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Faculty Summit 2010

Bing Dialog Model: Intent, Knowledge, and User Interaction

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Future Web – Intelligence, Ubiquity, and Trust

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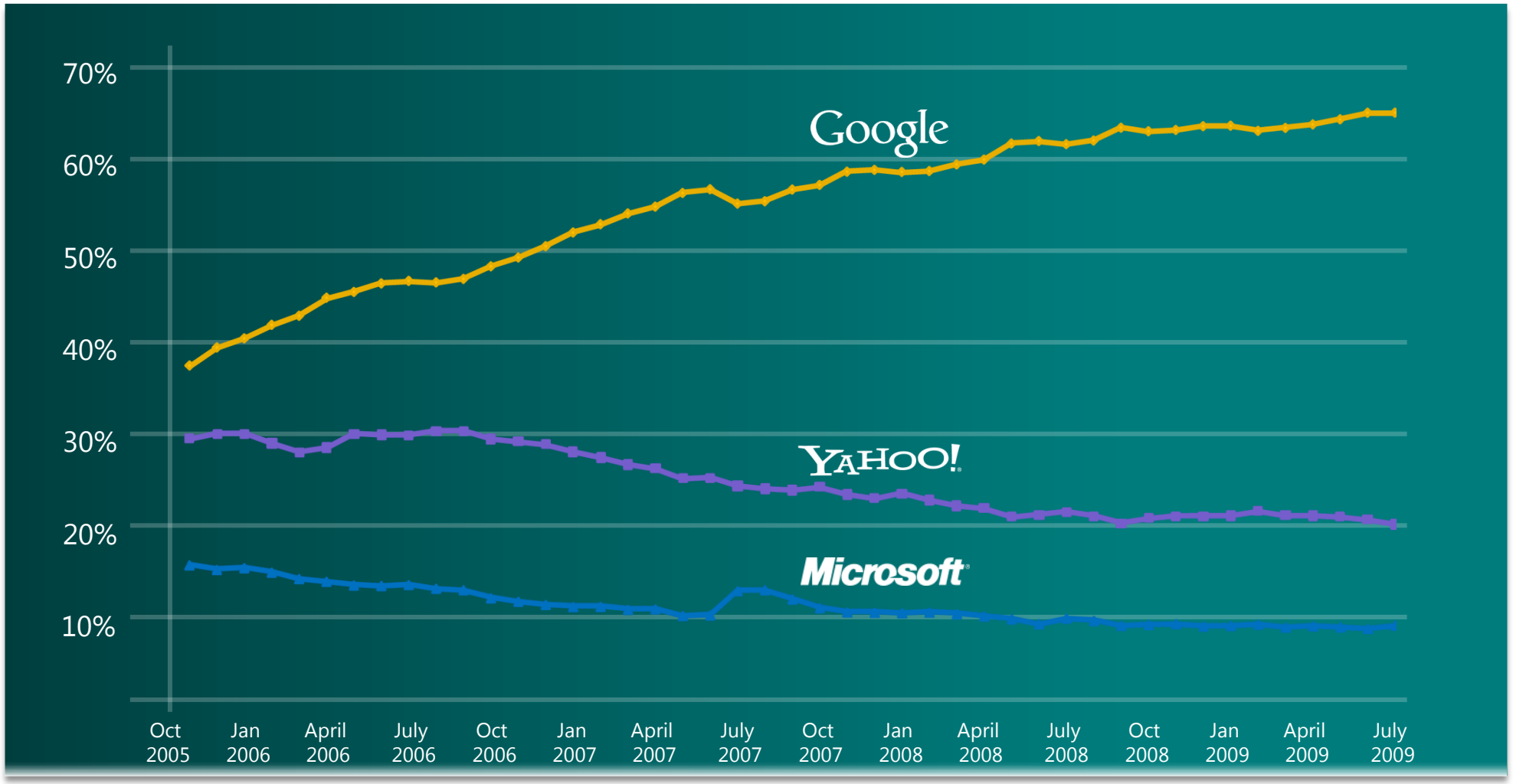
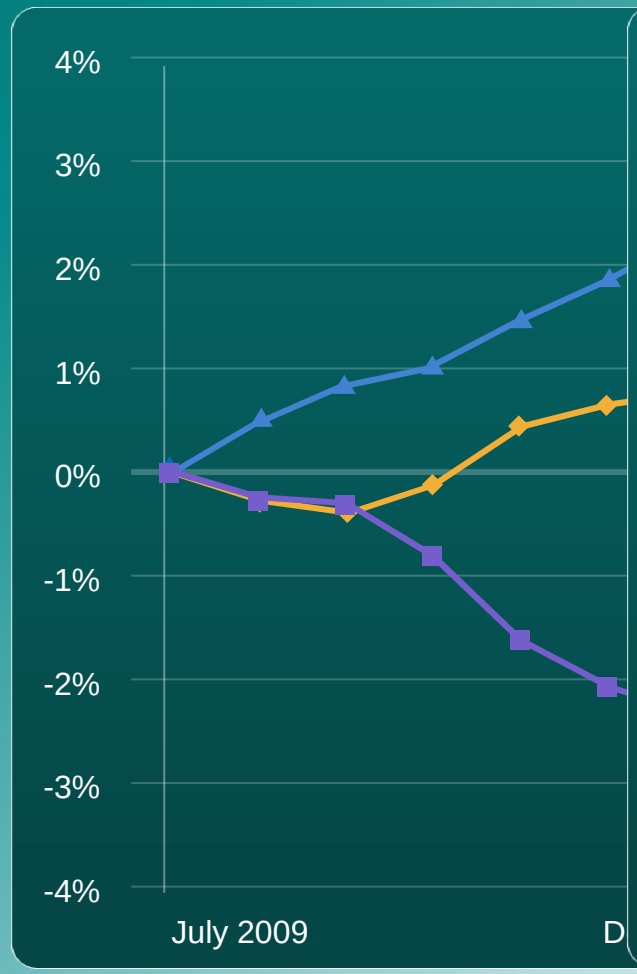
A Year Ago: The Challenge



