Semantic Successes and Challenges for Search Based Applications

24 September 2010

Gregory Grefenstette
Chief Science Officer
Exalead

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Search Based Application

Sue Feldman:

Search Based applications “employ search as a central component, but they solve a specific business problem or support an information-intensive process"

Sue Feldman, Vice President, Content Technologies, IDC

"Search-based applications as a group are growing much faster than enterprise search because their value in accomplishing a task is immediately recognized by business users, because they are quick to deploy, and because they either control costs or increase revenue. Good examples of those are call center support, e-discovery, marketing, sales, R&D research to locate opportunities and e-commerce."

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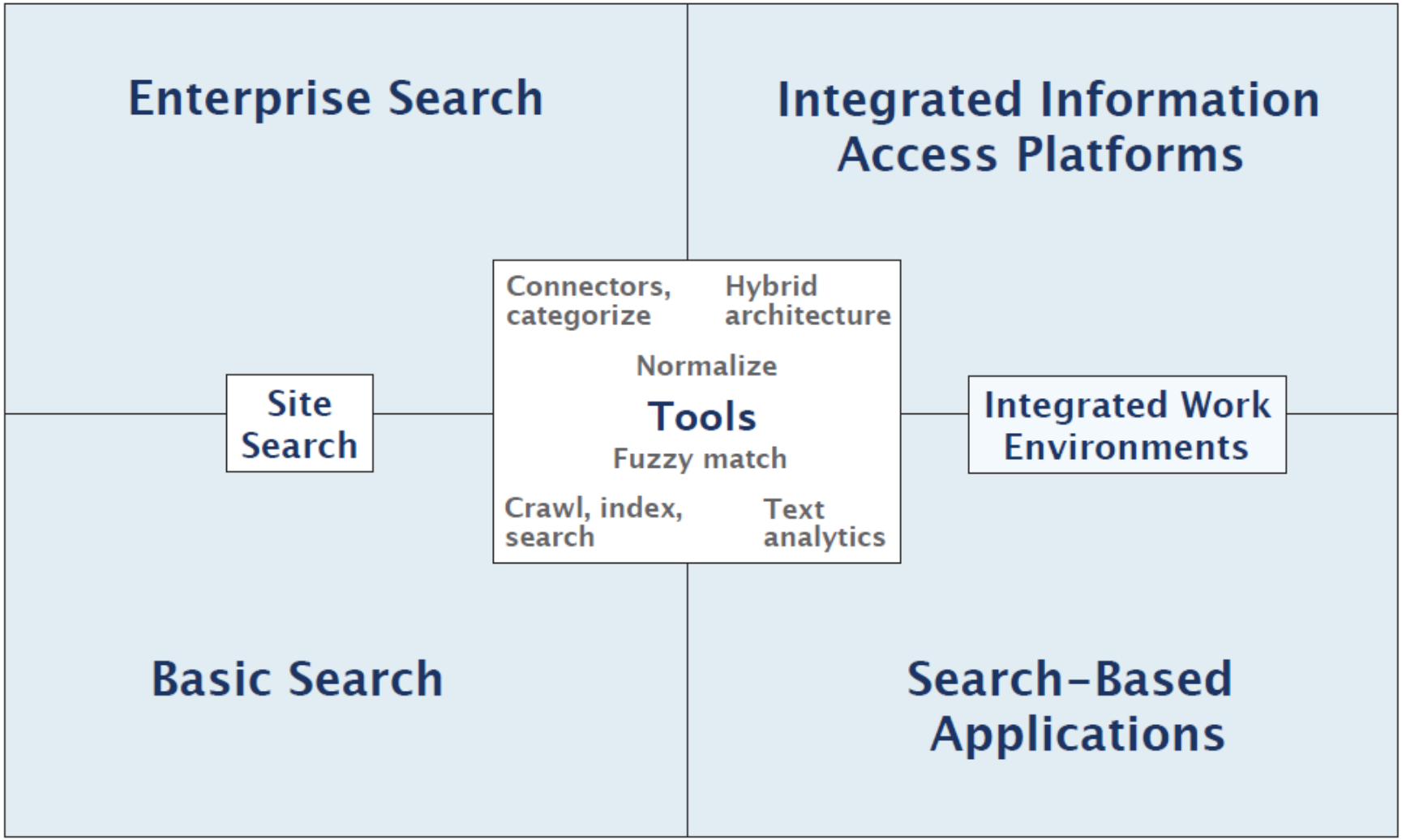
Search and Discovery Software: 2009 Market Map



Source: IDC

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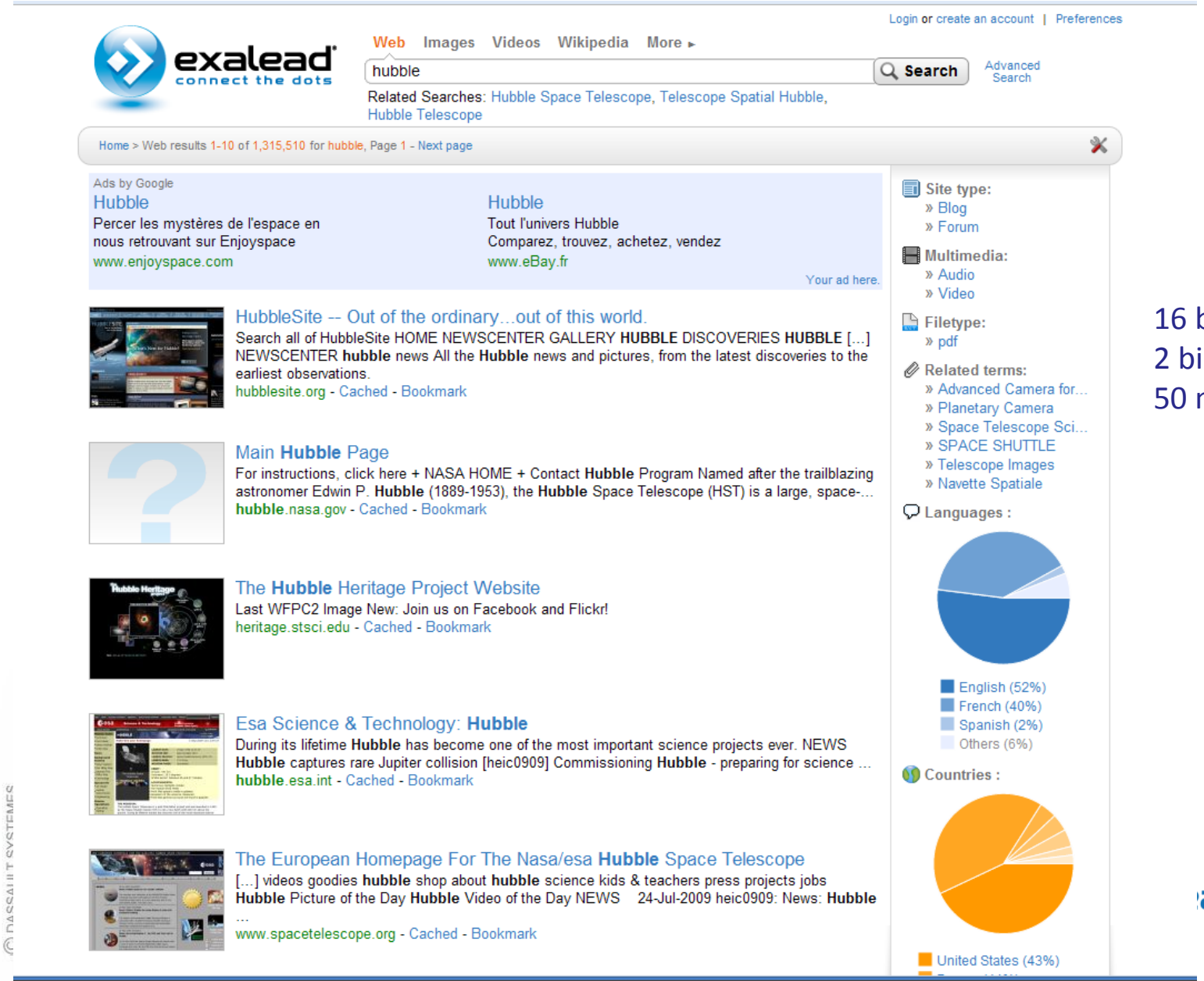
www.exalead.com/search, labs.exalead.com



16 billion web pages
2 billion images
50 million videos

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Semantics is three things to the ordinary person

Is this an example of that?

Are these two things the same?

What is the relation between these two things?

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Success 1

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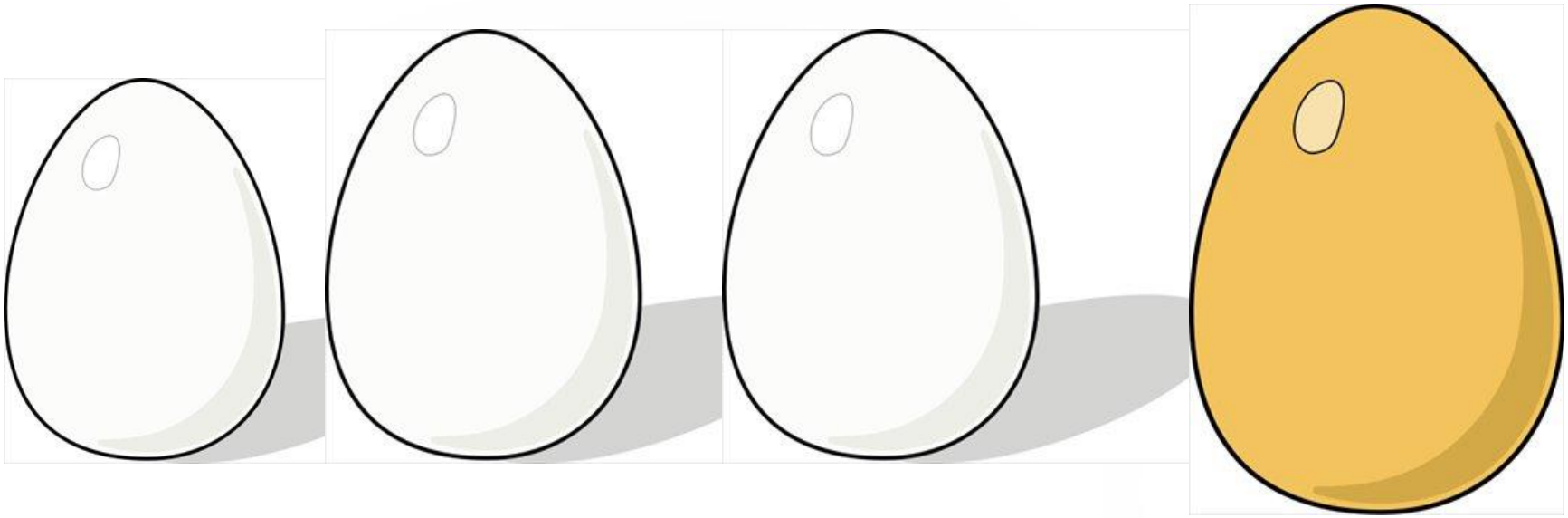
Egg Sorting



