Real-time, context-aware anticipatory search

Mobile Voice Conference
San Francisco, April 15, 2013

Marsal Gavalda
marsal@expectlabs.com

Expect Labs

"I get asked what
the next big thing
is a lot. I haven't had a good answer in a while. [...]
Lately, though, there's one big concept that seems really exciting, and that's
anticipatory systems."

Owen Thomas
ReadWrite

“My vision of search engines is that they won’t wait to be asked questions.

They'll be listening in on our conversations –what we say, what we write, what we read, what we hear– and they will anticipate our needs.”

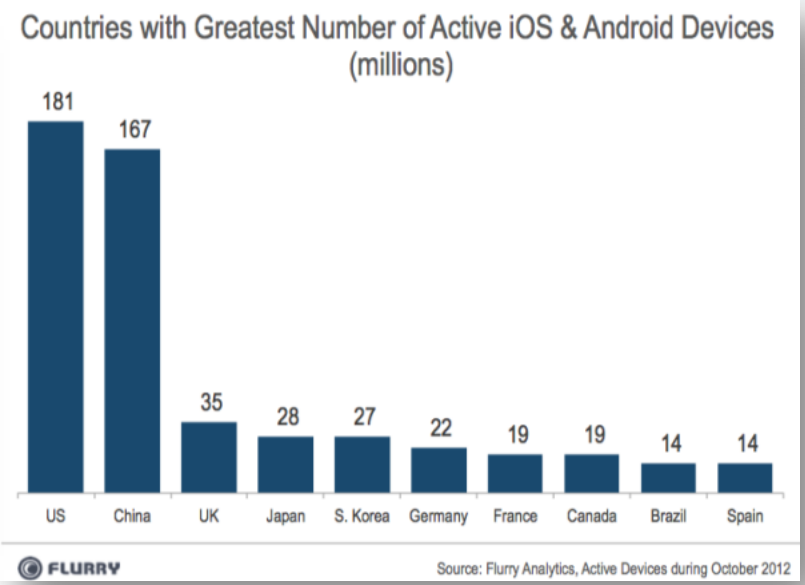
Ray Kurzweil
Google

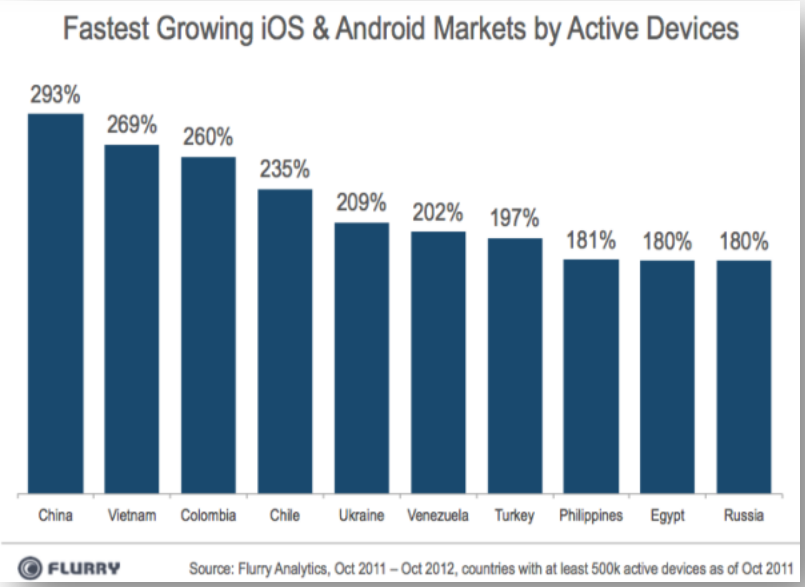

I'll meet you at Tony's Pizza in five minutes
SAMSUNG
12:03
Tony's Pizza Napoletana more info
1570 Stockton Street
San Francisco, CA 94133
(415) 835-9888
tonyspizzanapoletana.com
26 ZAGAT · 330 reviews
Directions
Search nearby
Save to map
more
Union St
Green St
Vallejo St
Broadway
Pacific Ave
Jackson St
Stockton St
Powell St
Kearny St
Grant Ave
Columbus Ave
Naked Lunch
City Lights Booksellers & Publishers
Hotel North Beach
Chinese

