



## The Global Language of Business

# Public Data APIs in Retail (EU 1169)

# Open Data Lecture Bern

Klaus Fuchs  
May 7th, 2015



# Who are the Auto-ID Labs?



[HOME](#)

[ABOUT US](#)

[WORKING WITH US](#)

[RESEARCH](#)

[PUBLICATIONS](#)

[OPEN SOURCE](#)

RESEARCH PARTNER



THE GLOBAL LANGUAGE  
FOR BUSINESS



The Global Language of Business

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# Auto-ID Labs are GS1's research partner and focus on «Internet of Things»

- Auto-ID Labs are research partners of GS1
- Research focus is centered around retail: From sensor technologies to behavior-changing apps
- Located at top-ranked universities:
  - Cambridge
  - MIT
  - **ETH + HSG**
  - Fudan
  - KAIST
  - Keio
- Links:
  - [www.autoidlabs.org](http://www.autoidlabs.org)
  - [www.autoidlabs.ch](http://www.autoidlabs.ch)



Sources: [www.autoidlabs.org](http://www.autoidlabs.org)

# Auto-ID Labs are GS1's research partner and focus on «Internet of Things»

- Our team:



**Assistant Prof. Dr. Alexander Ilic**

Director Auto-ID Labs

ETH / HSG

**Research:**  
Internet of Things; Mobile technology;  
Consumer behavior; Retailing

[alexander.ilic@unisg.ch](mailto:alexander.ilic@unisg.ch)



**Dr. Edward Ho**

Researcher

**Research:**  
Mobile social persuasion; consumer  
analytics; Internet of Things

[eho@ethz.ch](mailto:eho@ethz.ch)



**Runhua Xu**

Researcher

**Research:**  
Internet of Things; Consumer mobile  
applications; Post-purchase services

[rxu@ethz.ch](mailto:rxu@ethz.ch)



**Remo Frey**

Researcher

**Research:**  
Internet of Things; Consumer mobile  
applications

[rfrey@ethz.ch](mailto:rfrey@ethz.ch)



**Klaus Fuchs**

Researcher

**Research:**  
Internet of Things; APIs; Big data;  
Consumer mobile applications

[fuchsk@ethz.ch](mailto:fuchsk@ethz.ch)



**Denis Vučkovic**

Researcher

**Research:**  
Internet of Things; Big data; Consumer  
mobile applications

[vdenis@ethz.ch](mailto:vdenis@ethz.ch)



Sources: [www.autoidlabs.org](http://www.autoidlabs.org)

# Motivation: Today's **data-driven** product recommendation in e-commerce vs. ...



Klaus's Amazon.com Today's Deals Gift Cards Sell Help

Shop by  
Department ▾

Search All ▾

Inspired by Your Browsing History [See more](#)



Inspired by Your Shopping Trends [See more](#)



Recommendations for You in Books [See more](#)



Sales

Satisfaction

... brick & mortar retail: Do they really leverage product data to optimize sales?



# Workshop Agenda

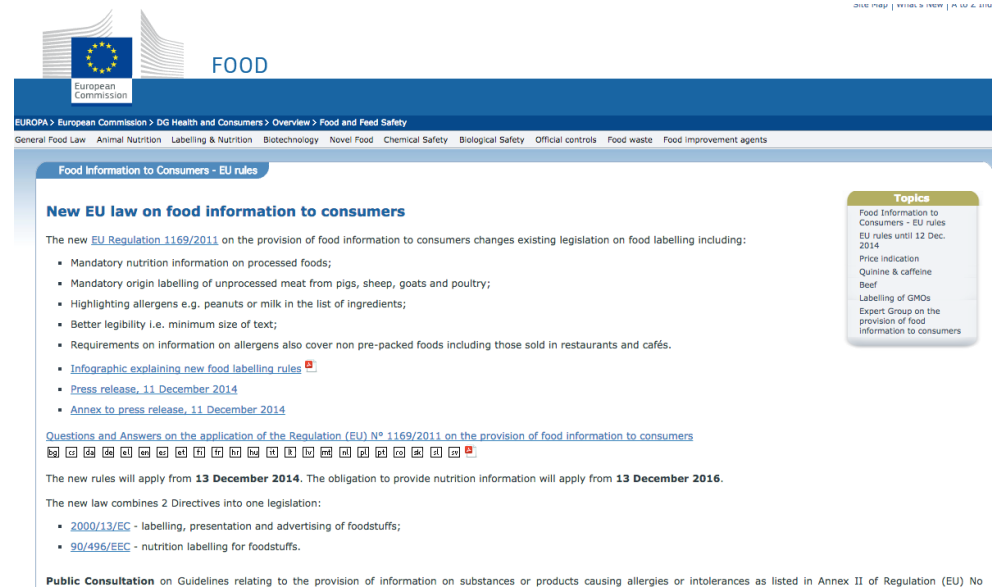
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- Motivation: Why APIs are so important
- Learnings: HackZurich
- Current public data projects at Auto-ID Labs
- Current retail trends
- Discussion and Q&A

# First driver: Regulation, EU-1169 / CH-LKV

- Regulators (EU, but also CH/BLV) empower consumer through open/public data
- EU-1169 is binding by Dec 13, 2016. CH will follow
- All European food manufacturers must publish nutritional data open
- Several aggregators (Trustbox, Codecheck, etc.) aggregate to public data

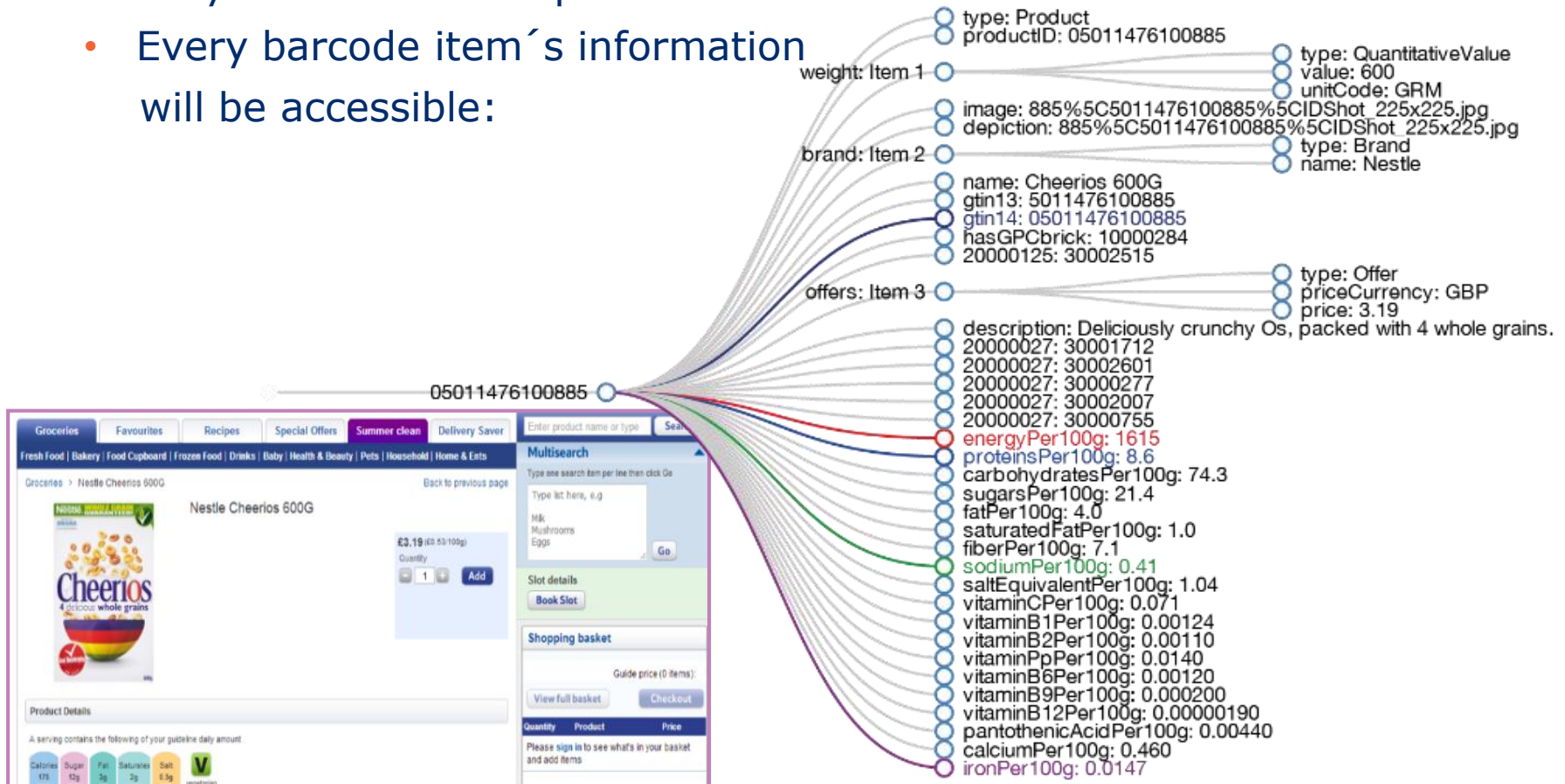
□ How to aggregate? Regulator says nothing about format of nutritional information



