

OdorVision 2015

Geruchsmanagement: Trends und Entwicklungen

Donnerstag, 25. Juni 2015, HSR Hochschule für Technik Rapperswil

Crowdsourcing

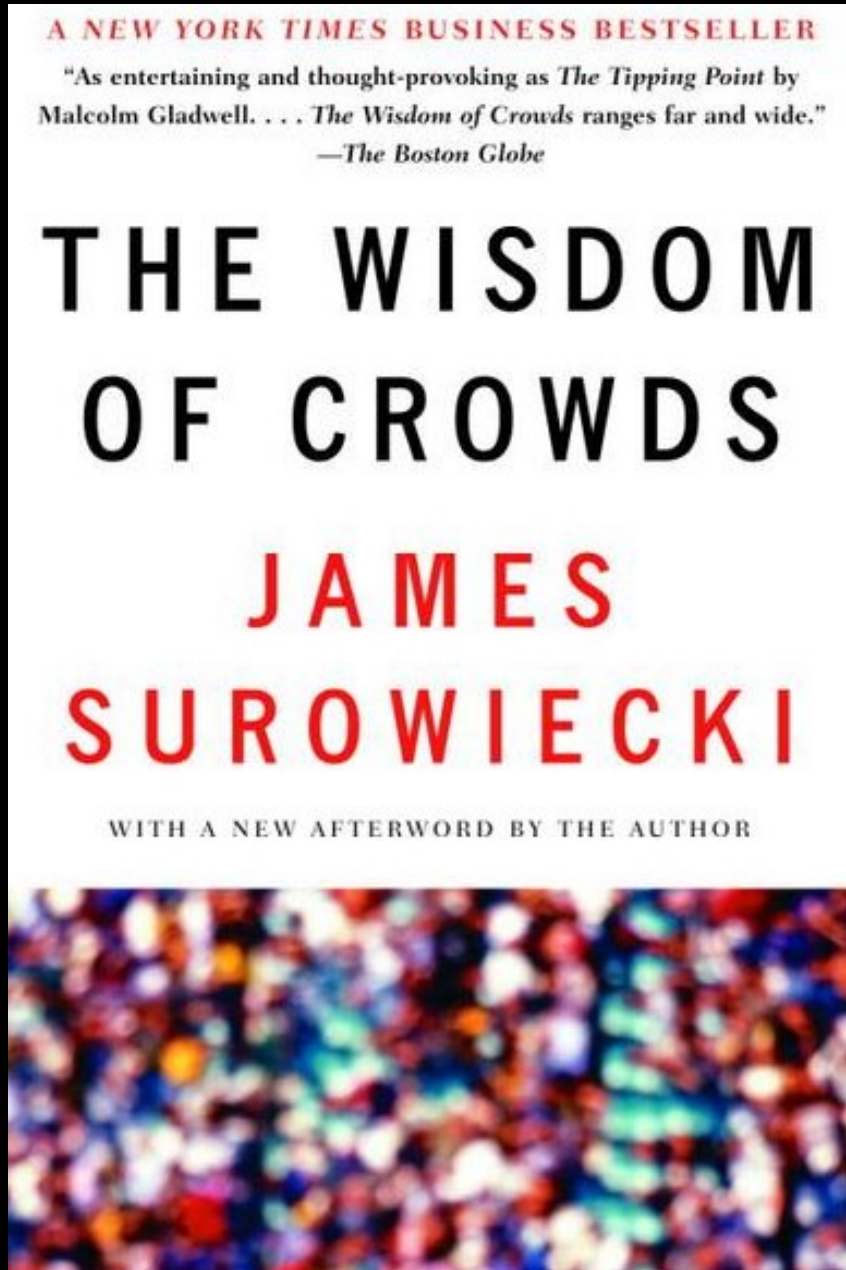
Prof. Dr. Peter Heinzmann *

cnlab itr ag, Obere Bahnhofstrasse 32b, 8640 Rapperswil www.cnlab.ch

HSR Hochschule für Technik Rapperswil, Oberseestrasse 10, 8640 Rapperswil

peter.heinzmann@cnlab.ch

2004
(1907)



Collective intelligence is the ability of a group of people to come to a joint decision which is smarter and better than any one individual – even an expert – could produce acting alone.

For a crowd to be smart, we need

- Diversity of opinions
- Independent solutions
- Decentralization of thoughts
- Mechanism for an aggregate decision

The Wisdom of the Crowd

<https://www.youtube.com/watch?v=iOucwX7Z1HU>, BBC, 4min48



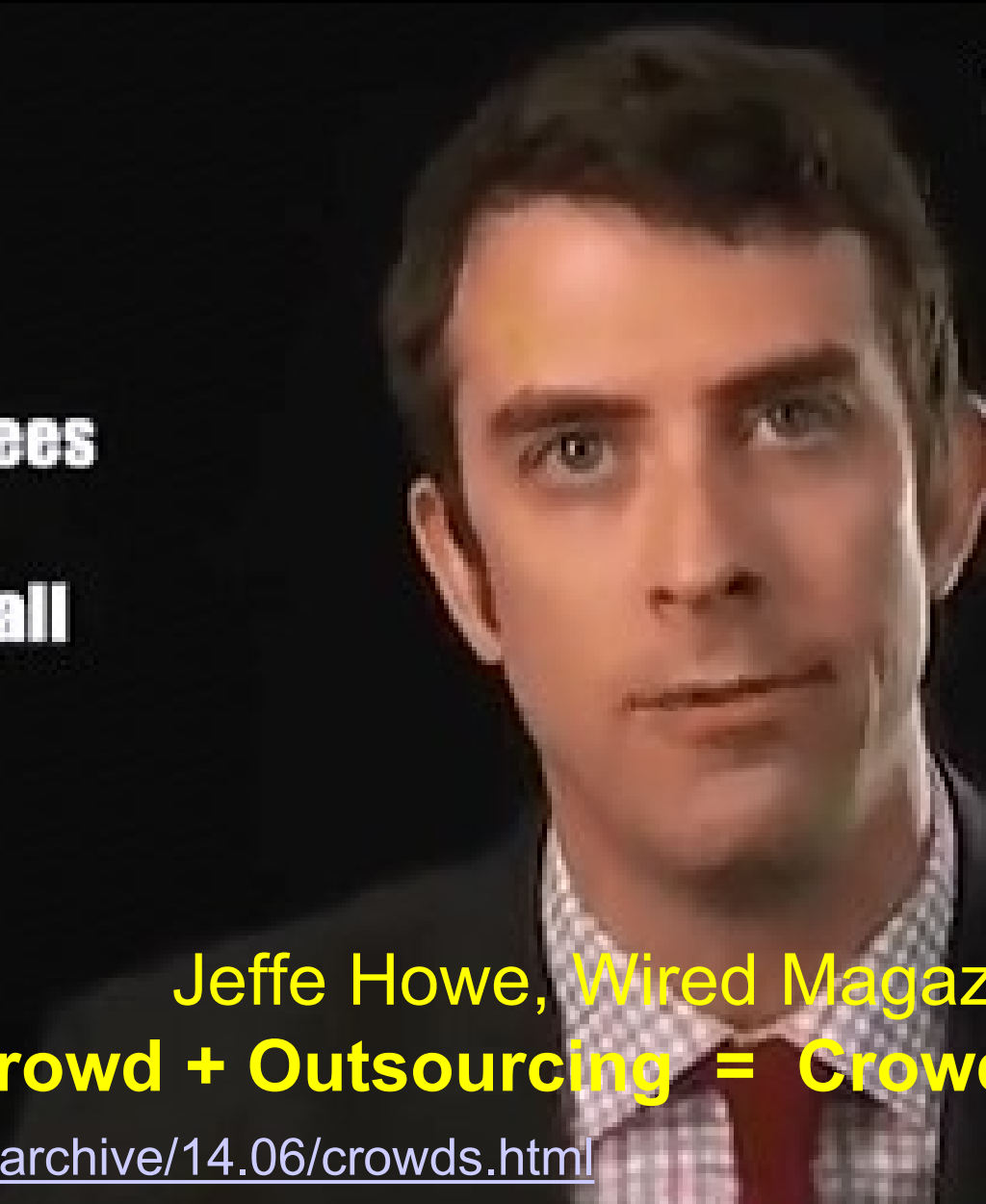
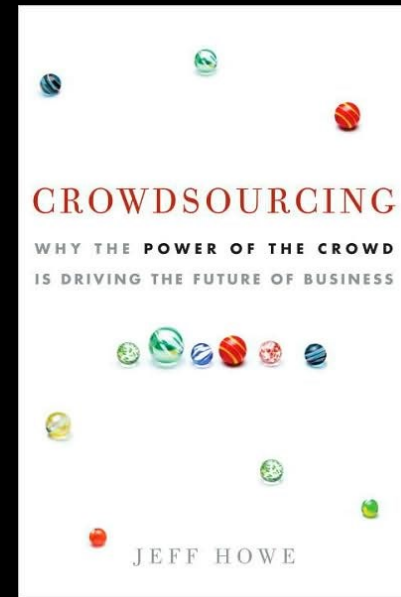
2006

**Crowdsourcing
is when a company
takes a job
that was once
performed by employees
and outsource it
in a form of an open call
to a large undefined
group of people
generally
using the Internet**