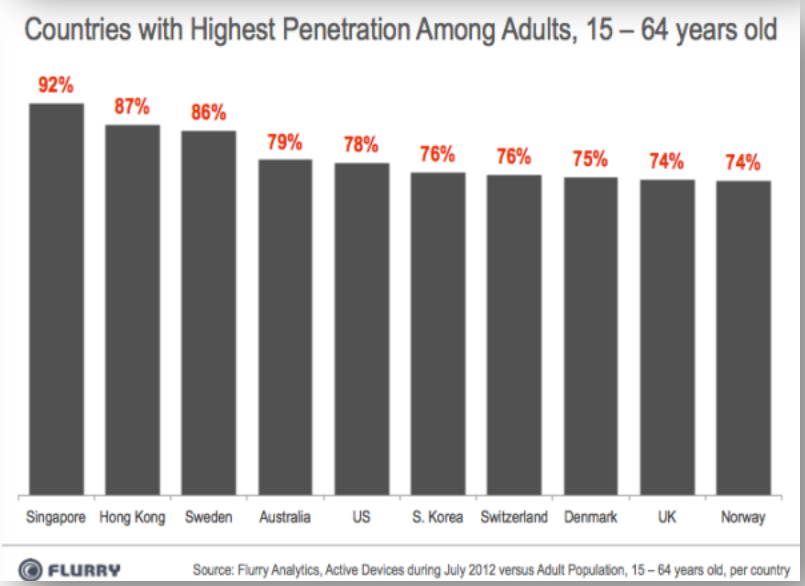
Enabling trends for anticipatory search

- **Mobile devices are powerful and ubiquitous.**
  - They capture, compute, transmit/receive, and present information.
- **Artificial intelligence is slowly but inexorably progressing.**
  - Cloud-based backend applies ASR, NLP, ML, etc. to make sense of user context and intent.
- **Applications can anticipate user's informational needs.**
  - Aware of situational context and real-time updates, a new class of anticipatory computing apps can begin to make accurate predictions of what information will be most useful to the user at any given time.

Mobile devices are ubiquitous







Mobile devices capture data via many sensors

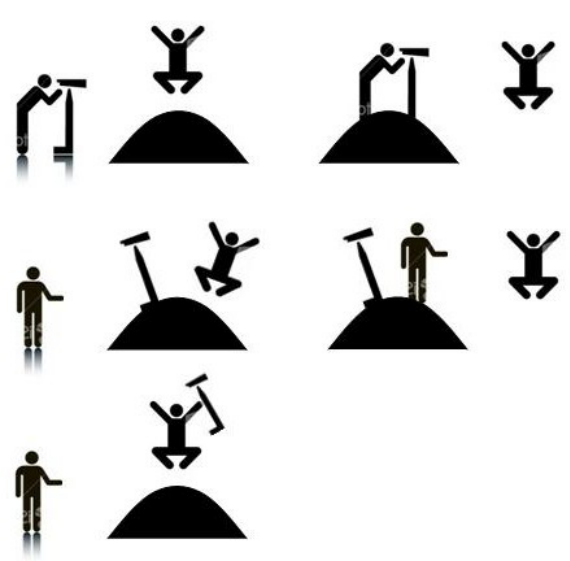
Cameras, microphone, WiFi, LTE, GPS, and…