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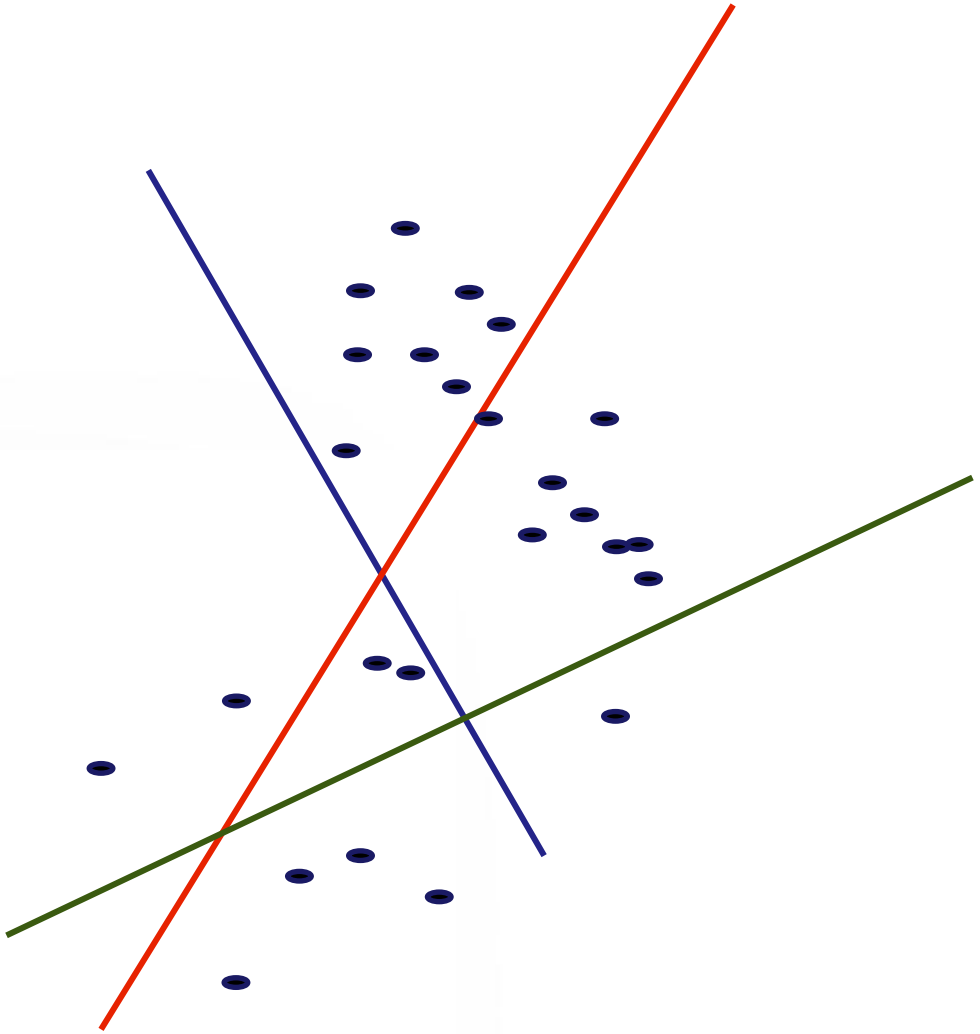
OLLIE original

Semantic Dimensions

Facets



Hunting Gathering

Shopping

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Success 2: Egg Sorting Semantics

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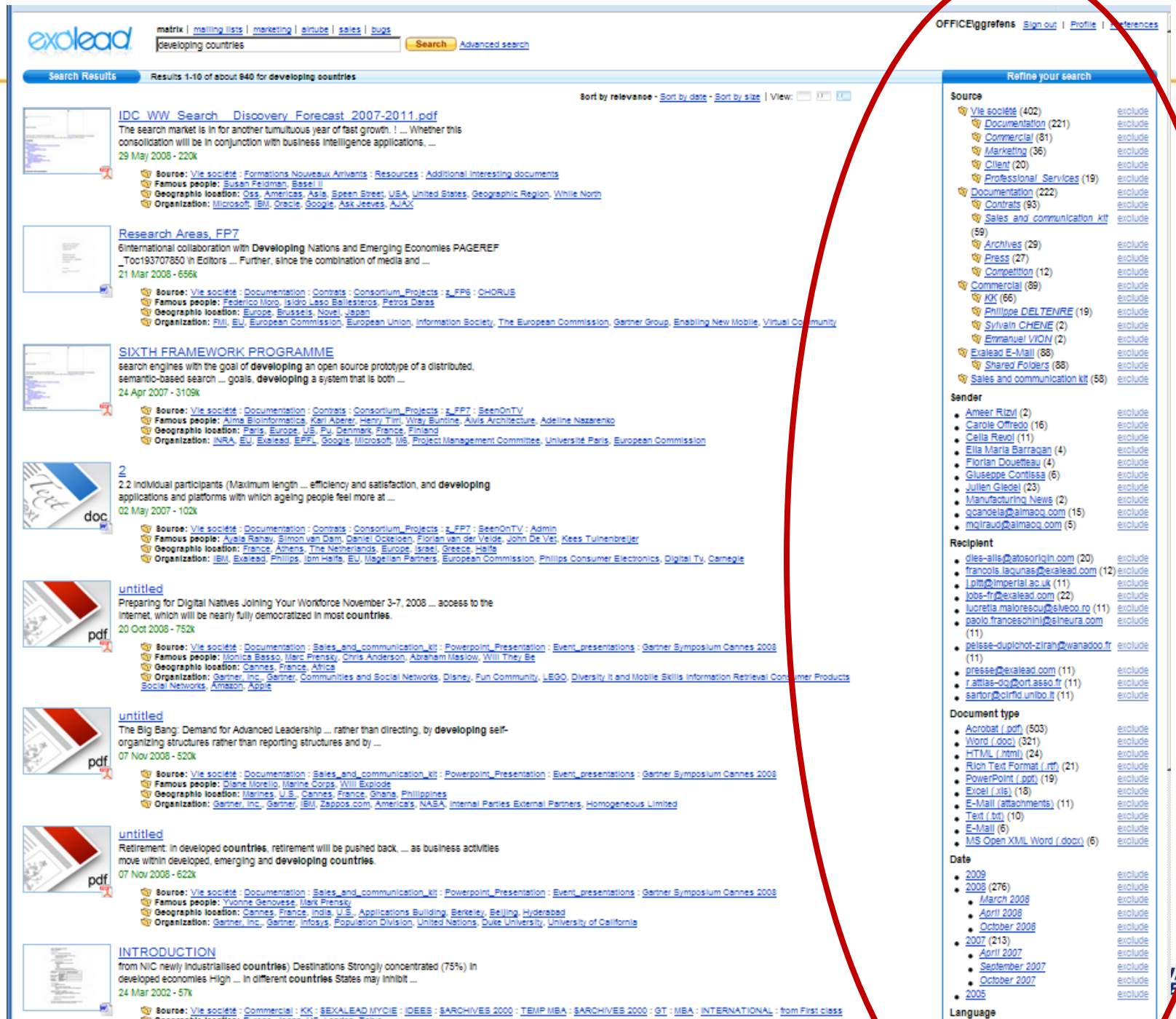

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Success 3: Semantic Type Extraction

- **MUC: named entities**
- **Affect: emotive content**
- **ML: classification, clustering**

The proposed merger between Mega, Inc. and CNA Systems, Incorporated, has been postponed, Mega CEO Joe Smith said in an analyst call. "CNA's 1st quarter revenue dropped by 32%, and they lost 23 million dollars," Smith explained. CNA Systems sources blame weak sales in China. CNA shares (CNAI) fell 47 percent to $9.84 on May 12, the first trading day after the announcement.

Company	Mega, Inc., CNA Systems, Incorporated
Date	May 12
Person	Joe Smith
Person Position	Mega CEO
Currency	23 million dollars, $9.84
Measurement	32%, 47 percent
Country	China
Concept	proposed merger, analyst call, 1st quarter revenue weak sales, first trading day
Event: M&A	The proposed merger between Mega, Inc. and CNA Systems, Inc. has been postponed

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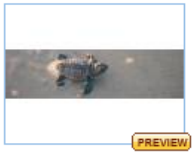
Sea turtle

Sea turtles (Superfamily Chelonioidea) are **turtles** found in all the world's oceans except the Arctic Ocean. There are **...** the body plan of **sea turtles** has remained **...**

en.wikipedia.org/wiki/Sea_turtle - Add to shortcuts

Categories: Sea **turtles**, Marine reptiles

See also: **People:** Pope John Paul II, Marine Laboratory, Marine Mammal Center



Loggerhead Sea Turtle

As with other **sea turtles**, females return to lay their eggs on or near the same beach where they hatched. **...** 1758 url http://www.**seaturtle**.org/mtn/archives/mtn108 **...**

en.wikipedia.org/wiki/Loggerhead_Sea_Turtle - Add to shortcuts

Categories: Sea **turtles**, Reptiles of Australia, **more »**

See also: **People:** June Haimoff, Marine Sanctuary

Sea Turtle Association of Japan, Kuroshima Research Station

research into the nesting of **sea turtles**, especially confirmation of the nesting of the hawksbill turtle for the **...** Specimens of corals, **sea turtles**, and sea shells **...**

en.wikipedia.org/wiki/Sea_Turtle_Association_of_Japan,_Kuroshima_Research_Station - Add to shortcuts

Category: Laboratories

See also: **People:** Kuroshima Research Station

ARCHELON, the Sea Turtle Protection Society of Greece

founded in 1983. It aims to protect **sea turtles** and their habitats in Greece through research, public awareness campaigns, **...** References Archelon's official website

en.wikipedia.org/wiki/ARCHELON,_the_Sea_Turtle_Protection_Society_of_Greece - Add to shortcuts

Category: Conservation in Greece

Ridley sea turtle

Ridley **Sea Turtles** (Lepidochelys) are a genus of **sea turtles** with two species; the Kemp's Ridley and the Olive Ridley. **...** Appearance Adult Ridley **Sea Turtles** grow to a **...**

en.wikipedia.org/wiki/Ridley_sea_turtle - Add to shortcuts

Category: Sea **turtles**

See also: **People:** Ridley Sea **Turtles**, Olive Ridley, **more »**

Narrow your search

Showing results in English
See results in all languages

Australia Bahia Magdalena Chelonia mydas China Coastal Crocodylus porosus Delaware Dermochelys coriacea Endangered fauna of Australia Eretmochelys imbricata Familia Cheloniidae Fauna of Bangladesh Fauna of Delaware and Maryland Fauna of Guyana Fauna of India Fauna of Southeast Asia Habitat Hawaii Hawksbill turtles Indonesia IUCN June Haimoff Lepidochelys kempii Loggerhead turtle Malaysia Marine Laboratory Marine reptiles Marine Sanctuary Marine turtles Mexico Natator depressus NOAA Olive Ridley Pakistan Papua New Guinea Philippines Pixar Red-eared slider Reptiles of Asia Reptiles of Australia Reptiles of Europe Reptiles of Pakistan Reptiles of South America Reptiles of the Philippines Reptiles of the United States Reptiles of Western Australia Ridley Sea Turtles Samuel Garman Sea Turtle Restoration Project Sea turtles Society of Greece Southeast Asia Texas Torres Strait Trachemys scripta elegans Truong Son Muntjac Walt Disney Imagineering Western Australia World Conservation Union