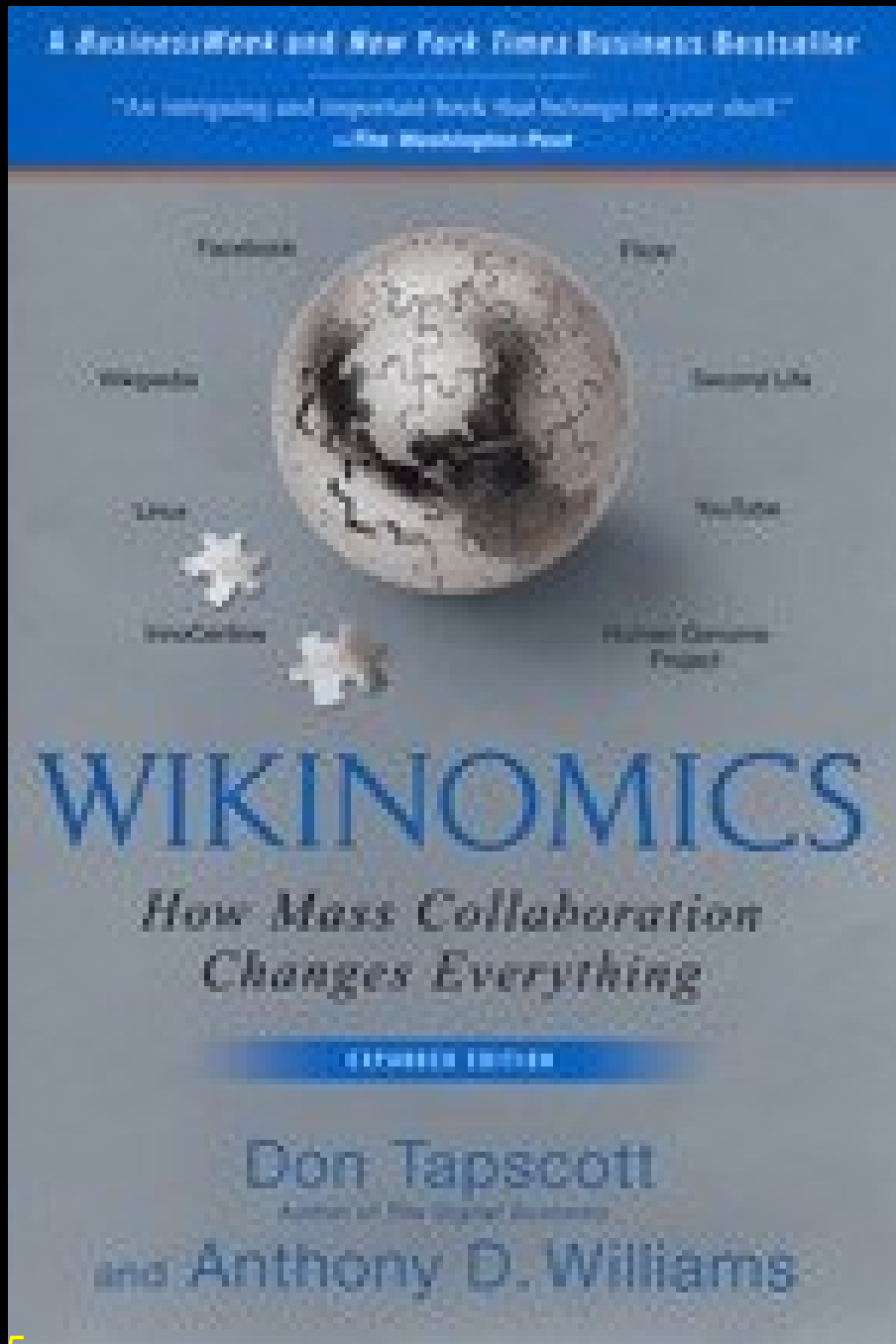
Jeffe Howe, Wired Magazine

Crowd + Outsourcing = Crowdsourcing

<http://www.wired.com/wired/archive/14.06/crowds.html>



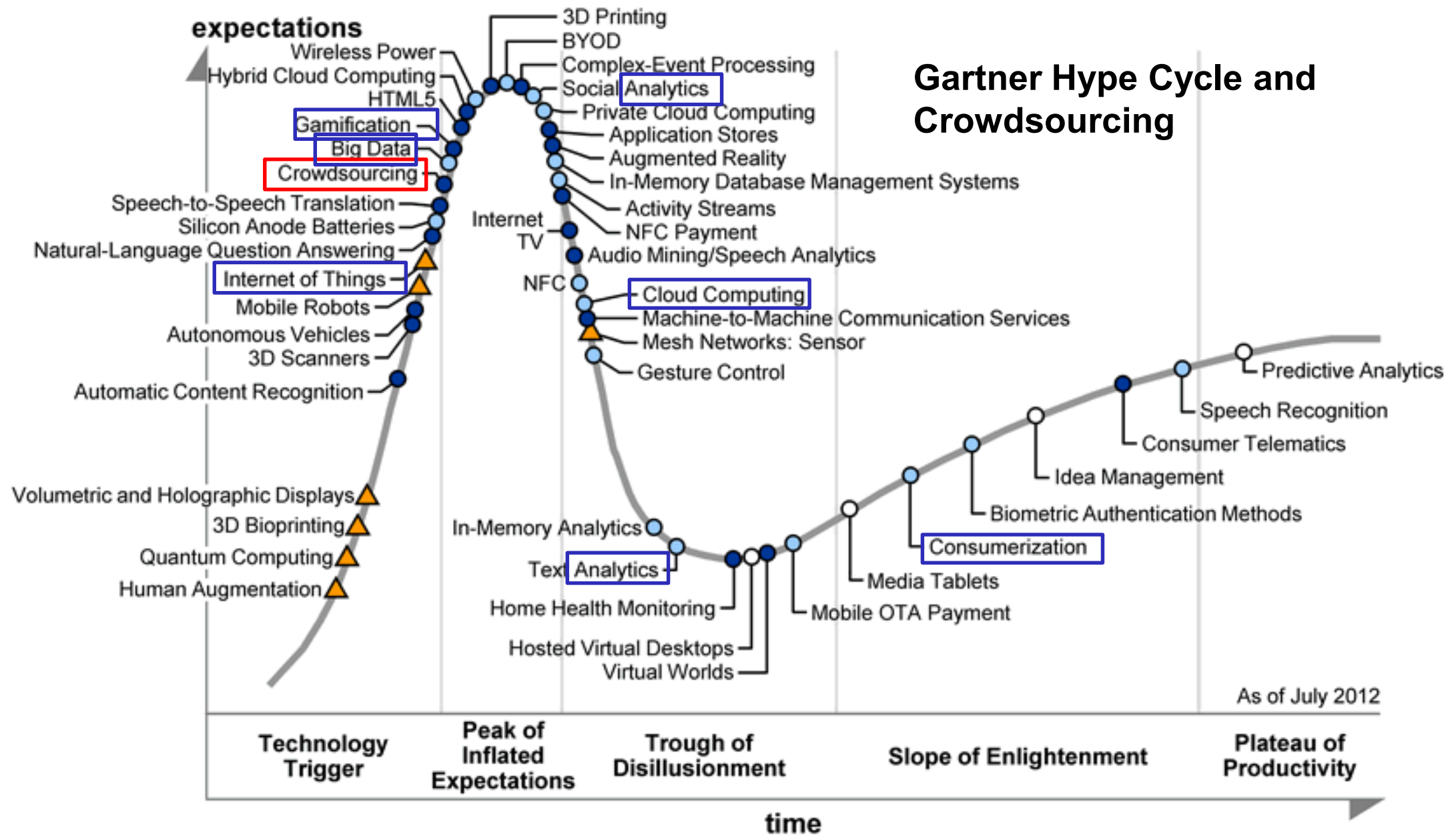
2006



Wieso nehmen Menschen an Wikinomics (Crowdsourcing) Projekten teil?

- Interesse, Freude
- Überzeugung, Weltanschauung
- Reputation
- Zeitvertreib
- Spieltrieb
- Geld verdienen

2012



What is Crowdsourcing?



<https://www.youtube.com/watch?v=Buyub6vIG3Q> (2010, 2min50)

<https://www.youtube.com/watch?v=-38uPkyH9vI> (15.3.2012, 3min48)

Crowdsourcing is the process of connecting with large groups of people via the Internet to make use of their knowledge, expertise, time or resources.

Crowdsourcing is a way of solving problems and producing things by connecting online with people that you otherwise wouldn't know.

Crowd-x-ing (Agenda)

1. Crowdfunding

Arbeiten, Dienstleistungen aus der Crowd
Informationen und Daten aus der Crowd

2. Crowdfunding

Geld, Investitionen aus der Crowd

3. Crowd Creativity (Crowddesign, Open Innovation)

Kreativität aus der Crowd

4. Auswertung und Visualisierung

5. Zusammenfassung und Ausblick

Crowdsourcing

**Crowdworking, Crowd Labor:
Arbeitsleistungen aus der Crowd**

**Crowd arbeitet bewusst und/oder unbewusst an
Projekten mit (Clickworking, Microworking)**

Wieso die Crowd? Was kann die Crowd (Menschen) besser als Computer?

Komplizierte Aufgaben

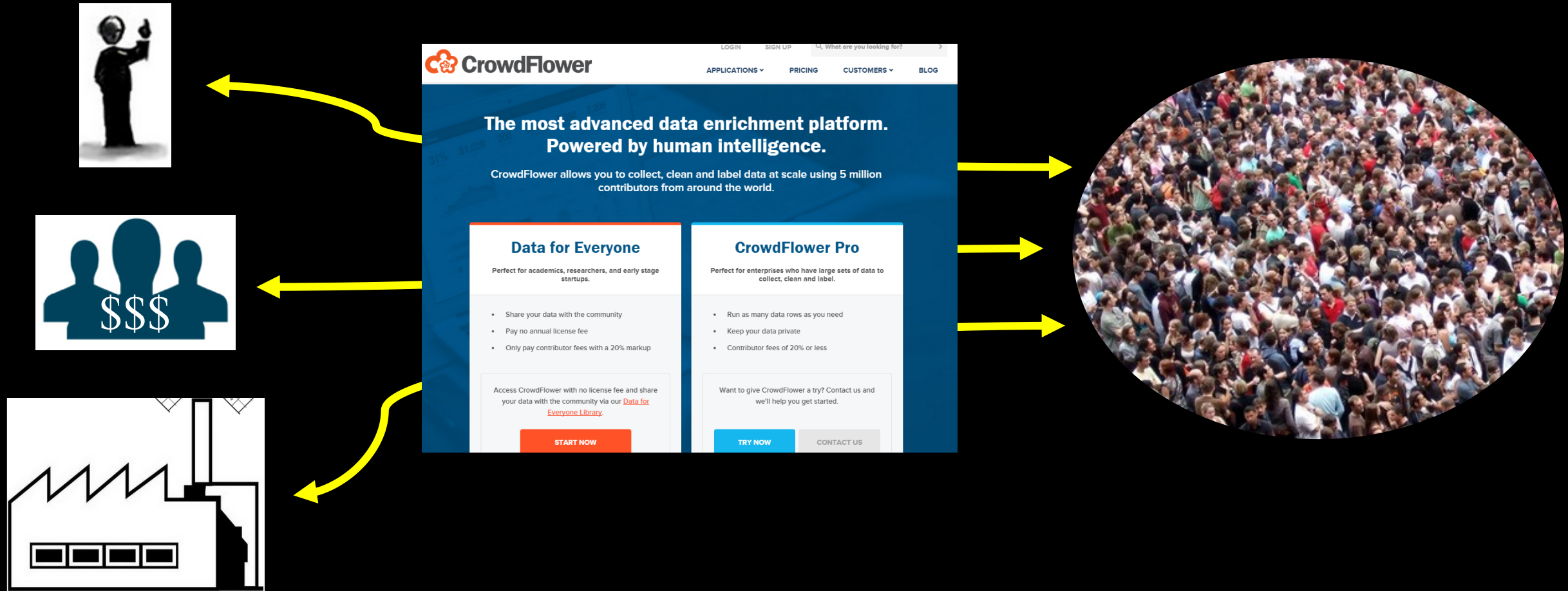
- Inhalte, Wissen erarbeiten
- Kreativarbeiten (Musik, Film, ...)
- Innovation
- Auf unerwartete Situationen reagieren
- Mit Menschen kommunizieren

Einfachere Aufgaben

- Bilder erkennen
 - Gegenstände finden
 - Gesichter erkennen
 - Texterkennen
- Sprache erkennen
 - Podcast Untertitel schreiben (Transkribieren)
- Bewerten, klassieren
- Daten erfassen
- Testen

Crowdsourcing Plattformen:

CrowdFlower - The worlds largest workforce



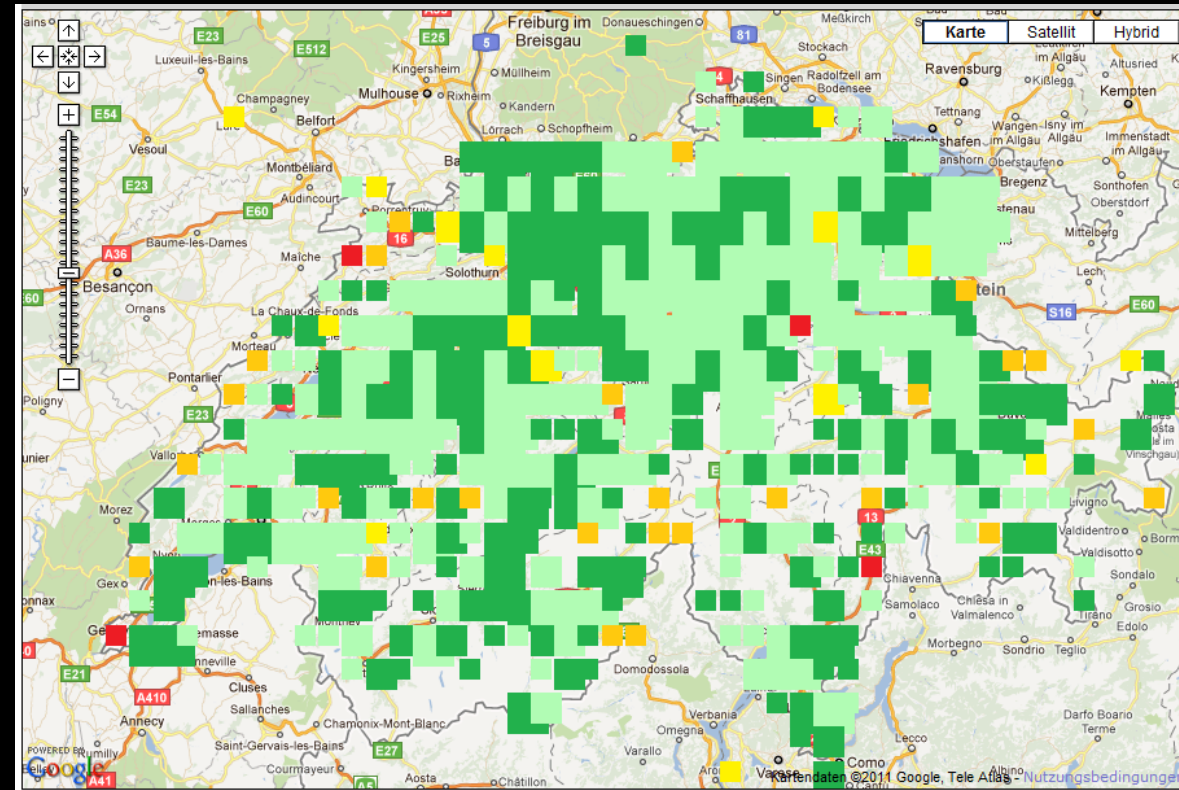
Beispiele zu Crowdsourcing Arbeitsbereichen und Vermittlungsplattformen (1)

