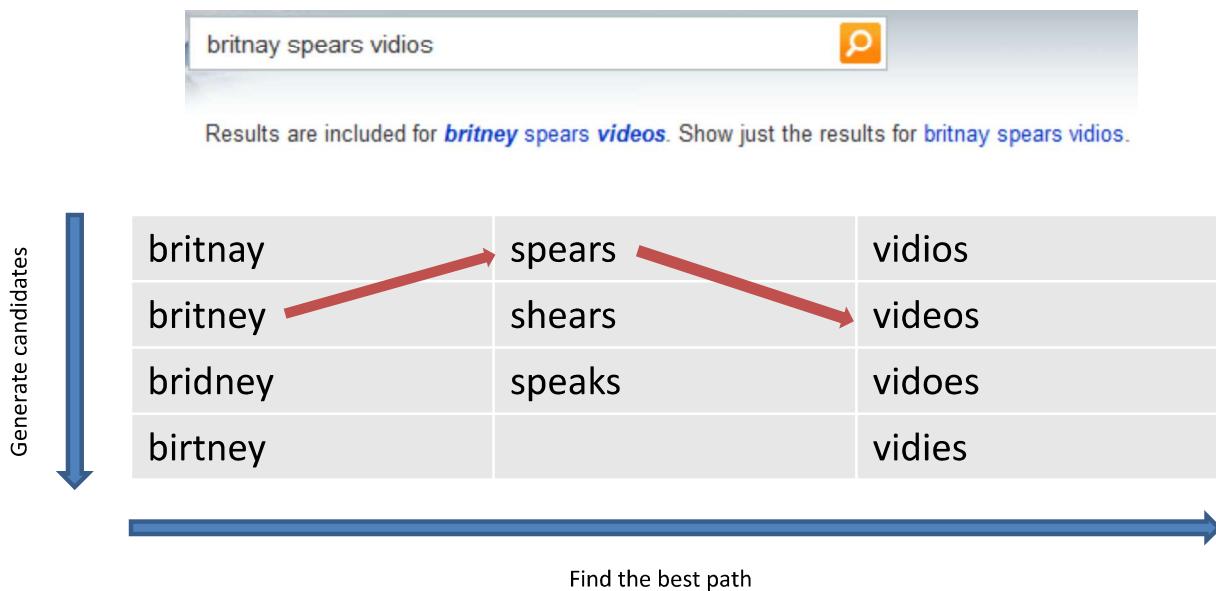


# **Applications**

# Spellchecking

488941 britney spears	29 brittent spears	9 britttany spears	5 borney spears	3 brittly spears	2 brizreny spears
40131 brittany spears	29 brittnay spears	9 brittanay spears	5 broitney spears	3 britmey spears	2 brittany spears
36315 brittney spears	29 britttany spears	9 britinany spears	5 brotny spears	3 britneey spears	2 britttany spears
24242 brittany spears	29 heinay spears	9 britney spears	5 brutenay spears	3 britnhy spears	2 britteneay spears
7331 britny spears	26 birttney spears	9 britnew spears	5 btinay spears	3 brittneay spears	2 britain spears
6633 briteny spears	26 breitney spears	9 britney spears	5 btritney spears	3 brittney spears	2 britane spears
2691 britteny spears	26 britinity spears	9 britxney spears	5 gritney spears	3 brittettly spears	2 brittaneny spears
1807 briney spears	26 britenay spears	9 britteny spears	5 spritney spears	3 brittex spears	2 britanin spears
1635 brittney spears	26 brittney spears	9 brittinetay spears	4 bittny spears	3 britteyyxx spears	2 brittan spears
1479 brittay spears	26 brittan spears	9 btrny spears	4 boritney spears	3 brittity spears	2 brittanee spears
1479 brittanny spears	26 brittne spears	9 brytny spears	4 brandy spears	3 brittney spears	2 brittannie spears
1321 brittinty spears	26 brittany spears	9 rhitney spears	4 brheitney spears	3 brittneye spears	2 brittant epears
1211 britnet spears	24 beitney spears	8 birtiny spears	4 bretainy spears	3 brittneyy spears	2 britannu spears
1096 brittiney spears	24 brittney spears	8 bithney spears	4 breetney spears	3 brittneey spears	2 britanil spears
991 brittaney spears	24 brighthty spears	8 brittany spears	4 breitney spears	3 britthney spears	2 brittanyt spears
991 brittney spears	24 brinting spears	8 brittyny spears	4 breitnay spears	3 brittneye spears	2 britteeny spears
811 britthney spears	24 brittany spears	8 breteny spears	4 briattany spears	3 britteny spears	2 britteneay spears
811 brittney spears	24 brittenny spears	8 brightny spears	4 briatney spears	3 brietney spears	2 brittene spears
664 brittney spears	24 brittin spears	8 brittay spears	4 briety spears	3 briltney spears	2 brittene spears
664 brittneyy spears	24 brittne spears	8 brittety spears	4 briotney spears	3 brtiany spears	2 britteneys spears
601 britney spears	24 brittishn spears	8 brittany spears	4 briutney spears	3 brtianyy spears	2 britin spears
601 britny spears	21 biritney spears	8 brittely spears	4 briutneny spears	3 britinay spears	2 britinary spears
544 brittancy spears	21 brittany spears	8 britency spears	4 briutney spears	3 brittinney spears	2 brittmy spears
544 brittany spears	21 bityn spears	8 britntay spears	4 briutaby spears	3 brittitanay spears	2 brittancy spears
364 brittay spears	21 bratney spears	8 britony spears	4 briutacy spears	3 briutinay spears	2 britnat spears
364 brittinty spears	21 britani spears	8 brittnner spears	4 britainey spears	3 britnet spears	2 brittnbey spears
329 brittney spears	21 britanis spears	8 brittany spears	4 briutinie spears	3 briytiny spears	2 britndy spears
269 brittney spears	21 brittany spears	7 britainy spears	4 briutinney spears	3 btitney spears	2 britnch spears