The screenshot shows the European Commission's website for food information. The header includes the European Commission logo and the word 'FOOD'. The navigation bar lists various topics: General Food Law, Animal Nutrition, Labelling & Nutrition, Biotechnology, Novel Food, Chemical Safety, Biological Safety, Official controls, Food waste, and Food improvement agents. The main content area is titled 'Food Information to Consumers - EU rules' and features a section 'New EU law on food information to consumers'. This section states that the new EU Regulation 1169/2011 changes existing legislation on food labelling, including mandatory nutrition information, origin labelling, allergen highlighting, and better legibility. It also mentions that the new rules will apply from 13 December 2014. A sidebar on the right lists 'Topics' such as Food Information to Consumers, EU rules, EU rules until 12 Dec. 2014, Price indication, Quinine & caffeine, Beef, and Labelling of GMOs. The footer of the page mentions 'Public Consultation' on guidelines relating to the provision of information on substances or products causing allergies or intolerances.

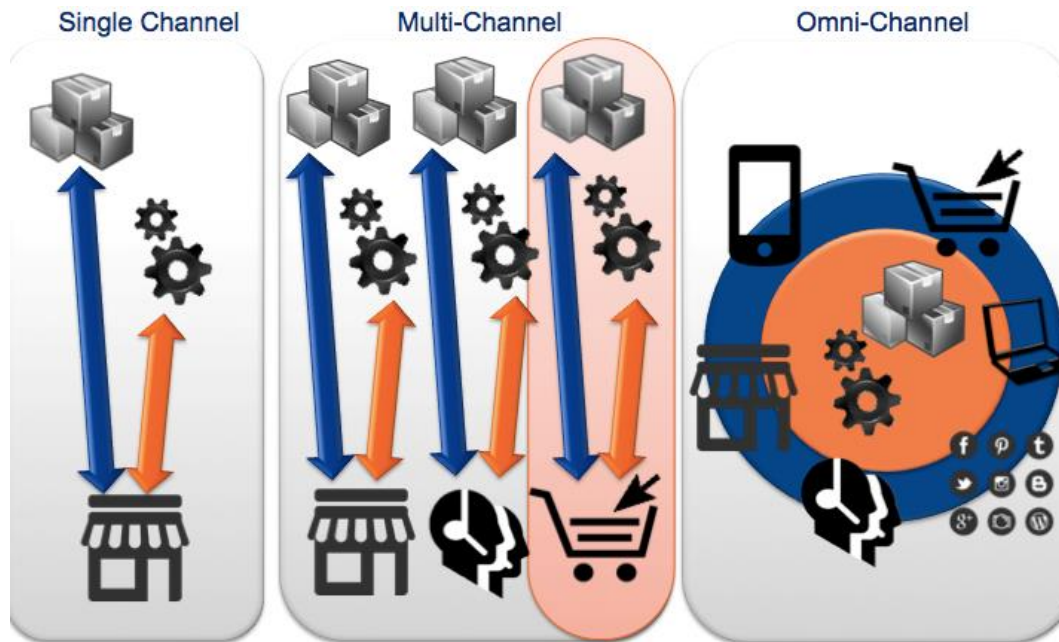
# First driver: Regulation, EU-1169 / CH-LKV

- Only in China + Europe
- Every barcode item's information will be accessible:



# Second driver: The Omni-Channel Consumer

- Consumers want to be able to shop mobile, physical, e-commerce etc.
- Current retailers do not use APIs a lot yet (Q2, 2015)
- Big changes are already observable



Switch from Single to Omni-Channel Consumers



Consumers expect ubiquitous Information

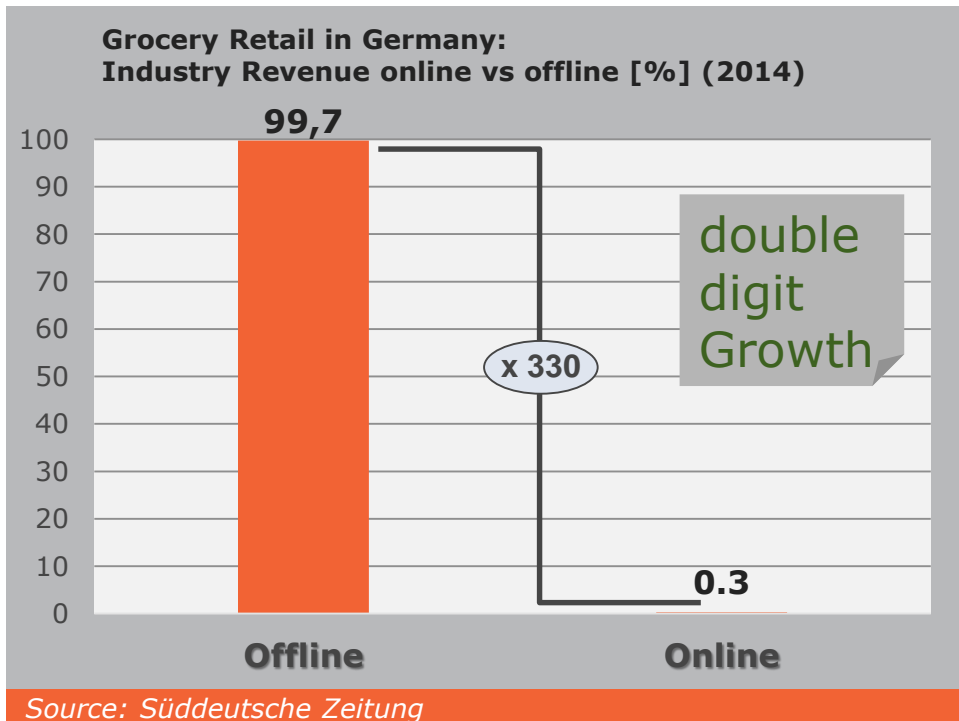
# Second driver: The Omni-Channel Consumer

- **Consumers head to where they receive the best value for their money** – often from offline to online
- **Digitalization in retail** offers savings, transparency, acceleration, personalization ...



