

Living Labs for Search

Anne Schuth

University of Amsterdam

Krisztian Balog

University of Stavanger

Liadh Kelly

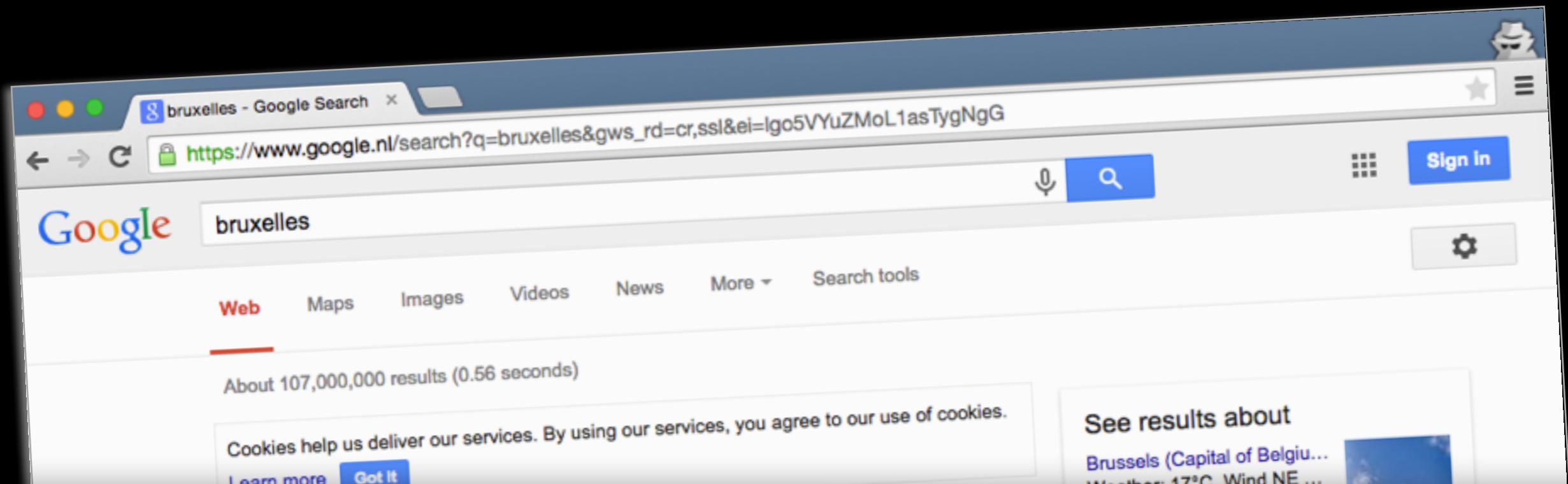
Trinity College Dublin

*Towards Networked Research
Infrastructures for Behavioural Studies
Brussels - May 7, 2015*



<http://living-labs.net>
[@livinglabsnet](https://twitter.com/livinglabsnet)

search
the lab
perspectives



Search is not just

Google

Welkom op de website van Bruxelles! We
werd in 1989 opgericht in het oude stadshart van Haarlem en ontwoppte zich ...

[Cafe Bruxelles: Home](#)

www.cafebruxelles.nl/home/ ▾ [Translate this page](#)

Home. Beste Gast, Welkom bij Bruxelles!! Wel bekend en geliefd in Haarlem vanwege
haar gezellige ongedwongen sfeer en het bonte gezelschap aan ...

Google

bing

Yandex

Baidu 百度

Internet Firm

SEZNA

YAHOO!

bruxelles

Web

Images

Video

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Bruxelles - Image Results

Bruxelles - Wikipedia, the free encyclopedia

Bruxelles | Define Bruxelles at Dictionary.com

Brussels - Wikipedia, the free encyclopedia

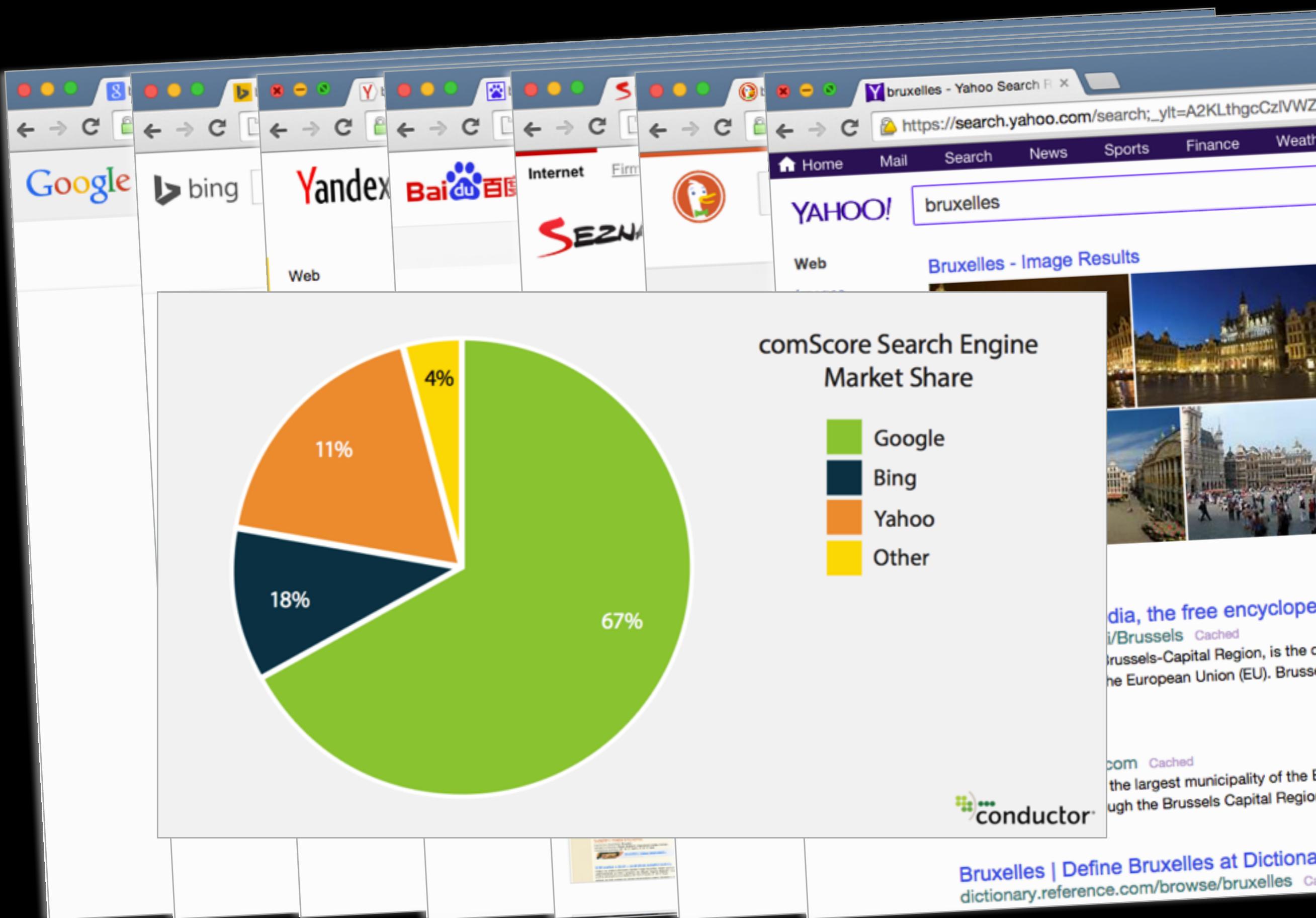
Brussels, officially the Brussels-Capital Region, is the de facto capital of the European Union (EU). Brusse

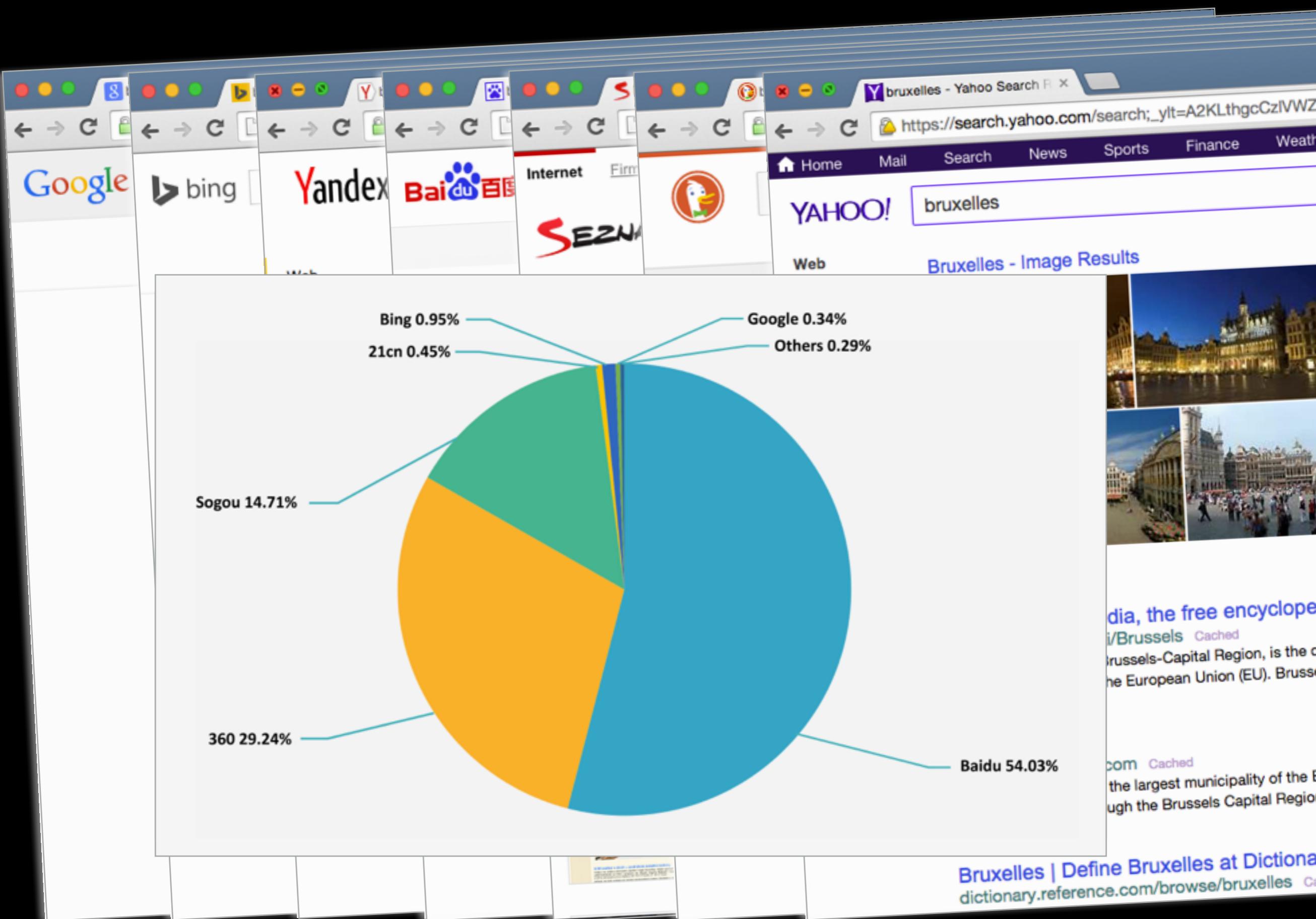
bruxelles.arounder.com Cached

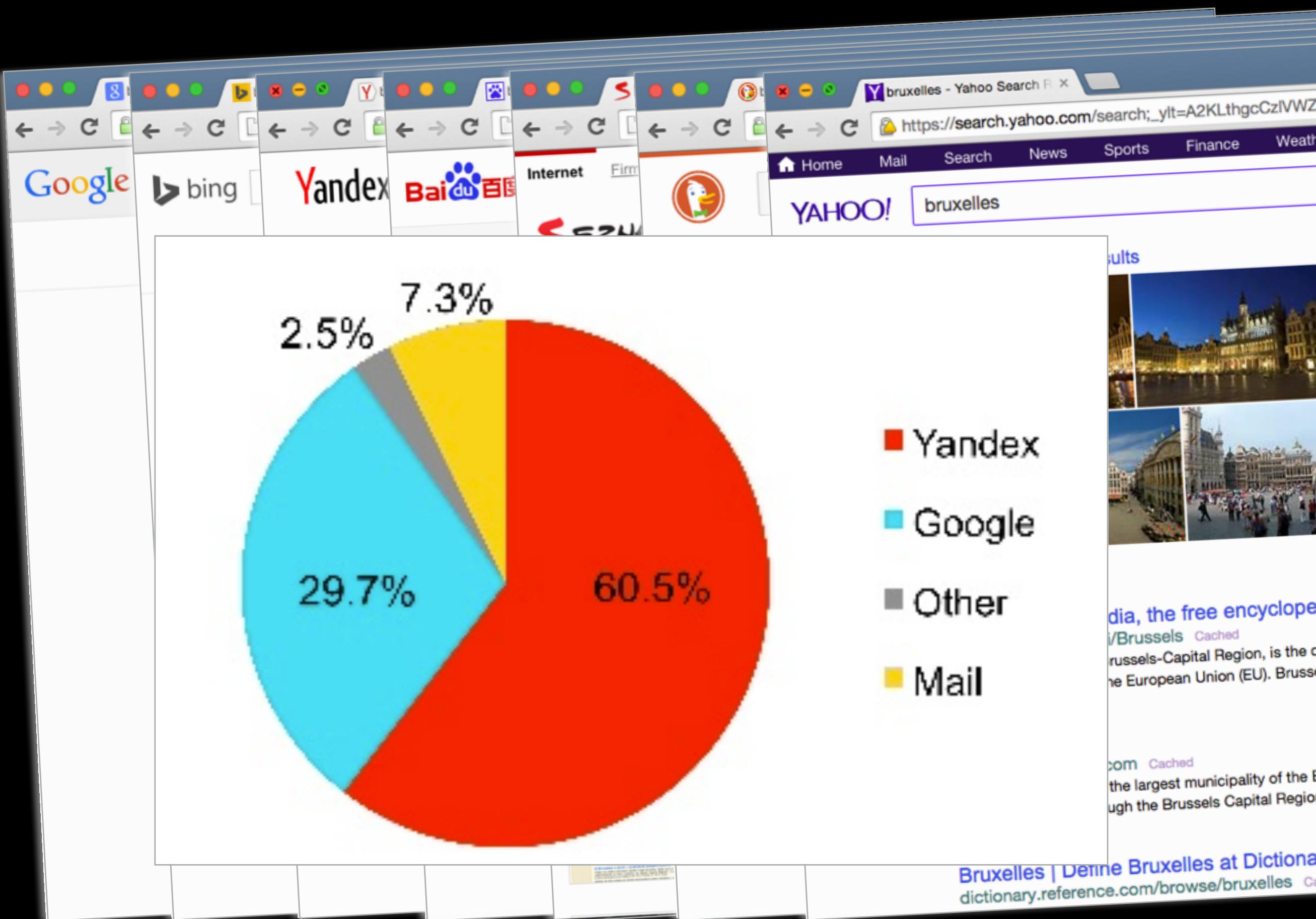
The City of Brussels is the largest municipality of the B