- **Bild, Musik-, Videoerstellung**
 - **Virtual Coir** <http://ericwhitacre.com/the-virtual-choir/>
- **Handel Verkauf von Fotos**
 - **iStockphoto** <http://deutsch.istockphoto.com>
- **Design**
 - **Logo, Banner, Flyer, Web** <http://de.wilogo.com/>
 - **Designaufgaben** <http://en.99designs.ch>
- **Programmierung**
 - **Topcoder** <http://www.topcoder.com/>
 - **Innocentive** <http://www.innocentive.com/>
- **Innovation**
 - **Industrie, Technologie** <http://www.ninesigma.com>
 - **Brainstorming Plattform** <https://www.atizo.com/>
 - **Home of Data Science** <https://www.kaggle.com/>

Beispiele zu Crowdsourcing Arbeitsbereichen und Vermittlungsplattformen (2)

- **Bilderkennung, Datenkategorisierung und Tagging**
 - Foto Moderator <http://crowdfunder.com/>
 - Flickr <http://www.flickr.com/photos/tags/crowdsourcing>
 - Datenkategorisierung <http://www.clickworker.com/datenkategorisierung-und-tagging/>
- **Sprachverarbeitung, Texten, Übersetzung**
 - Suchmaschinenoptimierte Texte <http://www.textbroker.de/>
 - Schreibaufgaben <http://www.content.de>
 - Übersetzungen <http://gengo.com>
- **Diverses**
 - Allgemeine Arbeitskräftevermittler massolution.com elance.com upwork.com twago.de
 - Amazon Mechanical Turk <https://www.mturk.com>
 - Search Engine Marketing <http://www.vworker.com/>
 - internes Crowdsourcing: <http://crowdcity.com/>

Internet Testing: cnlab Mobile Speedtest



<https://www.cnlab.ch/de/performance/speedtest>

<http://www.srf.ch/konsum/services/beratungsstellen/internet-speedtest>

cnlab SpeedTest: 74'000 Android-Messungen in den letzten 30 Tagen



<https://www.cnlab.ch/de/performance/speedtest-statistiken>

CrowdPee: Toiletten

Gender Neutral Toilets in Switzerland
Geschlechtsneutrale Toiletten in der Schweiz

CrowdPee

CrowdPee

CrowdPee is a project to collect data on bar and restaurant toilets in the city of Zürich.

CrowdPee ist ein Projekt, das Infos über die Toiletten in Zürcher Bars und Restaurants sammelt.



We want to know which ones:

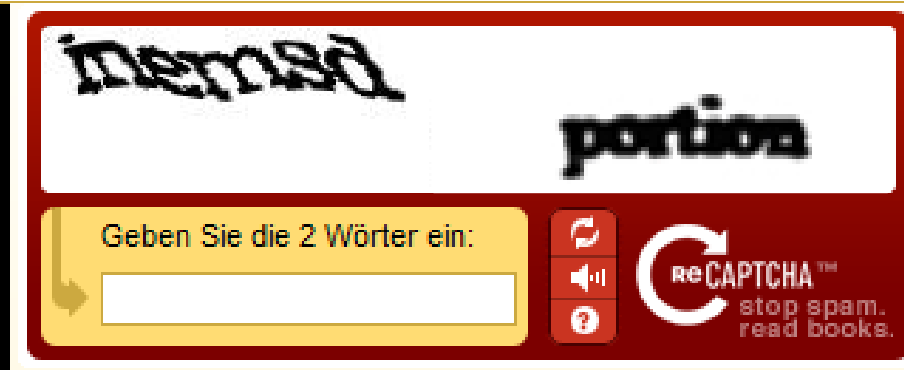
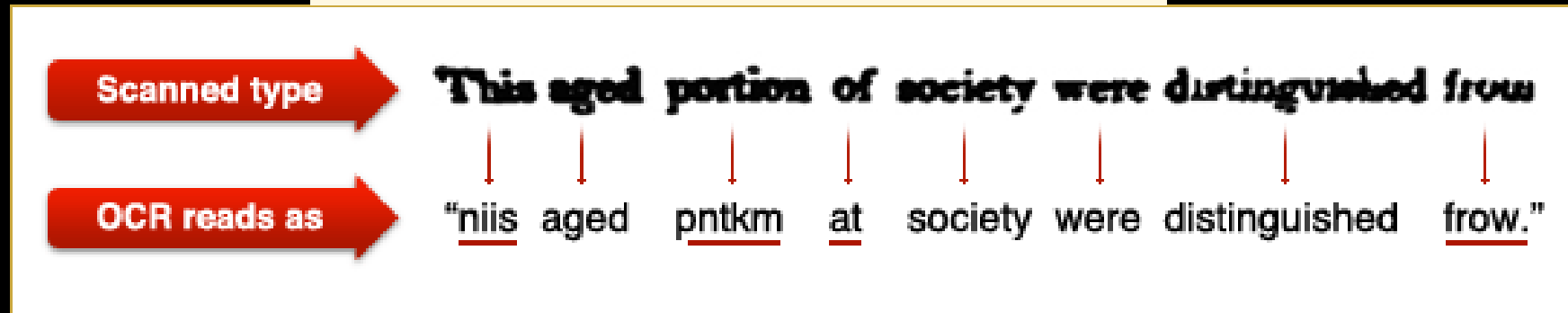
- are gender-neutral;
- are wheelchair-accessible;
- have baby-changing facilities.

To answer these three questions for any location in Zürich, [search here!](#)

- **Wir möchten wissen, welche Toiletten:**
 - **geschlechtsneutral sind**
 - **rollstuhlgängig sind**
 - **Wickeltische haben**
- <http://nearbysources.com/q/1/en/>

Crowd zur Unterstützung der Digitalisierung von Büchern

Completely Automated Public Turing Test To Tell Computers and Humans Apart (CAPTCHA)



TED, April 2011, Luis von Ahn:
Massive-scale online collaboration
https://www.ted.com/talks/luis_von_ahn_massive_scale_online_collaboration
(100Mwords/day)

Crowd Translating

www.duolingo.com

The screenshot shows the Duolingo website interface. At the top is a blue navigation bar with the Duolingo logo and links to Home, Words, Activity, Discussion, and Immersion. On the right side of the bar are icons for a user profile (with a dropdown arrow), a fire icon with a '0', a red shield icon with a '0', and a bell icon. Below the navigation bar is a white content area. On the left of this area is a 'Tips & notes' section. On the right is a 'Quit' button. In the center is a progress bar with a blue fill and a cloud icon containing a lightning bolt and the number '11'. Below the progress bar is the instruction 'Mark all correct translations'. Underneath this instruction are three numbered options, each with a checkbox and a text label: 1. ☐ Io sono la mela. 2. ☐ Sono la donna. 3. ☐ Io sono la ragazza. To the left of these options is the text 'I am the girl.'

Wikipedia to Spanish:

5 weeks with 100,000 users

80 hours with 1 million users

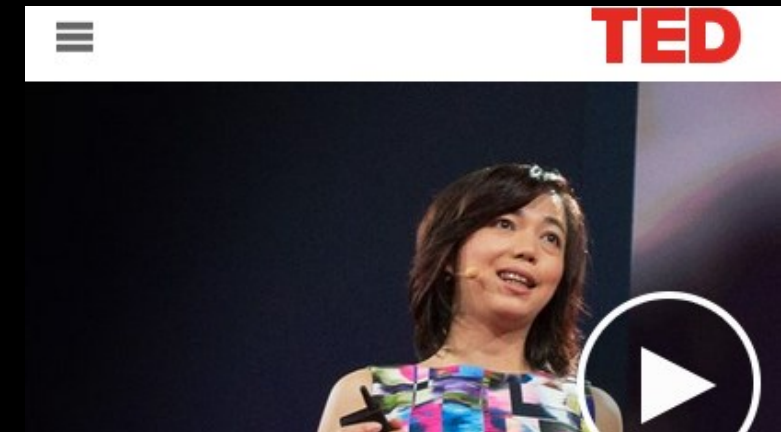
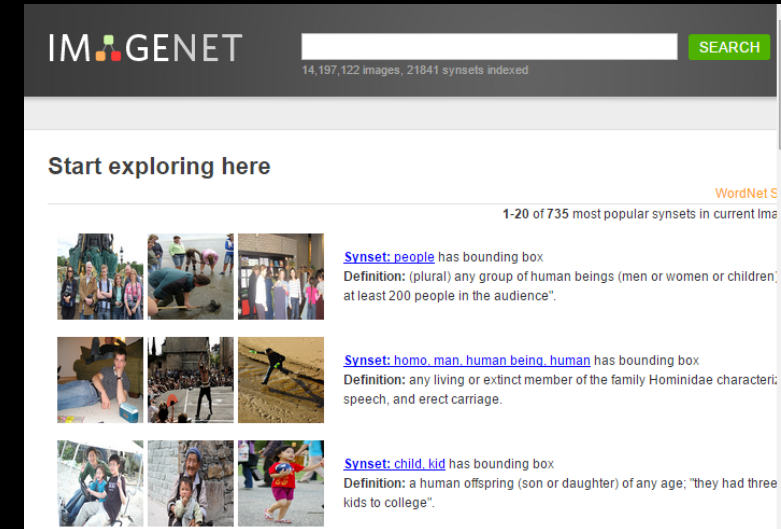
Imagenet: Interpretation von Bildern

Crowdsourced

- 14'197'122 images
- 21'841 synsets indexed (WordNet lexical database for the English language)

Computer Vision

- 15'000'000 photos
- TED, Mar 2015, Fei-Fei Li, teaching computers to understand pictures



[https://www.ted.com/talks/fei fei li how we re teaching computers to understand pictures](https://www.ted.com/talks/fei_fei_li_how_we_re_teaching_computers_to_understand_pictures) (TED 2015/03 17min58)

Crowd Reporting (Citizen Journalism): G-20 Summit 2009, London

When every cellphone can
record video and take pictures,
everyone is a potential news
source.