Categories Related terms People
Locations Organizations

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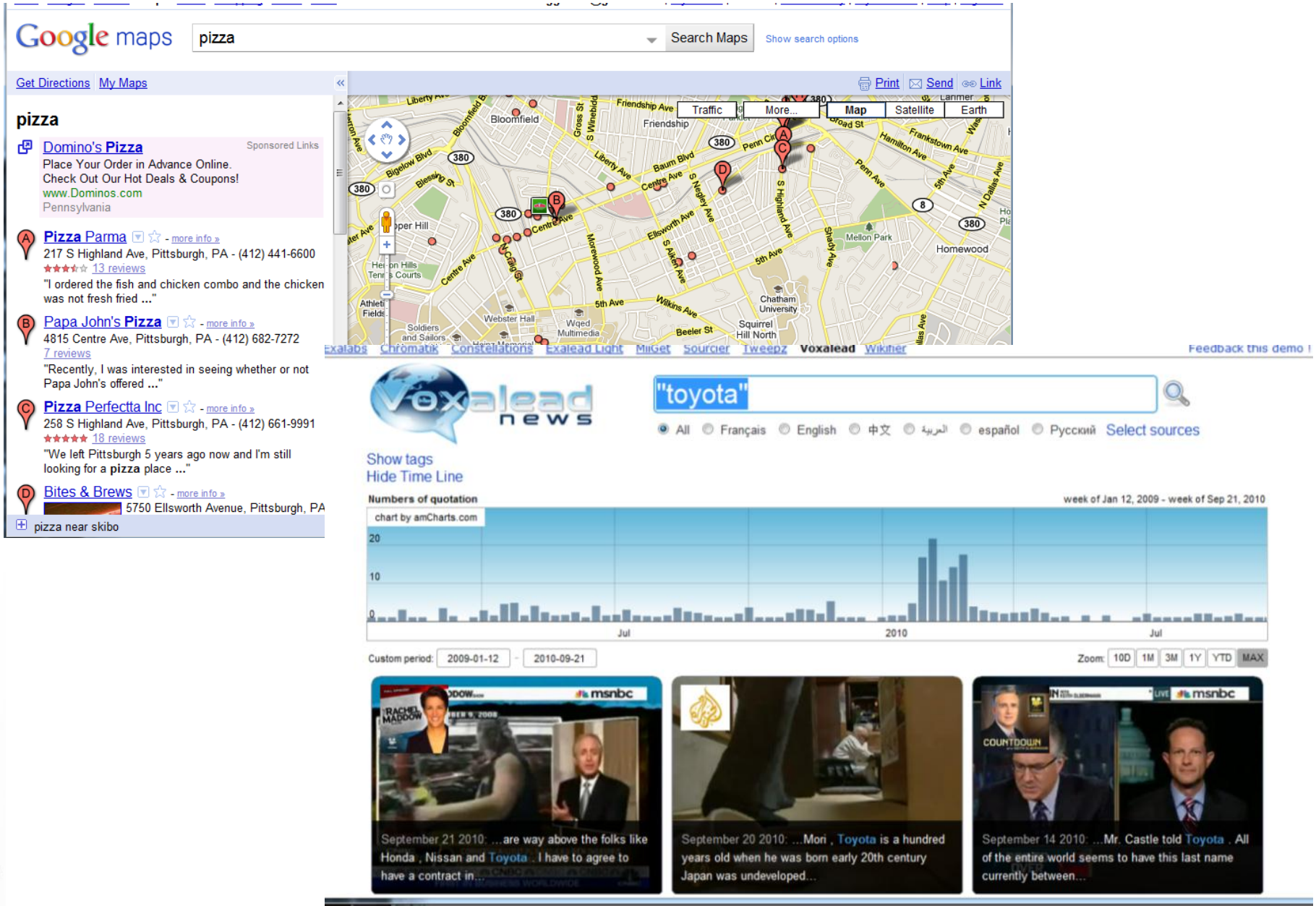
Success 4 : Geolocalised search and Timelines



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A search based application, including social graph