Source: Samsung

Context is key to understand intent

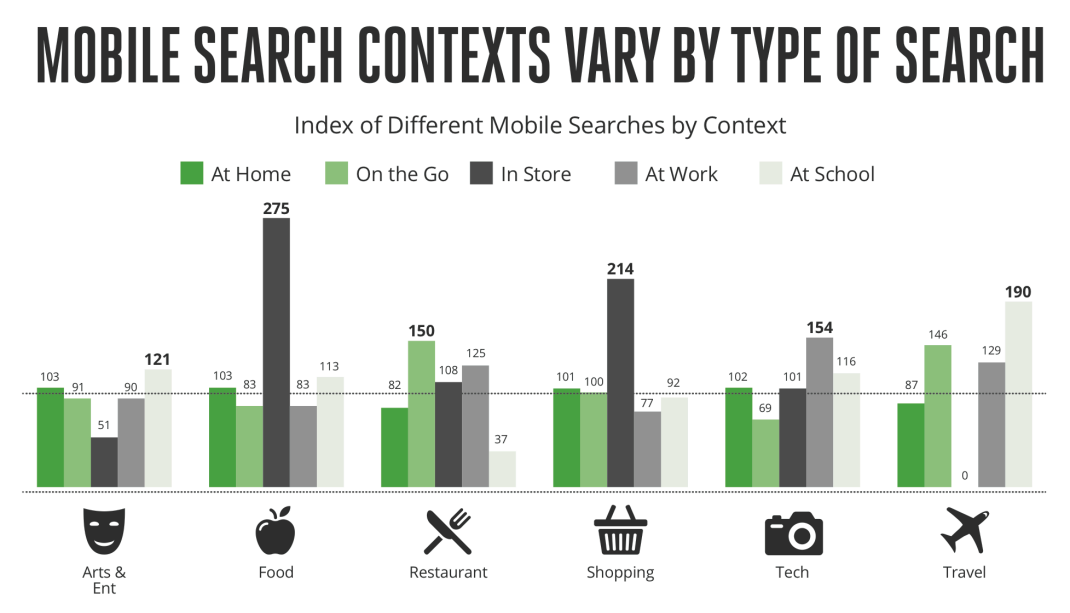
Natural language is ambiguous without context, e.g.,

"I saw the man on the hill with the telescope"



Source: Deniz Yuret

User location influences search goals



Source: Google/Nielsen Life360 Mobile Search Moments Q4 2012 (Base: total mobile searches n=6,303; Q: Where are you? Q: What category of information did you search for?)

Expect Labs

Artificial Intelligence slowly but inexorably improving

Progress in…

Automatic Speech Recognition

- Dynamic speaker adaptation
- Deep/recurrent neural networks
- Ultra large language models

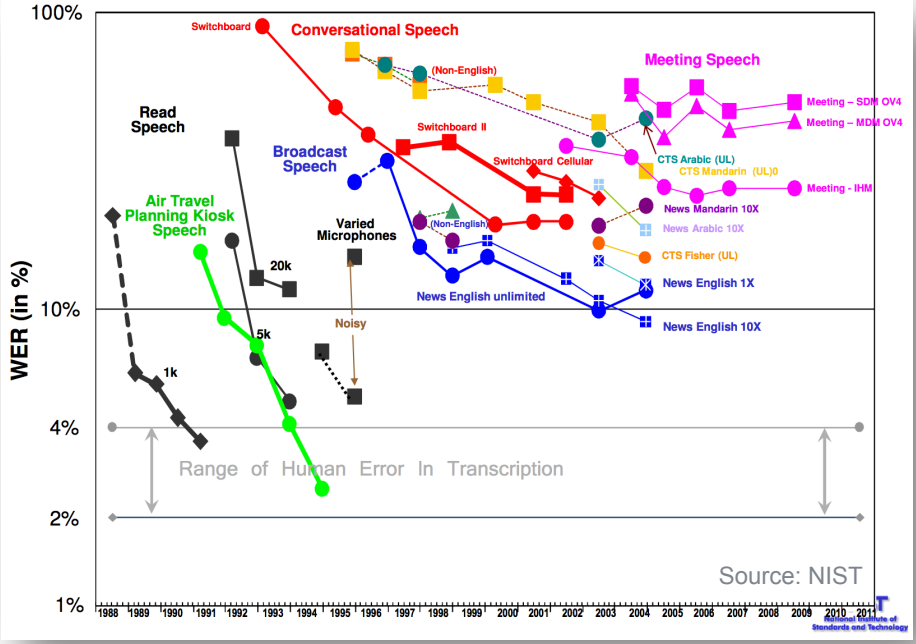
Natural Language Processing

- Conversation and topic modeling
- Knowledge Graph
  - 570 million entities
  - 18 billion facts & relationships