(TED by Reporter Paul Lewis)



http://www.ted.com/talks/paul_lewis_crowdsourcing_the_news 6:00-7:30

<http://www.theguardian.com/uk/video/2009/apr/21/g20-ian-tomlinson-new-video>



Crowdsensing

**Crowd stellt Sensoren zu Verfügung,
Cyberscience, Citizen Science**

Wetterstationen



- <http://www.cnlab.ch/wetter>
- <http://www.wetterstationen-online.de>
- <https://www.netatmo.com/weathermap>

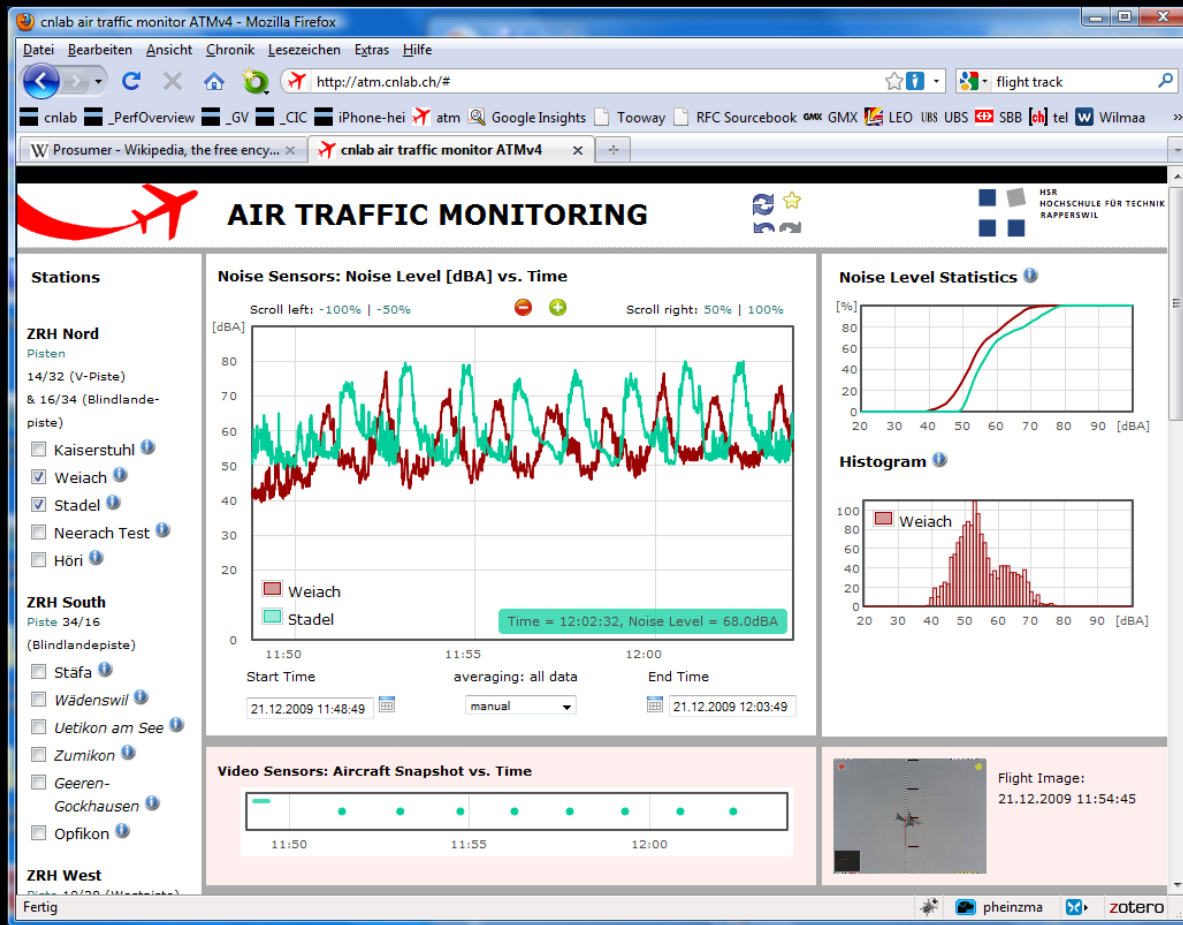


- [Weather Point 2.0 Kickstarter Projekt \(6/2015\)](#)



Air Traffic Monitoring

Fluglärm, Flugbewegungen



- **Fluglärm**

- <http://atm.cnlab.ch>
- <http://www.dfld.de>



- **Flugbewegungen**

- <http://www.flightradar24.com/>



Crowdsourcing: Bürger schaffen Wissen (Citizen Science <http://buergerschaffenwissen.de>)



Die Apfelblütenaktion

📍 *ortsunabhängig*

Apfelblüte, Klimawandel

Mit der Apfelblüte dem
Klimawandel auf der Spur

<http://buergerschaffenwissen.de/projekt/die-apfelbluetenaktion>



Migräne Radar 2.0

📍 *ortsunabhängig*

*Gesundheit, Migräne,
Migränetrigger, Migräneauslöser*
Migräne miteinander erforschen

<http://buergerschaffenwissen.de/projekt/migraene-radar-20>



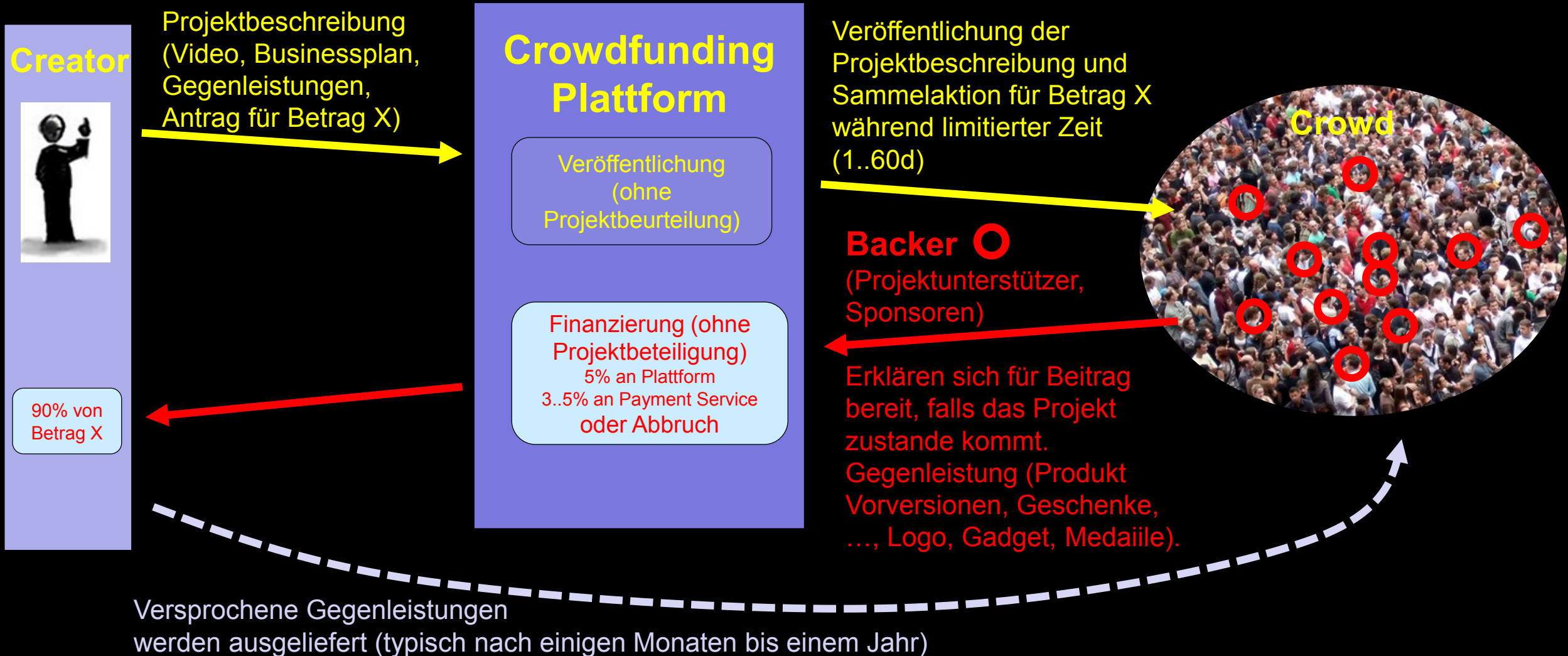
Crowdfunding

Geld, Investitionen aus der Crowd,
Crowdlending, Crowdfunding

Crowdfunding Begriffe

- **Crowdfunding: keine monetäre Gegenleistung**
- **Crowdinvesting:**
 - monetäre Gegenleistung
 - Real Estate [fundrise.com](https://www.fundrise.com) Immobilien Investitionen
- **Crowdsponsoring:**
 - gemeinnütziges Fundraising www.mysherpas.com www.idonate.ie
 - Sport Fundraising www.ibelieveinyou.ch
- **Microdonations: freiwillige Unterstützung mit Kleinstbeiträgen** [flattr.com](https://www.flattr.com)

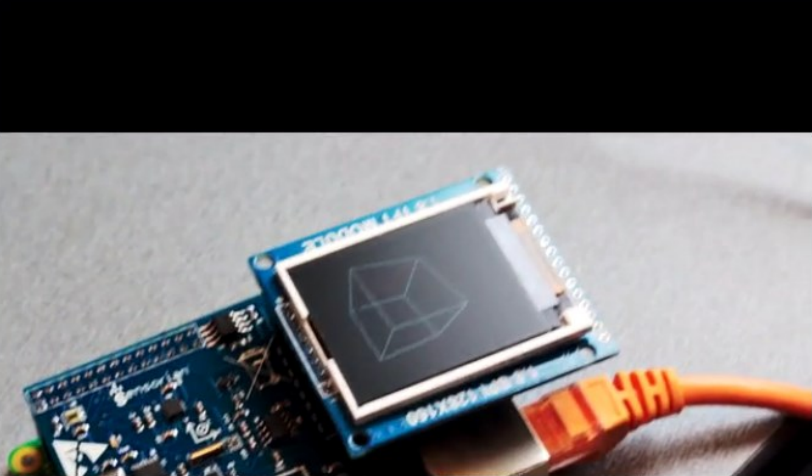
Crowdfunding Prinzip



Crowdfunding Plattformen

KICKSTARTER Discover Start Search Projects

Sensorian Shield: The Physical World Meets Cloud Computing
by Sensorian



348 backers
\$22,356 CAD
pledged of \$7,500 goal
35 hours to go

Back This Project ★

This project will be funded on Fri, Jun 26 2015 CEST.

Sensorian
First created | 0 backed
sensorian.io

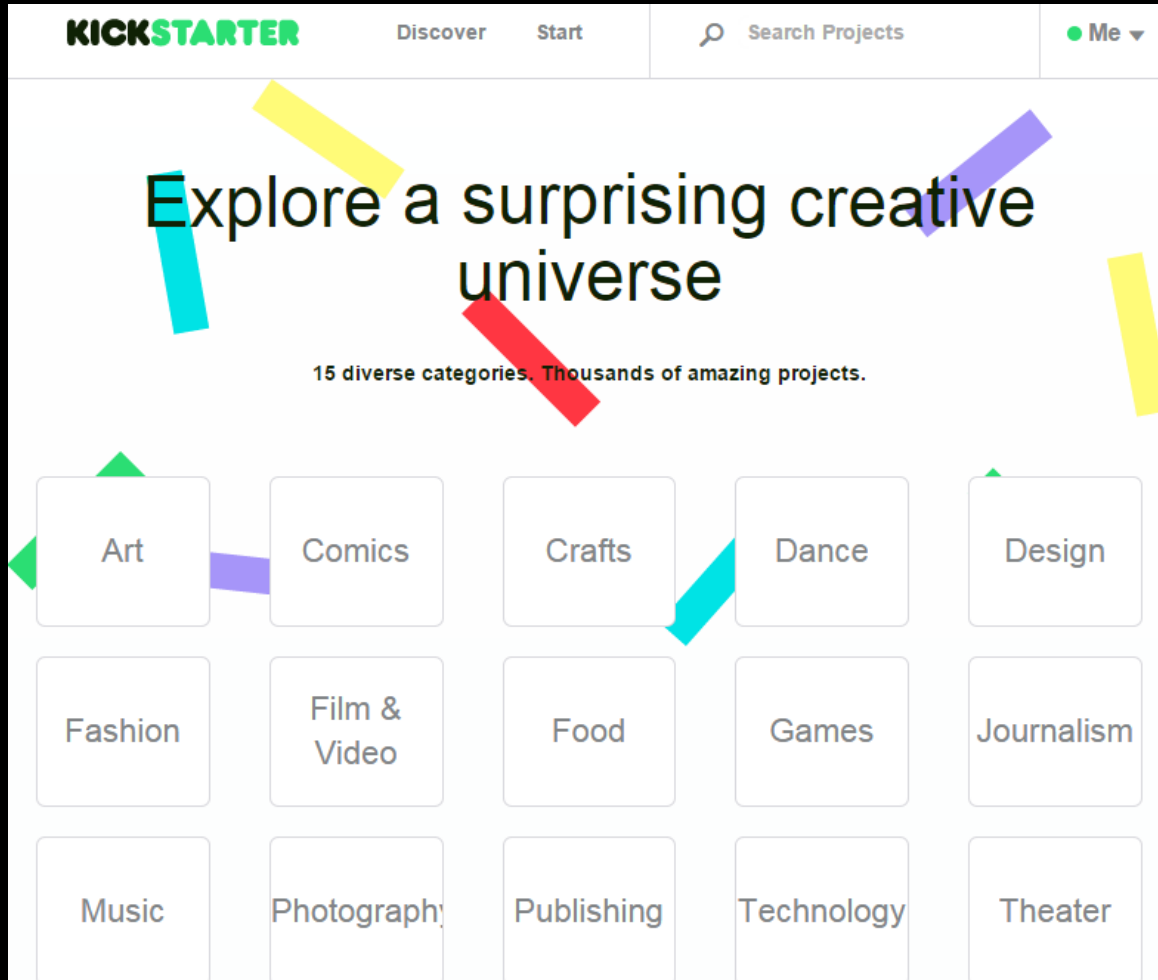
Supercharge your Raspberry Pi with our sensor-packed shield.
Harness the physical world in your projects and applications!