URBANIZER.COM

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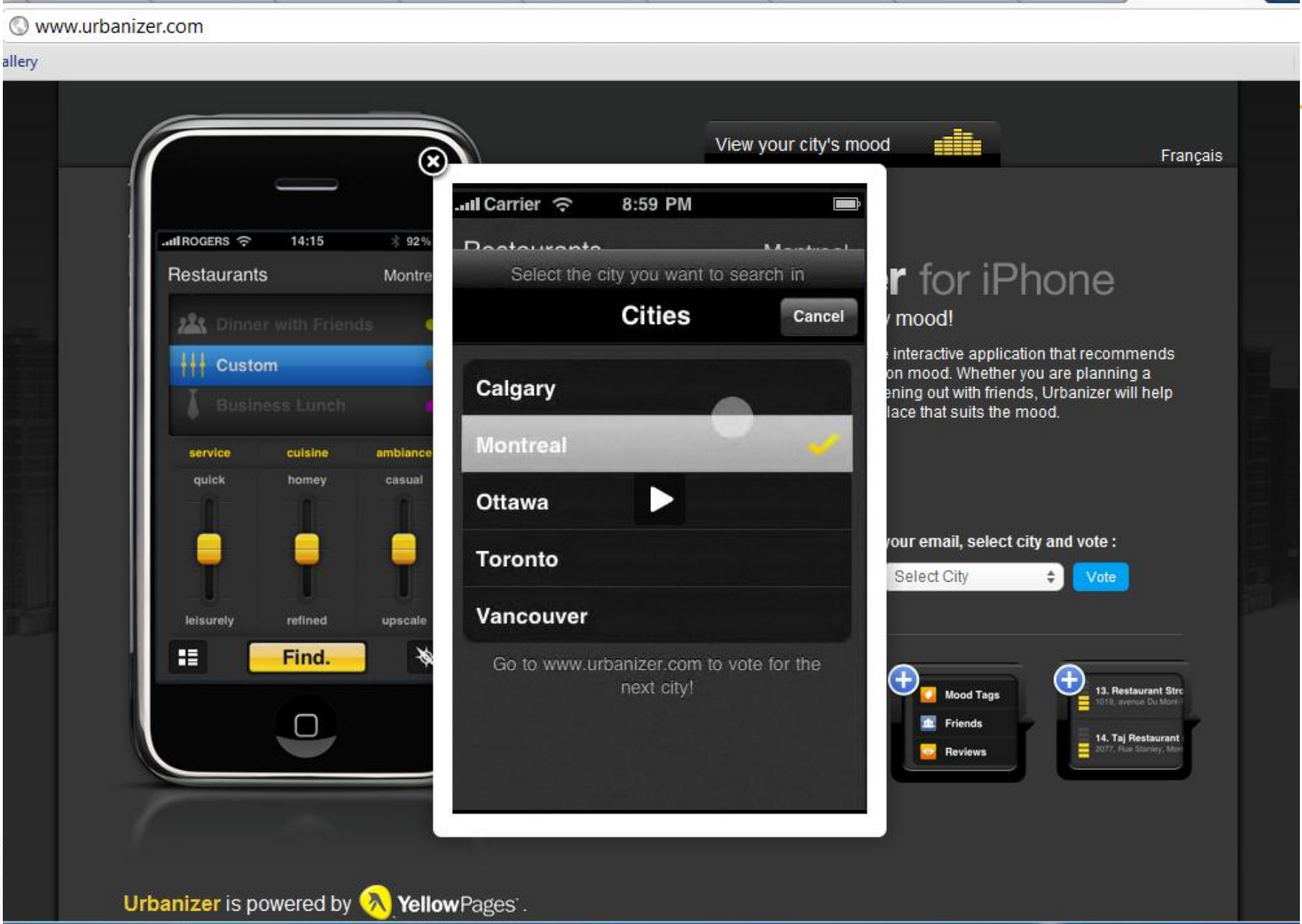
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Français
ROGERS 14:15 92%
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Business Lunch
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Select the city you want to search in
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Go to www.urbanizer.com to vote for the next city!
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Friends
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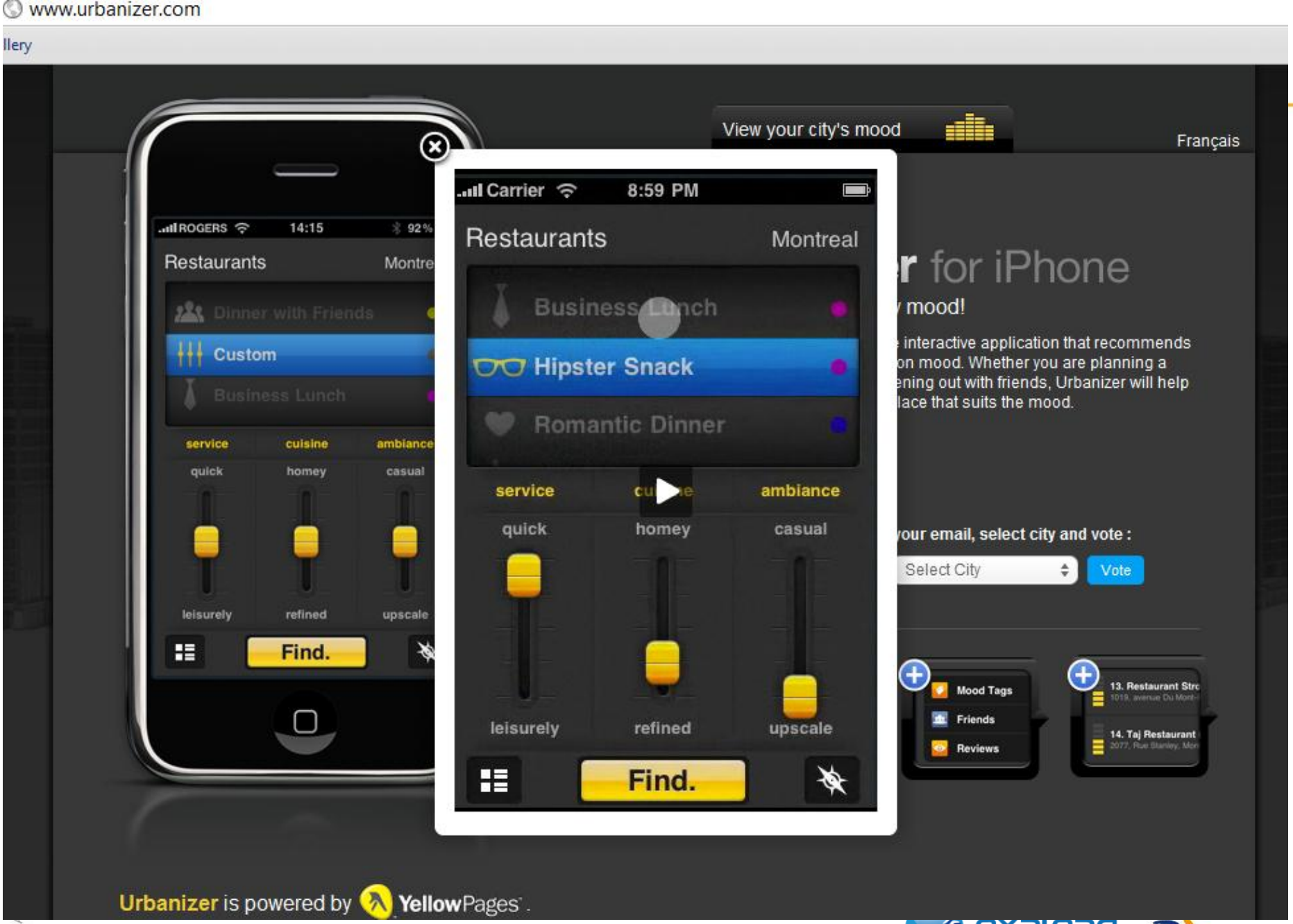
14. Taj Restaurant
Urbanizer is powered by YellowPages.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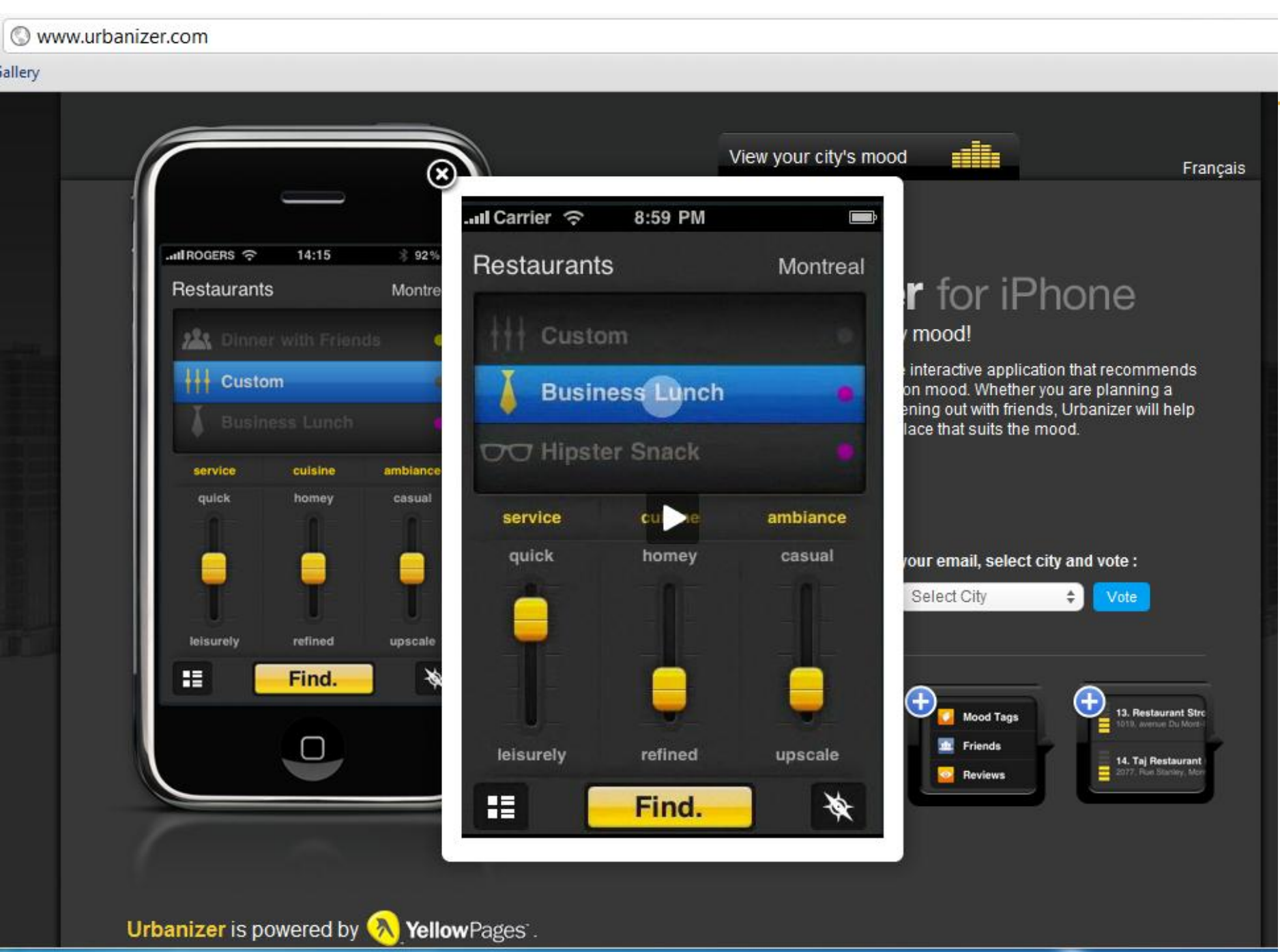
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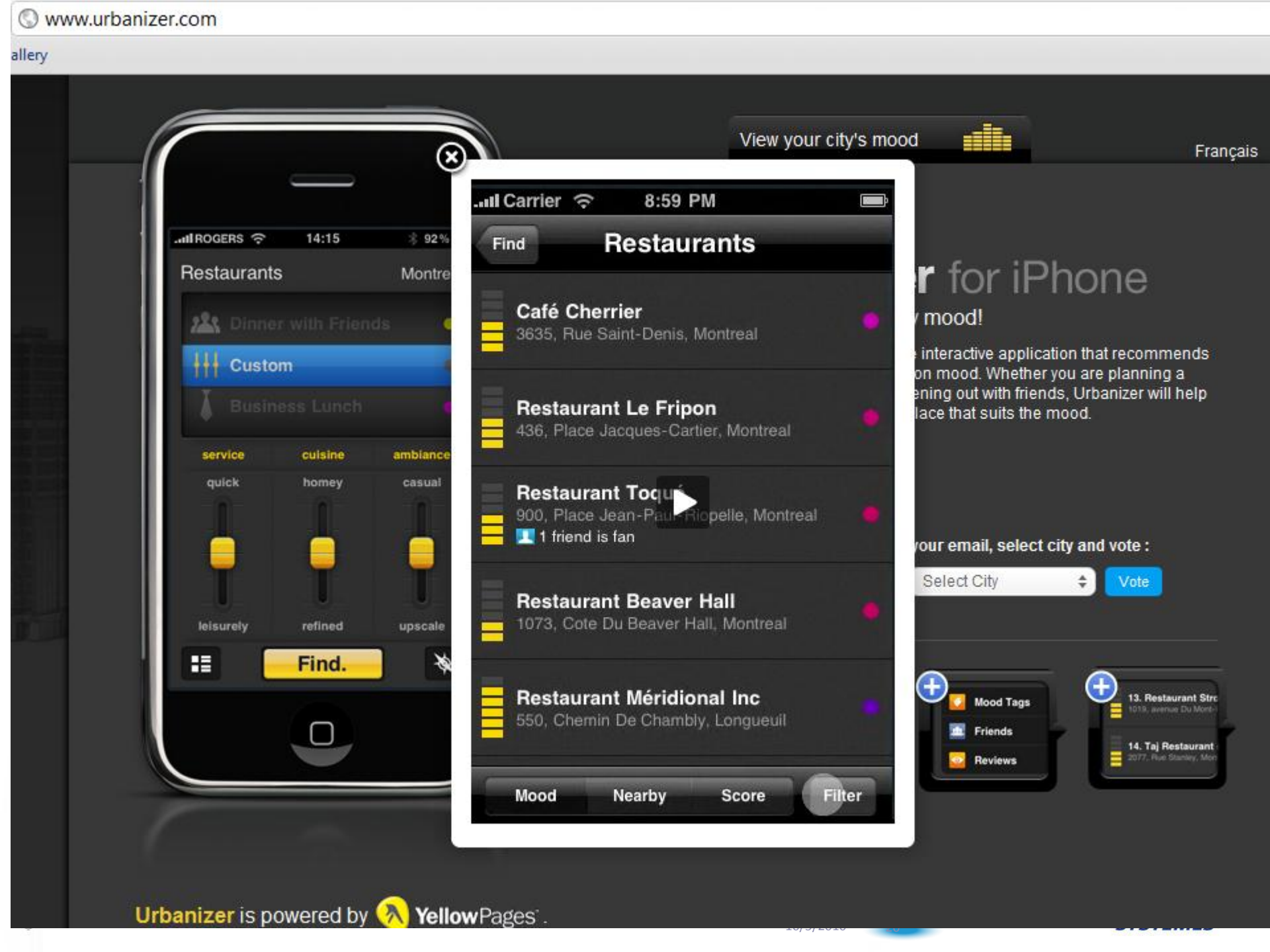
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3635, Rue Saint-Denis, Montreal
Restaurant Le Fripon
436, Place Jacques-Cartier, Montreal
Restaurant Toqué
900, Place Jean-Paul-Riopelle, Montreal
1 friend is fan
Restaurant Beaver Hall
1073, Cote Du Beaver Hall, Montreal
Restaurant Méridional Inc
550, Chemin De Chambly, Longueuil
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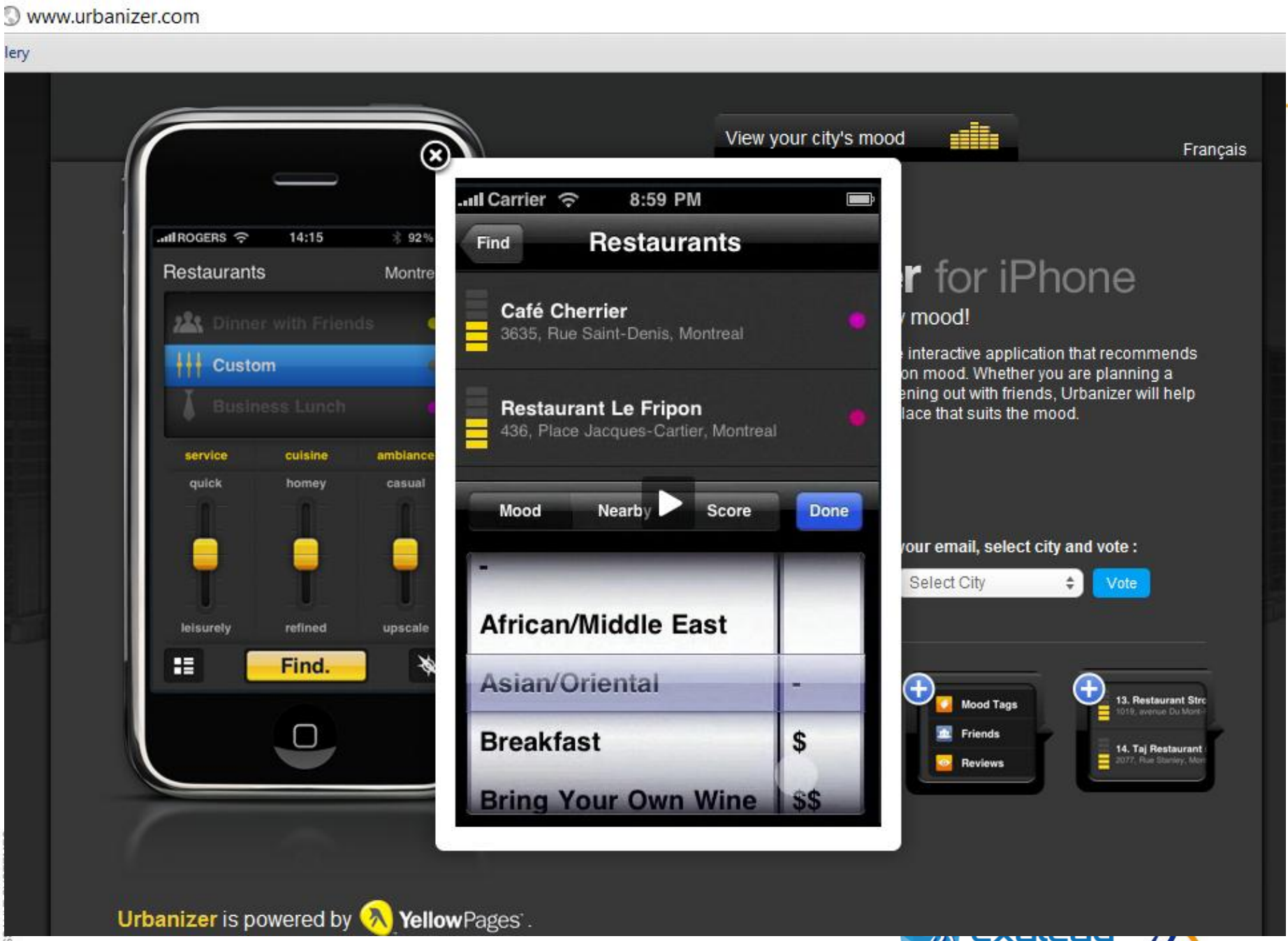