Machine Learning

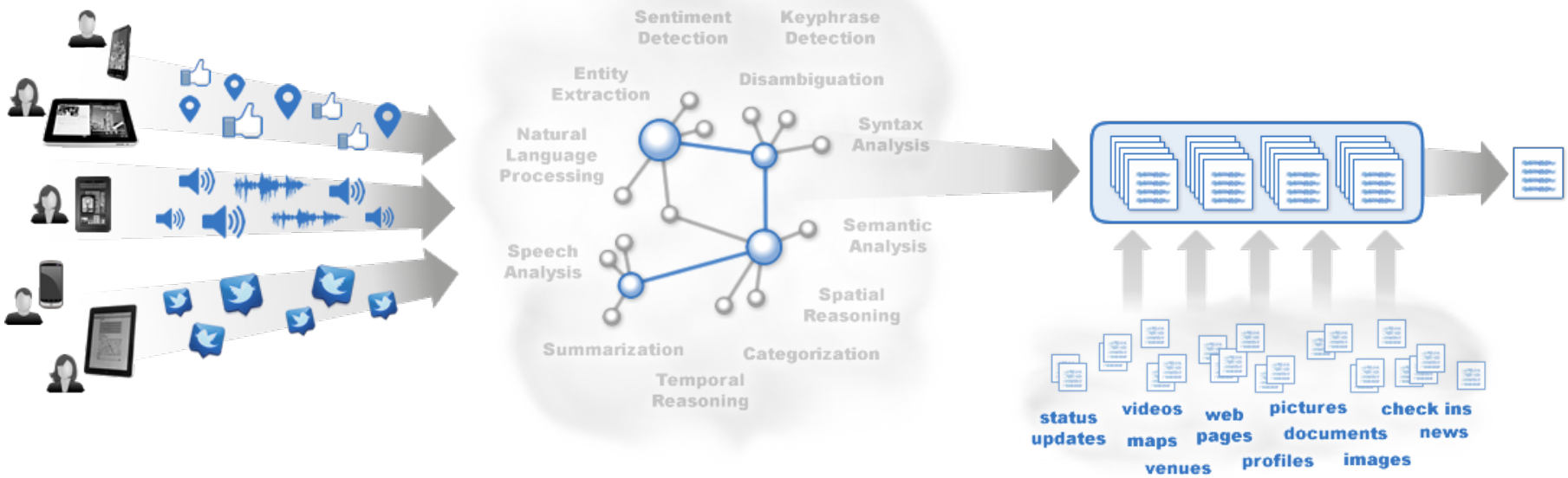
- Latent factor models for recommender systems

…lead to **improved understanding of natural, human-to-human conversations**.



Expect Labs

Expect Labs is building a new type of search platform to power this emerging class of anticipatory computing applications