Source: [www.businessinsider.com](http://www.businessinsider.com)

# Second driver: The Omni-Channel Consumer



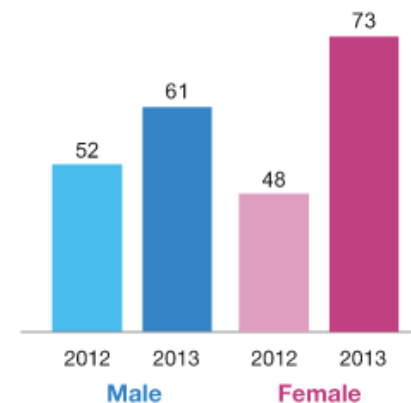
Answer: When information about the product universe is available and allows customers a friction-free shopping experience **(Think: APIs!)**

# Second driver: The Omni-Channel Consumer

- In South Korea mobile grocery shopping is the norm
- 2014: SK, M-Commerce 14bn USD market

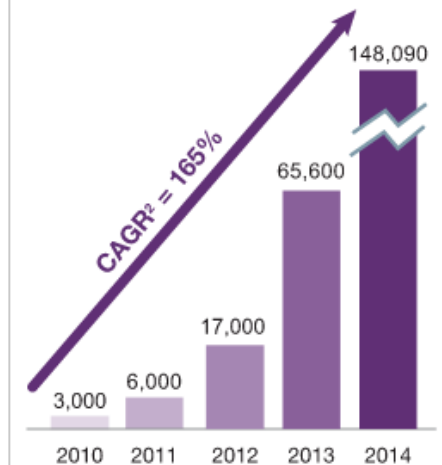
Mobile shopping is rising exponentially in South Korea, and the majority of consumers already have mobile-shopping experience.

Share of consumers with mobile-shopping experience,<sup>1</sup>  
%



Total value of mobile-commerce market is growing rapidly in South Korea.

Mobile-commerce market size,  
KRW 100 million



<sup>1</sup>DMC survey report, 423 males/females aged 19–49.

<sup>2</sup>Compound annual growth rate.

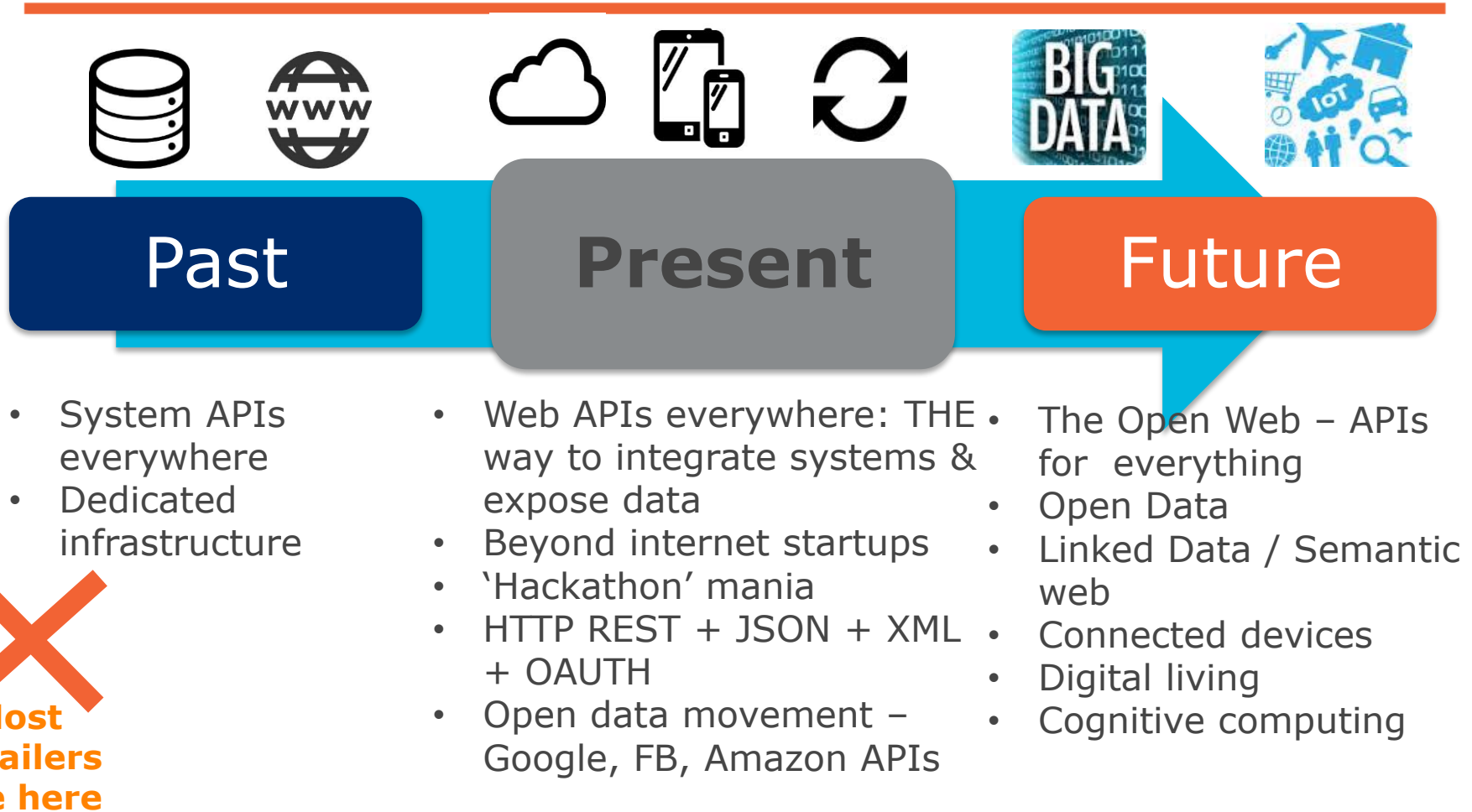
Source: Daewoo Securities; KCCI

# Motivation:

## **Why APIs are so important:**

1) Current data landscape not ready for developers.