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244 brittne spears	21 brittany spears	7 bitemy spears	4 briutnear spears	3 pretney spears	2 brittney6 spears
244 brytney spears	21 buttany spears	7 bitiny spears	4 briutnul spears	3 shriunay spears	2 brittuce spears
220 breathney spears	21 brittany spears	7 bretenay spears	4 briutneuy spears	2 barbittany spears	2 brittneyh spears
220 brittiany spears	19 binney spears	7 brianty spears	4 briutneuy spears	2 bobrittney spears	2 brittneya spears
199 brittineny spears	19 brittinty spears	7 brittinty spears	4 briutnney spears	2 bbittny spears	2 brittneyy spears
163 brittney spears	19 brittney spears	7 brittiany spears	4 brittaby spears	2 brittinty spears	2 brittnehy spears
147 breathy spears	19 brittene spears	7 brittly spears	4 britttery spears	2 bbitrtny spears	2 brittnejy spears
147 brittiney spears	19 brittony spears	7 britonej spears	4 britthay spears	2 beitany spears	2 brittne spears
147 britty spears	19 brittatty spears	7 britney spears	4 brittnay spears	2 beitnhy spears	2 brittu spears
147 brittoney spears	19 brittettay spears	7 brittnay spears	4 brittnat spears	2 bextney spears	2 brittoney spears
147 bruttney spears	17 britty spears	7 brittnay spears	4 brittnnny spears	2 betnhy spears	2 brittany spears
133 britteneyy spears	17 brieny spears	7 brittian spears	4 brittnye spears	2 betnay spears	2 brittney spears
123 britney spears	17 brittne spears	7 britny spears	4 brittinty spears	2 betny spears	2 britry spears
122 brittany spears	17 britthy spears	7 brittiany spears	4 briutney spears	2 bhrinay spears	2 brittany spears
121 britdney spears	17 brittanie spears	7 brittiney spears	4 briyenay spears	2 biney spears	2 brittanay spears
121 brittany spears	15 brytney spears	7 brittney spears	4 brnity spears	2 bintey spears	2 brittang spears
121 brittmy spears	15 briten spears	7 brittiany spears	4 bitteny spears	2 biretny spears	2 brittang spears
109 brittney spears	15 britterney spears	6 beritney spears	4 brittiany spears	2 bixitany spears	2 brittannay spears
109 britni spears	15 brittineny spears	6 birthtney spears	4 brytney spears	2 bixitany spears	2 brittannyn spears
109 brittant spears	15 brittamy spears	6 breshtney spears	4 brytny spears	2 bixitny spears	2 brittannyt spears
98 brittney spears	15 brittney spears	6 bretay spears	4 brytoni spears	2 birtey spears	2 brittany spears
98 brittney spears	15 brytnei spears	6 bretany spears	4 brytnei spears	2 birtheny spears	2 brittary spears
98 brittiany spears	15 btrtney spears	6 briatany spears	4 brixtny spears	2 birtieny spears	2 brittene spears
98 brittney spears	15 rittny spears	6 brixtny spears	4 drittny spears	2 birtmny spears	2 brittenty spears
89 brietyl spears	14 brixtay spears	6 brietenney spears	4 priteny spears	2 birtnet spears	2 brittinney spears
89 briinty spears	14 brittay spears	6 brixtian spears	3 beittany spears	2 bintnet spears	2 brittley spears
89 brittinty spears	14 britten spears	6 brittinty spears	3 bichney spears	2 bitttany spears	2 britt spears
89 brittie spears	12 beritney spears	6 brititney spears	3 birktny spears	2 bnrttany spears	2 brittney spears
89 brittey spears	12 bretiny spears	6 britnsy spears	3 birktny spears	2 bnttney spears	2 brittnety spears