A Year Later: The Bing Momentum

- Launched on June 1, 2009 and called a “Decision Engine”
- Fastest growing search engine in 2009
- “The best new product of the year 2009” - Crunchies Award by TechCrunch



U.S. Unique Users

92M

28%

71.7m

U.S. Market Share

12.1%

51%

8.0%

64%

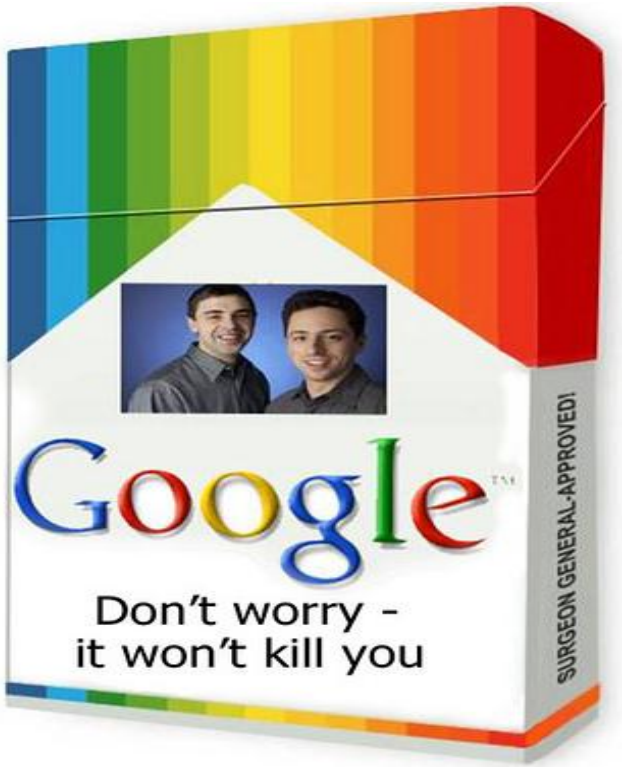
Unaided Awareness

34%

Perception Bing is a ‘Decision Engine’

Google's not just a brand; it's a habit

- Tough Love for Microsoft Search: Danny Sullivan
  - http://searchengineland.com/tough-love-for-microsoft-search-15968
  - Dec. 30, 2008



Elements of Search Quality

Relevance

Ensuring that best results rank at top

Completeness

Freshness

Speed

How fast do result pages render?