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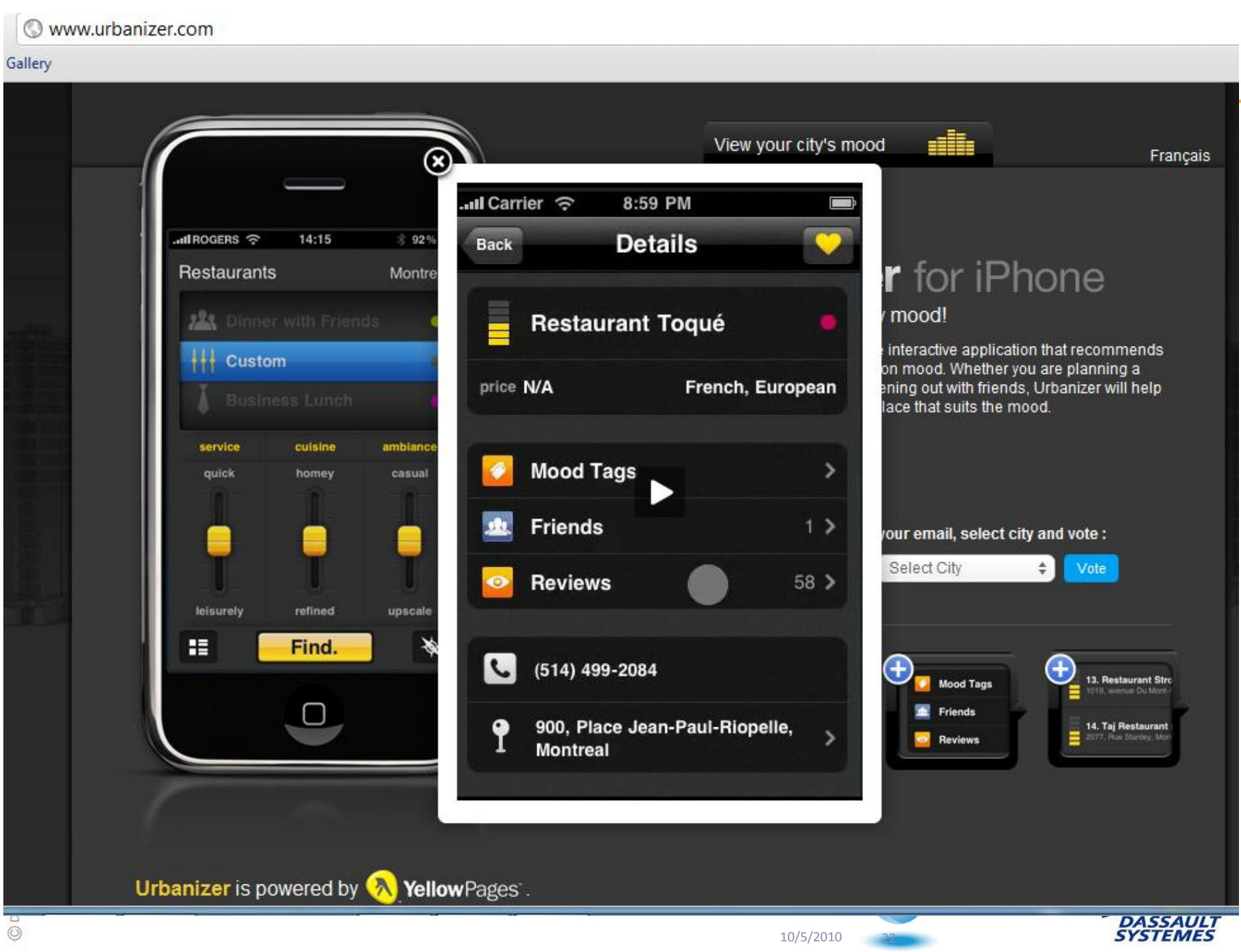
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Carrier 8:59 PM
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Details
Restaurant Toqué
price N/A
French, European
Mood Tags
Friends 1
Reviews 58
(514) 499-2084
900, Place Jean-Paul-Riopelle, Montreal
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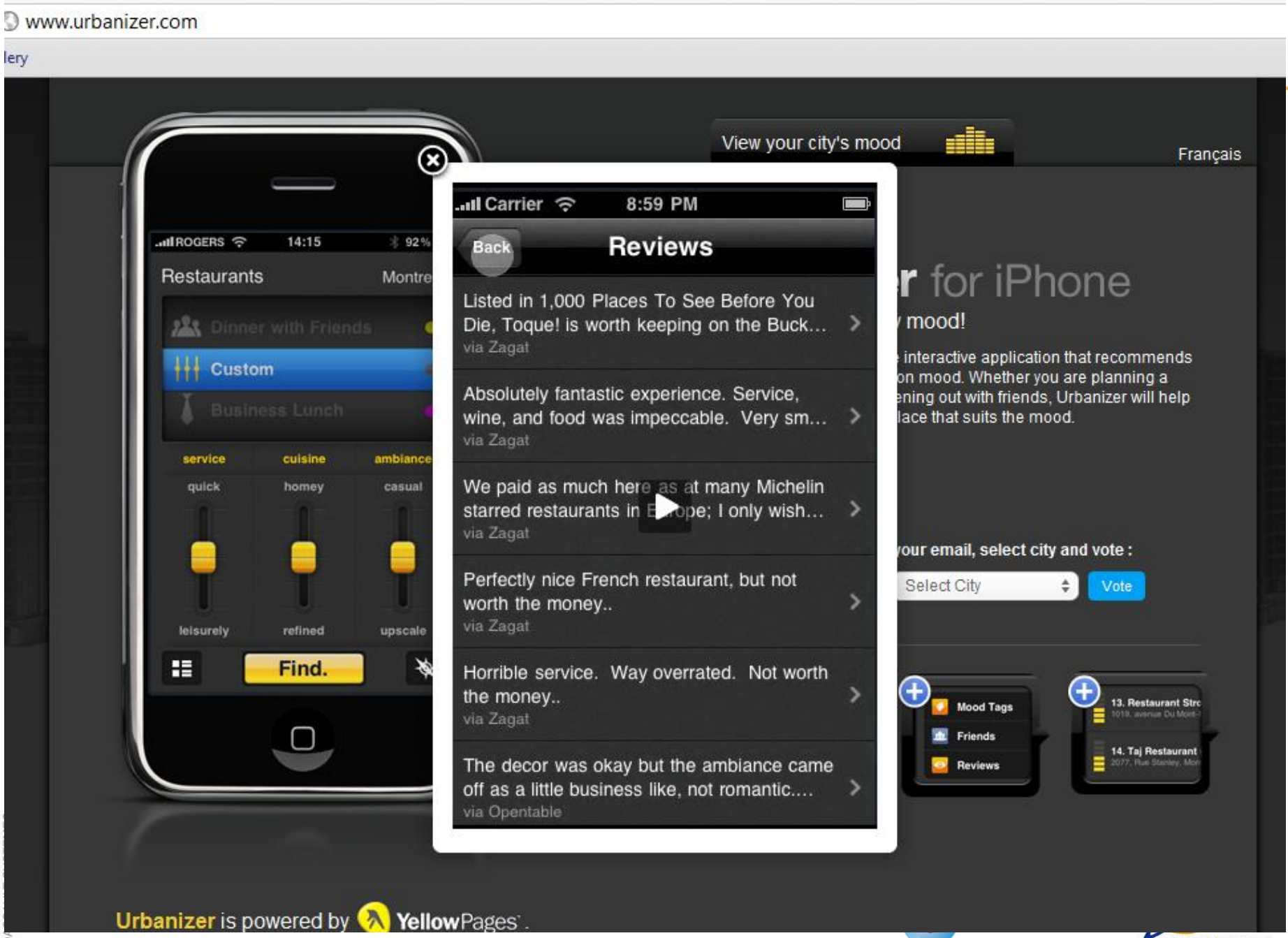
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Carrier 8:59 PM
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Reviews
Listed in 1,000 Places To See Before You Die, Toque! is worth keeping on the Buck...
via Zagat
Absolutely fantastic experience. Service, wine, and food was impeccable. Very sm...
via Zagat
We paid as much here as at many Michelin starred restaurants in Europe; I only wish...
via Zagat
Perfectly nice French restaurant, but not worth the money..
via Zagat
Horrible service. Way overrated. Not worth the money..
via Zagat
The decor was okay but the ambiance came off as a little business like, not romantic....
via Opentable
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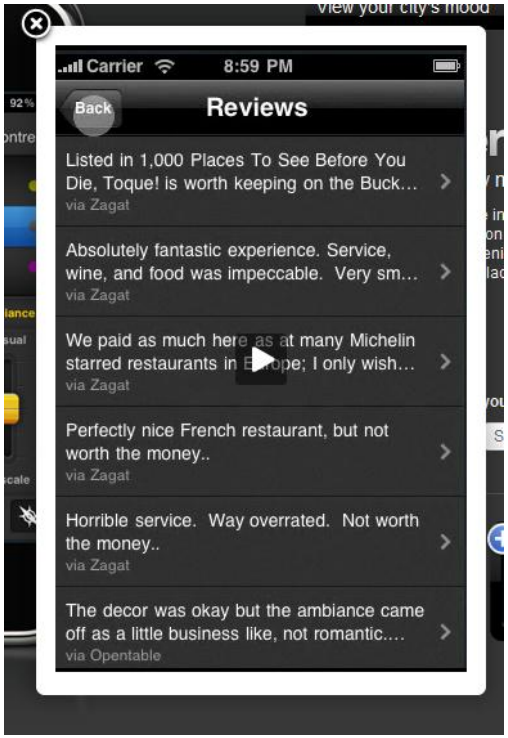
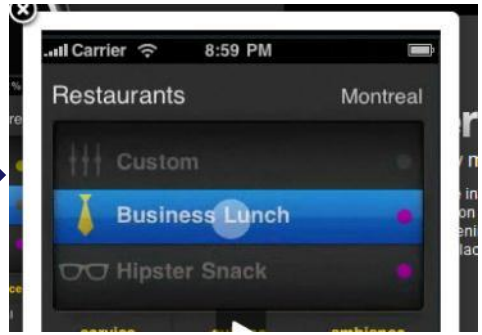
Extraction + Abstraction + Abstraction