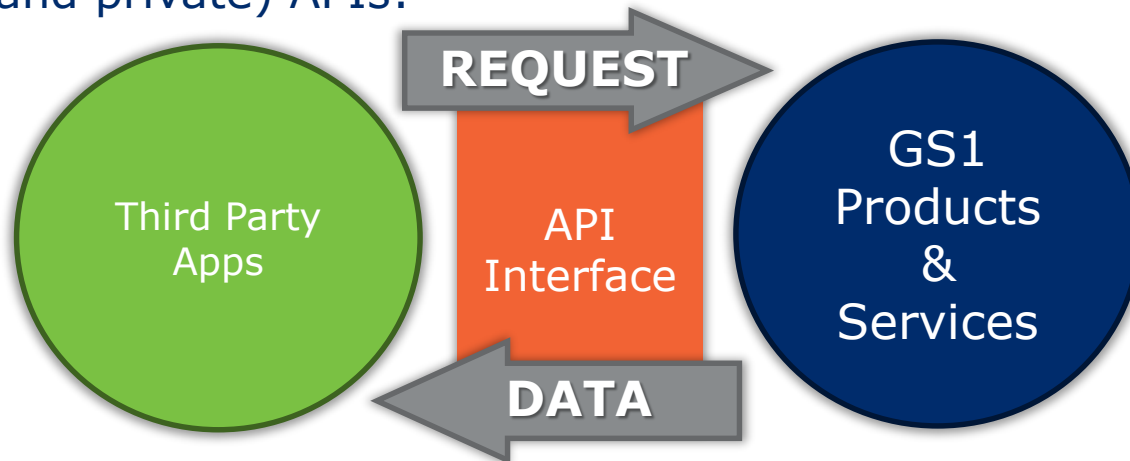
# API evolution



# APIs are the underlying data-sharing foundation that allow apps to collaborate...

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- Digital services rely on trusted data – made available through (open, public and private) APIs:



- You all have used services built on APIs that ease our daily life:

*Where is a store? ... Google Maps API*

*Where are good restaurants nearby? ... Yelp API*

*What do people think of a topic? ... Twitter API*

*Which interests has my user-base? ... Facebook API*

*What do popular sights in Brussels look like? ... Flickr API...*

# What are APIs

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- **APIs are Sets of requirements that govern how one "Apps can talk to one another"**
- **APIs are software-to-software interface, providing a bridge between apps, connected devices and back-end systems**

## Developer Library / SDK

- Procedure calls, routines, data structures, object classes, variables etc.
- Examples – Microsoft Windows API, JAVA API, Android SDK, iOS Developer Library

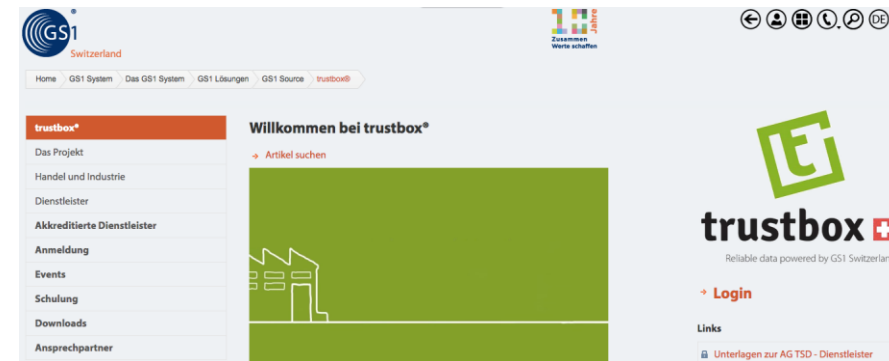
## Web APIs

- Web specifications that expose remote procedure calls using standard web technologies like HTTP, SOAP, XML, JSON, Web Services
- Facebook APIs, Twitter APIs, Google APIs

# Swiss Nutrition Data Aggregators

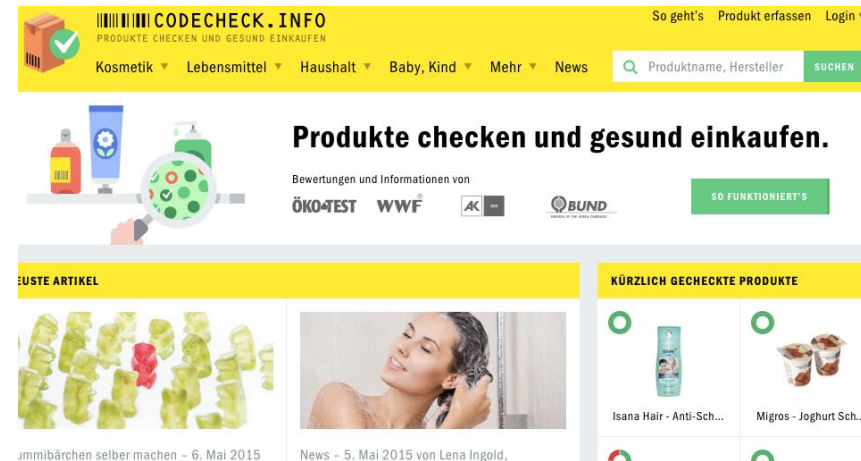
- **Trustbox**

- Developer access at 300 CHF/y
- Trusted data from manufacturers
- [www.gs1.ch](http://www.gs1.ch)
- "Public data"