# Spellchecking



1. Generate a set of candidates per query term using approximate matching techniques. Score each candidate according to, e.g., “distance” from the query term and usage frequency.
2. Find the best path in the lattice using the Viterbi algorithm. Use, e.g., candidate scores and bigram statistics to guide the search.

# Entity Extraction

↑ Levels of abstraction

...	...	...	...	...
MAN				FOOD
N/proper	V/past/eat	DET	ADJ	N/singular
Richard	ate	some	bad	curry

1. Logically annotate the text with zero or more computed layers of meta data. The original surface form of the text can be viewed as trivial meta data.
2. Apply a pattern matcher or grammar over selected layers. Use, e.g., handcrafted rules or machine-trained models. Extract the surface forms that correspond to the matching patterns.

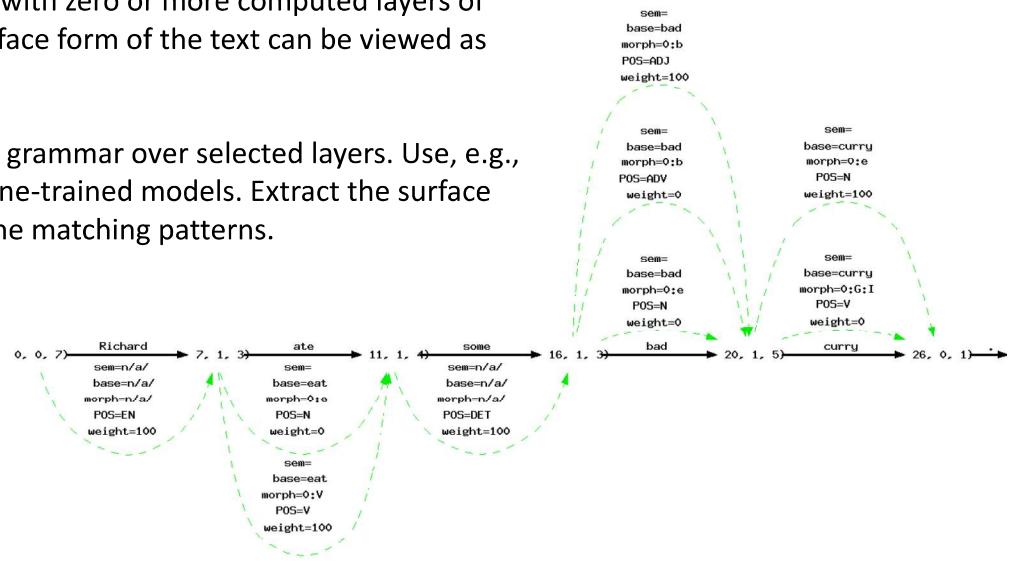
People

Roger Federer (68)  
 Andy Roddick (51)  
 Lindsay Davenport (5)  
 Andre Agassi (48)  
 Maria Sharapova (45)  
 Serena Williams (45)  
 Alicia Molik (36)  
 Marat Safin (34)  
 Nikolay Davydenko (2)  
 Joachim Johansson (1)  
 Svetlana Kuznetsova (1)