"…decor is not particularly elegant…"

ambiance ↓ 70

Business Lunch ≈ service ε [0,40] V cuisine ε [45,100] V ambiance ε [45,100]

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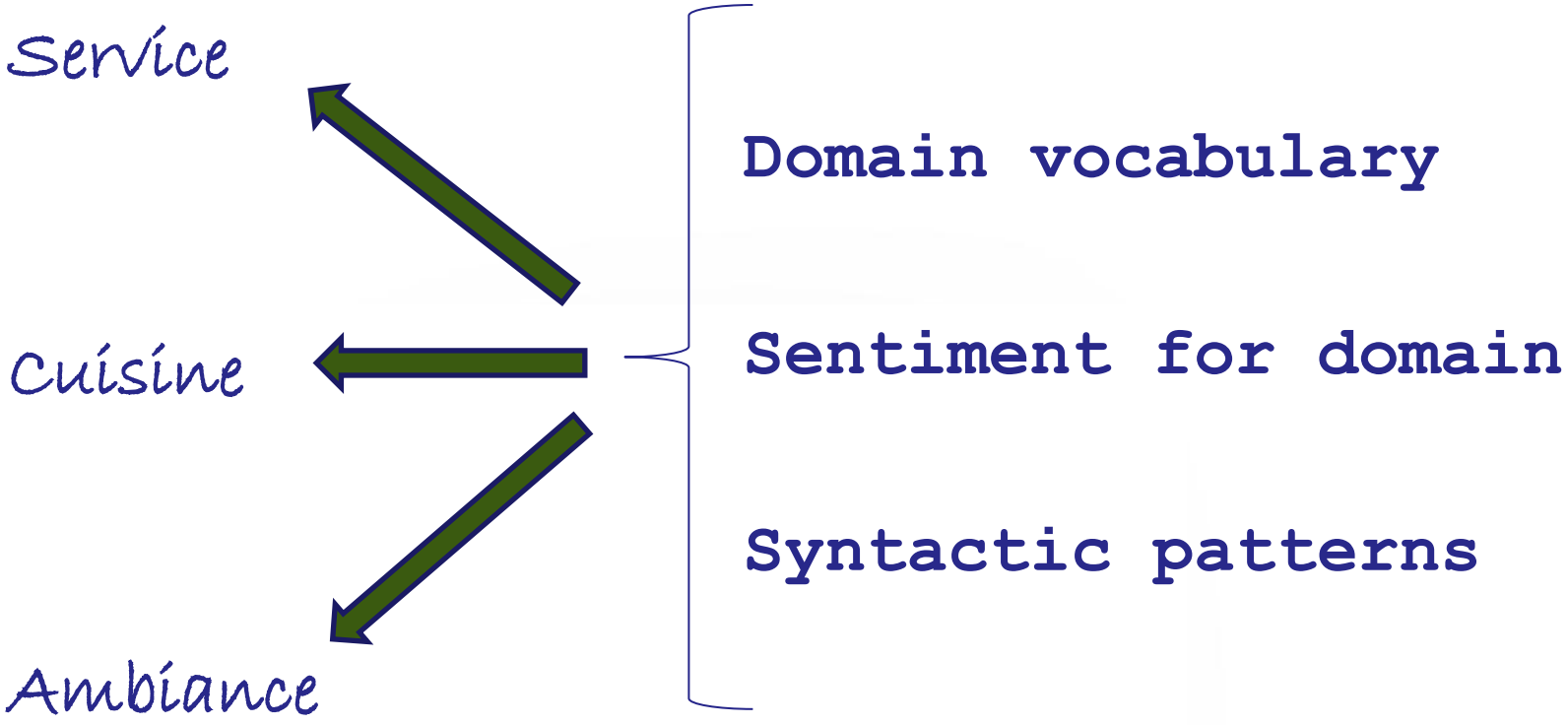
Domain modeling



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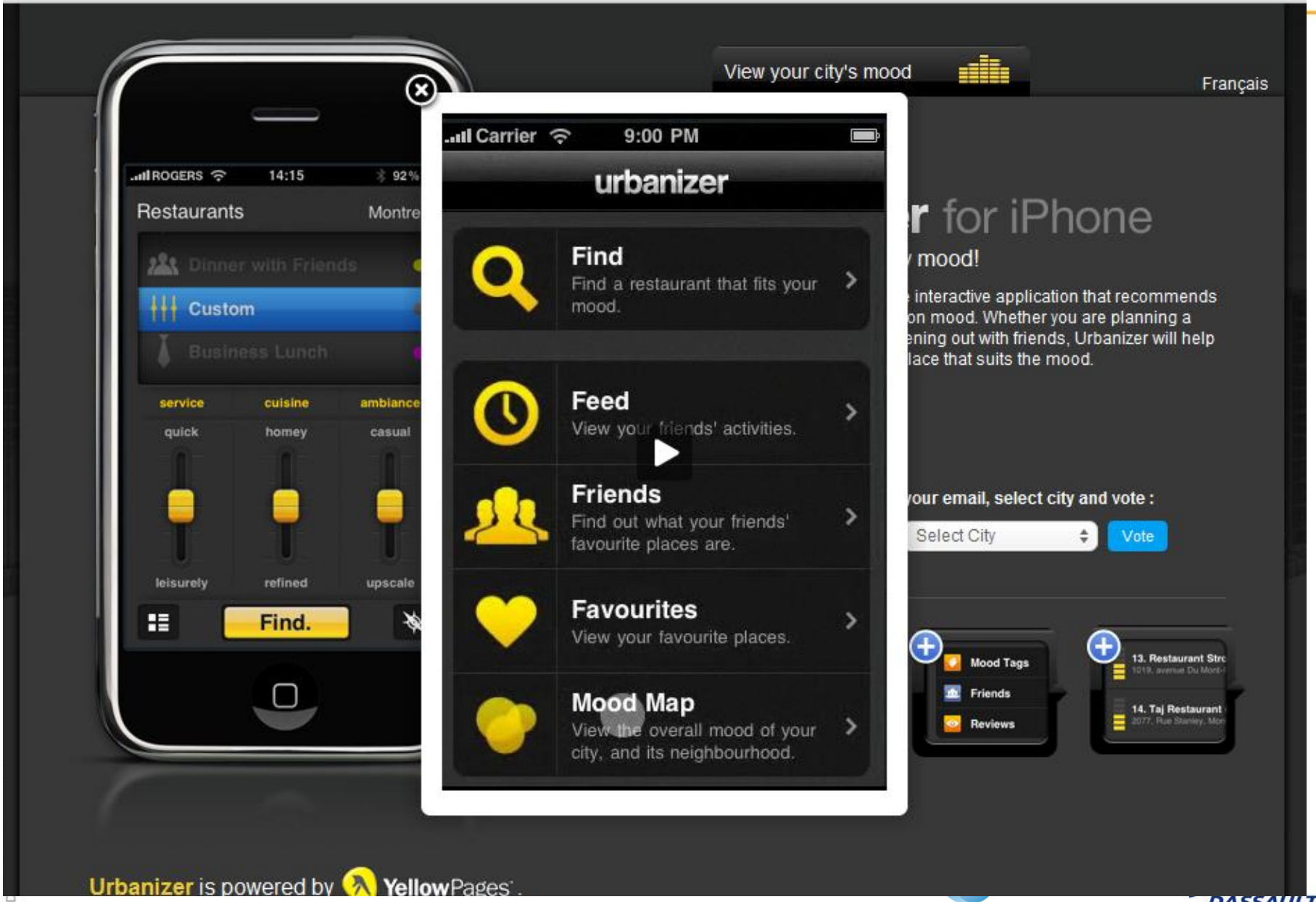

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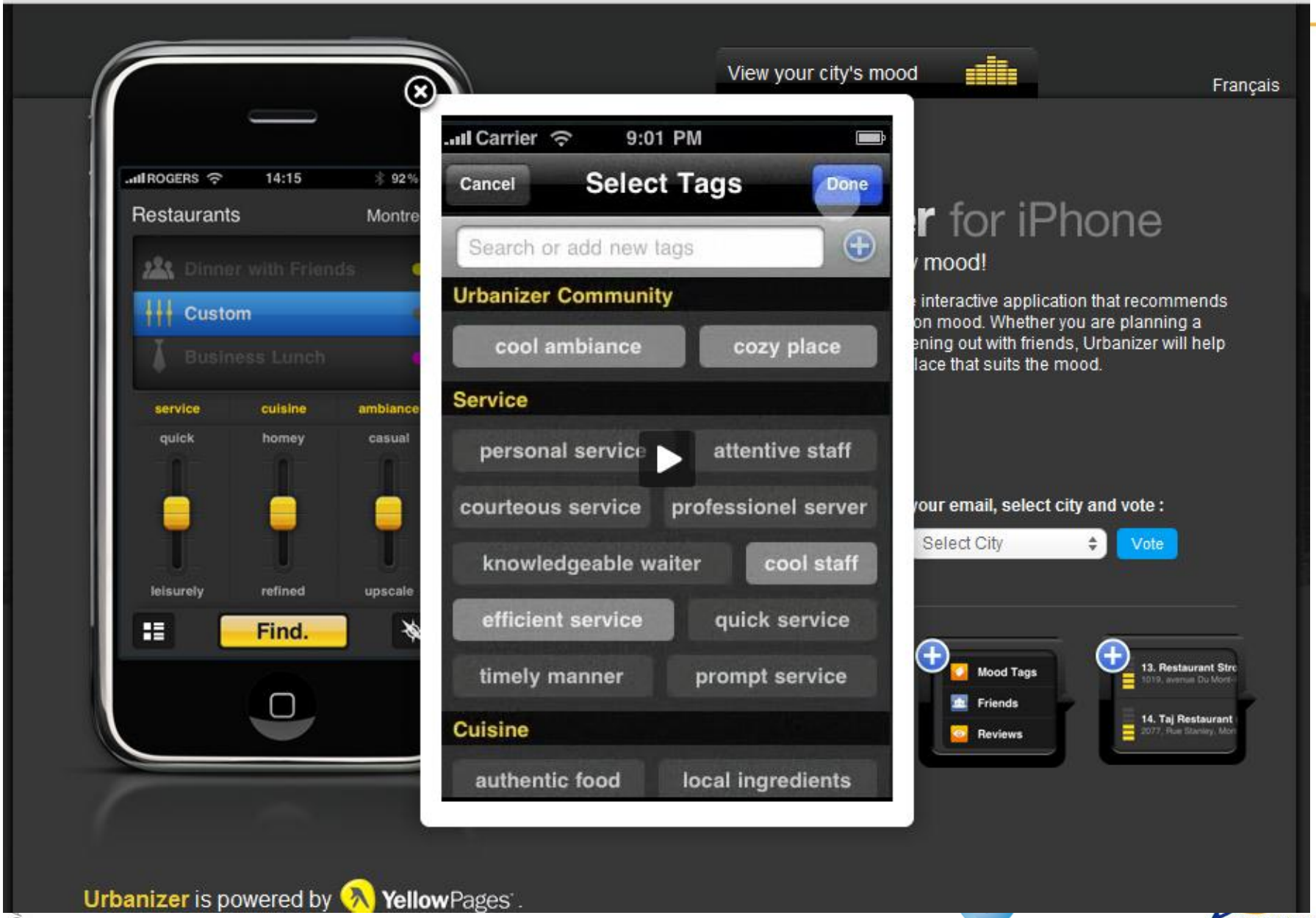