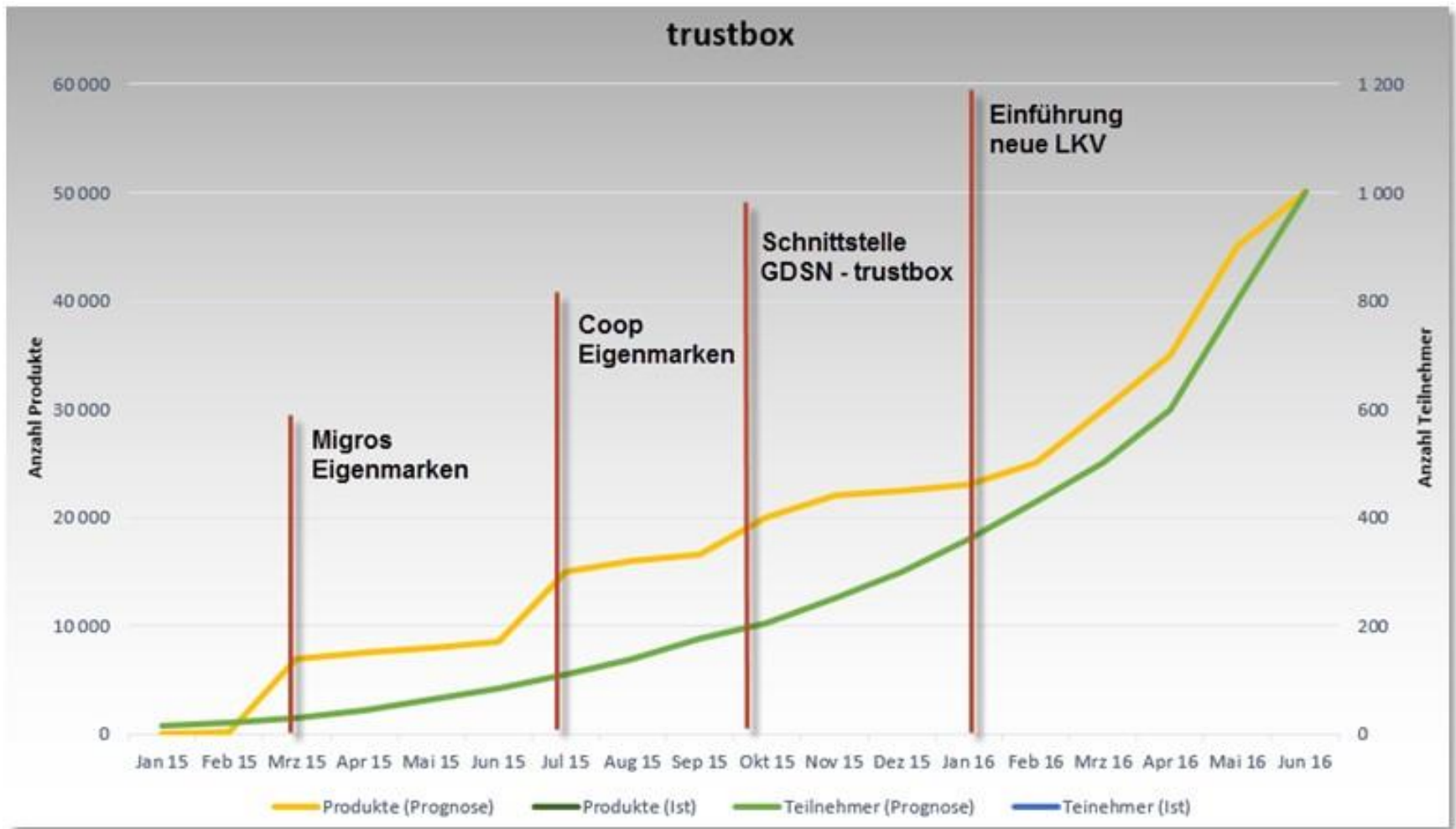


- **Codecheck**


- Developer access freemium
- trusted data + community input
- [www.codecheck.info](http://www.codecheck.info)
- "Open/Public data"




# Success from HackZurich: Migros enters own brands' information into Trustbox




# Example: There is room for improvement, leading to enormous friction for retail startups

**Prix Garantie** 


Mineralwasser




 **AB 158,90 EUR KAUFEN**

↓




Price for 1 bottle of water «183 USD»

**Coop - Geflügelaufschnitt** 

Aufschnitt PRODUK



**PRODUKTBEWERTUNG**

H. Kneriemien	Inhaltsstoffe
 bedenkenlos	E262, E301, E300
 Gefahrenpotenzial beachten	E450, E451, E452
 unbedingt meiden	Nitritpökelsalz, E621

[ALTERNATIVE PRODUKTE SUCHEN ►](#)

↓

Meat: «Must not consume»

Source: GS1 Switzerland

# JSON

- Let us look into a product example
- How to access data bases:
  - [www.codecheck.info](http://www.codecheck.info)
  - [www.gs1.ch](http://www.gs1.ch) (Trustbox)
  - Auto-ID Labs can provide you scripts and help on how to integrate
- Remember:
  - It is all work in progress, so be patient :)

```
    "@canonicalName": "generalVegan",  
    "value": "false"  
  },  
],  
  
"nutritionFactsGroup": {  
  "nutritionFacts": [  
    {  
      "@canonicalName": "totalFat",  
      "amount": "20",  
      "unitOfMeasure": "g"  
    },  
    {  
      "@canonicalName": "saturatedFat",  
      "amount": "8",  
      "unitOfMeasure": "g"  
    },  
    {  
      "@canonicalName": "totalCarbohydrate",  
      "amount": "64",  
      "unitOfMeasure": "g"  
    },  
    {  
      "@canonicalName": "sugars",  
      "amount": "28",  
      "unitOfMeasure": "g"  
    },  
    {  
      "@canonicalName": "dietaryFiber",  
      "amount": "7",  
      "unitOfMeasure": "g"  
    },  
    {  
      "@canonicalName": "protein",  
      "amount": "7",  
    },  
  ],  
}
```

# Workshop Agenda

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- Motivation: Why APIs are so important
- Learnings: HackZurich
- Current public data projects at Auto-ID Labs
- Current retail trends
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# Motivation:

## **Why APIs are so important:**

- 1) Current data landscape not ready for developers.
- 2) APIs can and will change the way we shop!

# There will be retail apps for almost every need within society: Retail + API = Innovation



Source: Auto-ID Labs ETH / HSG

In order to show how APIs change how we shop, we co-hosted Continental Europe's largest hackathon



THE LARGEST HACKATHON SWITZERLAND HAS EVER SEEN

# //ACK zürich

10-12 October 2014

THE EVENT IS OVER! STAY INFORMED ABOUT NEXT YEAR'S HACKZURICH:

PLAYLIST | 1/2 | HackZurich 2014 Official Aftermovie

**HackZurich**

- 351 Programmers
- 101 apps
- 15 retail apps
- 245k lines of code
- 2.2 tons of food
- 40 hours
- 45 Sponsors
- 3400 liters of drinks
- GS1 Switzerland
- Brands
- Retail
- Products
- APIs
- GTIN
- JSON

EVENT PAGE

Source: Auto-ID Labs ETH / HSG



# Hackathons are grounds for innovation: What's possible with «perfect retail APIs»

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- Hackathons are competitive events of 1-2 days where programmers gather to learn/hack/have fun.
- Hackathons usually feature sponsors, prizes, press coverage, etc.
- HackZurich: 40h, 351 programmers (80% students) , 101 apps
- Retail Innovation Workshop, October 2014:  
GS1 CH (Trustbox API)   
Migros (Switzerland's largest retailer)   
Auto-ID Labs ETH / HSG 
- Hackathons are ideal training grounds for innovation: E.g. Twitter

# Sponsor list 2014 shows importance of digitalization in various industries:



Source: HackZurich.com



# Enough heard, let us see HackZurich in action:

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Source: *HackZurich.com*

MOVIE:

Official Aftermovie:

<https://www.youtube.com/watch?v=rs2-Vp9ITLQ>

TV News (German):

<https://www.youtube.com/watch?v=XyZJi2sbBdg>

# Within HackZurich: Migros, GS1 and Auto-ID Labs organized the Retail API workshop

GS1 | Auto-ID Labs ETH / HSG | Migros

## RETAIL INNOVATION

October 10<sup>th</sup>-12<sup>th</sup>, 2014, Technopark Zurich

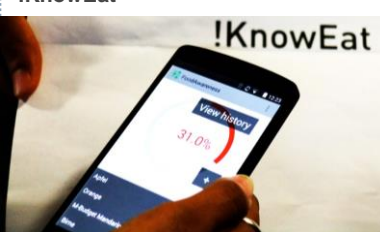
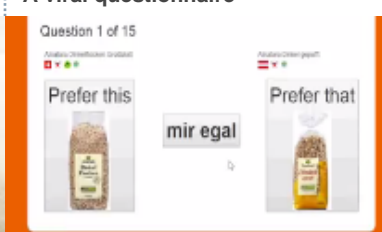
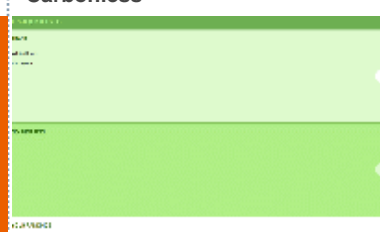