0:30 1:18

- <https://www.kickstarter.com>
- <https://www.indiegogo.com>
- <http://www.100-days.net>
- <http://www.gofundme.com>
- <https://wemakeit.com>
- <http://www.inkubato.com>
- <http://www.ibelieveinyou.ch>
- <https://www.startnext.com>
- <http://www.visionbakery.com>

Kickstarter

www.kickstarter.com



- Kickstarter
 - 2009 gegründet
 - Bis 2012 175 M\$ Unterstützungen zu 20k Projekten (Erfolgsquote: ca 45% der eingereichten Projekte)
 - Vermittlungsprovision von 5% der (erfolgreich gesammelten) Projektsumme
- Vermittler zwischen Creator und Backer
- Kleine Investitionen von Vielen
 - Sponsor, Förderer, Mäzen (**Backer**)

Crowdfunding der Basellandschaftlichen Kantonalbank

MITEINANDERERFOLGREICH Was ist BLKB Crowdfunding? Projekt einreichen Projekte entdecken

Empfohlene Projekte



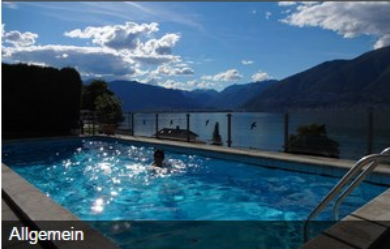
Soziales und Kinder / Jugend

PETKiDS-Club 2015

Seit 1995 betreibt der Tierschutz beider Basel Jugendtierschutzarbeit mit seinem PETKiDS-Club. Zum 20-Jahre-Jubiläum sind rund 40 Anlässe für die Kinder zwischen 7-12 Jahren geplant.

von Tierschutz beider Basel

104% finanziert CHF 4'680 zugesagt 19 Stunden



Allgemein

Wohnungseinrichtung

Wir möchten unseren Feriengästen, mit einer neuen Wohnungseinrichtung, noch mehr Freude und Wohlfühlmomente schenken. Sofa, Esszimmerstühle, Vorhänge ersetzen und Wohnzimmer/Fugen malen.

von Ferienwohnung im Tessin mit T...

0% finanziert CHF 0 zugesagt 19 Stunden



Bildung und Soziales

Möbel für die Basisstufe

Wir möchten, dass sich unsere Kleinsten an der Freien Christlichen Schule Liestal weiterhin wohl fühlen!

von sschenke

59% finanziert CHF 2'850 zugesagt 9 Tage

- **Schwarmfinanzierung mit Fokus auf Basellandschaft**
 - Plattform in Zusammenarbeit mit Swisscom
 - nur für Personen mit Wohnsitz in der Schweiz
 - miteinander-erfolgreich.ch
- **Unterstützer**
 - minimale Beitrag CHF 10
 - maximale Betrag CHF 3'000
 - Beitrag mit Kreditkarte (Visa/Mastercard) oder mit PostFinance-Card
- **Projekteinreichung**
 - Verbindungskonto für die Auszahlung muss bei der Basellandschaftlichen Kantonalbank sein

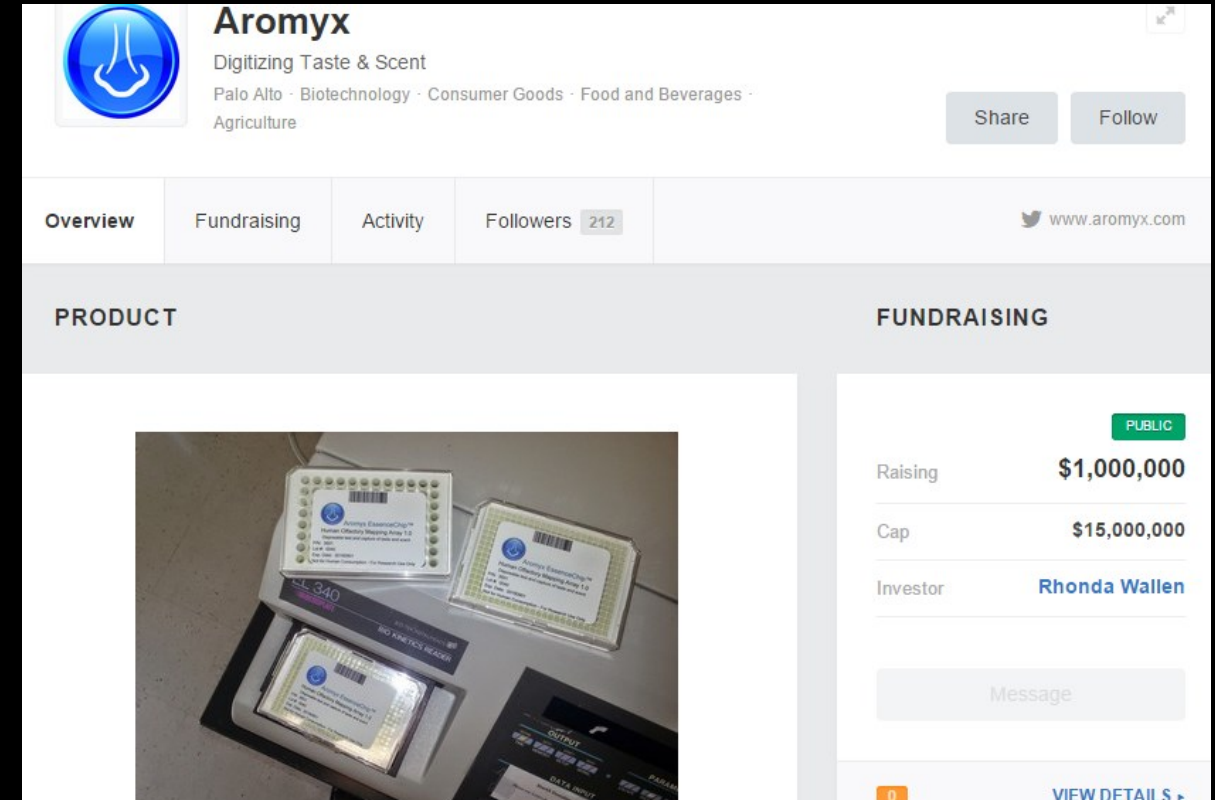
Hu Liang: Crowd-sourced investing

<https://www.ted.com/watch/ted-institute/ted-state-street/hu-liang-crowd-sourced-investing>

- **Group of independently thinking individuals collectively engaged to solve a problem.**
- **Crowd presence, mood,**
- **Twitter analysis**
- **Mass amateurisation of amateurs previously reserved to professionals**
- **Collective information, collective intelligence**
- **In 5 years everybody will use some crowd sourcing for investment**

Crowdfunding for Computers that Can Smell (1)

- angel.co/syndicates/funders
 - Raise Money with Syndicates
 - Fund that pools investor commitments
- **Aromyx EssenceChip**
 - digitizing and standardizing human sensory data from professional noses and consumer panels
 - flow into analytics, lab equipment and other scientific and computational tools



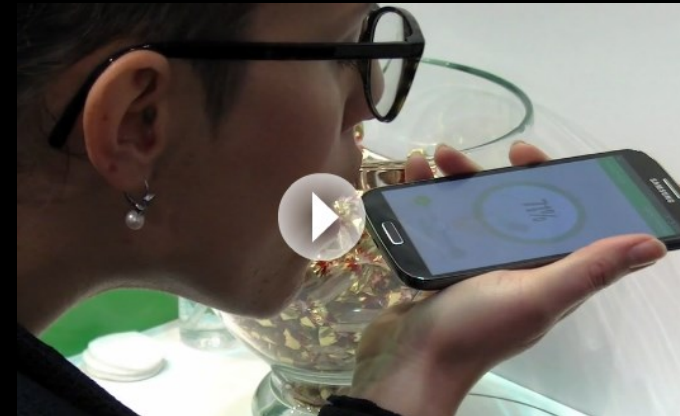
<https://drive.google.com/file/d/0B72oeKsDCzqMU0VncnV1dEtpQ0E/view?pli=1> (30min)

Crowdfunding, Funding for Computers that Can Smell (2): Electronic Nose

- MIT Mini Massenspektrometer
- Nano Engineered Applications / University of California “electronic nose“
- Samsung sensor that can identify more than 20 different smells (CES 2015)
- Sensirions Smartphone Sensoren, bis 2017 künstliche Nase: SGPC10 Gas-Sensor ermittelt Mundgeruch und Alkoholpegel



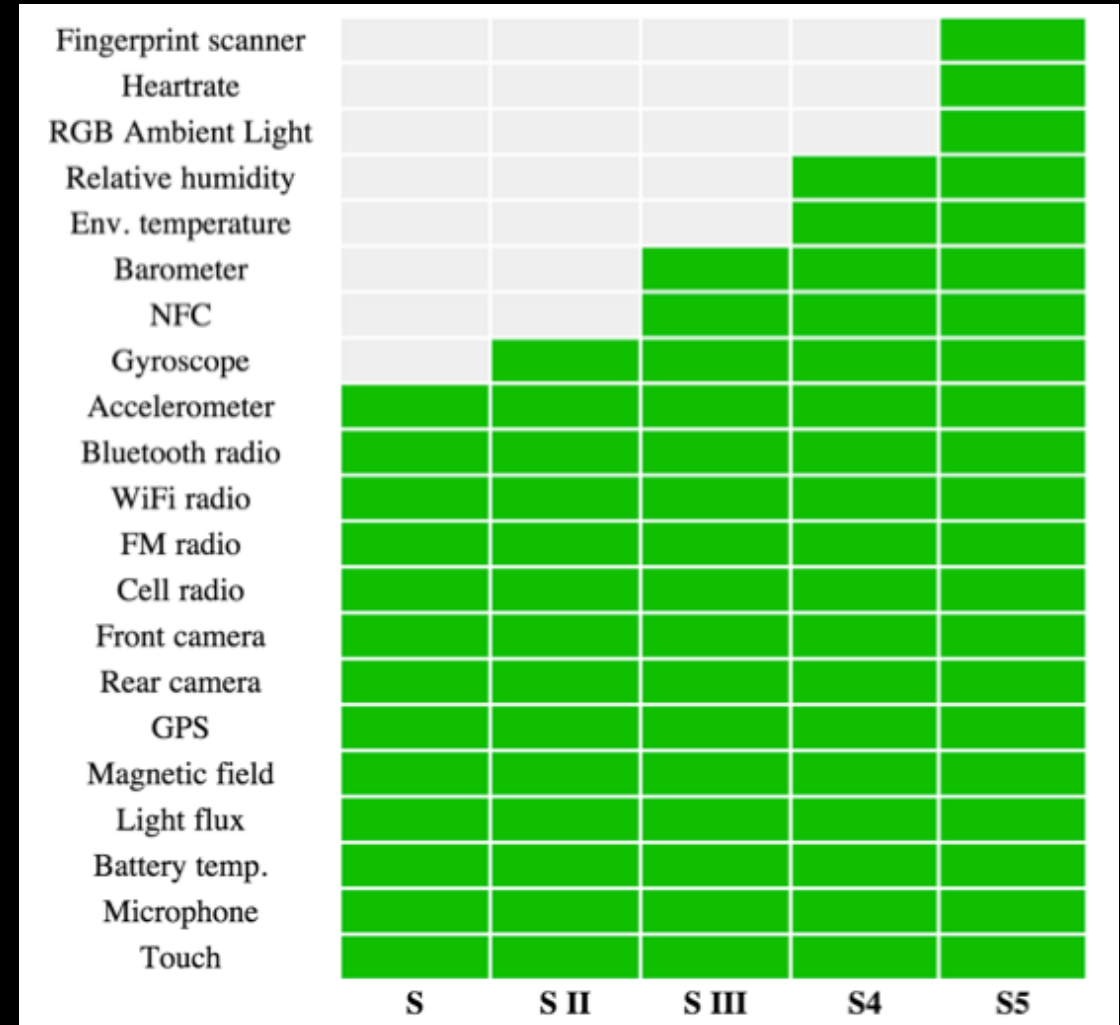
<http://magazine.ucr.edu/158> (1min12, 11/2014)



<http://www.20min.ch/digital/news/story/14269911> (2min12, 03/2015)

Funding for Crowdsourced Signal Mapping using Smartphone Sensors

- 2012/09: OpenSignal raises \$1.3M to map mobile network quality
- 2014/08: Crowdsourced mobile signal mapper OpenSignal has closed a \$4 million Series A funding round, led by chipmaker Qualcomm via its investment arm, Qualcomm Ventures.