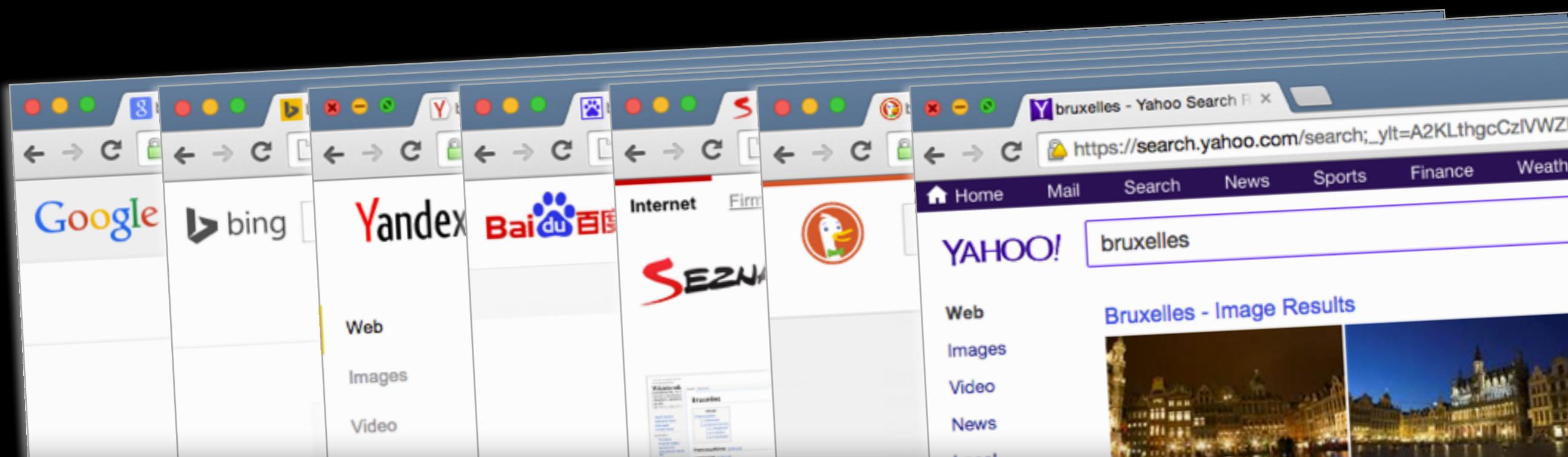
capital of Belgium, though the Brussels Capital Region

dictionary.reference.com/browse/bruxelles Cached

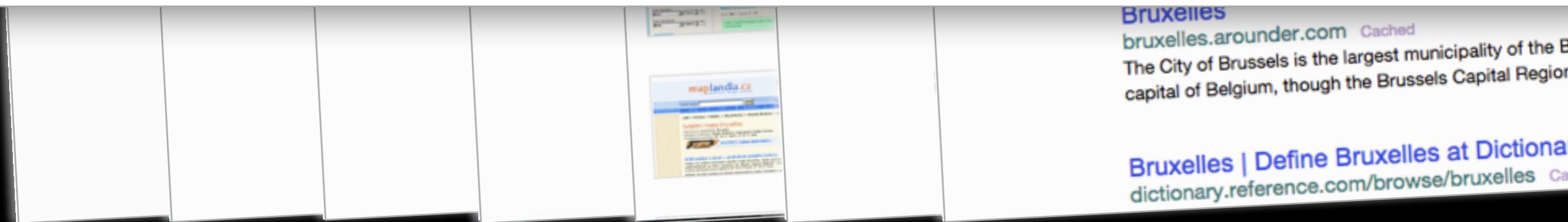






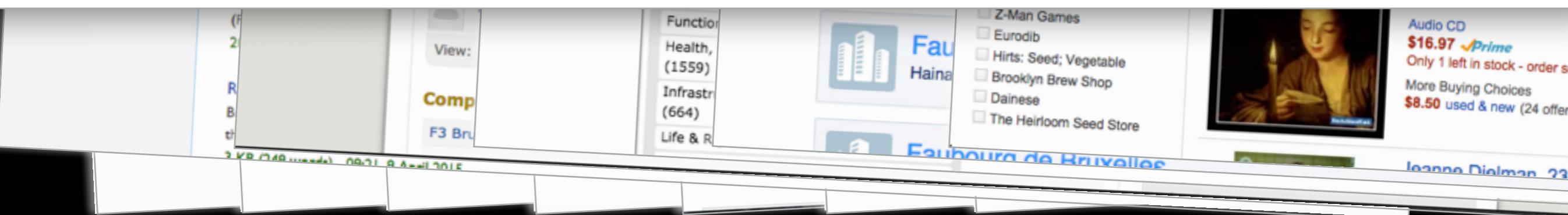


Search is not just web search



The image shows a Mac OS X desktop with a Docked Browser feature. There are five browser windows open in the Docked Browser dock at the bottom of the screen. From left to right, the windows are: 1) Wikipedia - The Free Encyclopedia, showing the main page. 2) IMDb (Find - IMDb), showing search results for 'Titles'. 3) Europa.eu, showing a search for 'bruxelles' with filters for Date (All), Language (English), and File format (All). 4) Booking.com: Search results for 'bruxelles' under the 'Cities' category. 5) Amazon.com: bruxelles, showing 1-16 of 14,057 results for "bruxelles". The Amazon window displays several products: 'Bruxelles 1893' by Z-Man Games (\$89.55), 'Brooklyn Brew Shop BRUXELLES BLONDE BEER MAKING MIX' (\$14.99 Prime), and 'Stolzel: Quadri Di Bruxelles' by Epoca Barocca and Stolzel (Audio CD \$16.97 Prime). The desktop background is a light blue gradient.

Search is not just in a browser



Nicolas Cage

TOP HIT

Nicolas Cage

WIKIPEDIA

Nicolas Cage

DOCUMENTS

us_census_2000_surnames.txt

lastnames.txt

us_english_word_list.txt

MAIL & MESSAGES

TIME.com, Somaly Mam, and 5 oth...

WEBPAGES

Nicolas cage was spotted in my sch...

TIL that Jason Schwartzman is a m...

My only claim to fame, is that Nicol...

Only Nicolas Cage can make a real...

Lazy Summer Days. - Imgur

pizza

NEARBY PLACES

Pizza Hut

Delta, BC, Can

Pizza Hut

104 Avenue, S

Pizza Hut

Austin Avenue

1 2 3 4

q w e r

view:

Comp

F3 Bru

AT&T 1:13 PM

Back

Q stone

YOUR DISTINCT B



Stone R
Annivers

Stone Bre

Style: Imperi

ABV: 10.8% I



First Had: 11-2



Stone 15th Anniversary
Escondidian Imperial Black
IPA

Stone Brewing Co.

Style: Imperial / Double Black IPA

ABV: 10.8% IBU: N/A



First Had: 12-25-2011 - Total Count: 1

Stone Smoked Porter with

ok glass, google
how long is the Brooklyn Bridge

Ask whatever's on your mind.



Stolzel: Quadri Di D

by Epoca Barocca and Sto

Audio CD

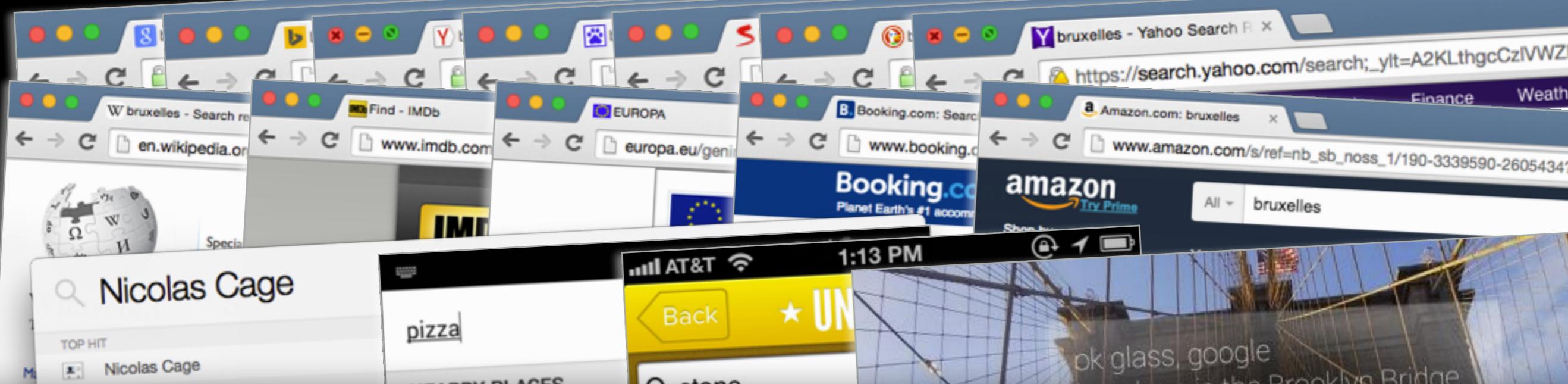
\$16.97 ✓Prime

Only 1 left in stock - order s

More Buying Choices

\$8.50 used & new (24 offer

Search is everywhere



Search - setting the stage

- **500 000 000** web searches every day

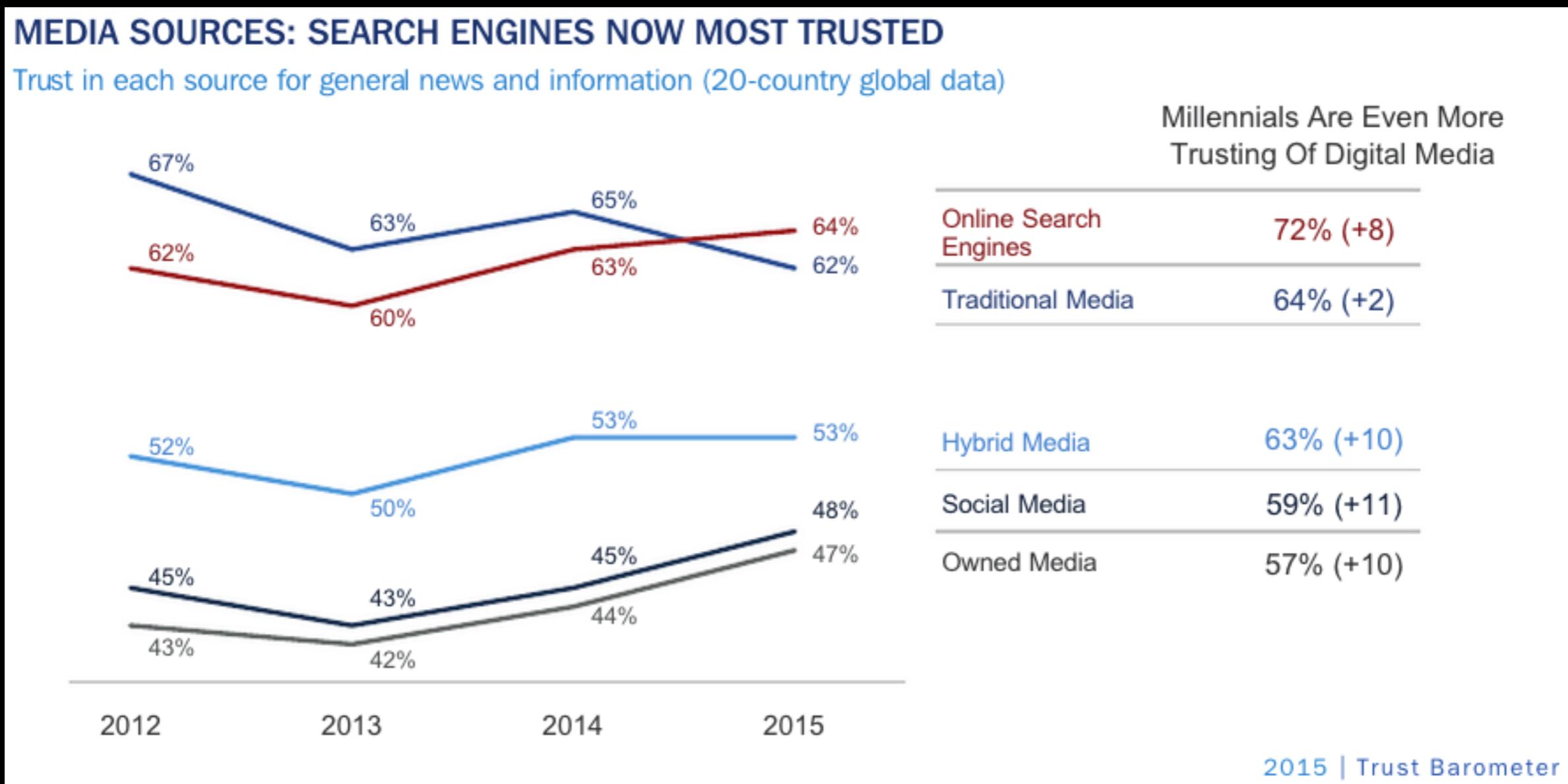
Search - setting the stage

- **500 000 000** web searches every day
- **Half the world's** population uses web search

Search - setting the stage

- **500 000 000** web searches every day
- **Half the world's** population uses web search
- Web **search is trusted** more than traditional media

Search - setting the stage



Search - setting the stage

- 500 000 000 web searches every day

**It matters whether
search performs well**

traditional media

Search

bruxelles - Google Search

https://www.google.nl/search?q=bruxelles&gws_rd=cr,ssl&ei=lgo5VYuZMoL1asTygNgG

Google bruxelles

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Een hapje en een drankje nuttigen in Belgische sfeer. Spijzen, dranken, agenda, foto's en algemene informatie over het café.
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Cafe Bruxelles - Haarlem
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See results about

Brussels (Capital of Belgium)
Weather: 17°C, Wind NE ...
Local time: Thursday 5:07... 