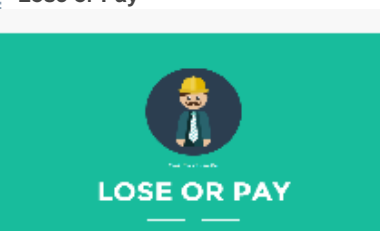
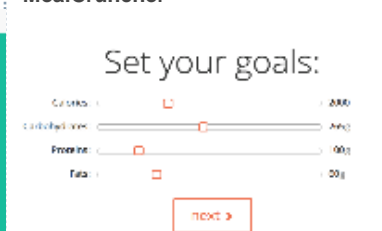
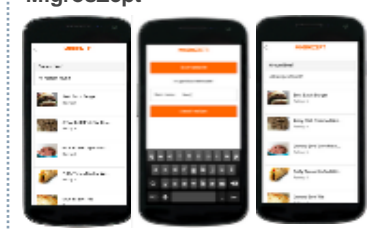
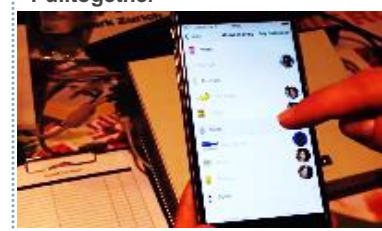
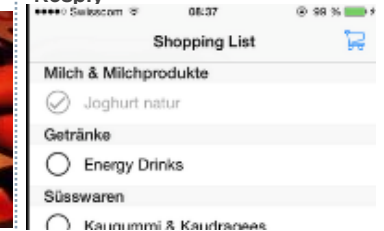


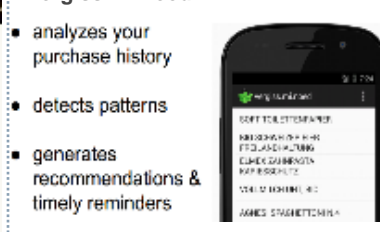

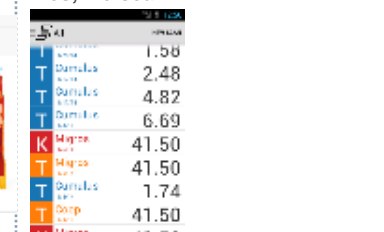


Save the date: HackZurich  
October 2-4, 2015

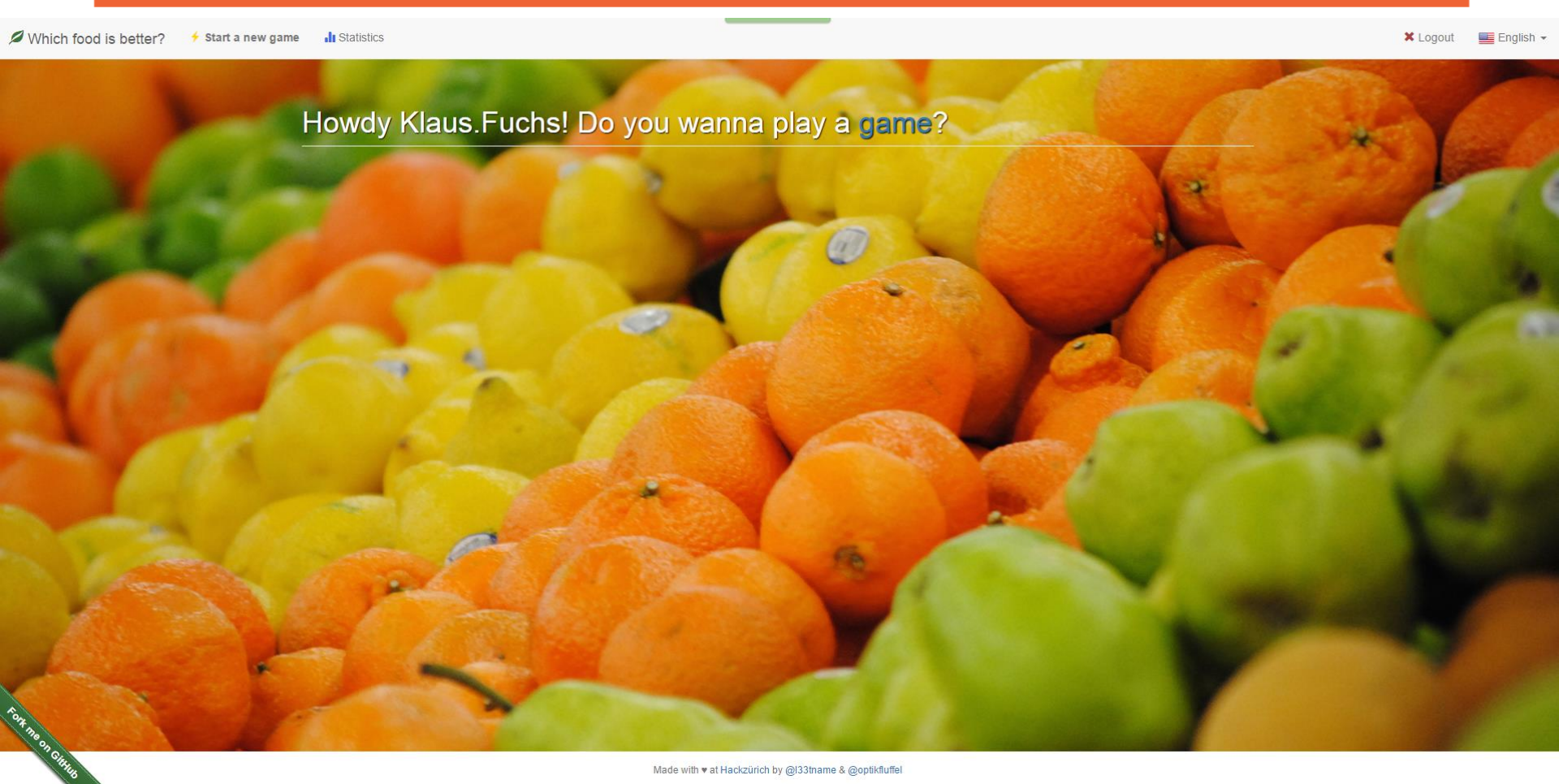
///ACK zürich

Source: Auto-ID Labs ETH / HSG

# Resulting retail apps serve many customer needs: From recipe to health to gamification

<p><b>!KnowEat</b></p>  <p>Health app that checks nutritional composition of your diet</p>	<p><b>A viral questionnaire</b></p>  <p>Game similar to Tinder which compares products in order to determine user profiles, tastes, preferences</p>	<p><b>Carbonless</b></p>  <p>Carbonless determines the CO2-impact of your shopping behavior and suggest similar products.</p>	<p><b>Fridgy</b></p>  <p>Fridgy offers personalized recipes based on preferences, health and allergies and directs you to the closest store dep on availability</p>	<p><b>getCooking</b></p>  <p>getCooking offers recipes with GTINs, creates shopping lists and assists the cooking process through voice-controlled iPad-app.</p>
<p><b>Lose or Pay</b></p>  <p>Diet app which helps one to lose weight</p>	<p><b>MealCruncher</b></p>  <p>Meal planning and ordering service that personalizes your diet for you.</p>	<p><b>MigrosZept</b></p>  <p>Scan a product code and get recipe suggestions that include the scanned product instantly.</p>	<p><b>Pulltogether</b></p>  <p>Doodle for collaborative social shopping: Distribute a large shopping list between friends</p>	<p><b>Resply</b></p>  <p>Smart shopping list that checks items off the list, once scanned with the phone camera</p>
<p><b>SugarBaby Tracking a product</b></p>  <p>App that helps people with diabetes to keep track of their calories and sugar input</p>	<p><b>The Pantry</b></p>  <p>App that delivers food to your door and takes care of a healthy diet.</p>	<p><b>Vergiss.mi.noed</b></p>  <ul style="list-style-type: none"> <li>analyzes your purchase history</li> <li>detects patterns</li> <li>generates recommendations &amp; timely reminders</li> </ul> <p>Predictive shopping list that knows when you need to buy which item again</p>	<p><b>Which food is worse?</b></p>  <p>Game that educates users which food is healthier than a comparable product</p>	<p><b>Yes, we scan!</b></p>  <p>App capable of scanning receipts, saving them and sharing them with people you add to groups.</p>

# Example (1/2): Game, Which food is better?



Source: Auto-ID Labs ETH / HSG



# Example (1/2): Game, Which food is better?

Which food is better?