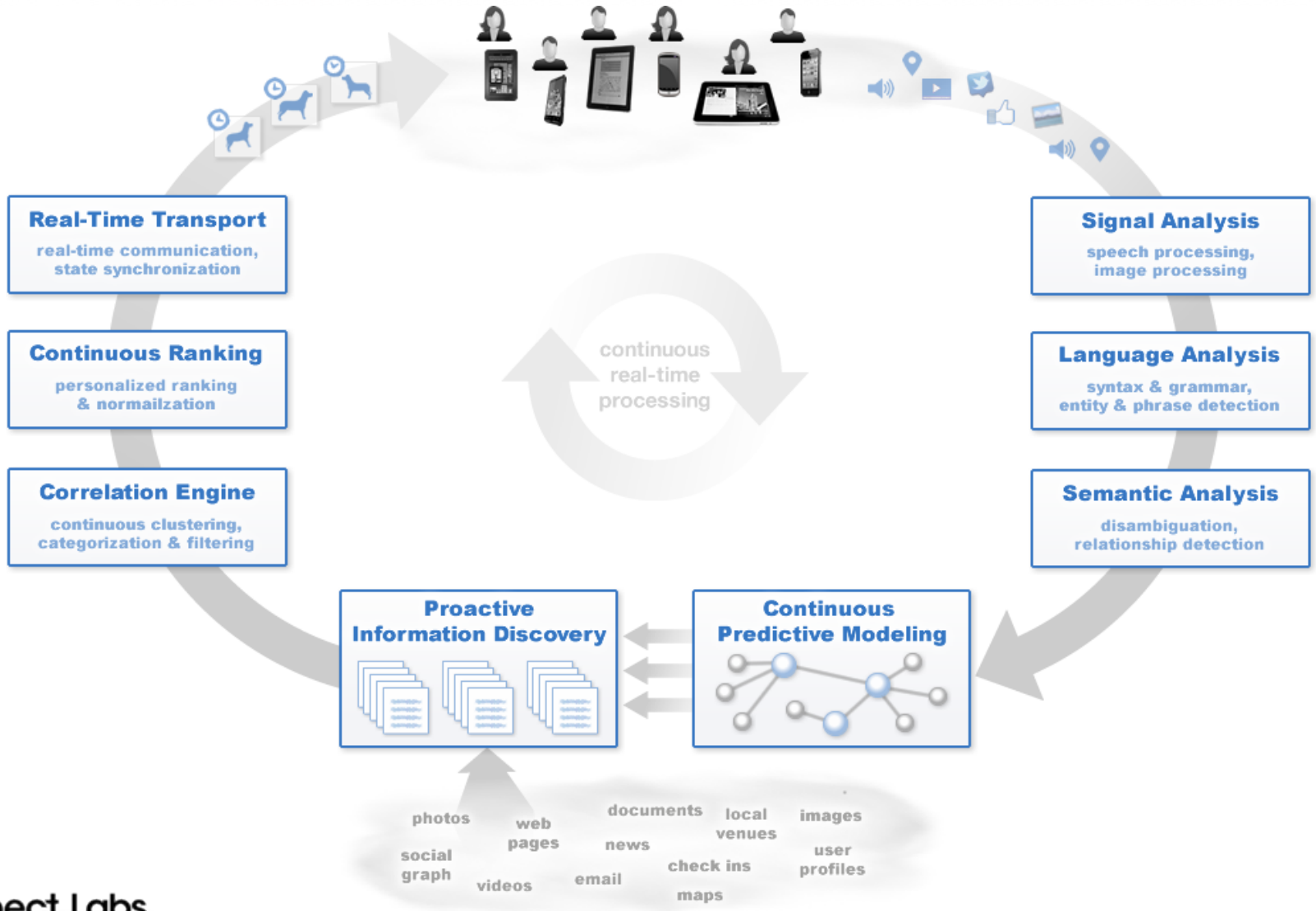


1 passively analyze multiple concurrent data streams for each user in real-time
voice, gps, video, updates, ...

2 generate a continuously changing model of user intent
based on long-running context

3 proactively find, correlate and rank relevant information
display to user as appropriate