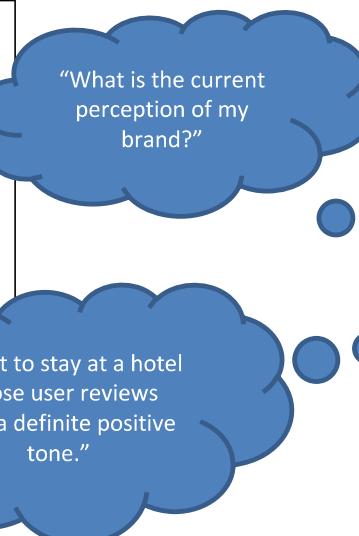
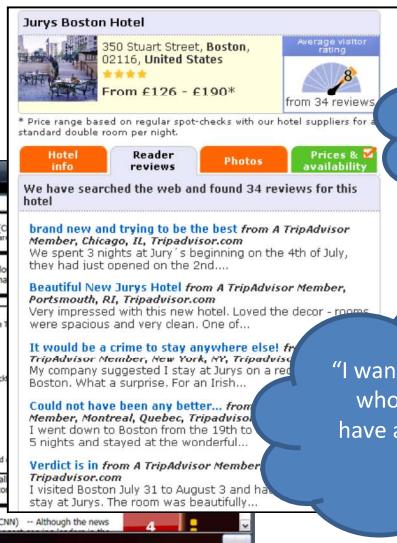
Refine your search

- albert einstein
- theory of relativity
- general theory of relativity
- bose einstein condensation
- physicists
- photoelectric effect
- special theory of relativity
- condensation
- speed of light
- bose-einstein condensation

more ▾



# Sentiment Analysis



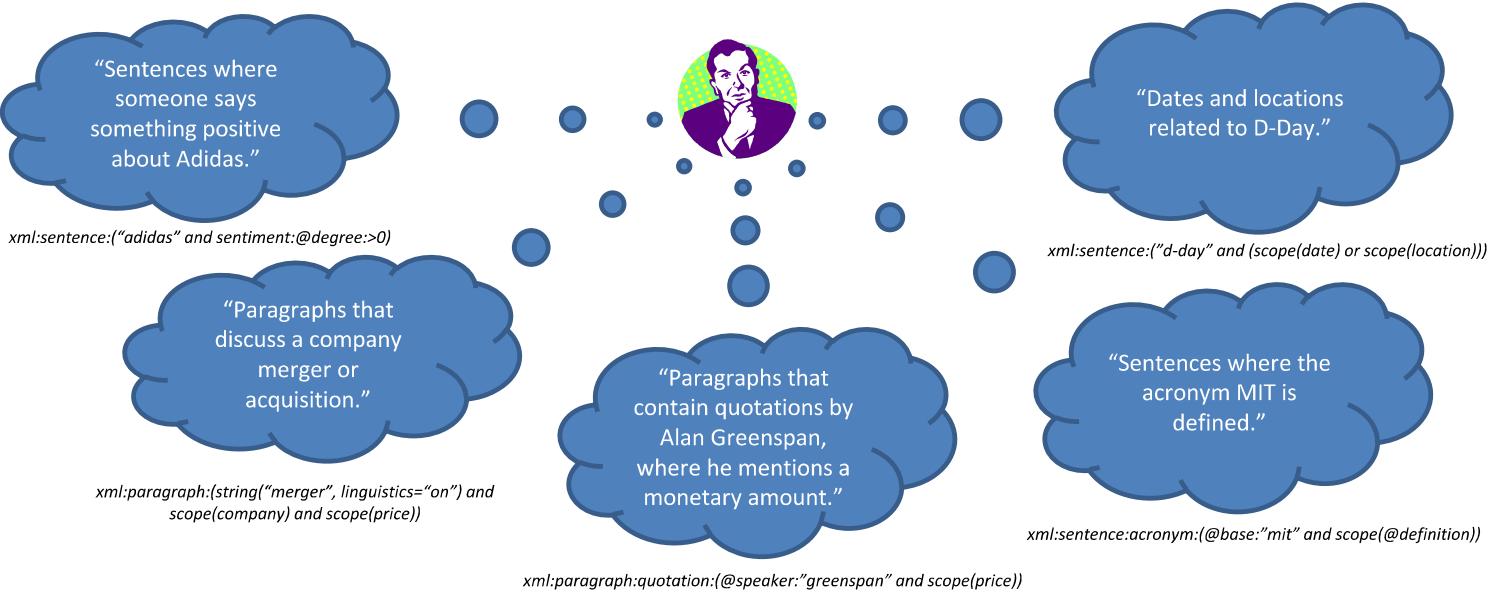
"I want to stay at a hotel whose user reviews have a definite positive tone."