Start a new game

Statistics

Logout

English

More saturated fatty acids? per 100g

M-Classic Erdbeer-Zitr.-  
Heidelb.-Mango



9

M-Classic Mini Karamell Waffeln



<https://whichfoodisbetter-133tname.rhcloud.com>

Started at [//ACK zürich](#) sponsored by  hacked with ❤️ by @133tname & @optikfuffel

# Example (1/2): Game, Which food is better?

Which food is better? Start a new game Statistics

Logout English

Less sugar? per 100g

Mahony

M-Budget Milchsokolade

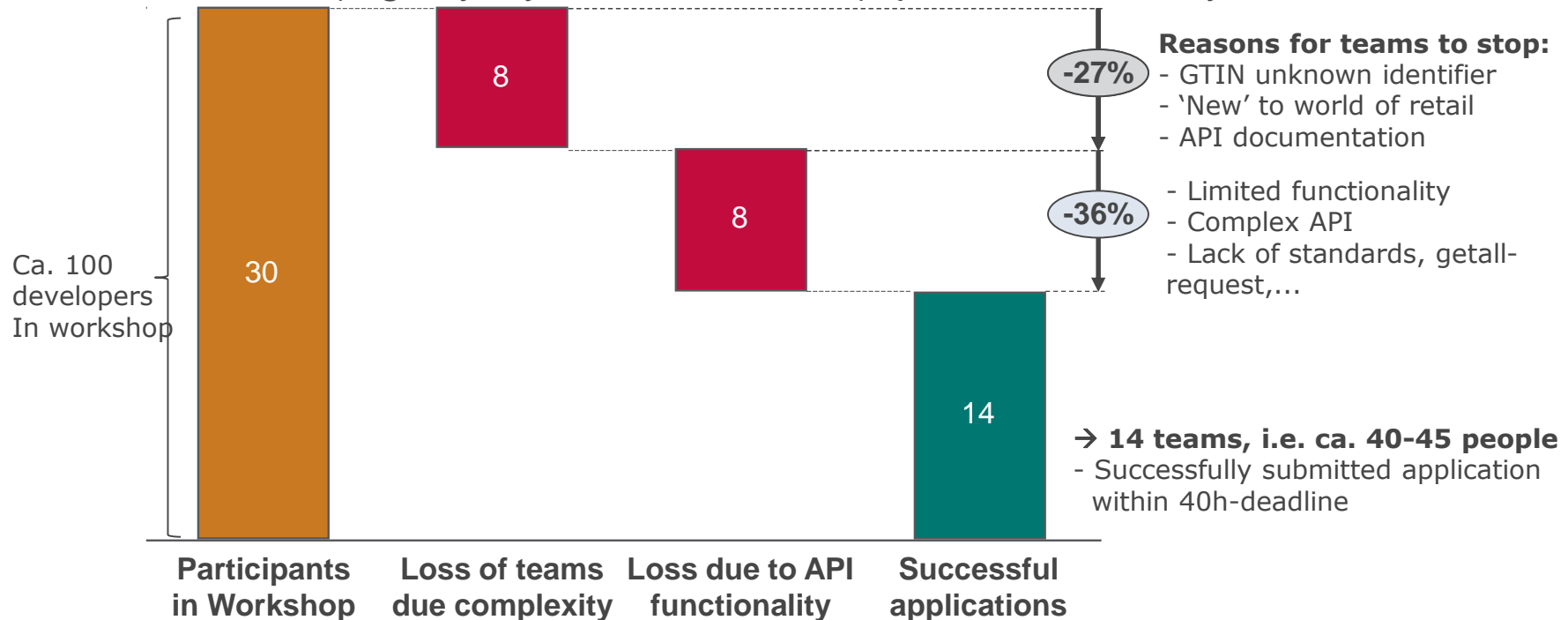
Started at [//ACK zürich](#) sponsored by [hacked with](#) by [@i33tname](#) & [@optiktuffel](#)

<https://whichfoodisbetter-i33tname.rhcloud.com>

# Retail is a hot topic in developer community, yet programmers are not familiar with GS1

✓ **Product master data is central to mobile apps.** Developers requested trusted data across retailers

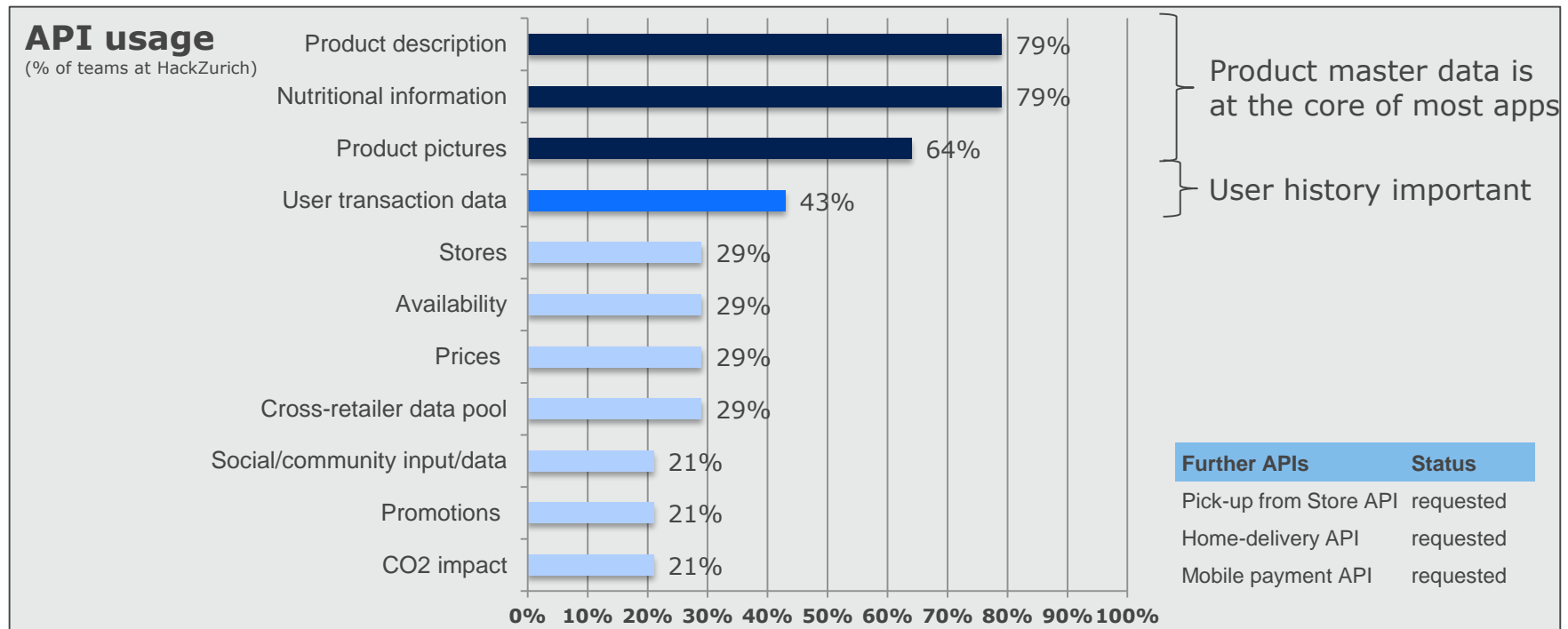
⚡ **Trusted product data alone is not sufficient.** Developers need historic information (e.g. loyalty transaction data), prices, availability, etc.