Ease of Use

Simple interface

Query & click

Semantic Impact on Search Quality

Relevance

Selection and ranking based on meaning and concepts, not keywords

Direct answers

Speed

Reduce efforts to task completion

Direct answers

Fewer clicks

Ease of Use

Intuitive queries

Simplified tasks

Information aggregation & classification

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Bing 2010 Summer Release

demo

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Principal Program Manager
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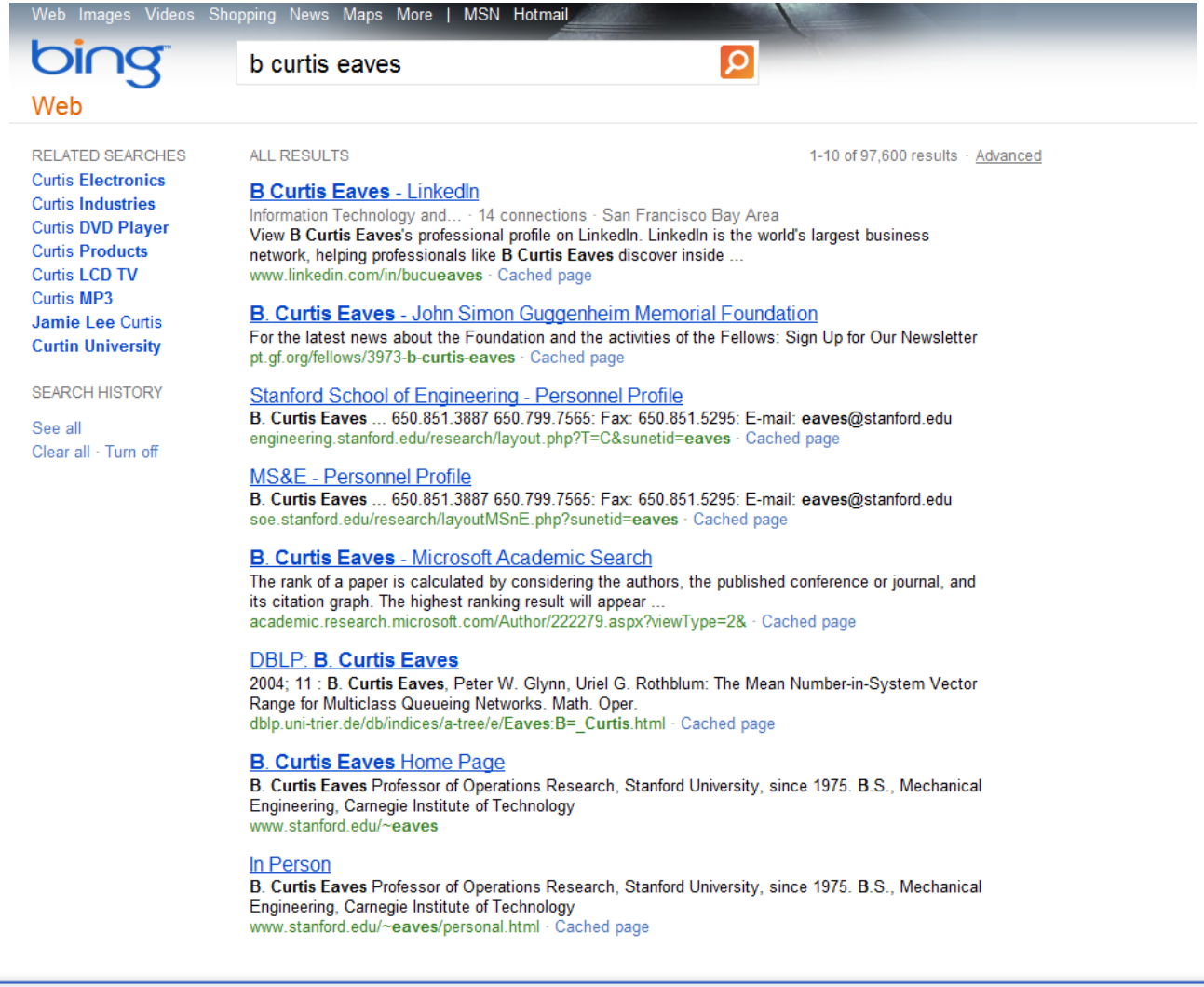
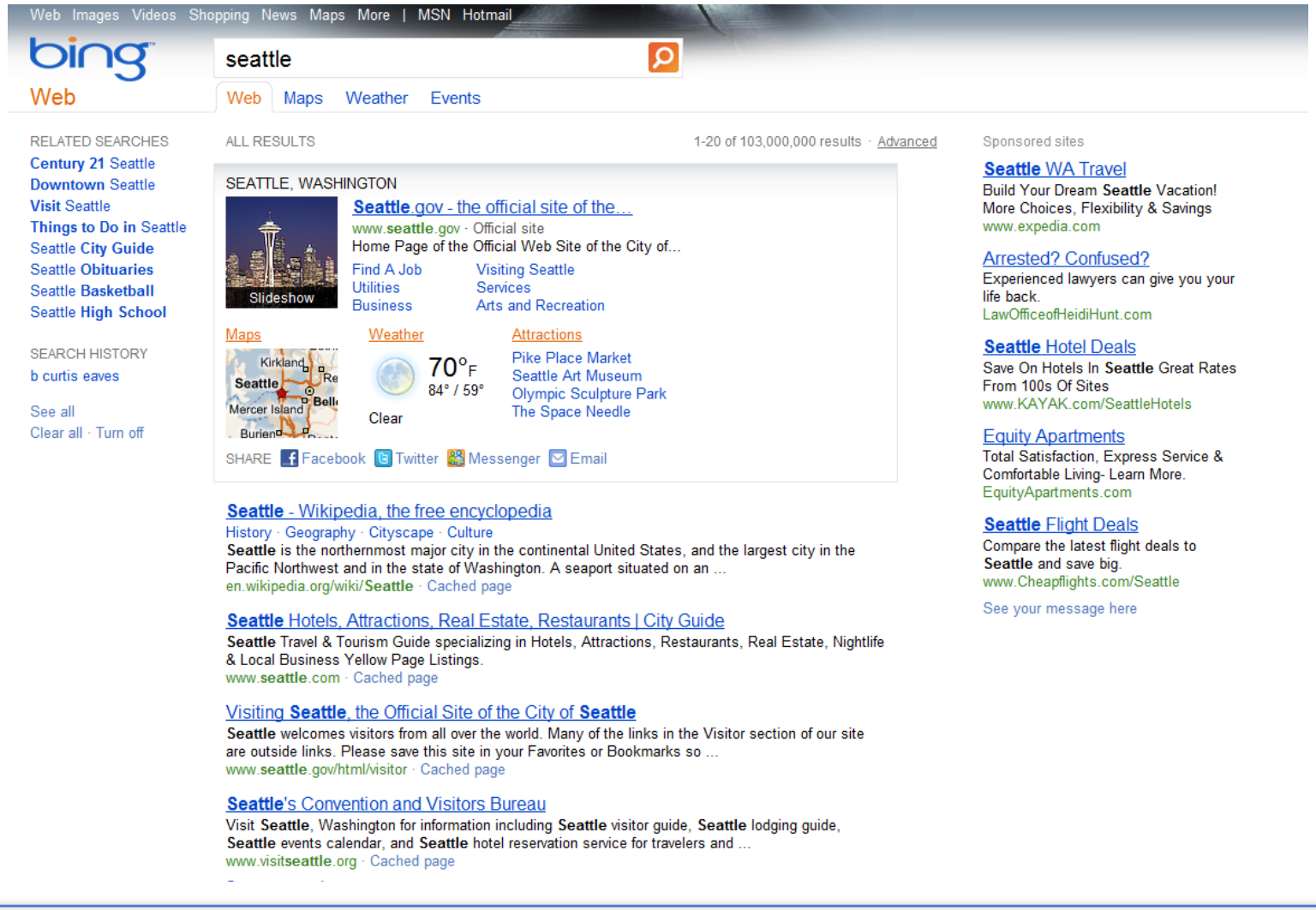
Traditional 10 Blue Links Presentation