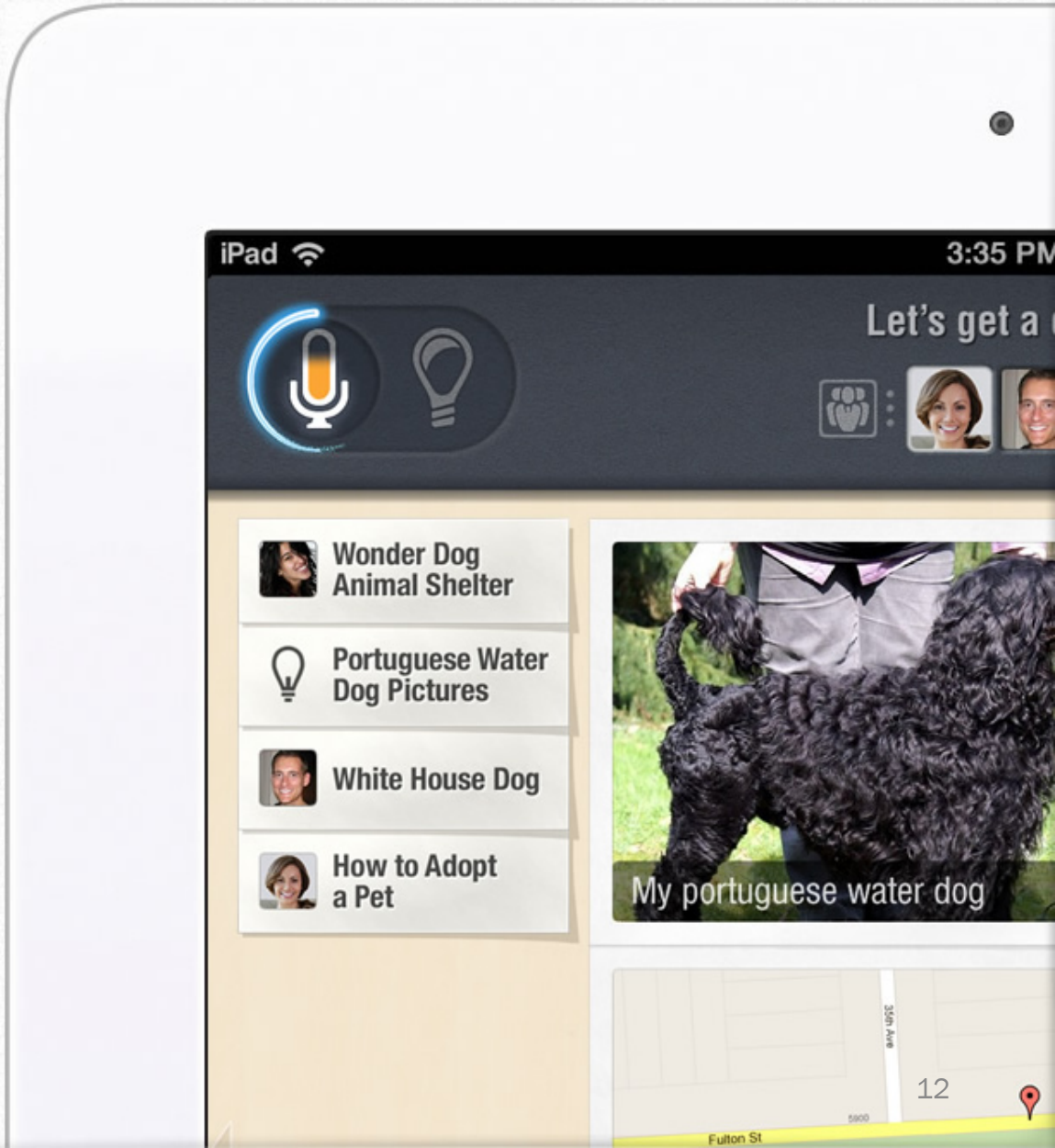
Our Anticipatory Computing Platform understands your conversation and finds the information you want before you need to ask