"What are the most emotionally charged issues in American politics right now?"

1. To construct a sentiment vocabulary, start by defining a small seed set of known polar opposites.
2. Expand the vocabulary by, e.g., looking at the context around the seeds in a training corpus.
3. Use the expanded vocabulary to build a classifier. Apply special heuristics to take care of, e.g., negations and irony.

<http://research.microsoft.com/en-us/projects/blews/>

# Contextual Search



Persons that appear in **documents** that contain the word {soccer}



## person@base

Jack Nicklaus (~10.0%)
Fred Davis (~10.0%)
Billie Jean King (~8.0%)
Richard Nixon (~8.0%)
John Wayne (~7.0%)
Margaret Smith (~7.0%)
Joe Frazier (~7.0%)
Irina Rodnina (~7.0%)
Mao Zedong (~6.0%)
Gordie Howe (~6.0%)
Richard M. Nixon (~6.0%)

[More...](#)

## person@base

Diego Maradona (~4.0%)
David Beckham (~4.0%)
Alan Shearer (~3.0%)
Michelle Akers (~3.0%)
Mia Hamm (~3.0%)
Eric Wynalda (~3.0%)
Freddy Adu (~3.0%)
Michel Platini (~2.0%)
Stanley Matthews (~2.0%)
Oliver Neuville (~2.0%)
Bobby Moore (~2.0%)

[More...](#)

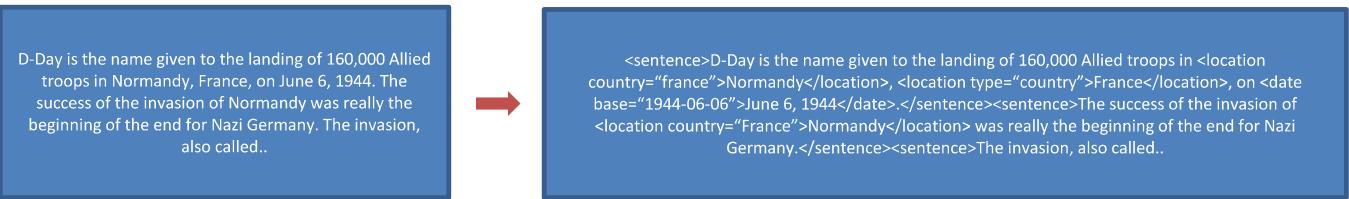
Persons that appear in **paragraphs** that contain the word {soccer}