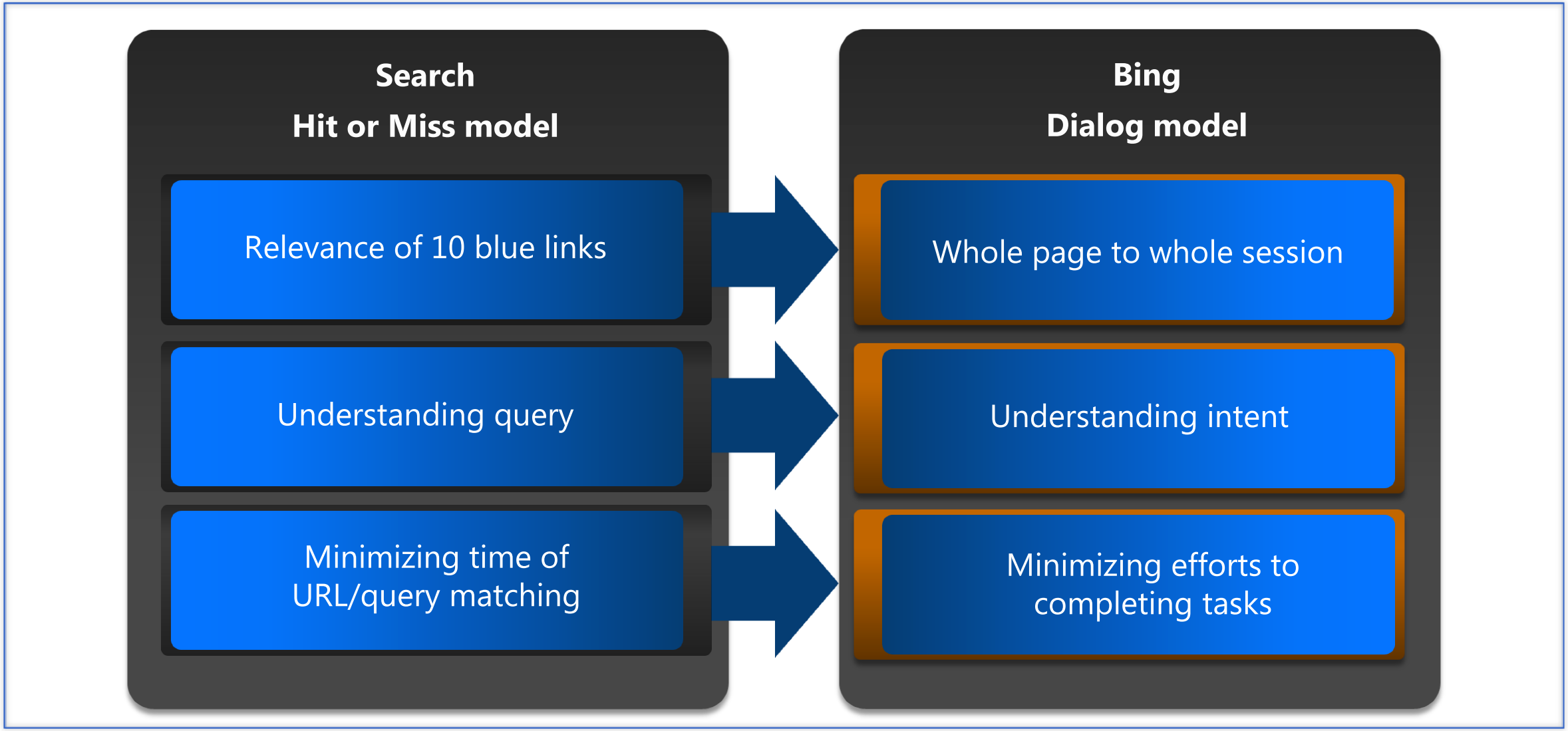


Organized Whole Page Presentation

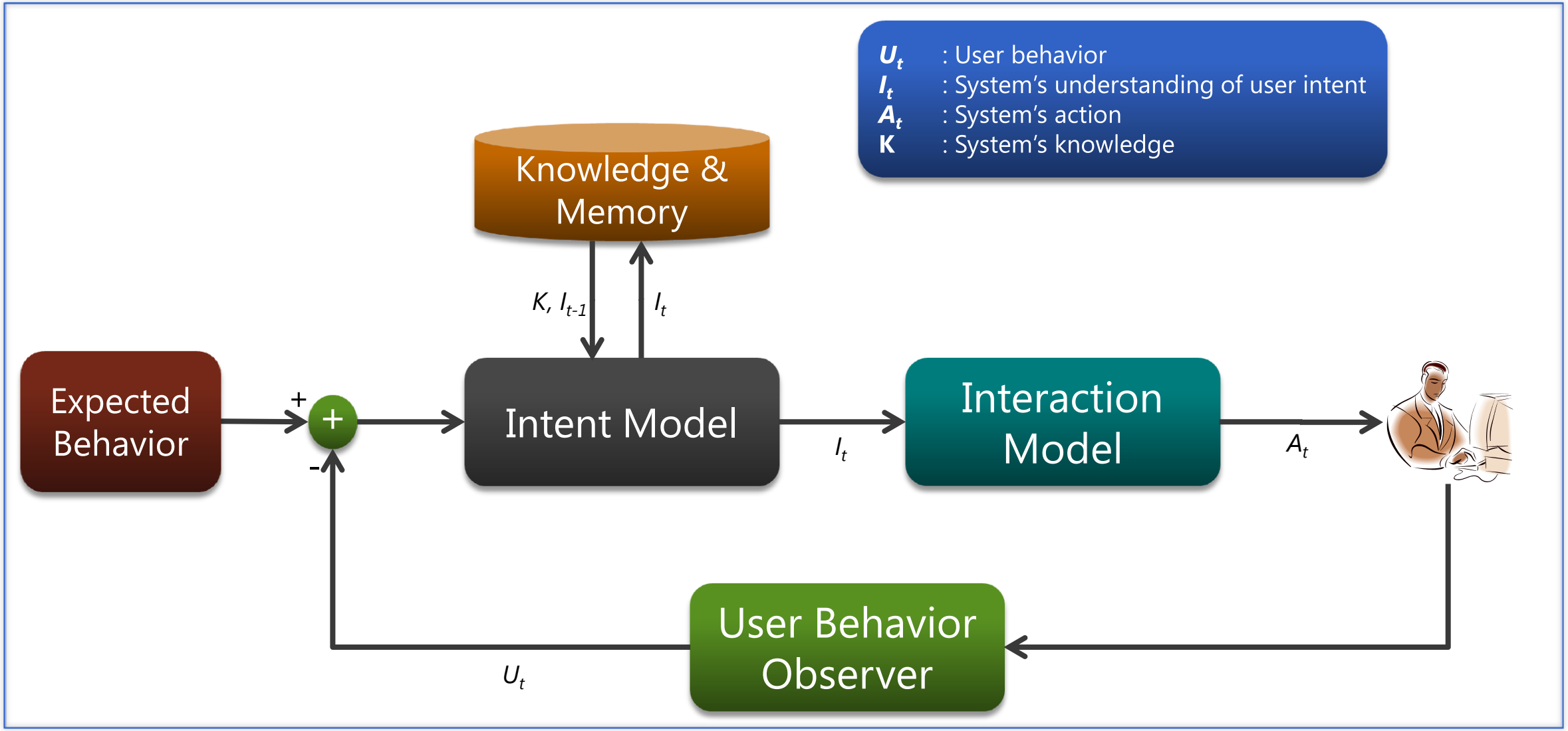


Los Links Episode Dos

The Search Evolution: Organizing the Web for Tasks



Bing Dialog Model: A Stateful Feedback System



Bing Dialog Model: BMR Framework

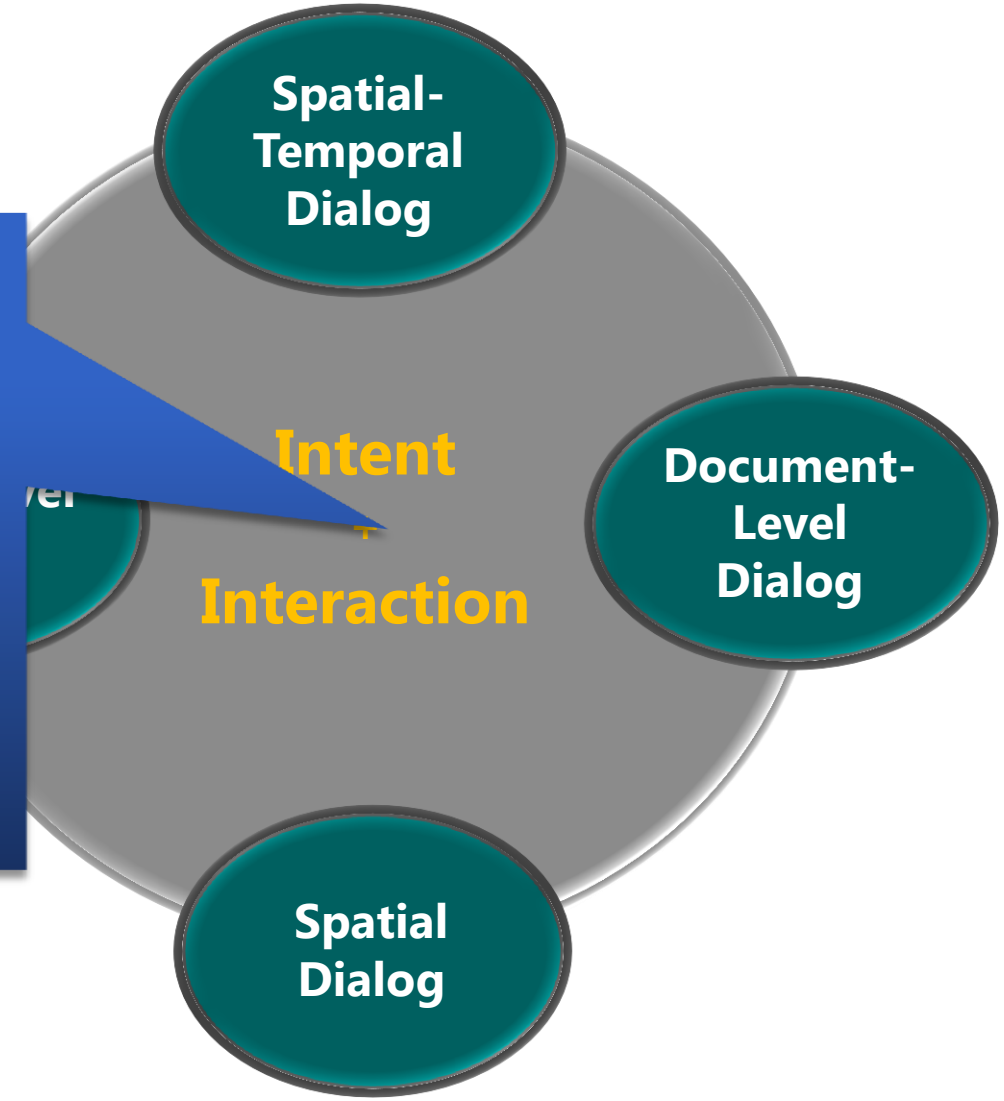
- Applying Bayesian Minimum Risk (BMR) Framework
  - Intent Model: $I_t = \mathbf{argmax}_I P(I \mid U_t, I_{t-1}; K)$