Expect Labs

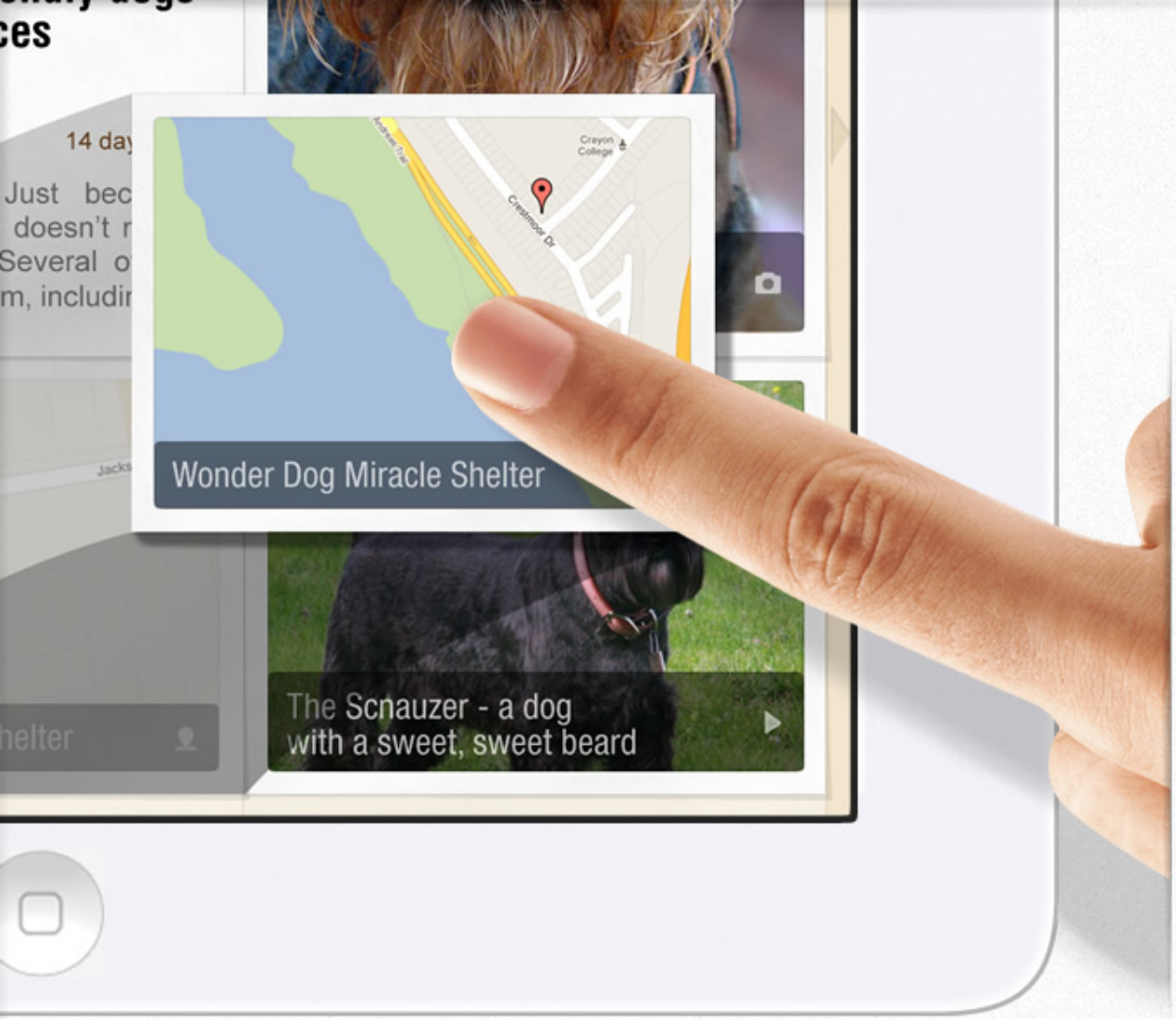
MindMeld

MindMeld understands your conversation
and automatically finds the information you want before you even ask for it.