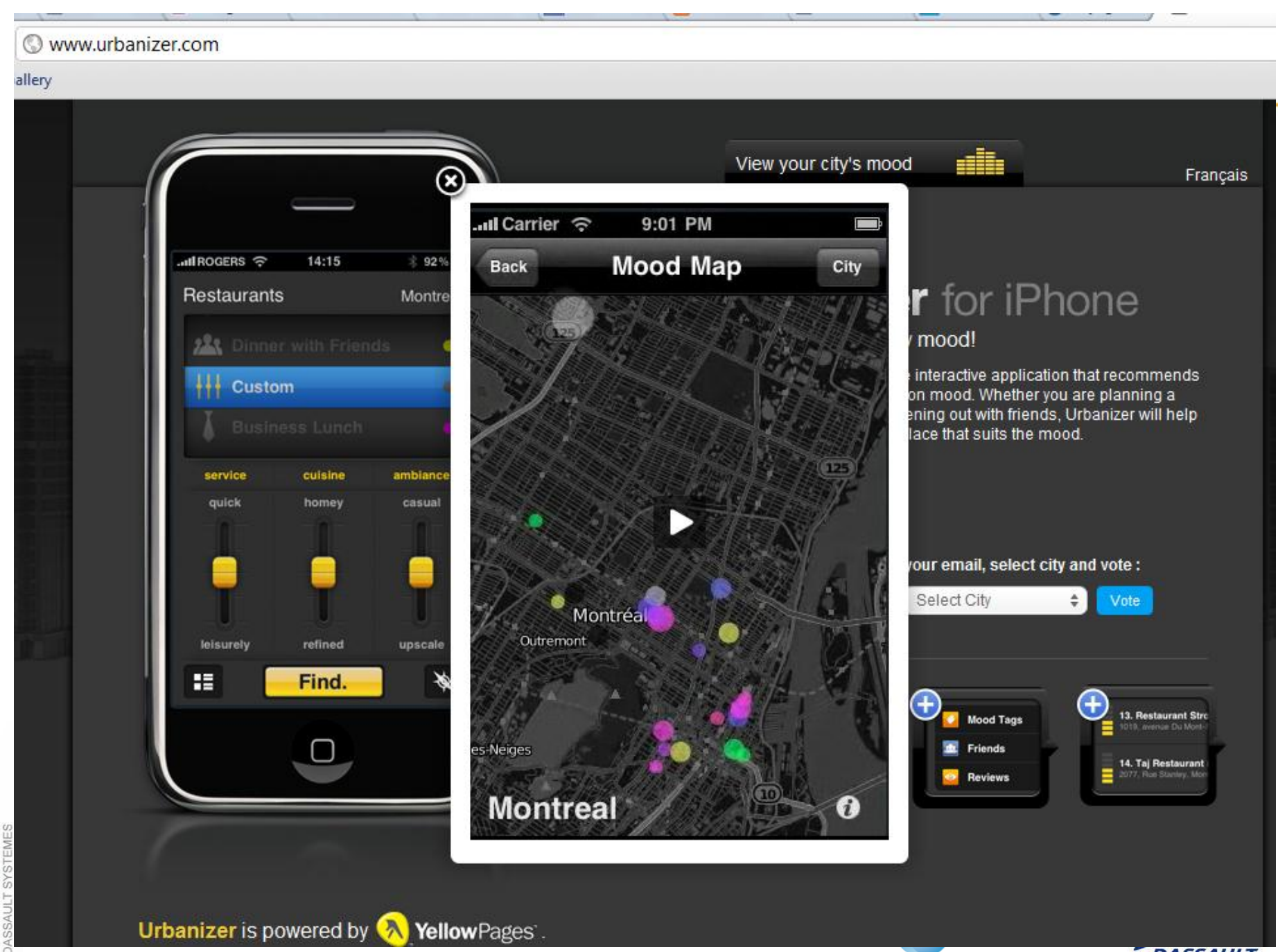

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Successes : Semantics for search

- **Information Extraction**
- **Faceted Search**
- **Sentiment Analysis**
  - → Domain Modeling
- **Friends' opinion**

- **Drawbacks**
  - Domain modeling economically feasible en masse

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Challenge: searching ad hoc, idiosyncratic spaces

Video Stream from Meetings

Jean Carletta, Human Communication Research Centre, School of Informatics, University of Edinburgh

Steve Renals, "Recognition and Understanding of Meetings", keynote for "Human Language Technologies: The 11th Annual Conference of the North American Chapter of the Association for Computational Linguistics", June 1–6, 2010, Los Angeles, CA.

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Challenge 1: searching ad hoc, idiosyncratic spaces

http://www.imrc.kist.re.kr/wiki/LifeLog

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Microsoft SenseCam

http://research.microsoft.com/en-us/um/cambridge/projects/sensecam/

http://justgetthere.us/blog/plugin/tag/cameras

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http://gadgets.infoniac.com/head-worn-camera-for-special-events.html

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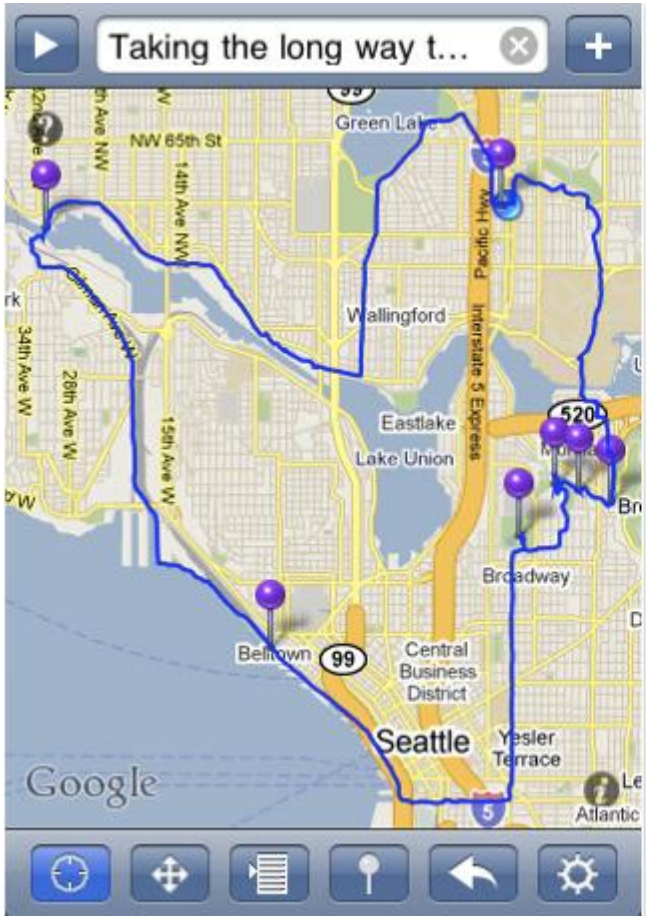
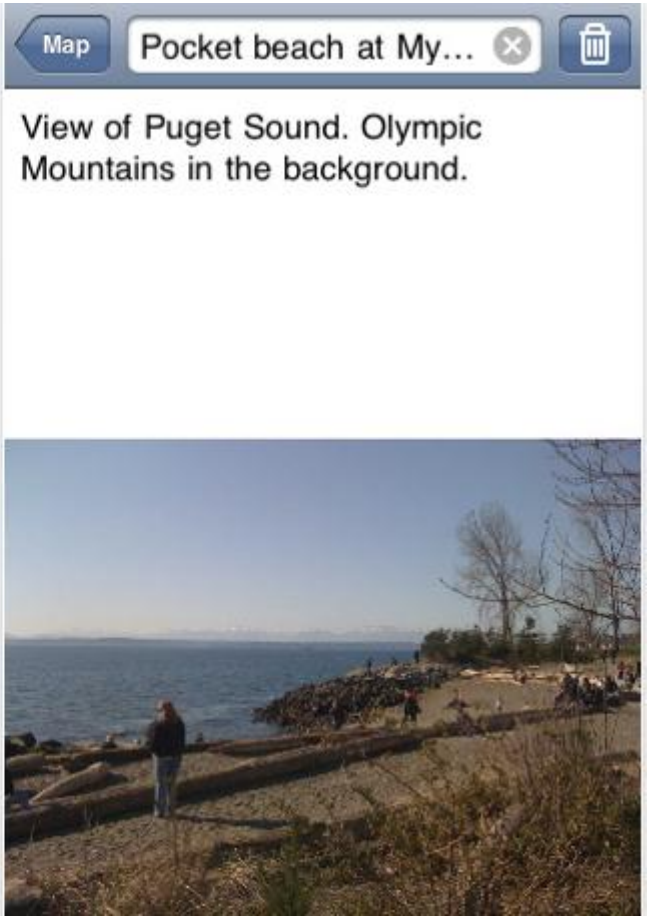
Bike My Way





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Insta Mapper

Jarel's iPhone

Click on positions to select track endpoints and to see other options.

2010-03-11 01:28:59	2663 ft	0 mph
2010-03-11 01:30:01	2663 ft	0 mph
2010-03-11 01:31:02	2663 ft	0 mph
2010-03-11 01:32:03	2663 ft	0 mph
2010-03-11 01:33:05	2663 ft	0 mph
2010-03-11 01:34:11	2663 ft	0 mph
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2010-03-11 01:36:13	2663 ft	0 mph
2010-03-11 01:37:13	2663 ft	0 mph
2010-03-11 01:38:16	2663 ft	0 mph
2010-03-11 01:39:21	2663 ft	0 mph
2010-03-11 01:40:25	2663 ft	0 mph
2010-03-11 01:41:29	2663 ft	0 mph
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2010-03-11 01:43:32	2663 ft	0 mph
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2010-03-11 07:07:56	2627 ft	0 mph
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2010-03-11 07:28:40	2926 ft	0 mph
2010-03-11 07:36:00	2903 ft	0 mph
2010-03-11 07:37:01	2857 ft	0 mph
2010-03-11 07:38:01	2857 ft	0 mph
2010-03-11 07:39:01	2857 ft	0 mph
2010-03-11 07:40:02	2857 ft	0 mph
2010-03-11 07:41:02	2857 ft	0 mph
2010-03-11 07:42:03	2857 ft	0 mph
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Mar 11 2010 Go

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Challenge 2: Mapping Pertinent User information

NOVEMBER 2009 ATLANTIC MAGAZINE

Filtering Reality

How an emerging technology could threaten civility

By Jamais Cascio

Presented By

IMAGE CREDIT: GLUEKIT

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Augmented Reality for Maintenance and Repair (ARMAR)

http://graphics.cs.columbia.edu/projects/armar/index.htm

(Left) A mechanic wearing a tracked head-worn display performs a maintenance task on a Rolls Royce DART 510 Engine. (Right) A view through the head-worn display depicts information provided using augmented reality to assist the mechanic.