City of Brussels (Capital o...
Weather: 17°C, Wind NE ...
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Feedback

Search

bruxelles - Google Search

https://www.google.nl/search?q=bruxelles&gws_rd=cr,ssl&ei=lgo5VYuZMoL1asTygNgG

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Feedback

Search

Information Retrieval

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Home. Beste Gast, Welkom bij Bruxelles!! Wel bekend en geliefd in Haarlem, maar ook haar gezellige ongedwongen sfeer en het bonte gezelschap aan ... **ranking**

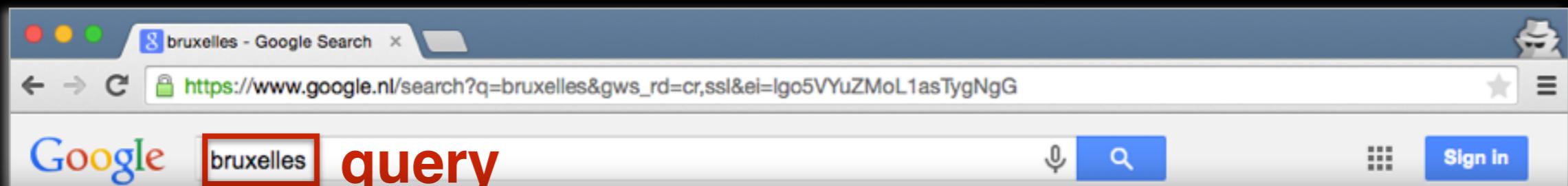
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Weather: 17°C, Wind NE ...
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Feedback

Search

Information Retrieval



Search is:
ranking documents
given a query

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haar gezellige ongedwongen sfeer en het bonte gezelschap aan ...

ranking

Information Retrieval

- Improving ...

Information Retrieval

- Improving ...
 - query understanding

Information Retrieval

- Improving ...
 - query understanding
 - rankings

Information Retrieval

- Improving ...
 - query understanding
 - rankings
 - design

Information Retrieval

- Improving ...
 - query understanding
 - rankings
 - design
 - user interactions

Information Retrieval

- Improving ...
 - query understanding
 - rankings
 - design
 - user interactions
 - ...

Information Retrieval

- Improving ...
 - query understanding
 - rankings
 - design
 - user interactions
 - ...
- Validation through experimentation

Information Retrieval

What about Observational Studies?

Why not compare with historical data?

Here's an example of Kindle Sales over time.

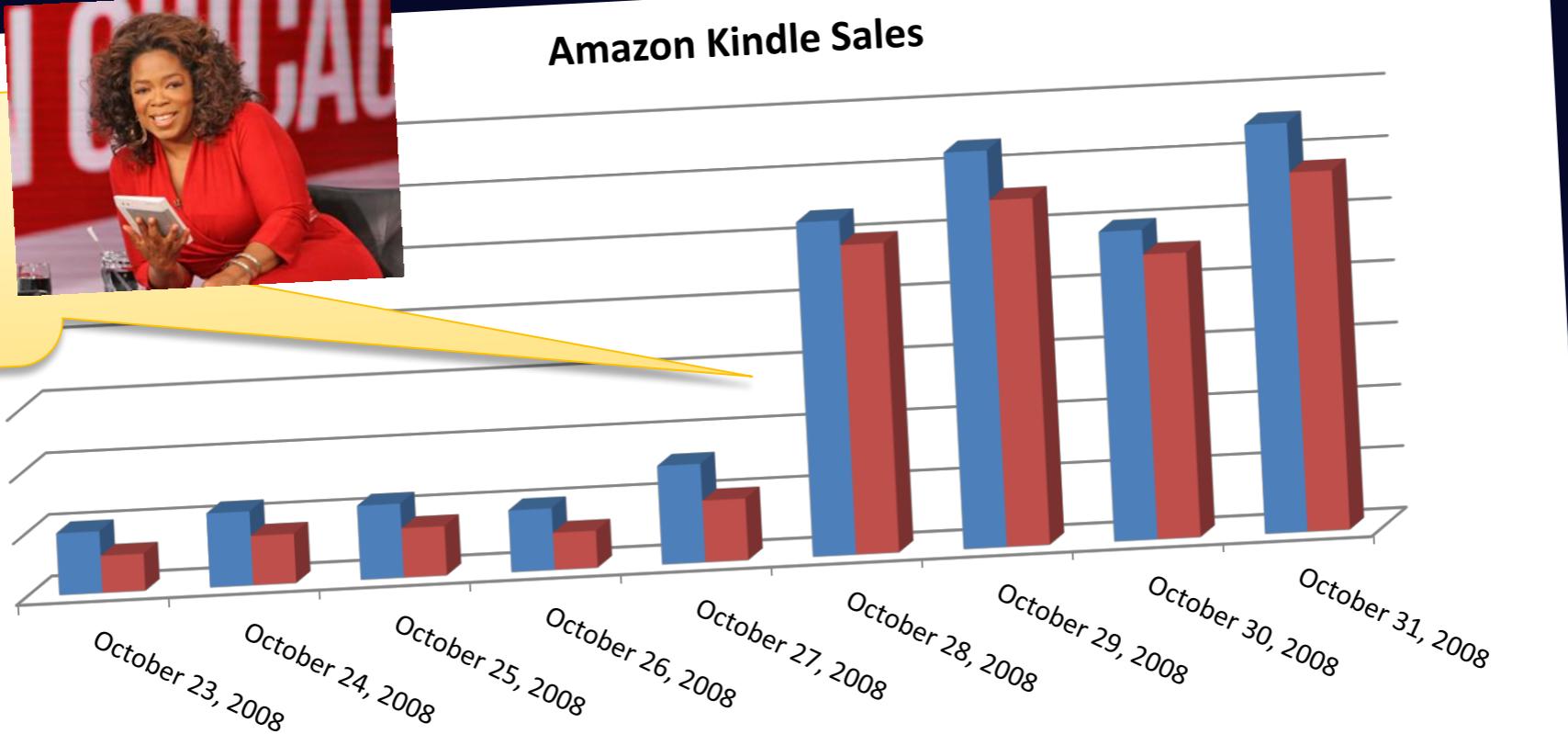
You changed the site, and there was an amazing spike



Information Retrieval

External Events can Dwarf Your Changes

Oprah calls Kindle "her new favorite thing"



- In this example of an A/B test, you'd be better off with version A
- In controlled experiments, both versions are impacted the same way by external events

Information Retrieval

Scaling Experiments at Bing

- KDD 2013 paper to appear: <http://bit.ly/ExPScale>
- We now run over 250 concurrent experiments at Bing



- We used to lockdown for Dec holidays. No more

Information Retrieval

Running Controlled Experiments at Scale (1)

Numbers below are approximate to give sense of scale

In a visit, you're in about 15 experiments

- In a visit, you're in about 15 experiments
 - There is no single Bing.
 - There are 30B variants (5^{15})
 - 90% of users are in experiments.
 - 10% are kept as holdout
- Sensitivity: we need to detect small effects
 - 0.1% change in the revenue/user metric > \$1M/year
 - 0.1% change in the revenue/user metric > \$1M/year
 - Not uncommon to see unintended revenue impact of +/-1% (>\$10M)
 - Sessions/UU, a key component of our OEC, is hard to move, so we're looking for small effects
 - Important experiments run on 10-20% of users

UI	Ex 1	Ex p 2	Ex P 3	Exp 4	Exp 5
Ads	Ex P 1	Ex P 2	Ex P 3	ExP 4	Exp 5
Relevance
...
Feature area

Information Retrieval

Running Controlled Experiments at Scale (1)



Search engine
research requires
experimentation

- Important experiments run on 10-20% of users

Evaluation of Search

bruxelles - Google Search

https://www.google.nl/search?q=bruxelles&gws_rd=cr,ssl&ei=lgo5V

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Een hapje en een drankje nuttigen in Belgische sfeer. Spijzen, dranken en algemene informatie over het café.
Stadshap - Diner - Contact - Spijzen

Brussels - Wikipedia, the free encyclopedia - Brussels
en.wikipedia.org/wiki/Brussels
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City of Brussels - Manneken Pis - Communities, regions - Royal Palace of Brussels

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Cafe Bruxelles: Home
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bruxelles - Bing

www.bing.com/search?q=bruxelles&go=Submit&qs=n&form=QBLS

bing bruxelles

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Bruxelles € 11.99 | Vergelijk.nl
Vergelijk.nl/Boek/_Bruxelles
Vergelijk de Prijs en Betaal Niet teveel voor je Bruxelles boek

Belgian Beer Café Bruxelles [Translate this page](#)
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Een hapje en een drankje nuttigen in Belgische sfeer. Spijzen, dranken, a...
algemene informatie over het café.

Spijken
Een Belgisch café is natuurlijk de plaats bij uitstek om ...

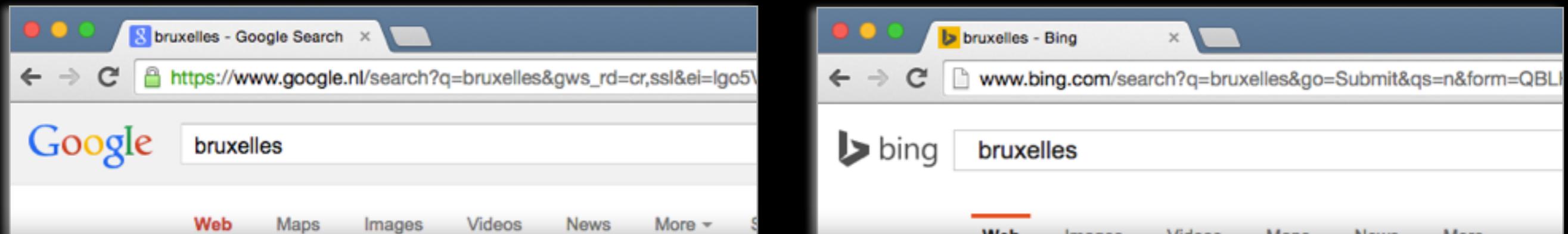
Contactgegevens Bruxel...
Bezoek Parc Breda. ... Adres: HAVERMARKT 7. 4811WG ...

Diner
Steak naturel: 14.20: Steak met een saus naar keuze: 15.95: Steak ...

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Evaluation of Search



Which ranking is better?

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Bezoek Parc Breda. ... Adres:
HAVERMARKT 7. 4811WG Breda

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Evaluation of Search

- **Offline**
 - Documents annotated for relevance

Evaluation of Search

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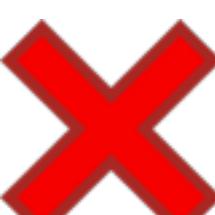
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bruxelles

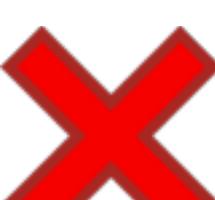
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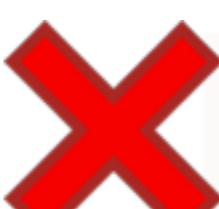
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Welkom op de website van Eet/ Biercafé Bruxelles en Bruxelles aan de Grote Markt. Het café werd in 1989 opgericht in het oude stadshart van Haarlem en ontwikkeld tot een gezellige en uitnodigende plek.

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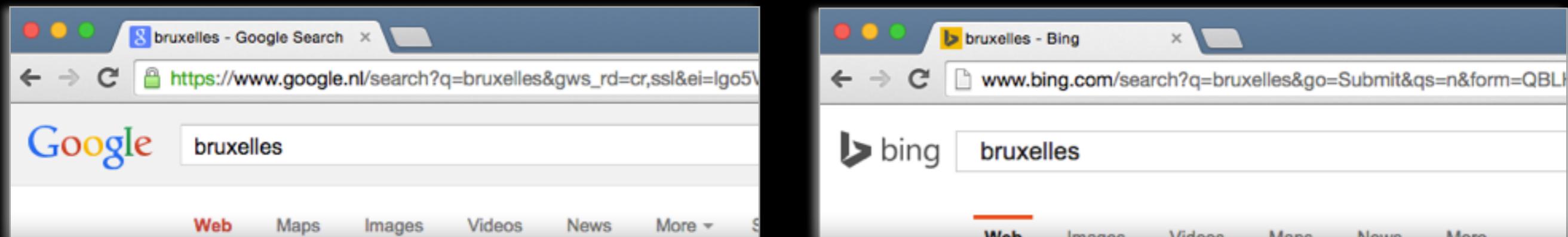
Contactgegevens Bruxel...
Bezoek Parc Breda. ... Adres.
HAVERMARKT 7. 4811WG ...

Diner
Steak naturel: 14.20; Steak met een saus naar keuze: 15.95; Steak ...

[See results only from bruxelles.nl](#)

Cafe Bruxelles [Translate this page](#)
[www.cafebruxelles.nl](#) ▾

Evaluation of Search



Annotations are unreliable, expensive

Brussels officially the Brussels-Capital Region (French: Région de Bruxelles-Capitale, Dutch: Brussels Hoofdstedelijk Gewest), is the capital and largest city of Belgium. It is a bilingual city with French and Dutch as official languages. The City of Brussels - Manneken Pis - Communities, regions - Royal Palace of Brussels - Brussels Capital Region

Cafe Bruxelles - Haarlem

www.cafebruxelles.nl/ ▾ Translate this page

Welkom op de website van Eet/ Biercafé Bruxelles en Bruxelles aan Zee. Het café werd in 1989 opgericht in het oude stadshart van Haarlem en ontwikkeld tot een gezellige en uitnodigende plek voor een drankje of een hapje.