  - Interaction Model: $A_t = \mathbf{argmin}_A E[\mathbf{Cost}(A, I_t)]$
- Considering productization feasibility
  - Local optimum vs. theoretical optimum
- Leveraging rich presentation capability
  - Infer multiple intent candidates
  - Generate dialog actions at multiple levels

Bing Dialog Model Implementation

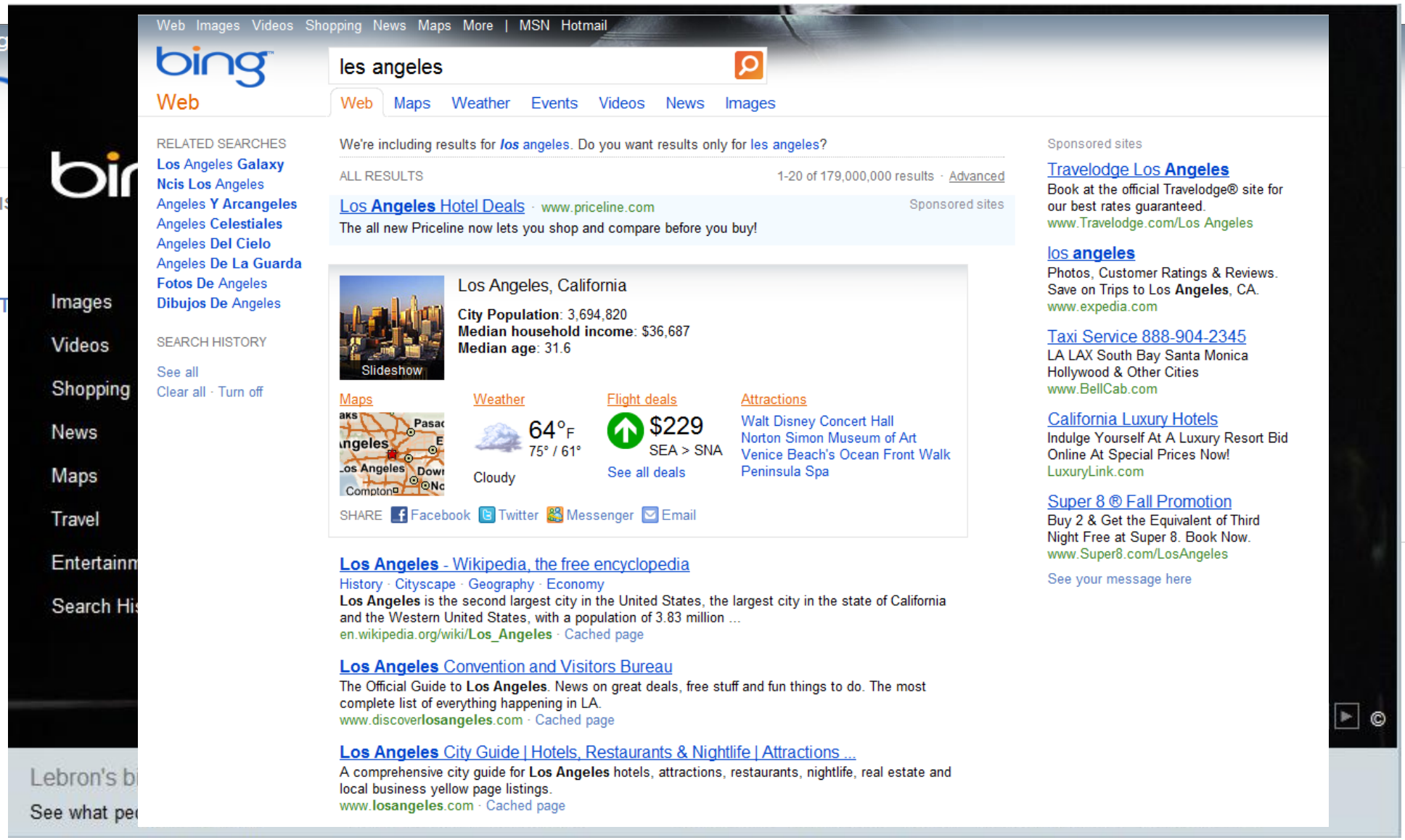
$I_t = \text{argmax}_I P(I \mid U_t, I_t\text{-}1 ; K)$
$A_t = \text{argmin}_A E[\text{Cost}(A, I_t)]$