Crowdcreativity

Virtual brainstorming platform with thousands of creative thinkers, Open innovation, Collective Intelligence

Collaborative Music Video Project

www.thejohnnycashproject.com

THE JOHNNY CASH PROJECT

A UNIQUE
COMMUNAL
WORK,
A LIVING
PORTRAIT
OF THE
MAN
IN
BLACK



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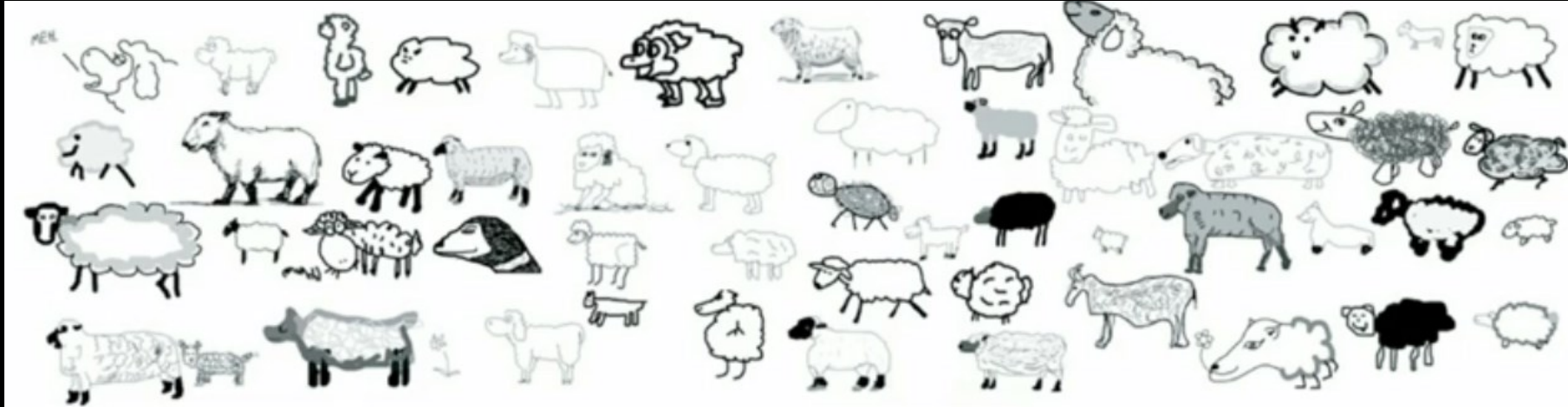
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- visual storytelling
- crowd can draw single frame using a flash drawing tool
- frames inserted into an eight second basic music video
- Contribution from
 - 250'000 people
 - from 172 countries
- Hundreds of variations of the same video

<https://www.youtube.com/watch?v=WwNVINt9iDk> (5min47)

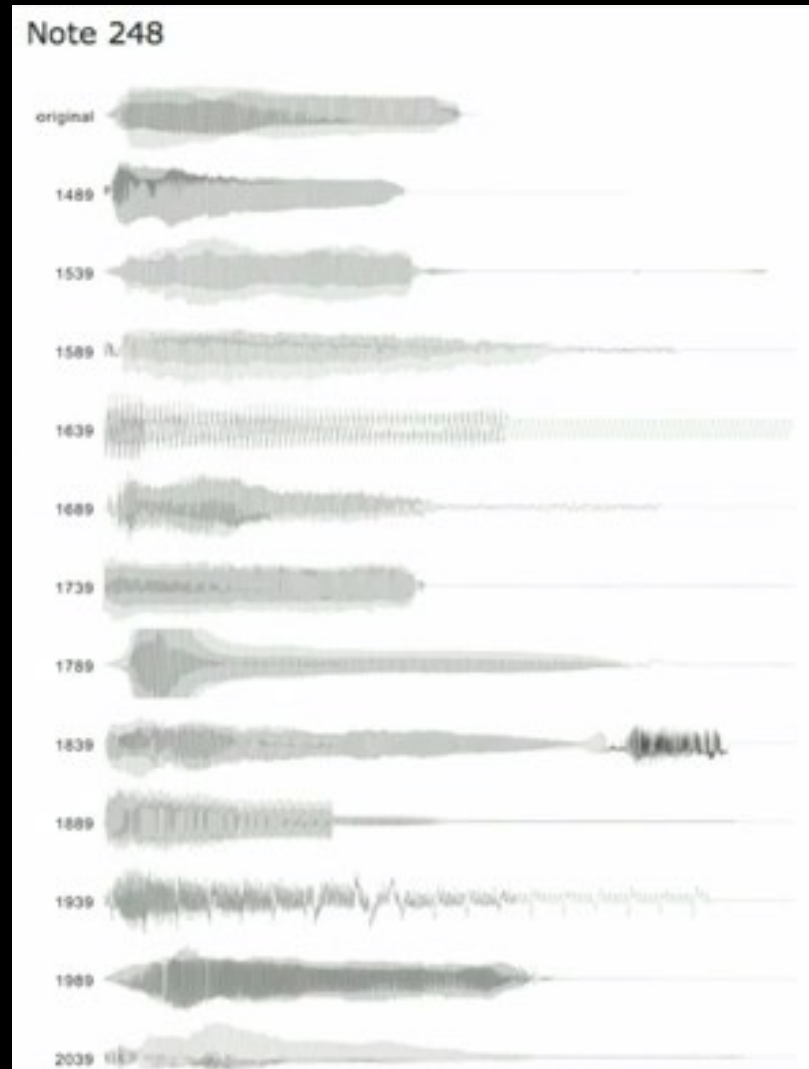
Mechanical Turk

sheepmarket.com



Approximate collection rate	: 11 sheep/hour
Average Wage	: \$.69/hour
Rejected sheep	: 662
Longest time spent drawing	: 46 minutes
Shortest time spent drawing	: 4 seconds
Time spent drawing (average/sheep)	: 105 seconds
Collection period	: 40 days
Unique IP addresses	: 7599

Collaborative Music



Y2K Millennium Development Goals by 2015

1. To eradicate extreme poverty and hunger
2. To achieve universal primary education
3. To promote gender equality
4. To reduce child mortality
5. To improve maternal health
6. To combat HIV/AIDS, malaria, and other diseases
7. To ensure environmental sustainability
8. To develop a global partnership for development

Jamie Drummond:

Let's crowdsource the world's goals

TEDGlobal 2012 · 12:10 · Filmed Jun 2012
Subtitles available in 21 languages

 View interactive transcript

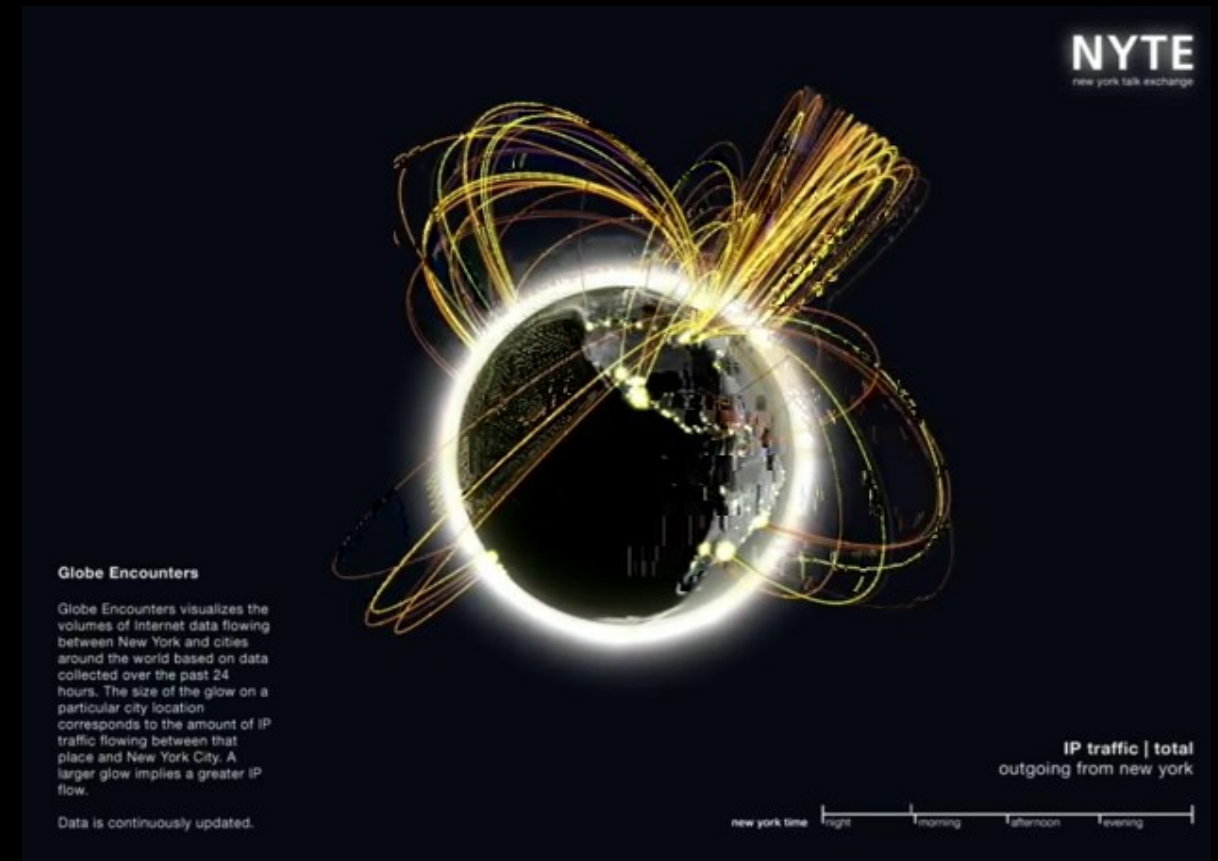


http://www.ted.com/talks/jamie_drummond_how_to_set_goals_for_the_world (12min02, 2012/6)

Analytics und Visualisierung

Visualizing Crowdsourced Data

- The 19th century culture was defined by the novel,
- the 20th century culture was defined by the cinema,
- and the culture of the 21st century will be defined by the interface.



https://www.ted.com/talks/aaron_koblin 00:40-03:30

Visualizing International Communication

- **Sensible Cities Lab and CurrentCity.org**
- **Drinking Data** <http://senseable.mit.edu/ccfs>
- **Spending Patterns** <http://senseable.mit.edu/bbva>
- **Network and Society** <http://senseable.mit.edu/network>