Cafe Bruxelles: Home

www.cafebruxelles.nl/home/ ▾ Translate this page

Home - Bruxelles - Haarlem - Biercafé - Cafetaria - Brasserie - Koffiebar - Winkel - Restaurant - Bar - Club - Winkel - Biercafé - Cafetaria - Brasserie - Koffiebar - Winkel - Restaurant - Bar - Club

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See results only from bruxelles.nl

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Agenda

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Evaluation of Search

- **Offline**
 - Documents annotated for relevance

Evaluation of Search

- **Offline**
 - Documents annotated for relevance
- **Online**
 - User interactions

Evaluation of Search

bruxelles - Google Search

https://www.google.nl/search?q=bruxelles&gws_rd=cr,ssl&ei=lgo5V

Google bruxelles

Web Maps Images Videos News More

About 107,000,000 results (0.56 seconds)

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Learn more Got It

Belgian Beer Café Bruxelles - Breda
www.bruxelles.nl/ Translate this page
Een hapje en een drankje nuttigen in Belgische sfeer. Spijzen, dranken en algemene informatie over het café.
Stadshap - Diner - Contact - Spijzen

Brussels - Wikipedia, the free encyclopedia - Brussels
en.wikipedia.org/wiki/Brussels
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Cafe Bruxelles: Home
www.cafebruxelles.nl/home/ Translate this page

bruxelles - Bing

www.bing.com/search?q=bruxelles&go=Submit&qs=n&form=QBLS

bing bruxelles

Web Images Videos Maps News More

36.800.000 RESULTS Narrow by language Narrow by region

Bruxelles € 11.99 | Vergelijk.nl
Vergelijk.nl/Boek/_Bruxelles
Vergelijk de Prijs en Betaal Niet teveel voor je Bruxelles boek

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Evaluation of Search

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Cafe Bruxelles: Home
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bruxelles - Bing

www.bing.com/search?q=bruxelles&go=Submit&qs=n&form=QBLS

bing bruxelles

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Narrow by region

Bruxelles € 11.99 | Vergelijken
[Vergelijk.nl/Boek/_Bruxelles](#)
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Diner
Steak naturel: 14.20: Steak met een saus naar keuze: 15.95: Steak ...

Stadshap
Maandag Keuze uit drie vegetarische gerechten: 5,95: Dinsdag ...

Foto's
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Agenda
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Cafe Bruxelles Translate this page
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Evaluation of Search

bruxelles - Google Search

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Cafe Bruxelles
www.cafebruxelles.nl/ [Translate this page](#)
Welkom op de website van Cafe Bruxelles! Het café werd in 1989 opgericht door een groep jonge mensen die een alternatieve en gezellige ontmoetingsplaats wilden creëren. Sindsdien is het een geliefde bestemming voor mensen die op zoek zijn naar een ontspannen en gezellige omgeving om te ontspannen en te socialiseren.

Cafe Bruxelles: Home
www.cafebruxelles.nl/home/ [Translate this page](#)

bruxelles - Bing

www.bing.com/search?q=bruxelles&go=Submit&qs=n&form=QBLI

bing bruxelles

Web Images Videos Maps News More

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See results only from bruxelles.nl

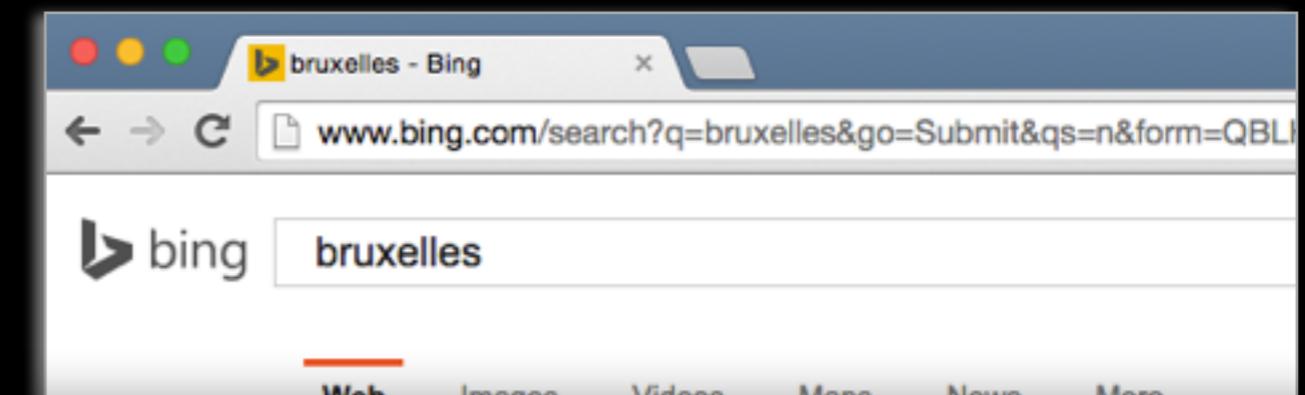
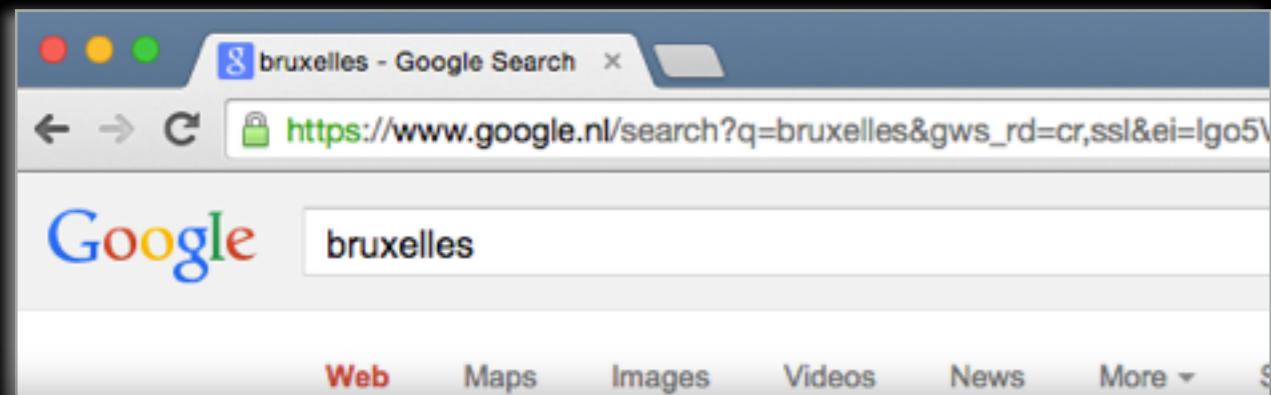
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www.cafebruxelles.nl ▾

Stadshap
Maandag Keuze uit drie ve gerechten: 5,95: Dinsdag ...

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Agenda
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Evaluation of Search

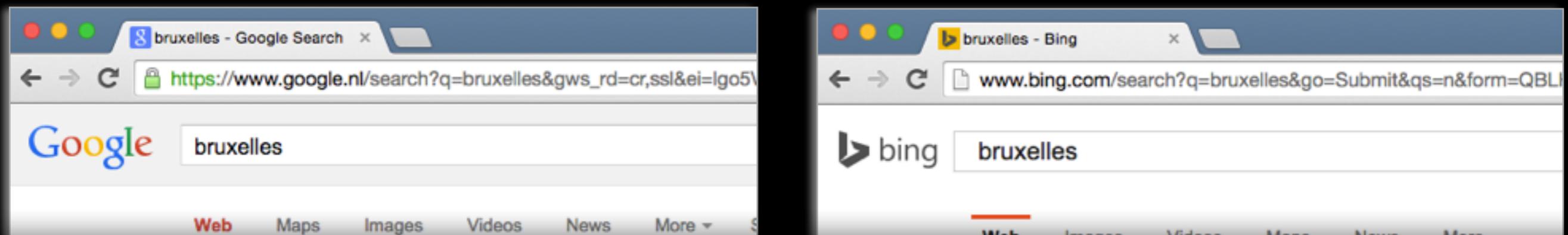


Clicks reveal what
users prefer

A screenshot of a search result page for "bruxelles". A large black rectangular box highlights the first search result, which is for "Cafe Bruxelles". The result includes a link to the website, a small image of a hand holding a coffee cup, and some descriptive text about the cafe. The rest of the search results are visible below the highlighted box.

A screenshot of a search result page for "bruxelles". A large black rectangular box highlights the first search result, which is for "Cafe Bruxelles". The result includes a link to the website, a small image of a hand holding a coffee cup, and some descriptive text about the cafe. The rest of the search results are visible below the highlighted box.

Evaluation of Search



Researchers don't have clicks (yet!)

A large hand cursor icon is positioned over the 'Cafe Bruxelles' link in the Google search results, indicating a click action.

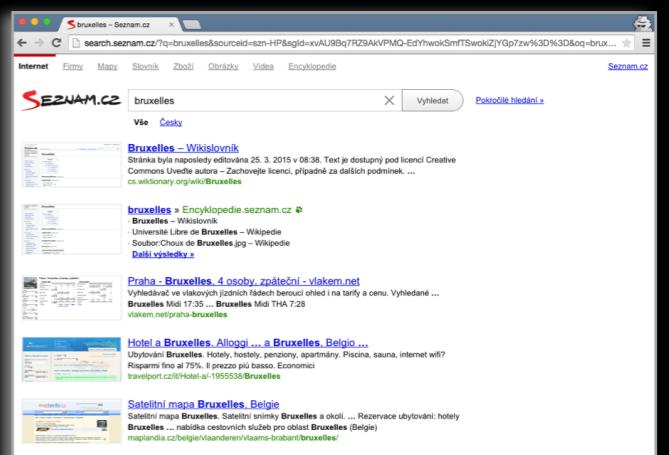
A large hand cursor icon is positioned over the 'Cafe Bruxelles' link in the Bing search results, indicating a click action.

search
the lab
perspectives

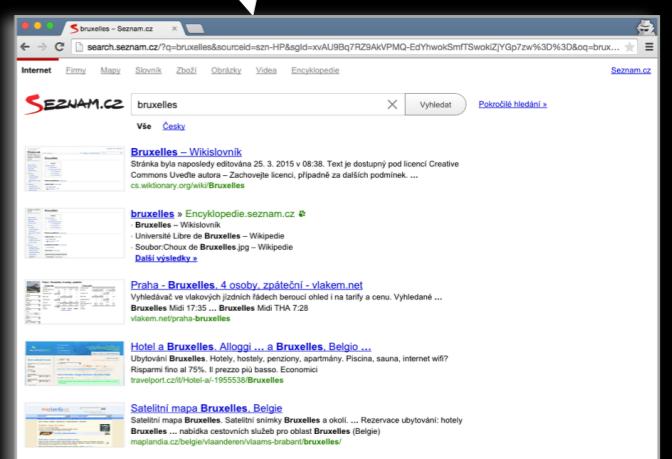
Living Labs for Search or giving researchers clicks