When applied to Autosuggest:

U_t is key stroke
I_t is closest seen queries
A_t is list of suggested queries
Cost() is selection efforts



Simple & Explicit Query-Level Dialog

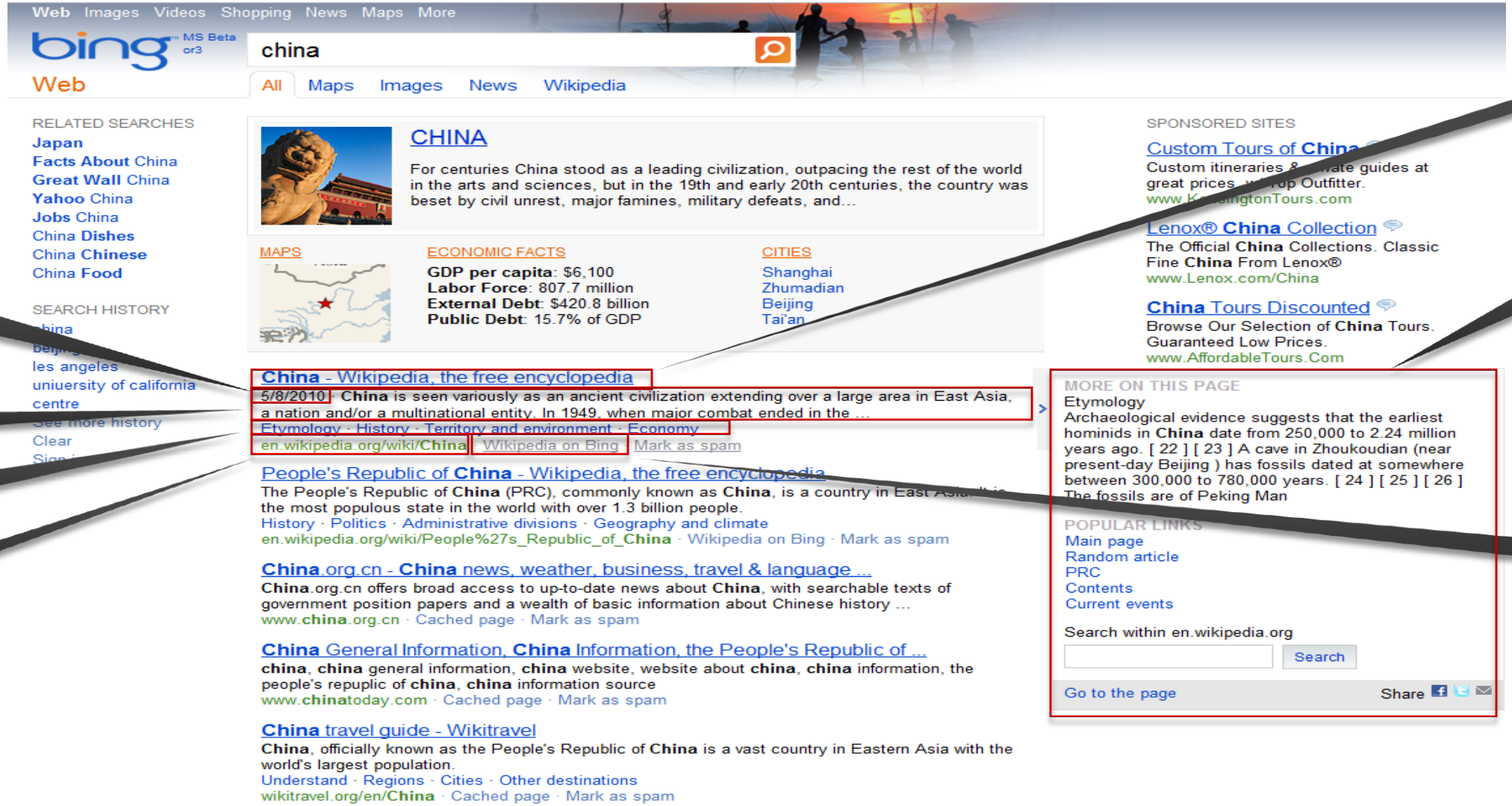


Structured Query Composition

demo

Kuansan Wang, PhD
Principal Researcher
Microsoft Research

Document-Level Dialog



Page Time Stamp

Caption

Deep Links

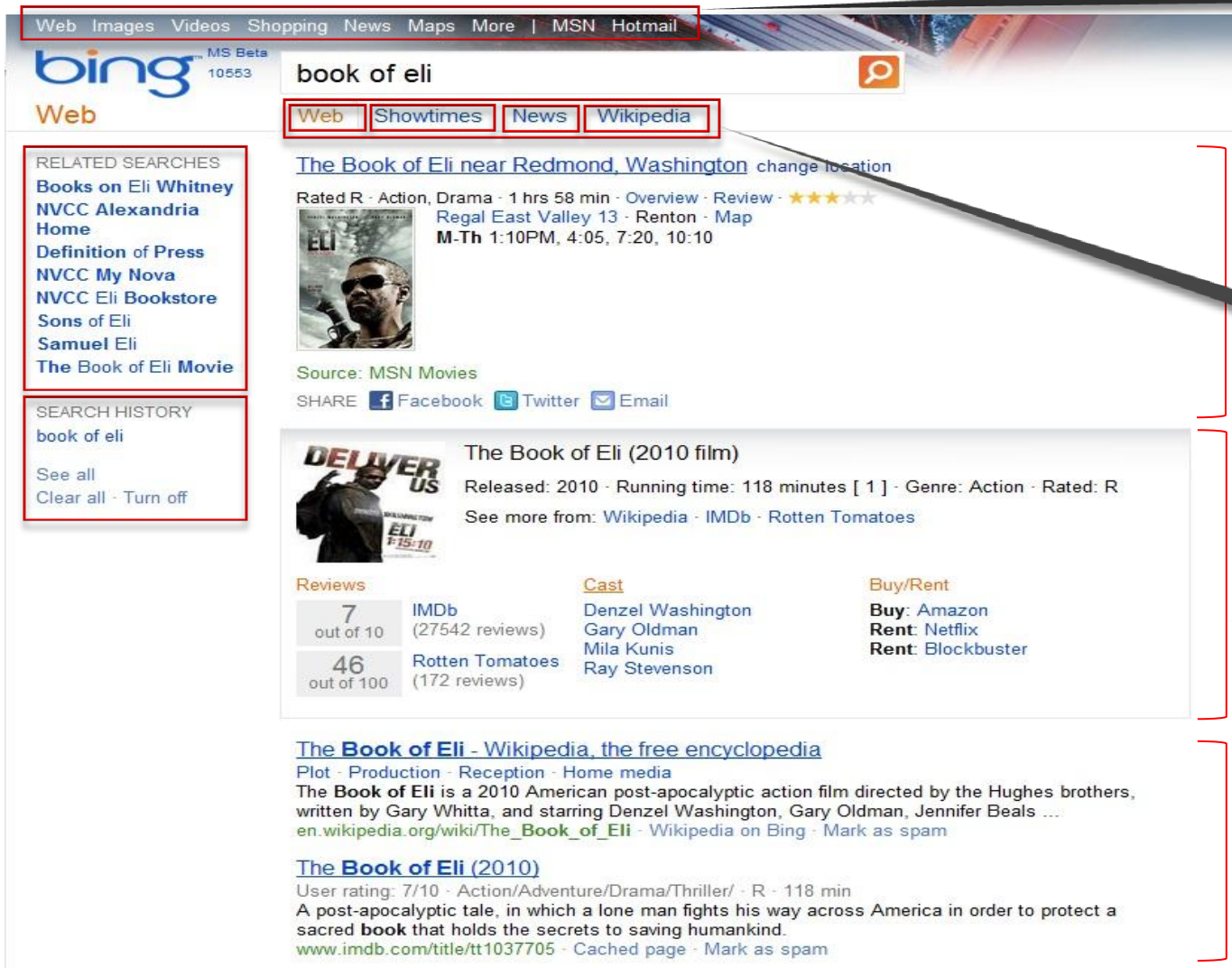
URL

Title

Additional Caption Preview

Enhanced View

Spatial Dialog

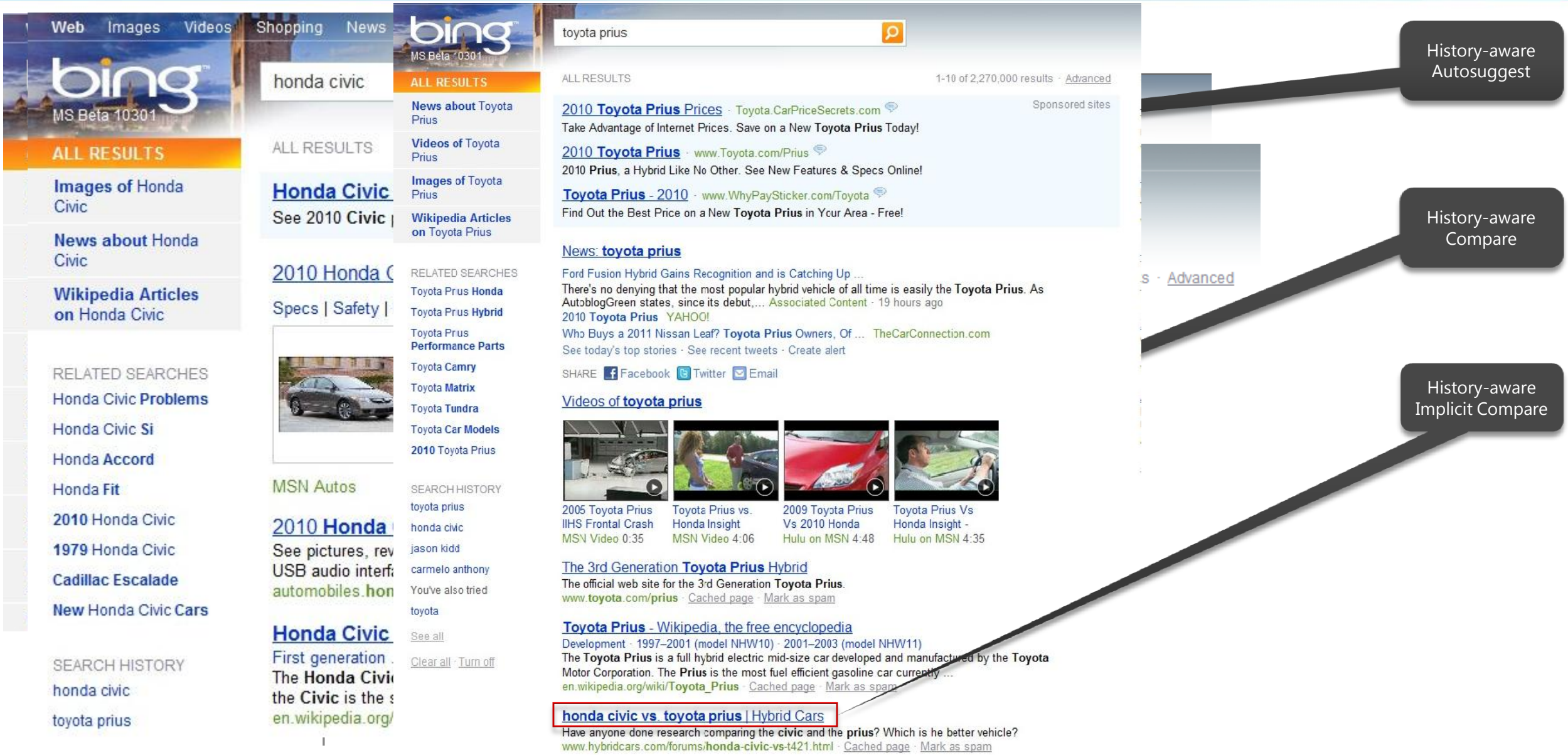


All Bing Vertical Services