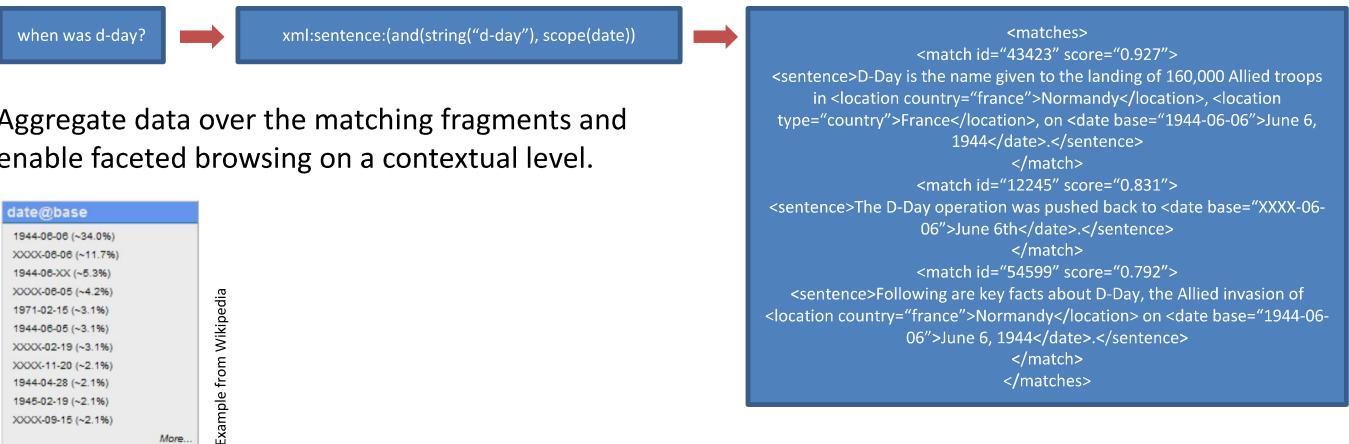
Example from Wikipedia

# Contextual Search

1. During content processing, identify structural and semantic regions of interest. Mark them up in context, possibly decorated with meta data.



2. Make all the marked-up data fully searchable in a way that preserves context and where retrieval can be constrained on both structure and content. Possibly translate natural language queries into suitable system queries.



date@base
1944-06-06 (~34.0%)
XXXX-06-06 (~11.7%)
1944-06-XX (~5.3%)
XXXX-06-05 (~4.2%)
1971-02-15 (~3.1%)
1944-06-05 (~3.1%)
XXXX-02-19 (~3.1%)
XXXX-11-20 (~2.1%)
1944-04-28 (~2.1%)
1945-02-19 (~2.1%)
XXXX-09-15 (~2.1%)

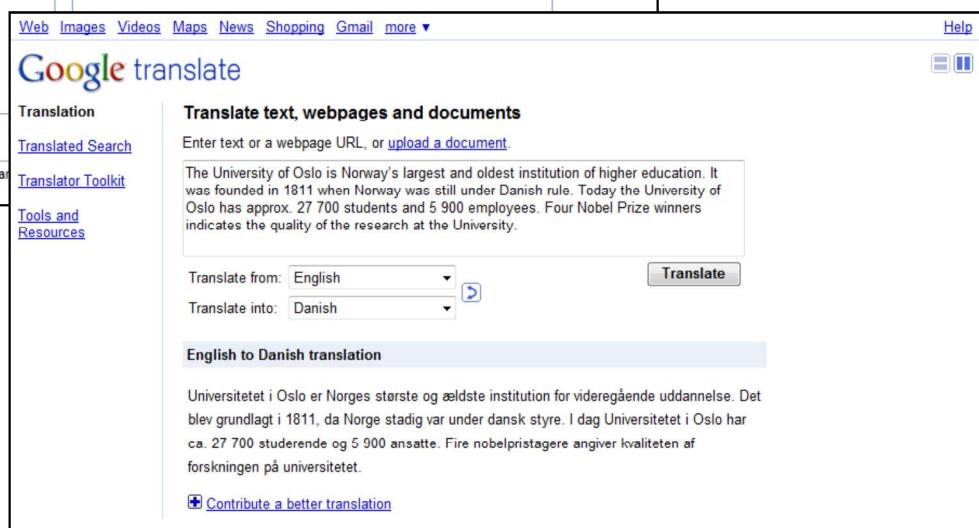
Example from Wikipedia

More...