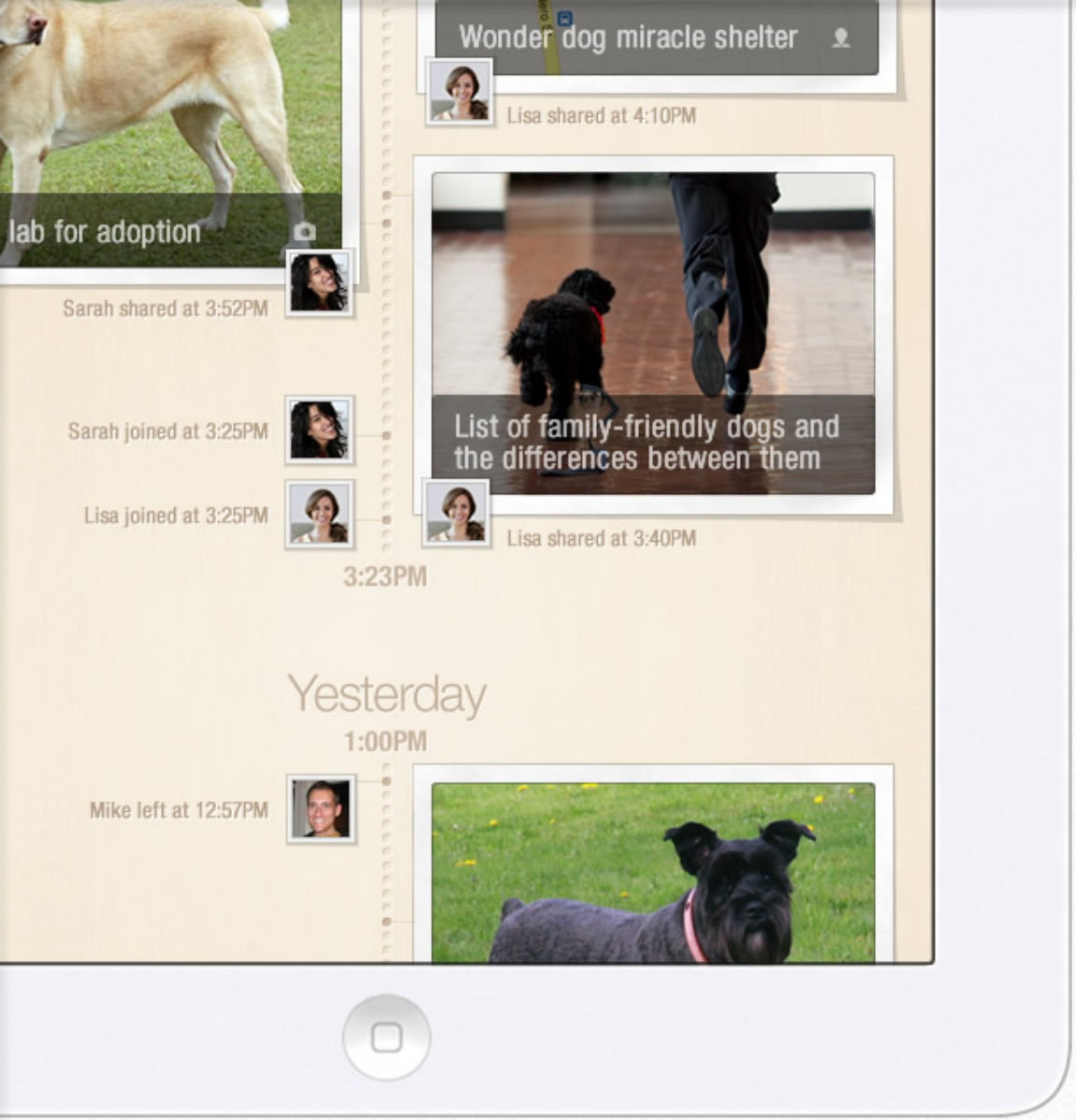
MindMeld automatically finds relevant information

As you talk, MindMeld scours your social graph and the entire web for relevant information so that anything you may need is always at your fingertips.



MindMeld lets you share with a single swipe

If something catches your eye, simply slide it to the sharing panel, and everyone in your conversation can see it instantly.



MindMeld organizes and archives your thoughts

Everything you share is intuitively organized and archived in the cloud so you can access it anytime from anywhere.