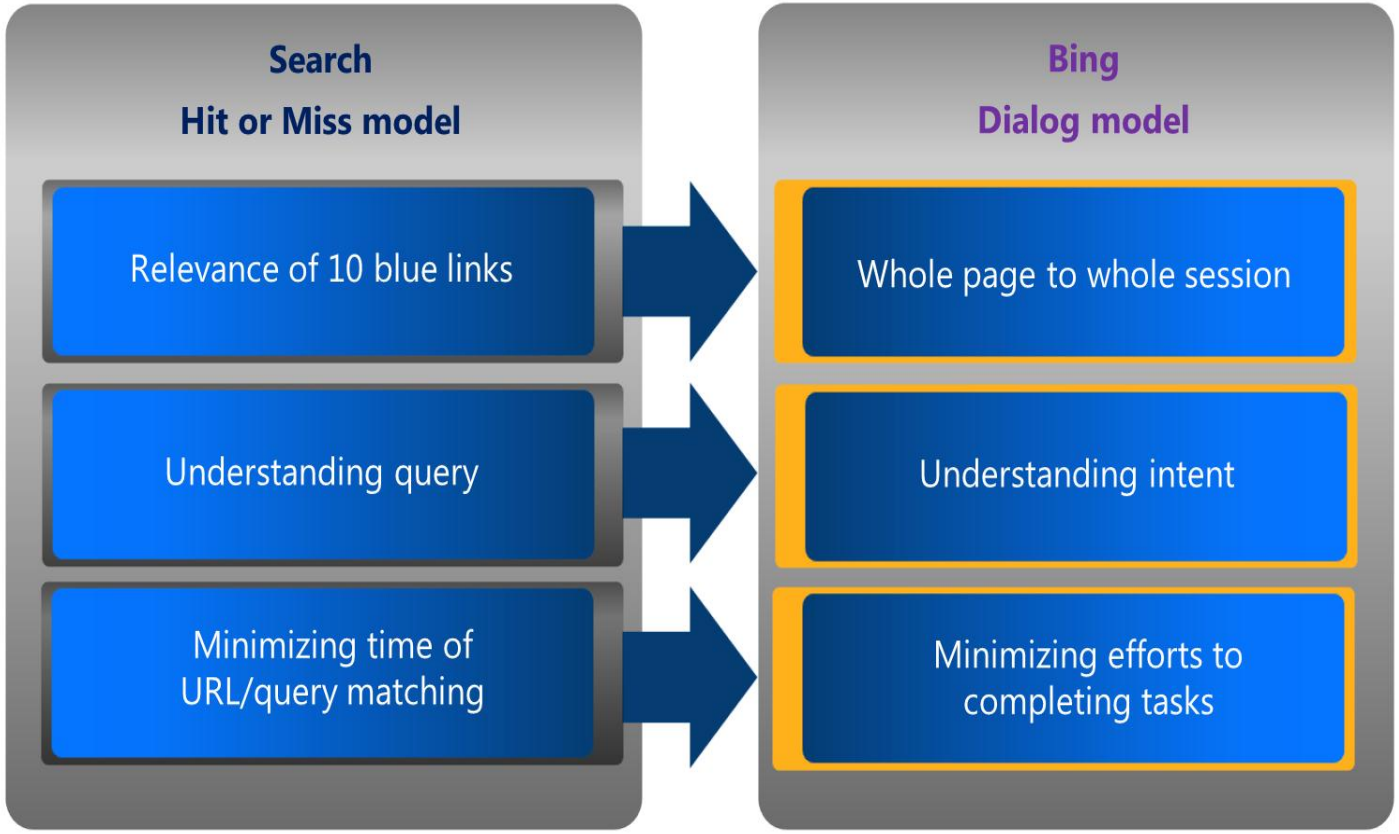
Quick Tabs for relevant Bing verticals, domains, answers

Entity-based result summary

Spatial-Temporal Dialog: Re-Rank with Session



Bing: The Decision Engine



- Driving the Search Evolution from topical directory to site finder to task completion
- Acquiring and computing knowledge
- Understanding user intent and designing user interaction
- Minimizing ***Cost()*** i.e. the user efforts to accomplish a task

Bing & Research Community

- Microsoft Web N-gram Services
  - Provide large scale web index data for language modeling research work
  - Public beta since April 2010 (http://research.microsoft.com/web-ngram)
  - SIGIR workshop July 2010
  - New API Services and query data in Microsoft Web N-gram Services starting TODAY on http://research.microsoft.com/web-ngram

- Announcing the first Bing-MSR Challenge (Fall 2010)
  - Awards
    - Bing-MSR Fellowships
    - Conference/Workshop Travel grants
  - Check http://research.microsoft.com/web-ngram for more details beginning August

Q & A

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