Datenauswertung und Visualisierung

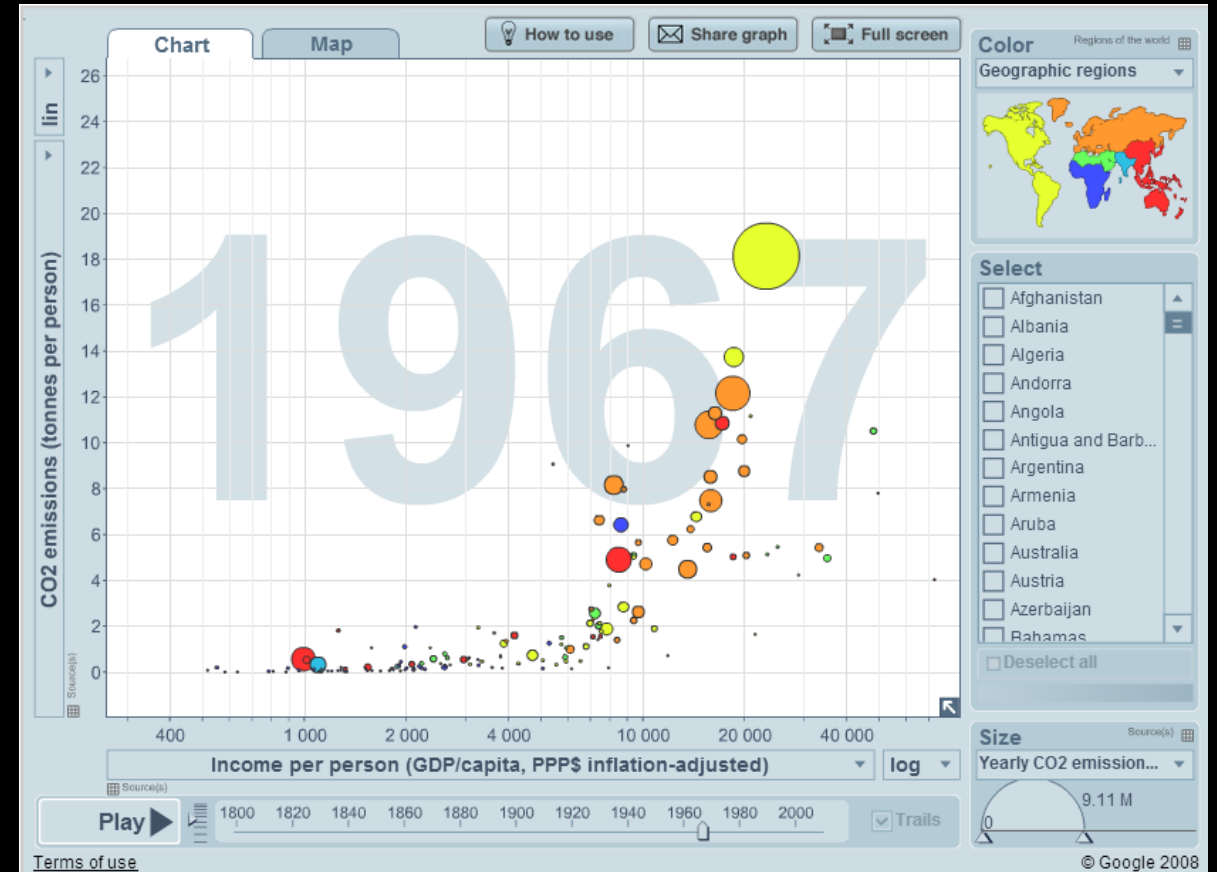
Hans Rosling:

**Let my dataset
change your
mindset**

TED@State · 19:56 · Filmed Jun 2009



http://www.ted.com/talks/hans_rosling_at_state
(3min40-4min30)



<http://www.gapminder.org/>



Ausblick und Zusammenfassung

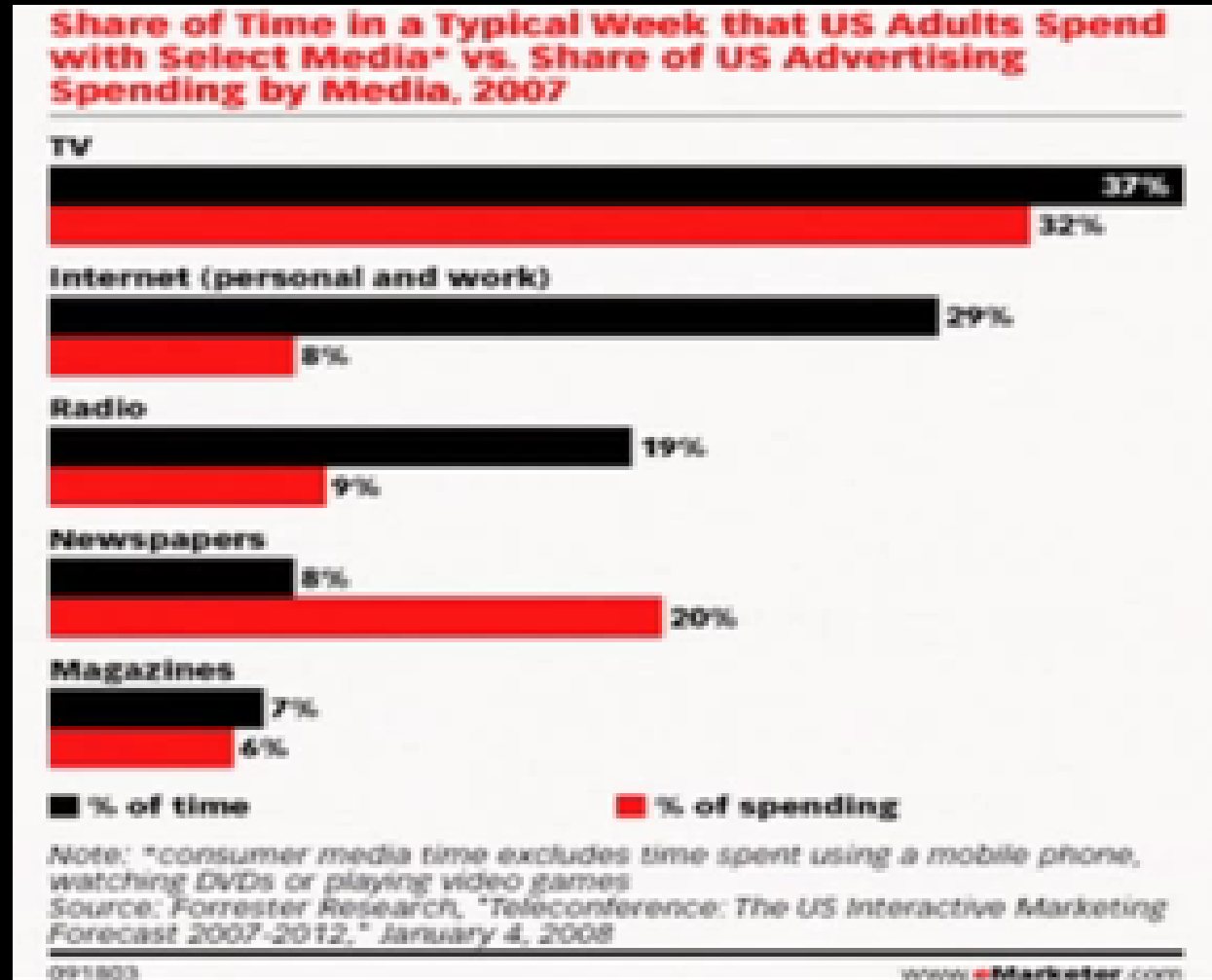
The power and the danger of online crowds

http://www.ted.com/talks/james_surowiecki_on_the_turning_point_for_social_media (16min49)

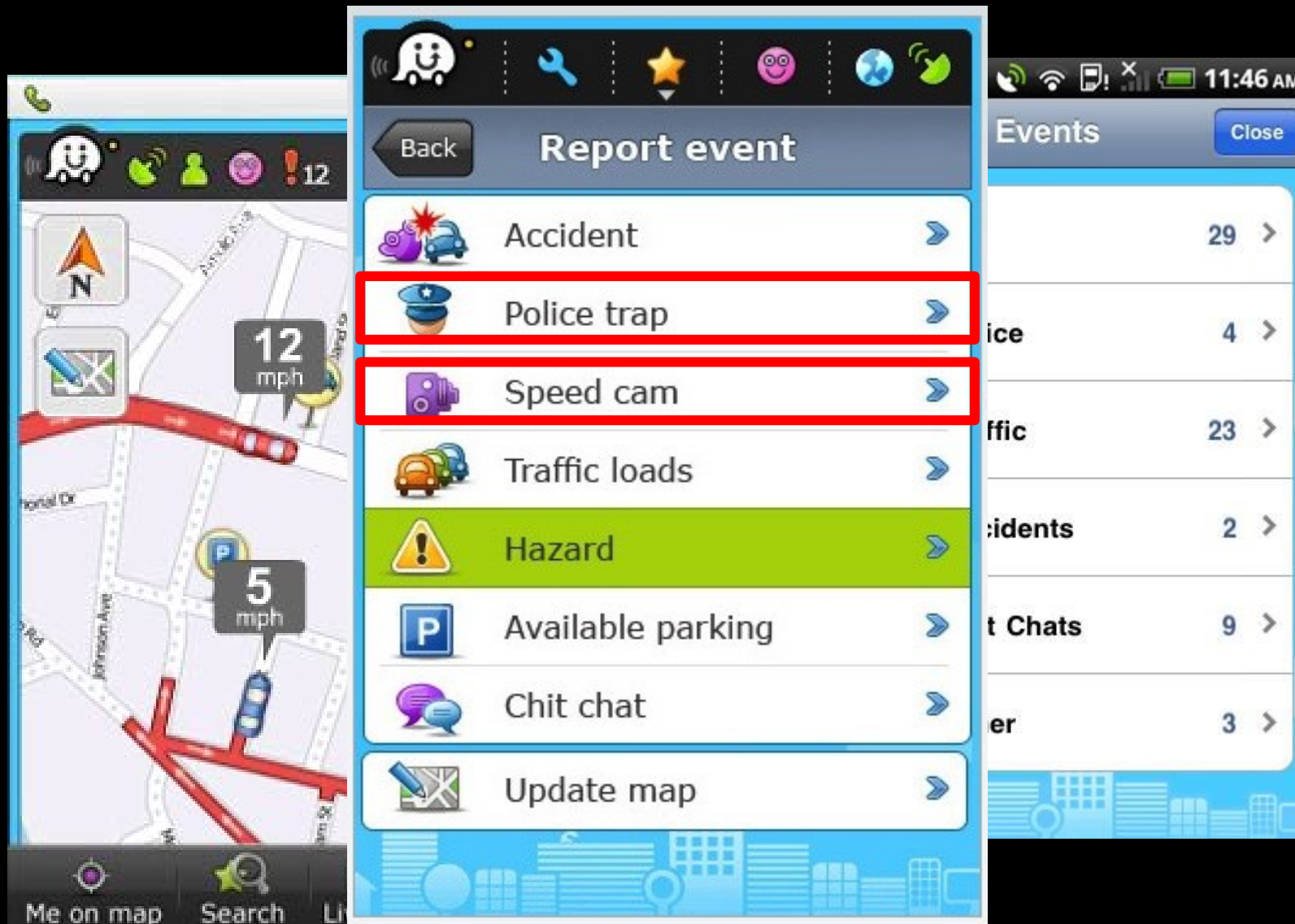
Crowdsourcing: Achieving Data Quality with Imperfect Humans