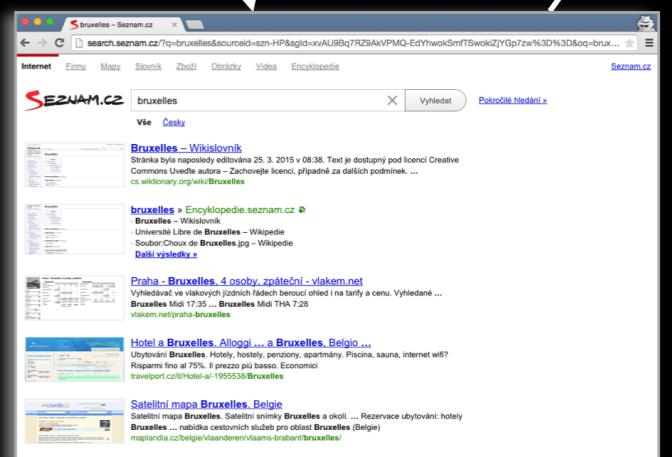
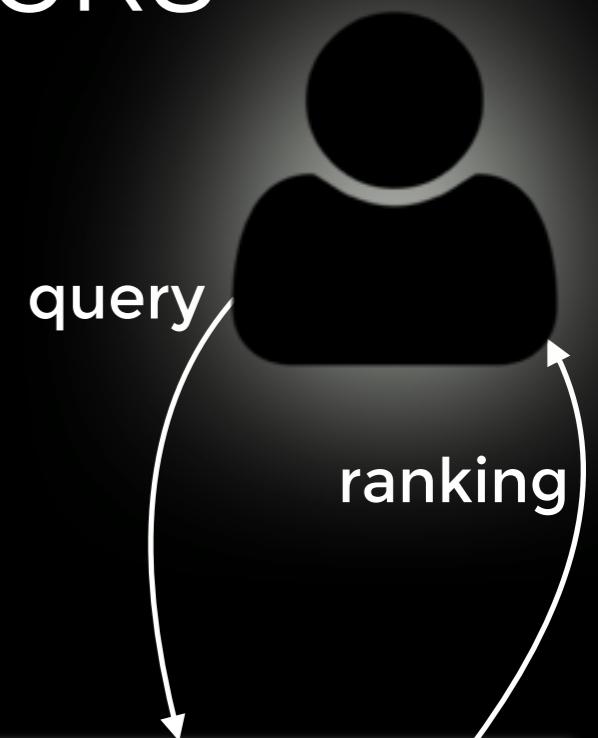
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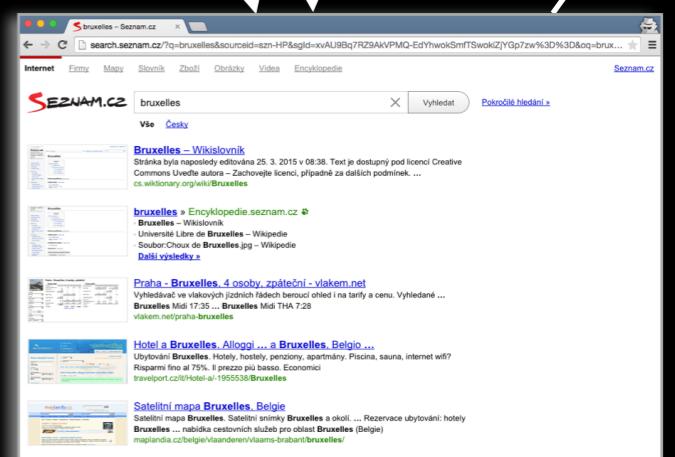
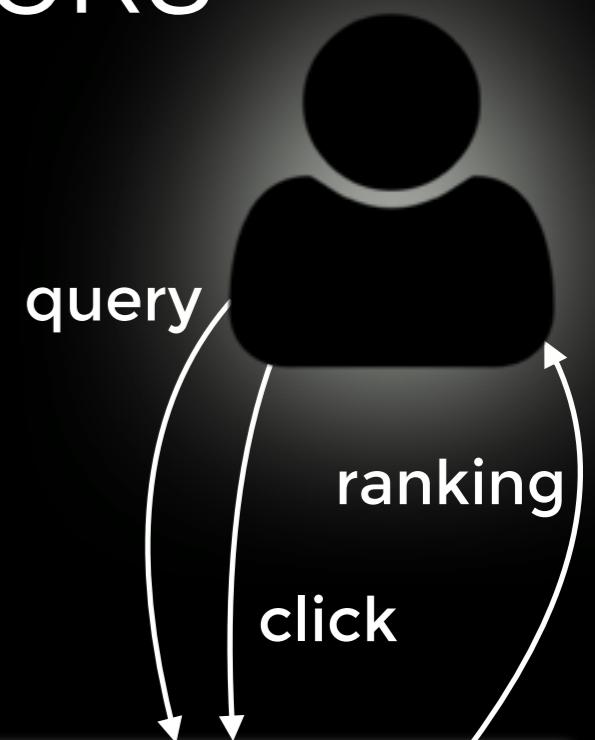
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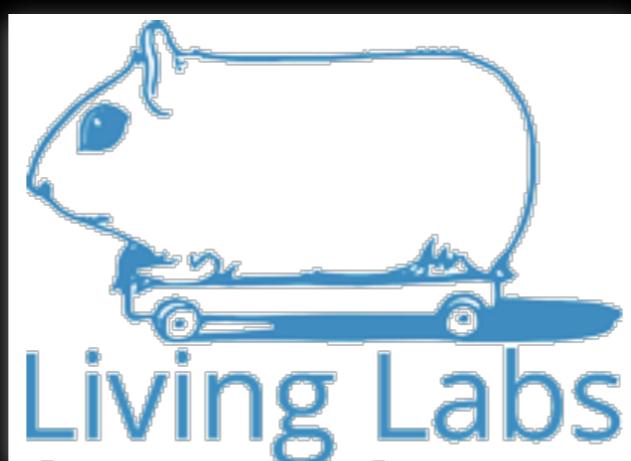
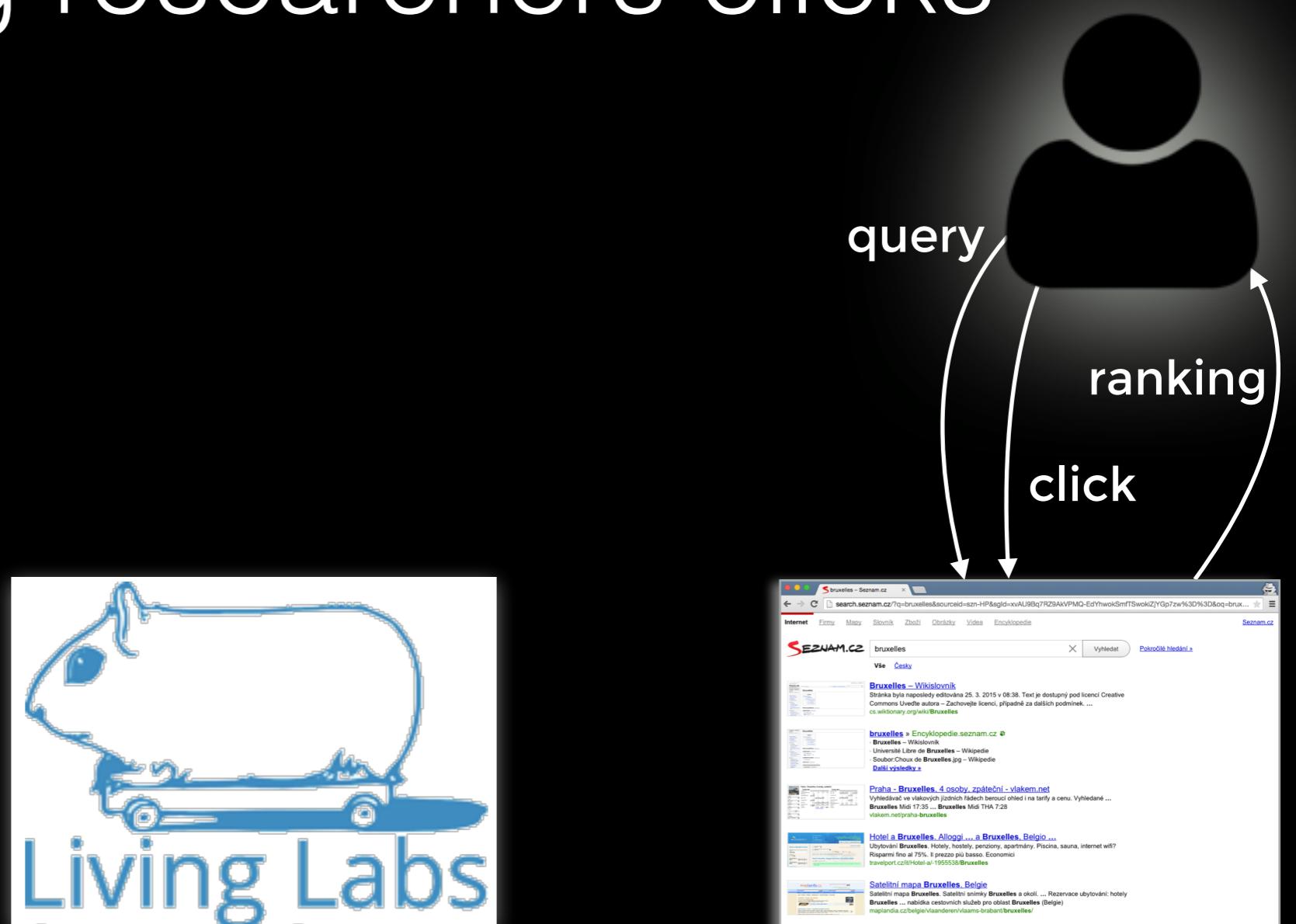
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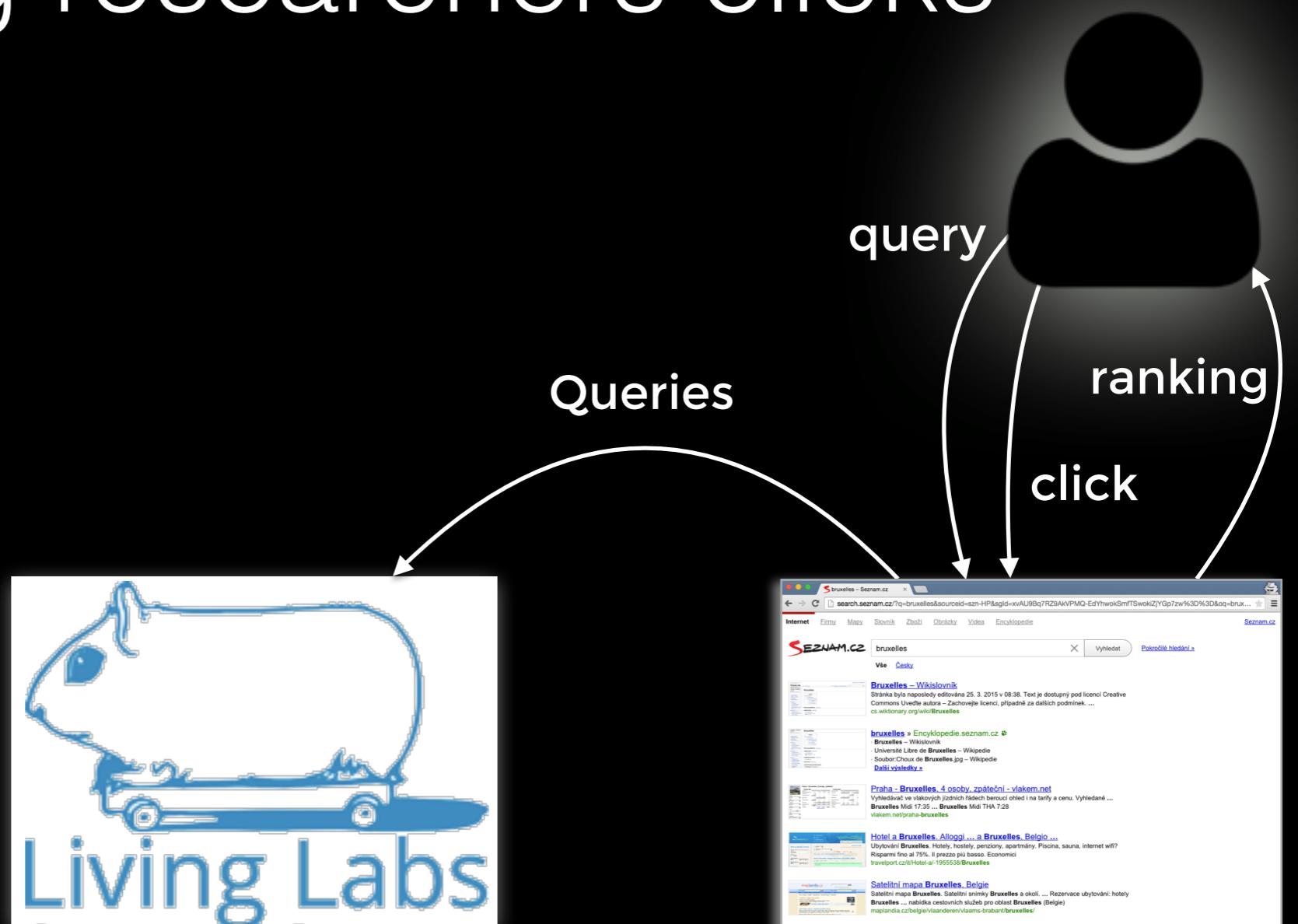
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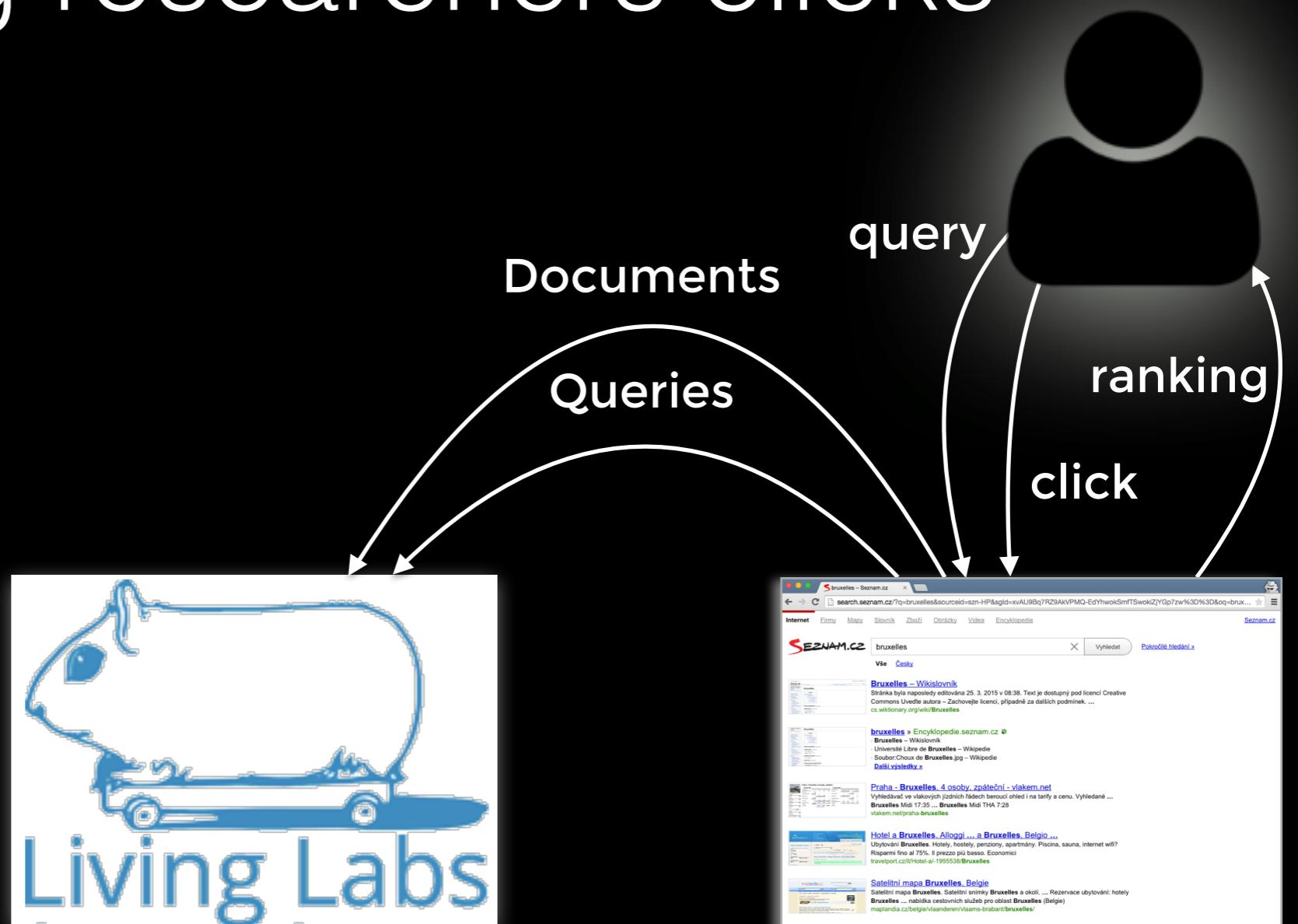