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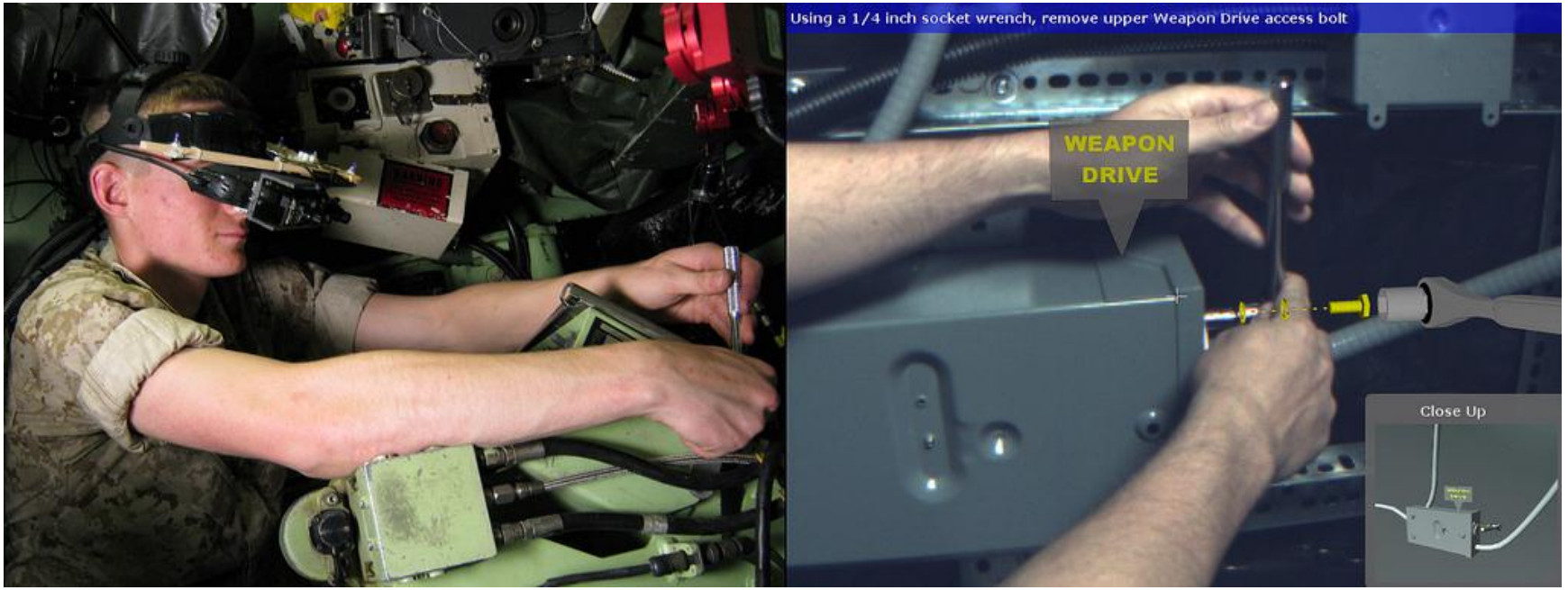
http://graphics.cs.columbia.edu/projects/armar/index.htm



(Left) A mechanic wearing a tracked head-worn display performs a maintenance task inside an LAV-25A1 armored personnel carrier. (Right) The AR condition in the study: A view through the head-worn display captured in a similar domain depicts information pro vided using augmented reality to assist the mechanic.

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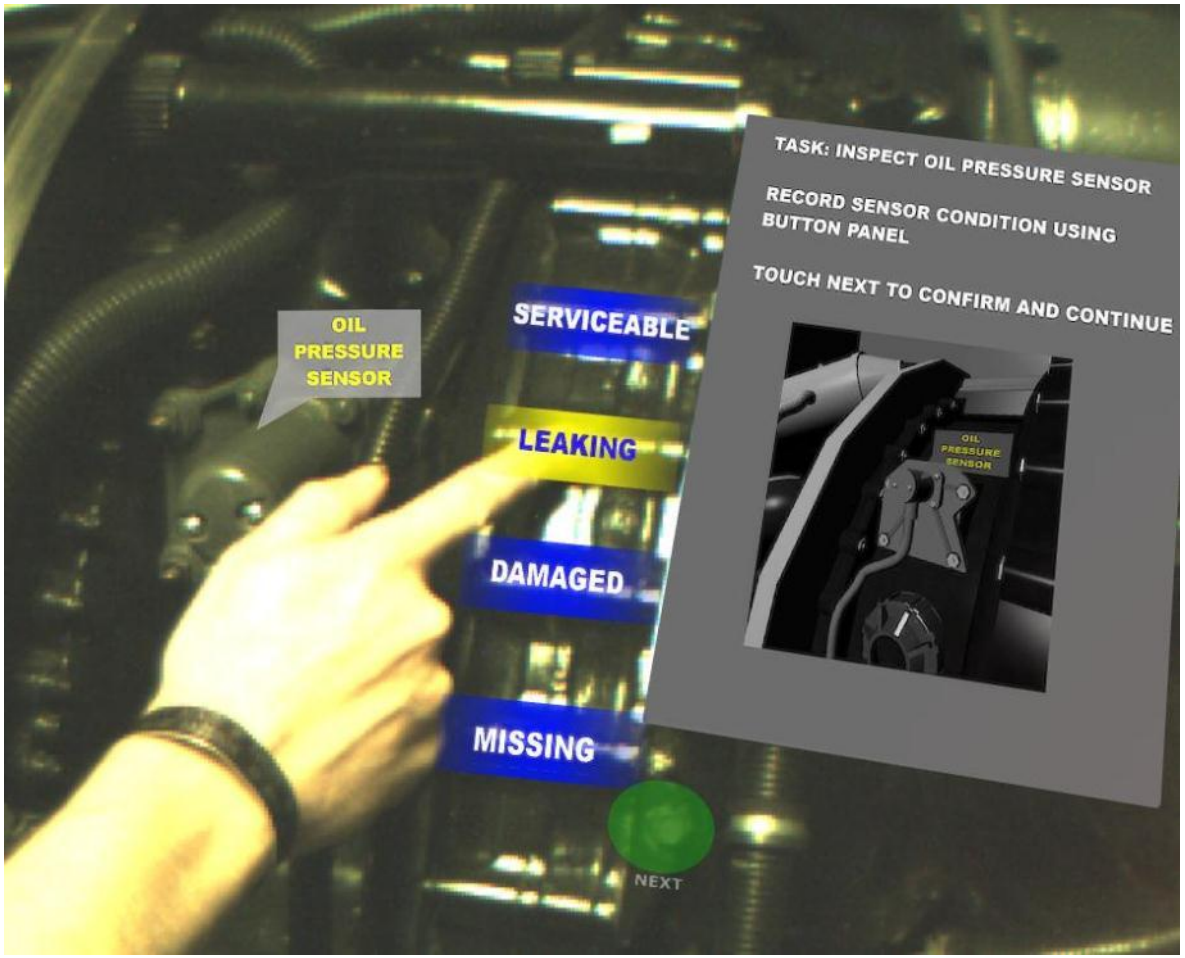
A user manipulates 3D virtual buttons while receiving haptic feedback from the underlying grooves of an engine compression section



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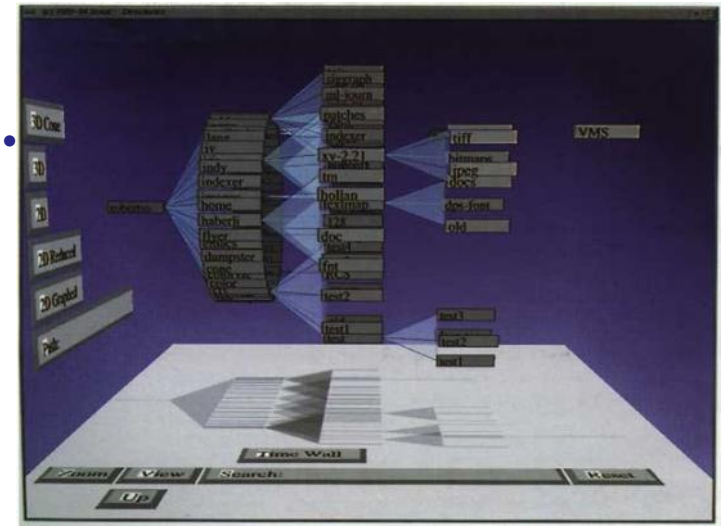
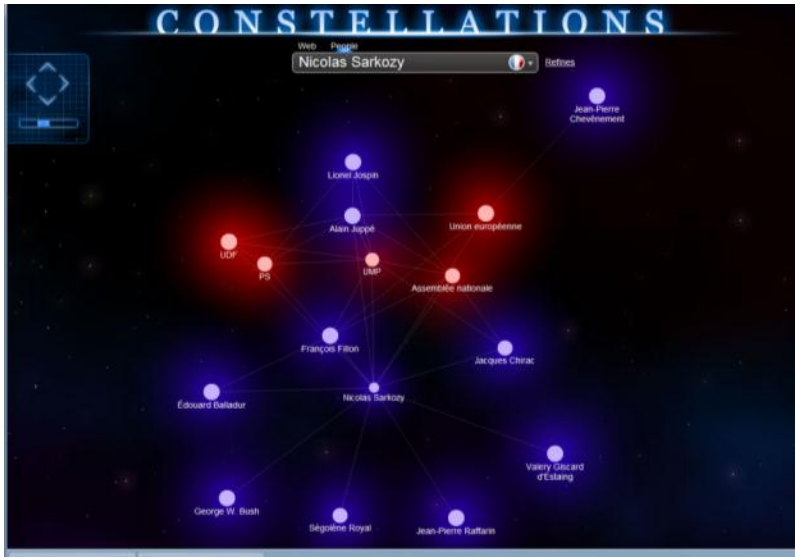
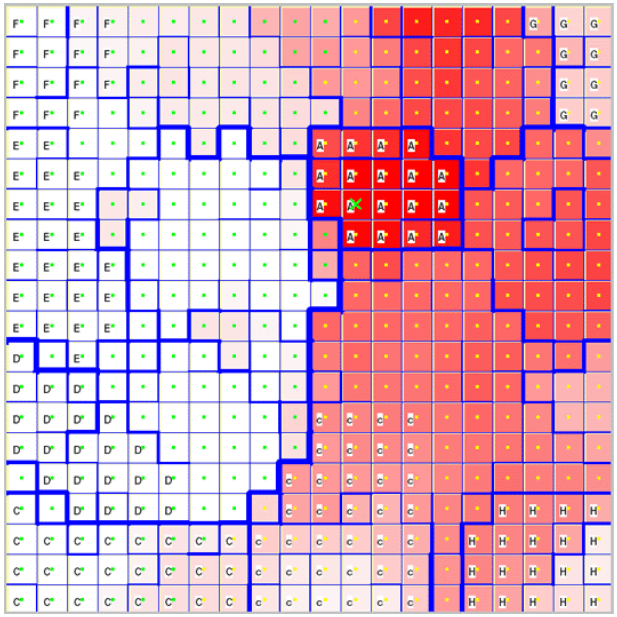
Challenge 3 : liberation from real world maps







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What does space mean in a virtual world

http://twomeneatingforthree.com/

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Conclusions

Successes

- Entities, Affect
- Faceted Search
- Local Search

Challenges

- Idiosyncratic volume
- Idiosyncratic abstraction
- Assigning meaning to virtual space

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