# Machine Translation

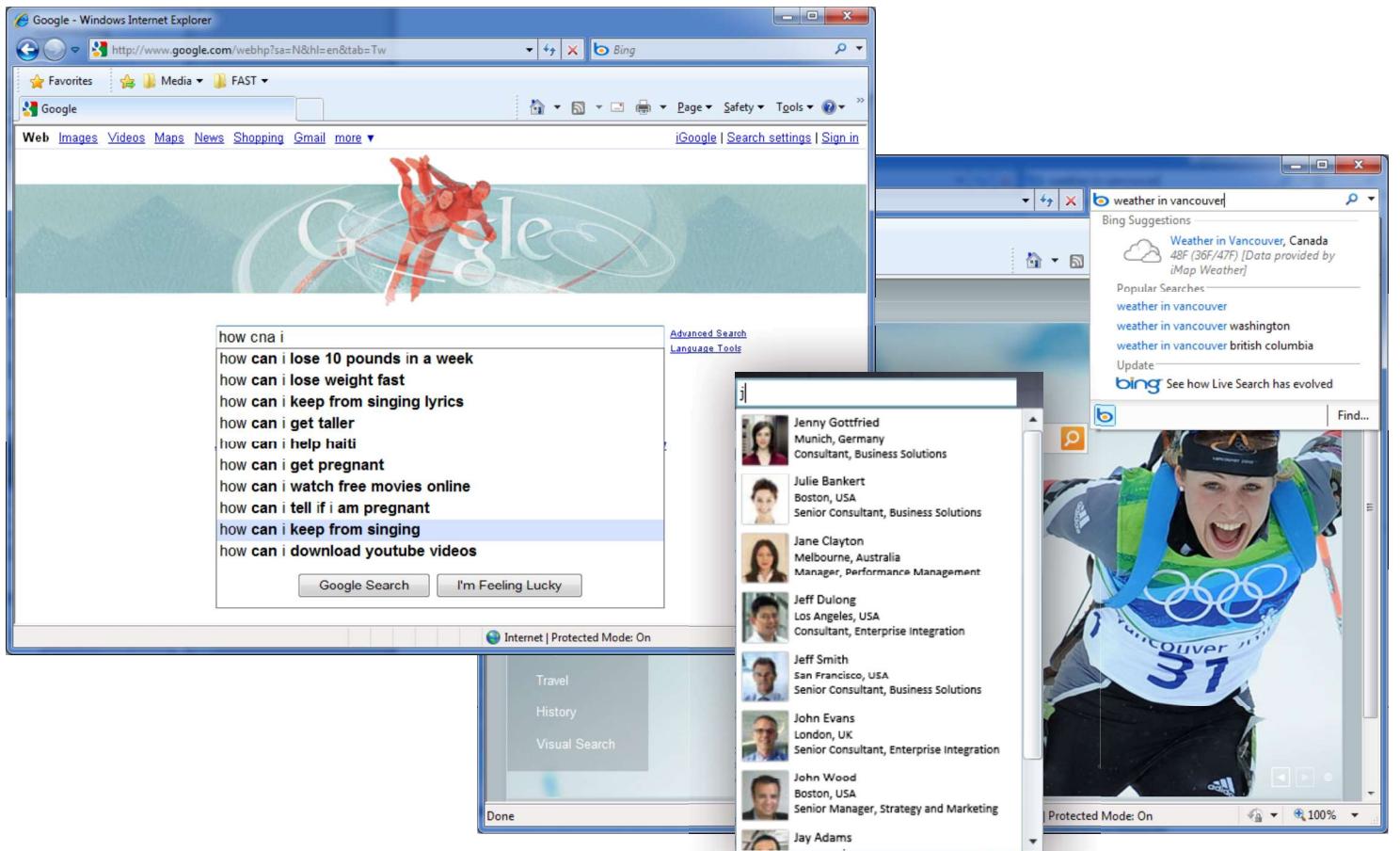


The screenshot shows the Bing Translator interface. At the top, there are links for Web, Images, News, More, MSN, and Hotmail. On the right, there are links for Sign in, Norway, and Preferences. The main header says "Translator" with a "Beta" badge. Below the header, there are links for Home, Tools, and Help. A toolbar includes "Languages" (set to English), a dropdown for the target language (set to Danish), a "Translate" button, a "Clear All" button, and an "Add to Favorites" button. A message at the top right says "Free online translation service for a truly worldwide web". Below this, there's a "Report offensive translations" link. The main area has two text boxes. The left box contains the English text: "The University of Oslo is Norway's largest and oldest institution of higher education. It was founded in 1811 when Norway was still under Danish rule. Today the University of Oslo has approx. 27 700 students and 5 900 employees. Four Nobel Prize winners indicates the quality of the research at the University." The right box contains the translated Danish text: "Universitetet i Oslo er Norges største og ældste institution af de videregående uddannelser. Det blev grundlagt i 1811 hvor Norge var stadig under dansk regel. Universitetet i Oslo har i dag ca. 27 700 studerende og 5 900 medarbejdere. Fire Nobelprisen vindere angiver kvaliteten af forskningen på universitetet." Below the text boxes is a navigation bar with links for Web, Images, Videos, Maps, News, Shopping, Gmail, more, and Help.