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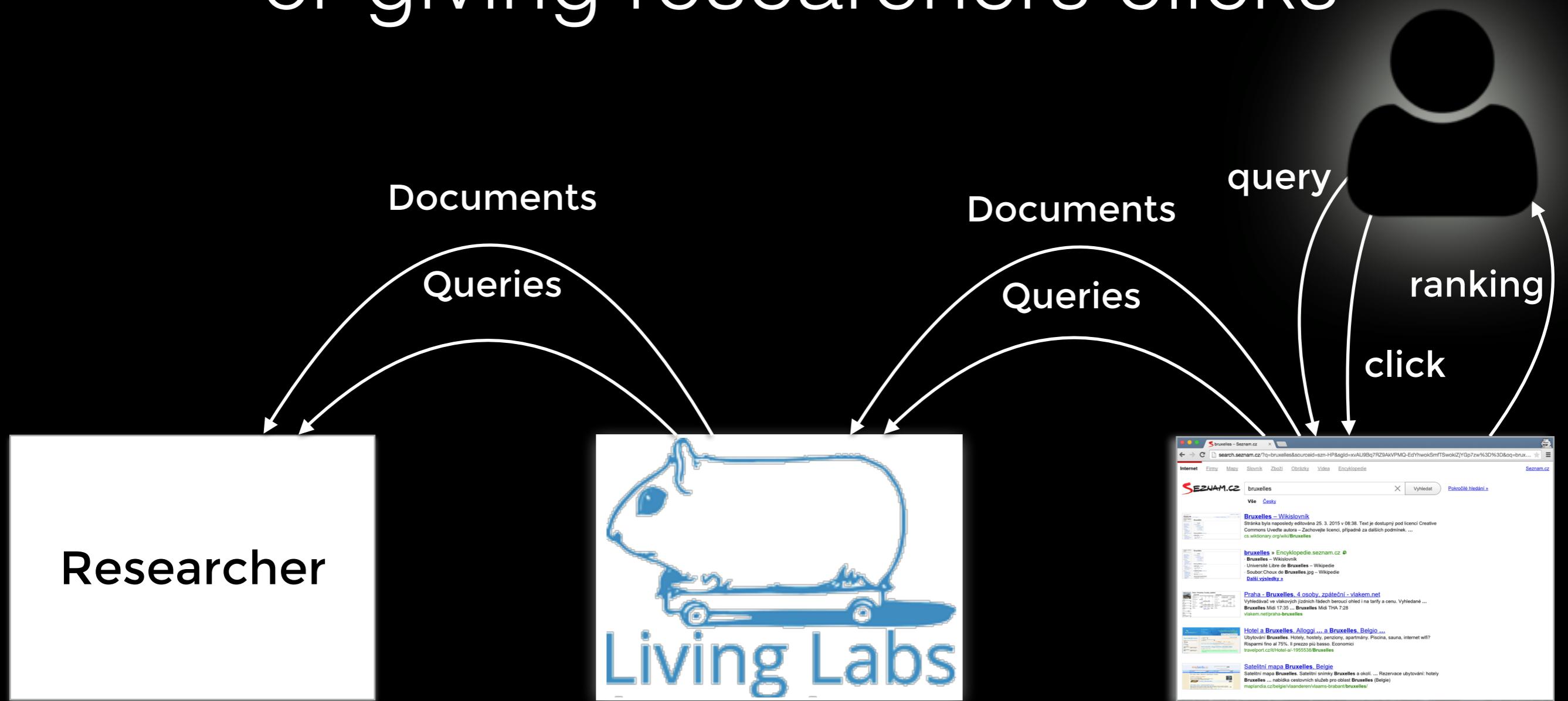
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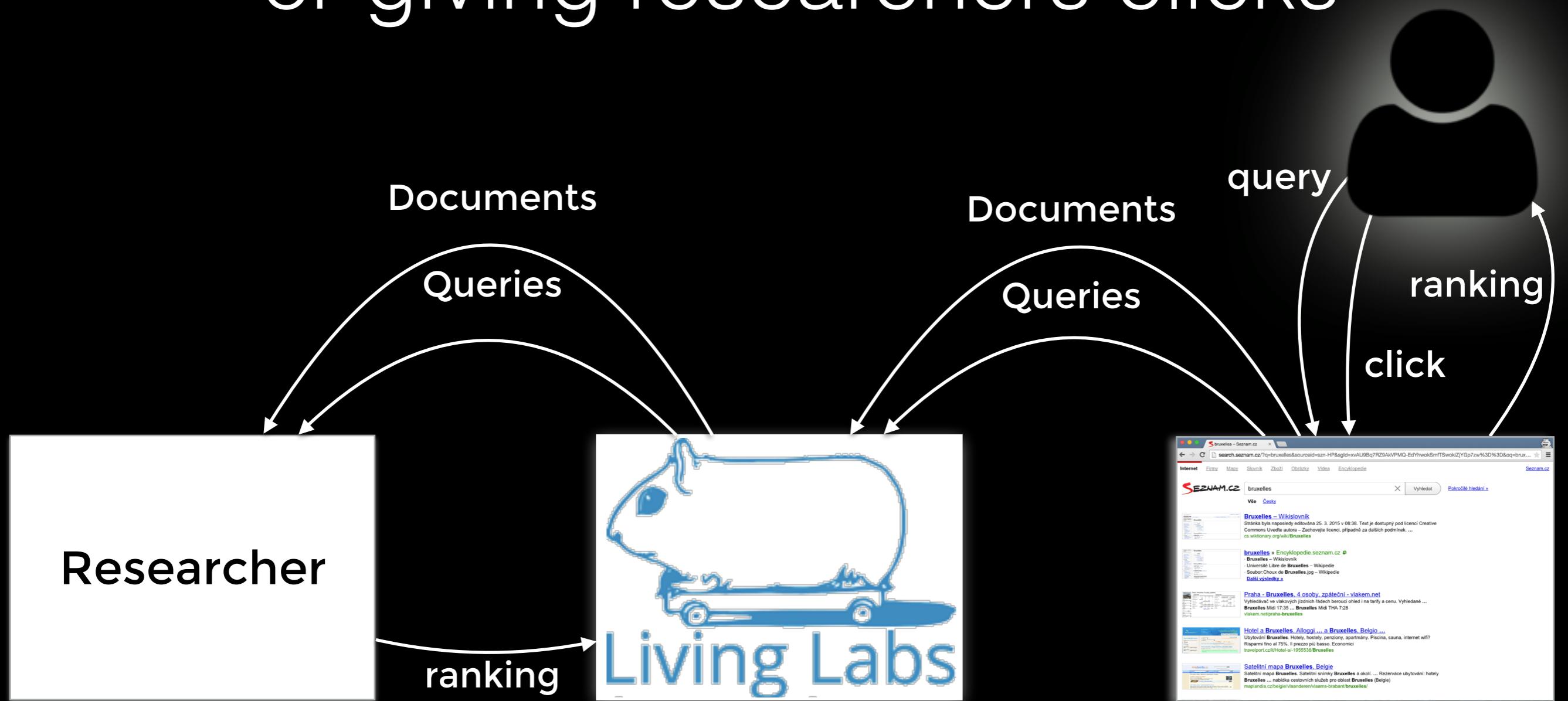
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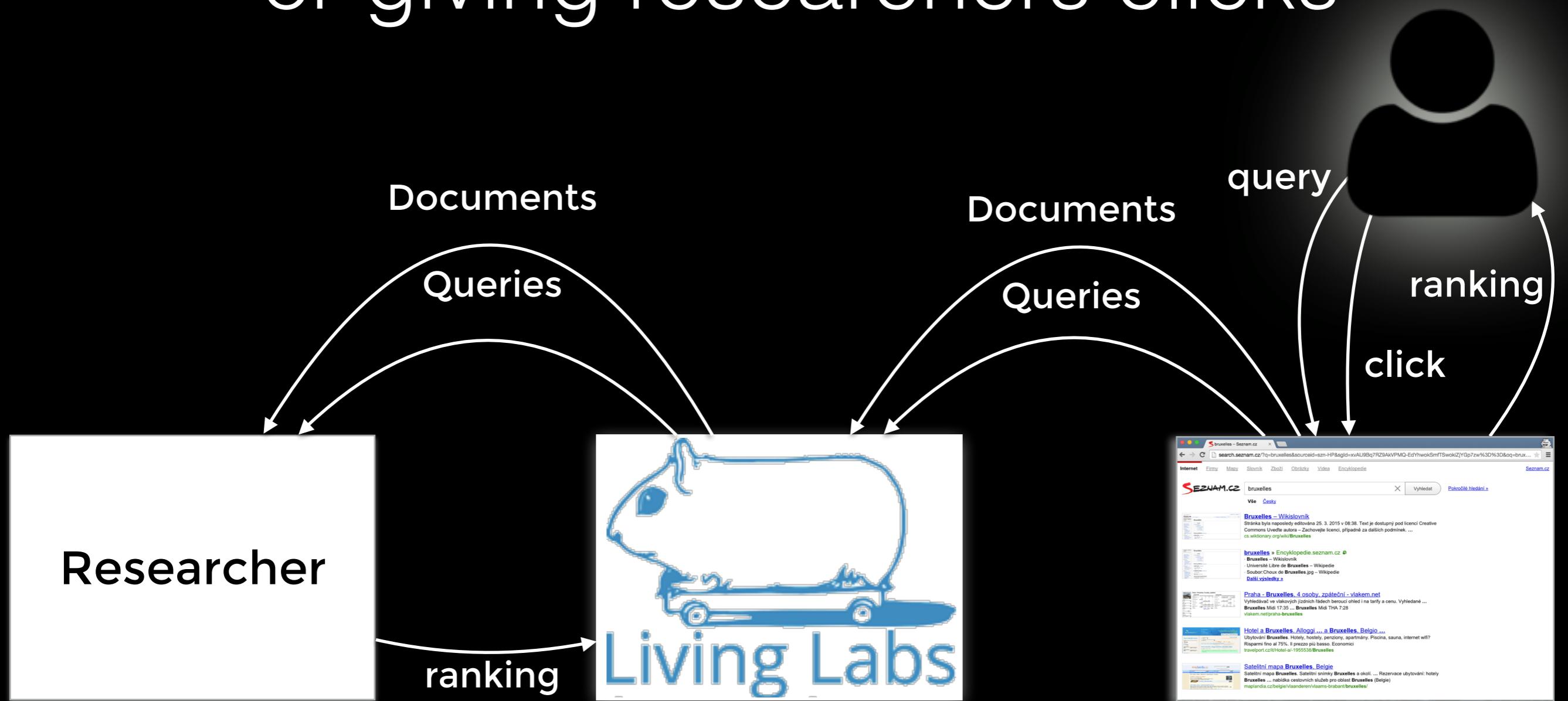
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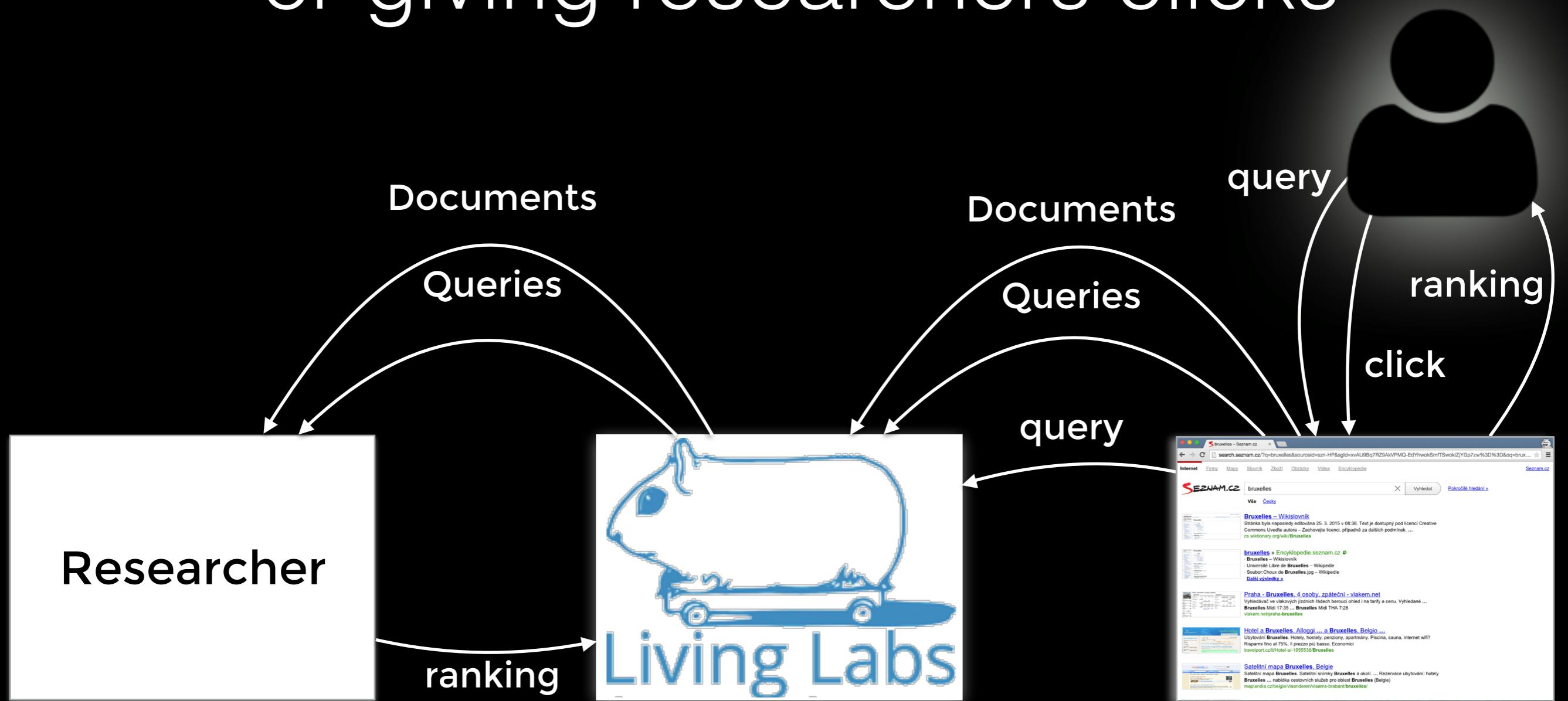
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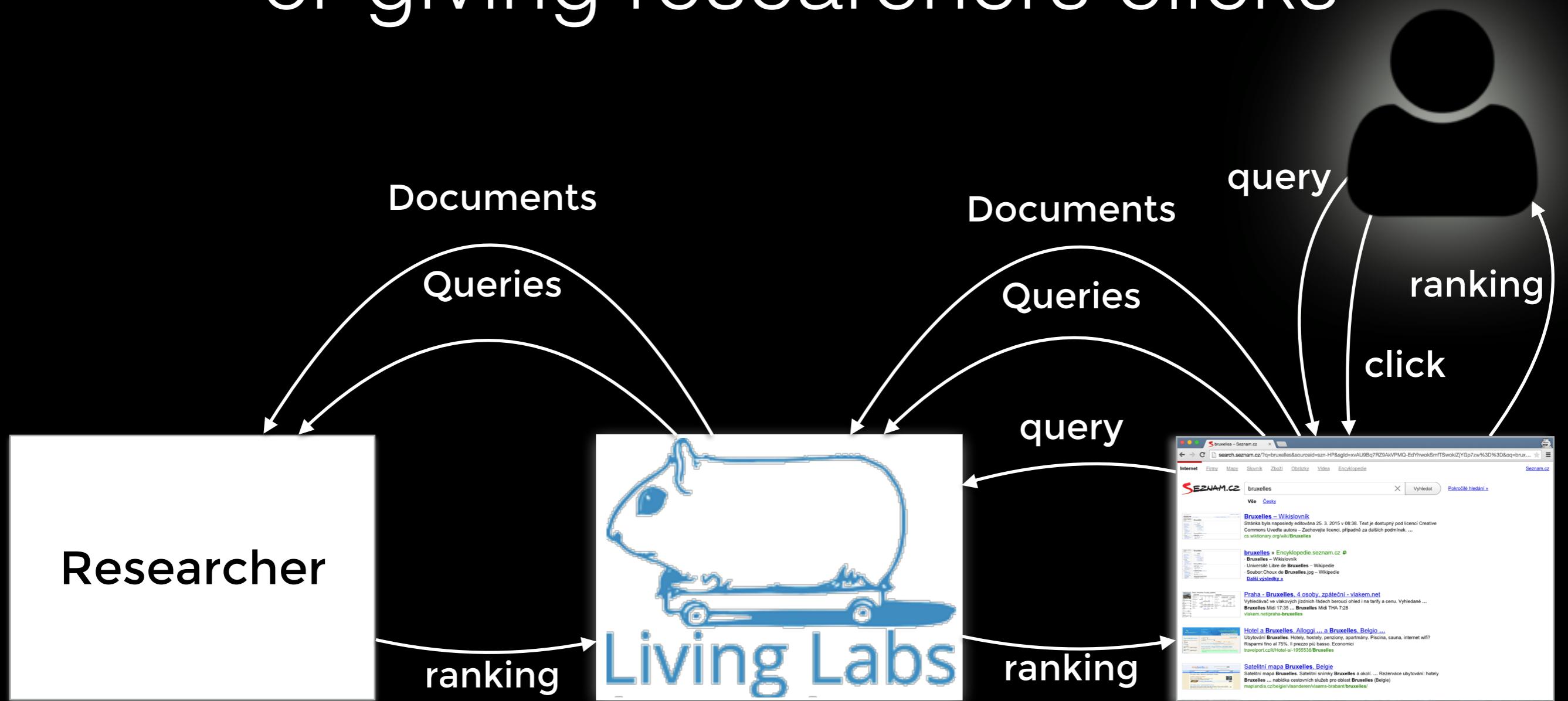
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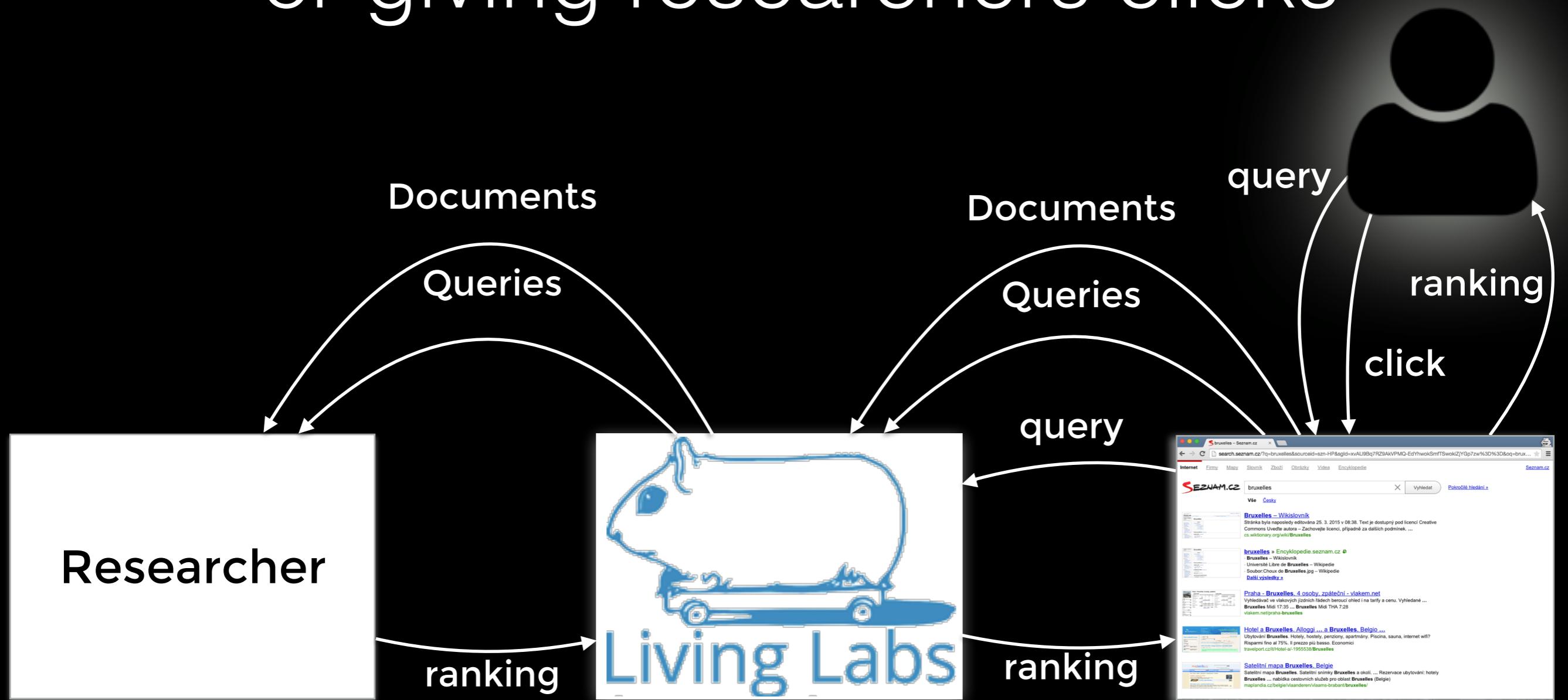