Panos Ipeirotis,
New York University

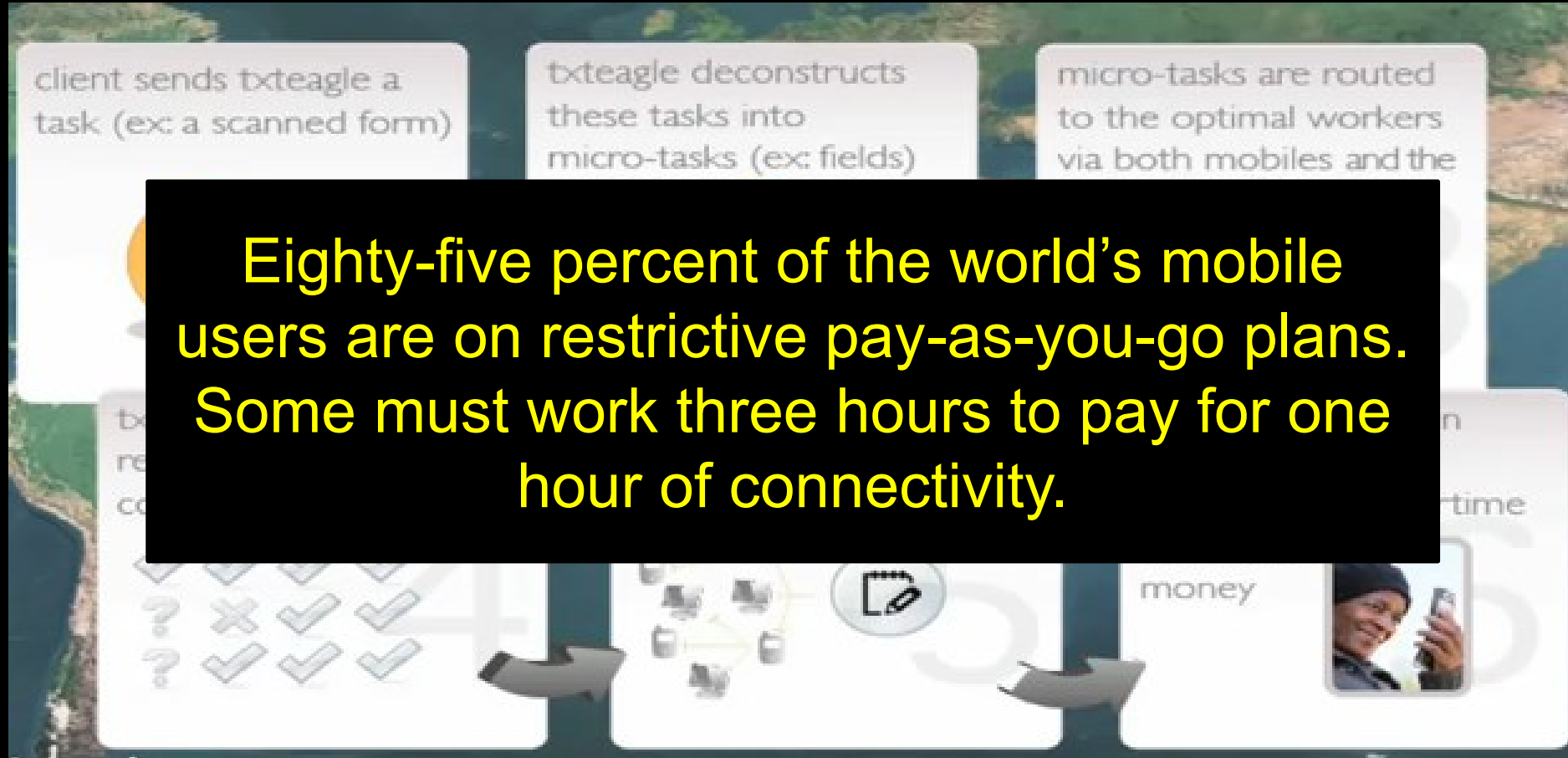
- Brand advertising



Mobile Crowdsourcing: Erfassung von Verkehrsinformationen «Waze»

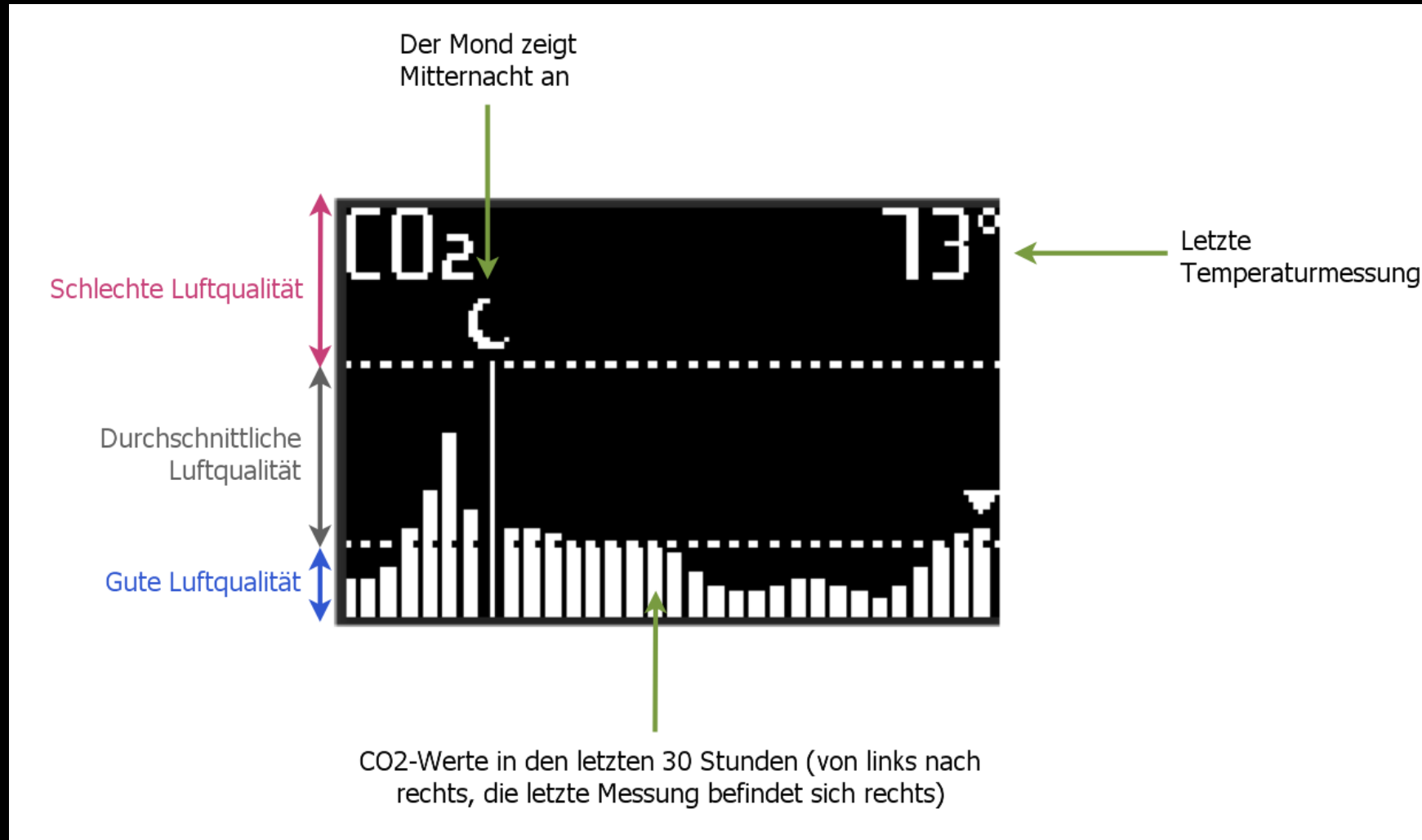


Mobile Crowdsourcing: txteagle www.jana.com aggregate consumer insights about people in emerging economies



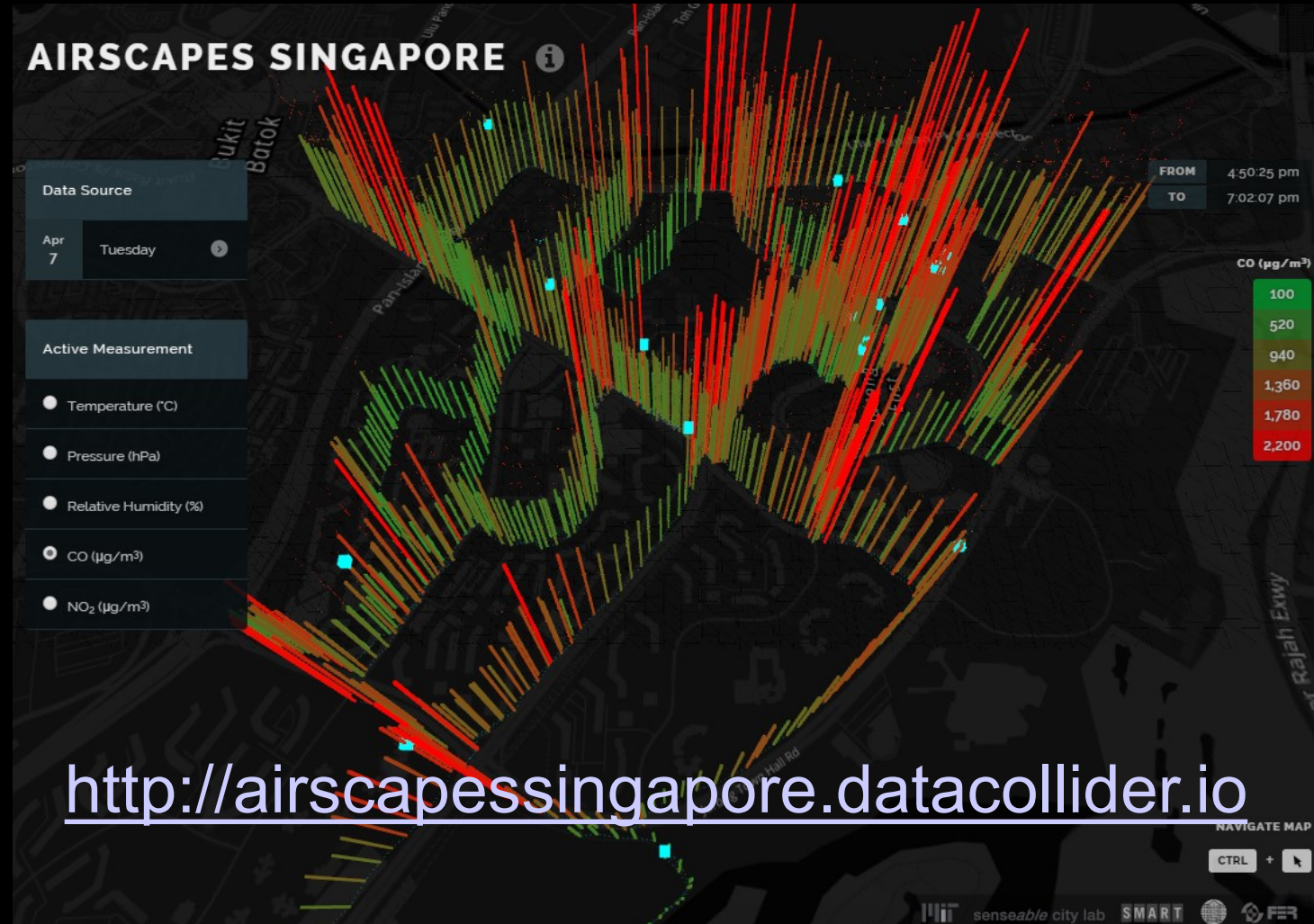
Nathan Eagle, ex. MIT, TED 2010, Mobile Crowdsourcing
<https://www.youtube.com/watch?v=HHhzXVEQdCE> (9min33)

Internet of Things (IoT) Crowdsensing Withings Smart Body Analyzer



<https://healthmate.withings.com> (Quantified Self)

Luftverschmutzung



... und wie weiter ?

- **Classic Crowdsourcing ist da und nicht mehr wegzudenken**
- **Mobile und Internet of Things Crowdsourcing wird noch einschneidender als Classic Crowdsourcing**
- **Was auf uns zukommt, versteht ihr nur richtig, wenn ihr selbst mitmacht**

Download PDF ab 26.6.2015

www.cnlab.ch > Publikationen

Prof. Dr. P. Heinzmann

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HSR Hochschule für Technik Rapperswil, Oberseestrasse 10, 8640 Rapperswil

peter.heinzmann@cnlab.ch

Sharing Economy, On-Demand Prinip

- **Mobilität**
 - Taxidienste: Uber, Lyft, Curb, Sidecar, Blablacar
 - Lieferdienste: Shyp, Instacard
 - Car Sharing: obility, Sharoo
- **Unterkünfte**
 - Ferien: Airbnb, Couchsurfing, Homeaway, Wimdu, Hapimag, Interhome
 - Gewerberäume
- **Dienstleistungen**
 - Jacando (Putzen, Gartenarbeiten, Umzug und Transport, Familienbetreuung, Technische Hilfe, Handwerksarbeiten)
 - Mila Swisscom Friend (Computer, Mobile Devices, TV, Networks), EWZ Expert (Lampen montieren, Kabel anschliessen, Multimedia installieren, Mobiliar aufbauen)

TED-Talks on Sharing Economy

Rachel Botsman:

The case for collaborative consumption

TEDxSydney · 16:34 · Filmed May 2010

Subtitles available in 29 languages

 View interactive transcript



- April 14, 2015, TEDxBarcelona
The sharing economy
www.tedxbarcelona.com
- Dec 2010, Rachel Botsman,
The case for collaborative consumption
- Sep 2012, Rachel Botsman,
The currency of the new economy is trust