The screenshot shows the Google Translate interface. At the top, there are links for Web, Images, Videos, Maps, News, Shopping, Gmail, more, and Help. The main header says "Google translate". Below the header, there are links for Translation, Translated Search, and Translator Toolkit. There are also links for Tools and Resources. A message at the top right says "Help". The main area has a "Translate text, webpages and documents" section. It says "Enter text or a webpage URL, or upload a document." Below this, there is a text box containing the same English text as the Bing interface. To the right of the text box is a "Translate" button. Below the text box, there are dropdown menus for "Translate from: English" and "Translate into: Danish". Underneath these, there is a section titled "English to Danish translation" which displays the same Danish translation as the Bing interface. At the bottom, there is a link "Contribute a better translation".

# Query Completion



# Caption Generation

- **Intra-document search**

- Locate and rank relevant document fragments
- But do it fast!

- **Perceived relevancy**

- First impressions count
- Can make or break a service

- **Trends towards richer captions**

- Format-specific interactivity
- Actionable elements

Google search results for "why should i avoid sans serif fonts?":

Results 1 - 10 of about 123,000 for why should i avoid sans serif fonts? (0.07 seconds)

Links include:

- How to Select Fonts for Your Website
- Glyphs in sans-serif fonts, as the term is used in CSS, have stroke endings .... a UA applying these guidelines should nevertheless avoid creating font-size ...
- www.w3.org/TR/CSS2/fonts.html - Cached - Similar
- Fonthow to Select Fonts for Your Website
- Glyphs in sans-serif fonts, as the term is used in CSS, have stroke endings .... a UA applying these guidelines should nevertheless avoid creating font-size ...
- www.w3.org/TR/CSS2/fonts.html - Cached - Similar
- Credit Card Processing Experts - 5 Extra Credit Card Processing ...
- <pre style="margin-bottom: 0px; font-family: Arial, sans-serif; font-size: 10px; border: 1px solid #ccc; padding: 5px;">-p {margin-bottom: 0px;}>font face="Arial, sans-serif">font .... To avoid paying these extra fees, you should know the terms of your credit card ...
- www.creditcardprocessingexperts.com/5\_extra\_credit\_card\_processing\_charges\_merchants\_can\_avoid.html - Cached
- Sans Serif Fonts
- Avoid setting long passages of text in a light-weight sans serif font. Apart from lacking colour, continuous blocks of light text are hard to read ...
- www.slideshare.net/mcmrbt/sans-serif-fonts - Cached - Similar

Bing search results for "polyteknisk forening adresse":

Results 1 - 10 of 997 results - Advanced

Links include:

- Reford fra Oslo Talent Forum
- Hathora, Martine Bjørnstad - Adress: InnovatNett Rosenkrantz gate 7, 0159 OSLO. InnovatNett er en undergruppe av Polyteknisk Forening
- www.innovatnett.no/nrreford\_celestatenforum\_020906.htm - Cached page
- Polyteknisk Forening - Foreretting og Forbund Øvrløke, Oslo - Gule Stider ...
- www.gulestider.no/gc/companydetails.c7e841ed92025405 - Cached page
- Innemekningsklima / Medien / Hovedsiden - Polyteknisk Forening
- Arbeidsgivars nent: Arbeidsgivars adresse - © Polyteknisk Forening
- www.polyteknisk.no/gjengsett/pjm/Medien/Innemekningsklima - Cached page
- HABITAT Norge
- HABITAT Norge http://www.habitatnor.no Adresse: Polyteknisk Forening, Rosenkrantzg. 7, 0159 OSLO Telefon: 47 22 42 69 70 Email: polyteknisk@polyteknik.no Oslo, september 2008 ...
- www.habitatnor.no/componentoption,com\_document/task\_id,22Itemid,27 - Cached page - PDF file

Wikipedia page: Office Business Applications: Unlocking the Business Value of IT

Summary: Business Value of IT Gurpreet Singh Director, Emerging Technologies, Microsoft Corporation Sources of Business Performance Sources of Business Performance The Work of Business Create Lead Qualified? Retire Lead Create Opt... Author: Gurpreet Singh

Comments: June 13, 2006

Tags: Add

Diagram sections include:

- Sources of Business Performance
- The Work of Business
- "Real World" Information Work
- The Results Gap
- A New Breed of Application