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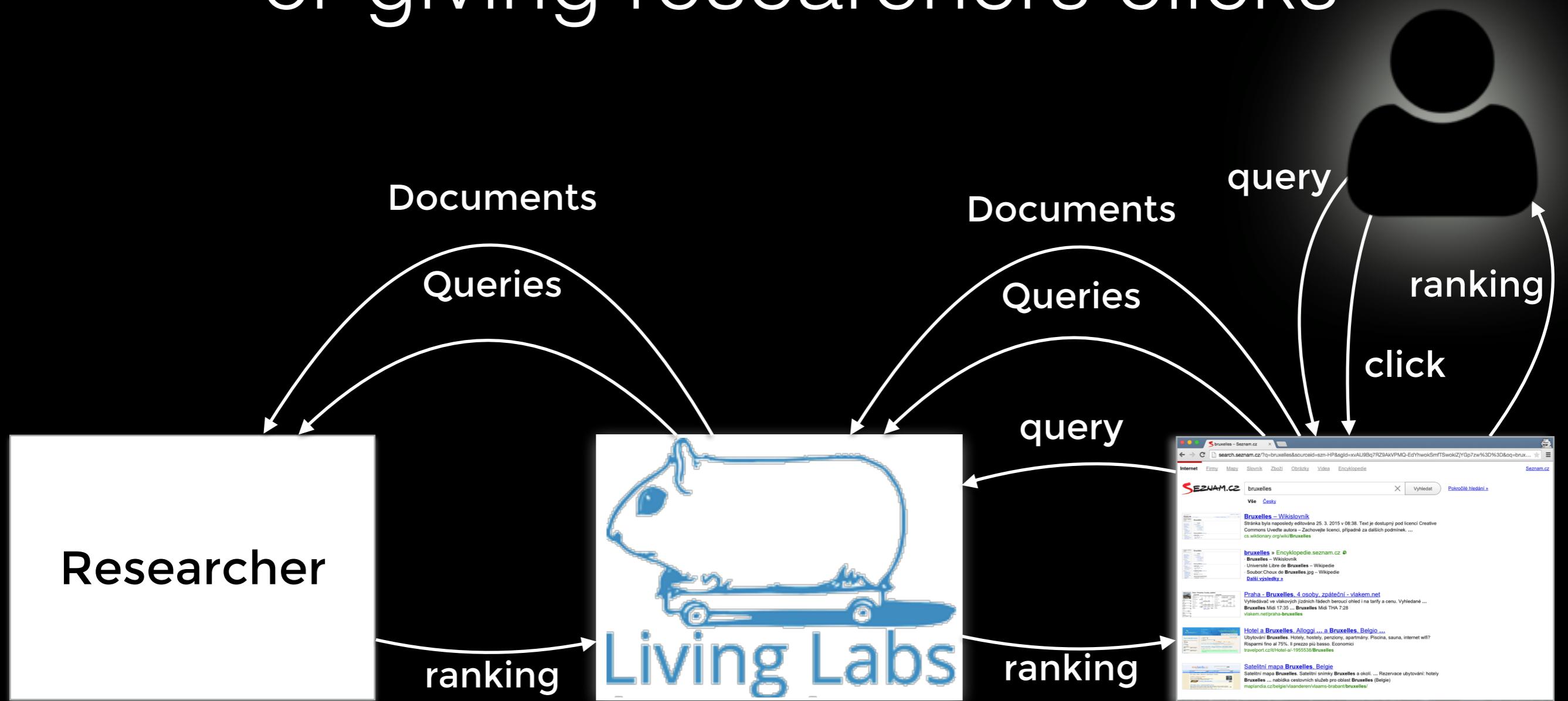
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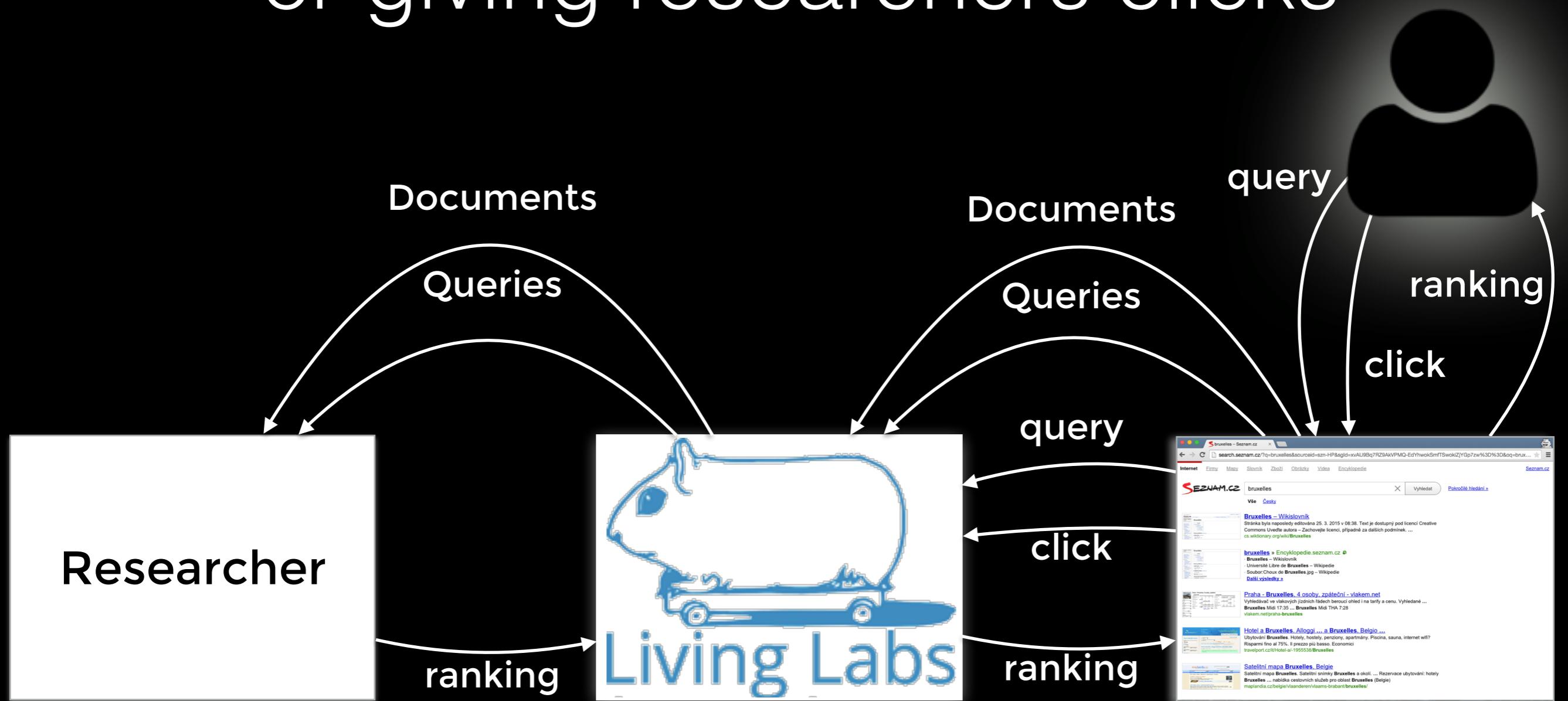
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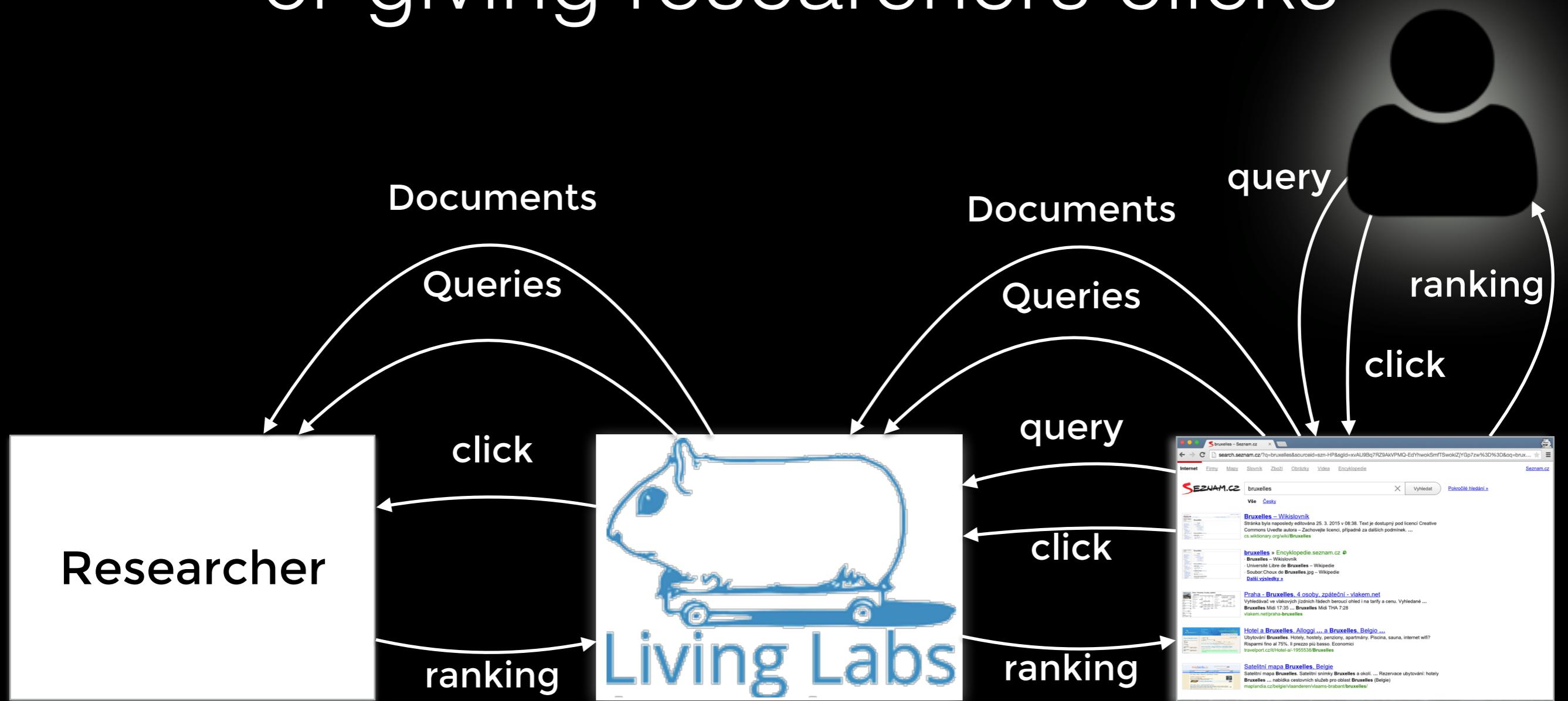
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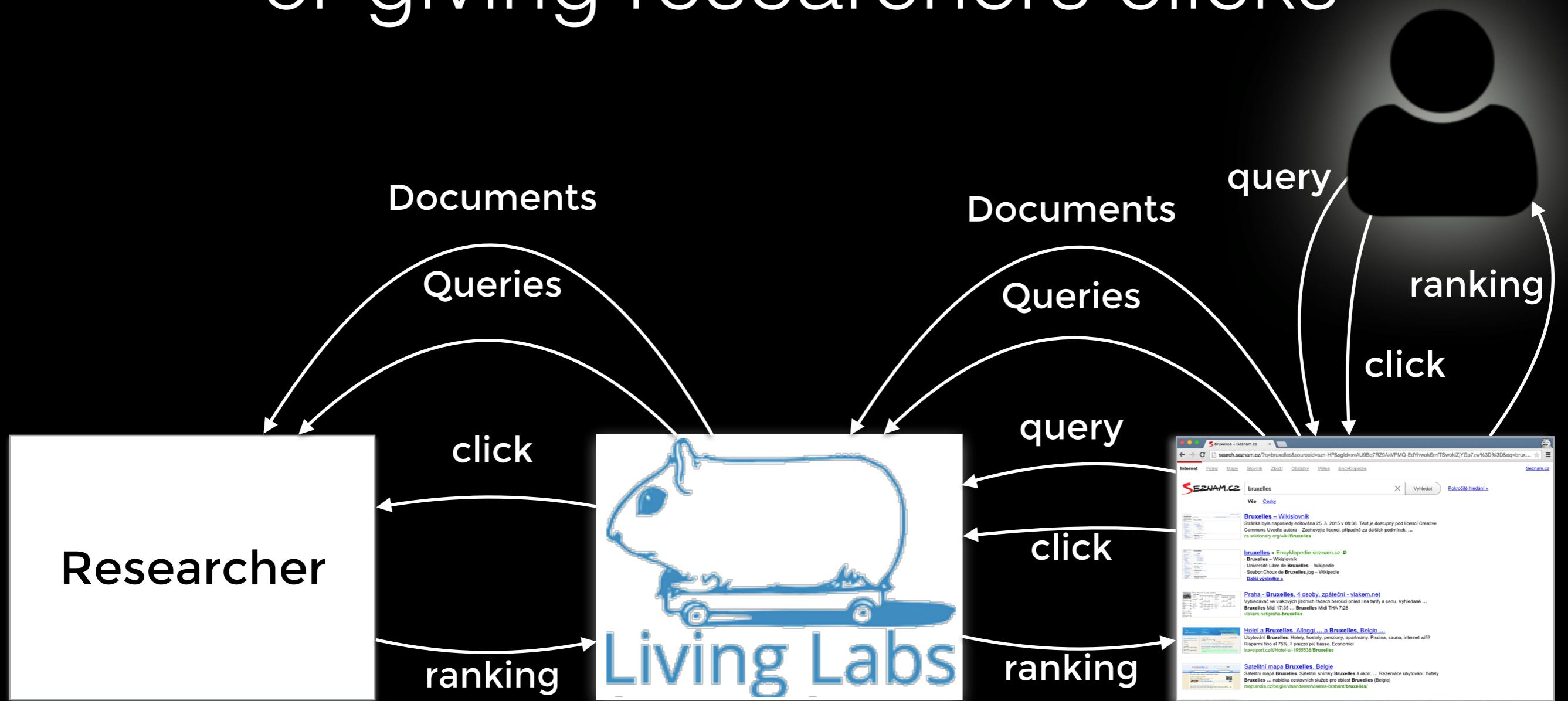
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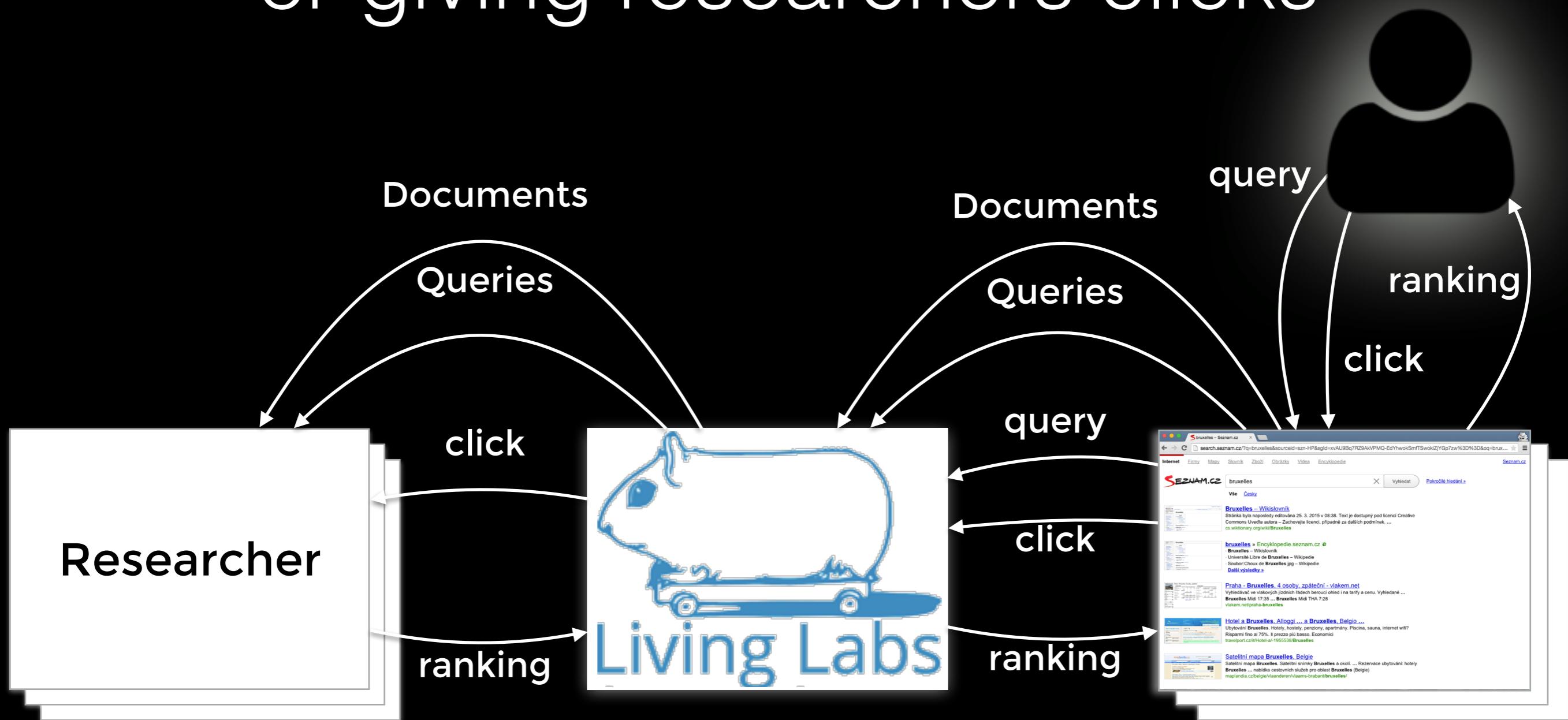
Living Labs for Search or giving researchers clicks



