Introduction to Search Engine Technology
Task Completion and Search Assistance

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Task Completion Assistance

- Focus on user’s need rather than on the keywords, and go beyond “10 blue links” to deliver task completion assistance
- Examples ahead; some experiences are no longer available, and are testament to the constant trial-and-error going on in the field
Beyond “10 Blue Links”

- Integration of multiple sources of data
  - Maps, videos, images, news, ...
- Query formulation and refinement assistance
  - Spell correction, expand/narrow suggestions, facets
  - Some of this happens “as you type”
- Integration of search and text analysis, e.g. understanding concepts in documents and matching those to queries
  - Named entities, directives/modifiers ("download", "reviews" etc.)
- Tapping of UGC (user-generated content)

Beyond “10 Blue Links” (cont.)

- Optimization of the experience delivered by the search result page as a whole rather than as a collection of independent links/tidbits
  - Page real-estate is scarce and every pixel matters
- Actionable widgets
- Infinite browsing on the search results page
- More elaborate personalization
- Leveraging of social network
- Knowledge graph results
- Virtual assistants
OneBoxes / Direct Displays

Simple Task-Focused Mashups
Yahoo! Search Assist

Google Suggest
Post-evaluation Related Concepts

Search As-You-Type

First debuted in Web search by Alltheweb (Yahoo!) in May 2006
Search As-You-Type – Google Instant

Search As-You-Type

Yahoo! Search Direct: the Direct Display is fetched as you type
Rich Media with Intent Disambiguation

Compare to Today’s Mobile Search Cards
Quicklinks Extraction

Faceted Search
Medical Facets

- No hierarchy
- No counts

Review Facets

- Upon click
Review Facets (2)

Upon click

Review Facets (3)

Sentiment analysis and attribute classification applied on user-generated content
Multi-Collection Federation: Architecture

Query Interpretation

Source Selection & Dispatching

Web Images Weather News ... Video Ads

Blending and Page Composition

Results page

Multiple Sources to the Extreme: Kosmix Dynamic, Search-Driven Holistic Overview

In April 2011, Kosmix was acquired by Walmart (!) and became @WalmartLabs
Multiple Sources to the Extreme: **Y! Glue**
Dynamic, Search-Driven Holistic Overview
Infinite Browse in Knowledge Graph

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"Infinite Scroll" in the KG

Tom Hanks

Thomas Jeffrey "Tom" Hanks is an American actor, producer, writer, and director. Hanks is best known for his roles in films such as "Forrest Gump," "Cast Away," and "Saving Private Ryan." He won the Academy Award for Best Actor for his performance in "Forrest Gump." Hanks attended Chatham University, where he was a student athlete in basketball. He later studied at the University of Texas at Austin, where he performed in a number of productions.

Awards
- Academy Award for Best Actor (1994, "Forrest Gump")
- Golden Globe Award for Best Actor (1994, "Forrest Gump")
- BAFTA Award for Best Actor in a Leading Role (1994, "Forrest Gump")

Films
- "Forrest Gump" (1994)
- "Cast Away" (2000)
- "Saving Private Ryan" (1998)
- "Cast Away" (2000)
- "The Terminal" (2004)
- "Big" (1988)
- "Sleepless in Seattle" (1993)

People also search for
- "Forrest Gump"
- Tom Hanks
- Dustin Hoffman
- Robert Zemeckis

"Forrest Gump" (1994)

"Forrest Gump" is a 1994 American epic romantic comedy-drama film based on the 1986 novel of the same name by Winston Groom. The film was directed by Robert Zemeckis and starred Tom Hanks, Robin Wright, Gary Sinise and Sally Field. The story follows several decades in the life of Forrest Gump, a naive and slow-witted yet well-intentioned man...
Task Completion Apps

This specific experience has been around for years...

Note automatically filled forms!

Task Completion Apps – Movie Rental

Upon click
Task Completion Apps – Movie Rental (2)

Upon click

Task Completion Apps – Restaurant Reservation (1)

Upon click
Task Completion Apps – Restaurant Reservation (2)

Bing Cards: Holistic Info + Tasks
Digital Assistants Rely Heavily on Search Behind the Scenes

Personalized Search Assistance

- Which Alex am I interested in?

  Alex Smola
  Machine Learning Expert
  Colleague of Andrew Ng

  Alex Morgan
  USWMT Soccer Player

  Alex Rodriguez
  US Baseball Player

  Protocol: open an incognito browser, issue the context query, then start typing “alex”...
Concluding Thoughts

- As the Web evolves, the complexity of tasks that can be completed online will continue to grow.
- However, completing these tasks requires a cognitive process of interacting with "the Web" that is not trivial.
  - Search engines are a major component of that interaction.
- On mobile, there are also form-factor challenges.
Concluding Thoughts (cont.)

- The engines are trying to simplify task completion by:
  - Intent analysis and disambiguation, including personalization
  - Providing shortcuts to concise nuggets of information
  - Providing richer abstracts, including quicklinks
  - Assisting in query formulation and reformulation
  - Combining search and navigation via faceted search
  - Integrating content from a variety of (sometimes structured) sources
  - Providing “actionable” results via apps
- More surely to come