Living Labs for Search or giving researchers clicks



Living Labs for Search or giving researchers clicks



Living Labs - search engines



Living Labs - search engines

	Web search
Provider	seznam.cz
Data	pre-computed document-query features
Site traffic	high
Info needs	vary

Living Labs - search engines

	Web search	Product search
Provider	seznam.cz	regiojatek.hu
Data	pre-computed document-query features	raw queries and (highly structured) documents
Site traffic	high	relatively low (~4K sessions/day)
Info needs	vary	(mostly) transactional

Living Labs - search engines

	Web search	Product search	Local domain search
Provider	seznam.cz	regiojatek.hu	uva.nl
Data	pre-computed document-query features	raw queries and (highly structured) documents	raw queries and (generally textual) documents
Site traffic	high	relatively low (~4K sessions/day)	relatively low
Info needs	vary	(mostly) transactional	(mostly) navigational

Living Labs - researchers

- 39 teams signed up
 - Industry:
904labs, Microsoft, Plista, Yahoo
 - Academia:
au, bw, cz, fr, ie, in, jp, nl, no, uk, us
- 12 teams submitted rankings

search
the lab
perspectives

Interoperability

- All our efforts are **publicly available**

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Interoperability

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- We are very eager to **work with others**
 - *Do you “own” a search engine?*

Cross Discipline

Cross Discipline

- **Currently** Information Retrieval Researchers and computer scientists

Cross Discipline

- **Currently** Information Retrieval Researchers and computer scientists
- Potentially interesting for
 - Behavioral Sciences, Human computer interaction, Design, Information Law, Ethics, ...?
 - You?

Transferable Know-how

- Can we **experiment with users?**

Transferable Know-how

The screenshot shows a news article from The Guardian. At the top, there are navigation links: 'sign in' with a user icon, a search bar with a magnifying glass icon, and 'jobs more International beta'. The main title 'the guardian' is displayed in large white letters, with 'Winner of the Pulitzer prize 2014' in smaller text below it. Below the title is a horizontal menu with categories: 'home > tech' (highlighted in blue), 'UK', 'election', 'world', 'sport', 'football', 'opinion', 'culture', 'business', and 'all' (with a three-bars icon). The main headline reads 'Facebook reveals news feed experiment to control emotions'. A sub-headline below it says 'Protests over secret study involving 689,000 users in which friends' postings were moved to influence moods'. A poll question is also visible: 'Poll: Facebook's secret mood experiment: have you lost trust in the social network?'. The background features a blurred image of a Facebook logo.

sign in search

jobs more International beta

the guardian
Winner of the Pulitzer prize 2014

home > tech UK election world sport football opinion culture business all

Facebook

Facebook reveals news feed experiment to control emotions

Protests over secret study involving 689,000 users in which friends' postings were moved to influence moods

Poll: Facebook's secret mood experiment: have you lost trust in the social network?

Transferable Know-how

- Can we **experiment with users**?
- Do **users need to know** that they are part off an experiment?

Transferable Know-how

- Can we **experiment with users**?
- Do **users need to know** that they are part off an experiment?
- Do users need to **know the aim** of an experiment?

Transferable Know-how

- Can we **experiment with users**?
- Do **users need to know** that they are part off an experiment?
- Do users need to **know the aim** of an experiment?
- **What data** can we collect?

Transferable Know-how

- Can we **experiment with users**?
- Do **users need to know** that they are part off an experiment?
- Do users need to **know the aim** of an experiment?
- **What data** can we collect?
- Do (public) **universities** have different **responsibility** than (private) companies in this regard?

Transferable Know-how

- Can we **experiment with users**?
- Do **users need to know** that they are part off an experiment?
- Do users need to **know the aim** of an experiment?
- **What data** can we collect?
- Do (public) **universities** have different **responsibility** than (private) companies in this regard?
- Can we **reuse/share/store** experimental data?

Thank You



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