# API analytics show that besides product master data, transaction data is most important

✓ **Product master data is central to mobile apps.** Developers requested trusted data across retailers

⚡ **Trusted product data alone is not sufficient.** Developers need historic information (e.g. loyalty transaction data), prices, availability, etc.



# Workshop Agenda

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- Motivation: Why APIs are so important
- Learnings: HackZurich
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# The Auto-ID Labs are analyzing how API-based applications influence human habits:

## Shoco Nutrition Panel

- **API + Nutrition**
- We give people feedback on their shopping habits
- +1 day of purchase they receive nutrition scores
- Does data layer lead to behavior change?
- Will customers become (more) loyal to such a service/retailer?



Source: [www.healthology.com.au](http://www.healthology.com.au)

## Personalized Couponing

- **API + Couponing**
- Real-time couponing based on API-detected traits: e.g. vegetarian, household size etc.
- Do APIs allow for improved personalization?



Source: Auto-ID Labs ETH / HSG

## Toxocoloy Study

- **API + Exposure**
- Swiss households can enter their shampoo consumption by scanning barcode labeled products
- An ETH developed app will give Isothiazolinones exposure per person
- Basis: API w/ lab analysis of 200 household products



Sources: [medicaldaily.com](http://medicaldaily.com)

# Workshop Agenda

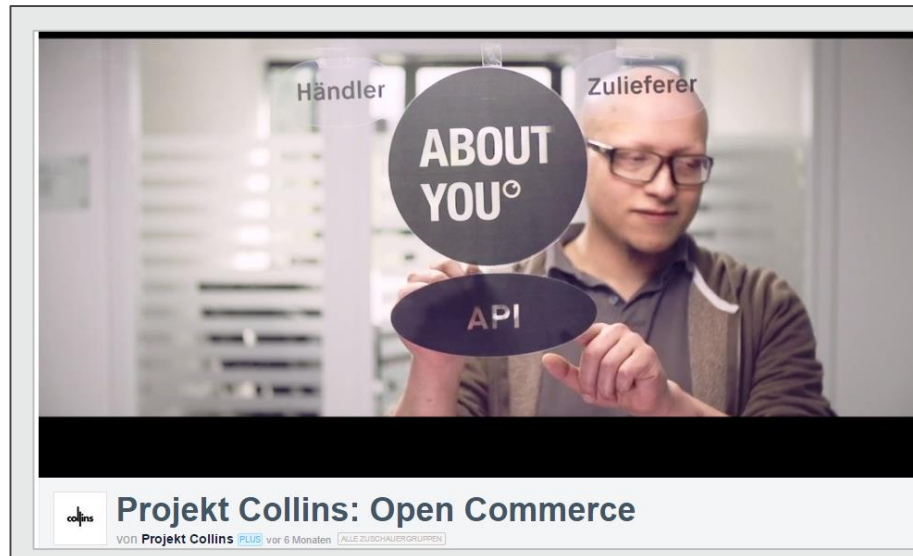
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# Reference Project (1/4):

## «Otto Fashion Retail: Project Collins API»

- **Fashion API:** Project Collins offers 3<sup>rd</sup> parties to create own apps selling products from of the Otto product scope
- Successful market adoption: Double-digit M revenue in 2014 (year 1), aimed break-even in year 5
- 180 FTEs, 13 countries



# OTTO

- 4350 employees
- 2.3bn EUR sales revenue

Sources: 1) Otto, Germany, 2) Gründerszene.de 3) Wikipedia

# Reference Project (2/4): «Groupon: Project Snap»

- **Brand Analytics API:** Groupon Snap lets customers take photos of their receipts and reimburses them for brand-specific purchases
- Launched in Q3 2014
- Will consumers switch from loyalty cards to apps like Snap?

1 ————— 2 ————— 3

**Download the Snap App**  
Search "Snap by Groupon" in the App Store or Play Store

**Check Out This Week's Offers**  
Find cash-back offers on the grocery items you need.

**Shop Anywhere and Get Cash Back**  
Just snap a photo of your receipt. It's that simple!

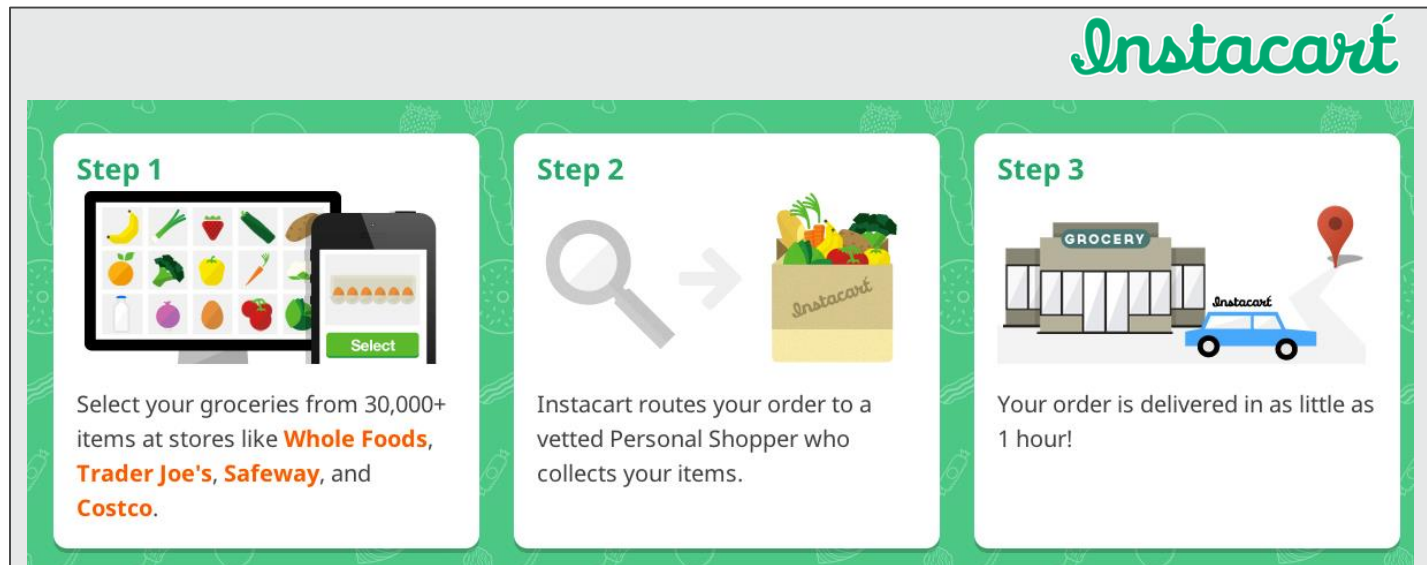
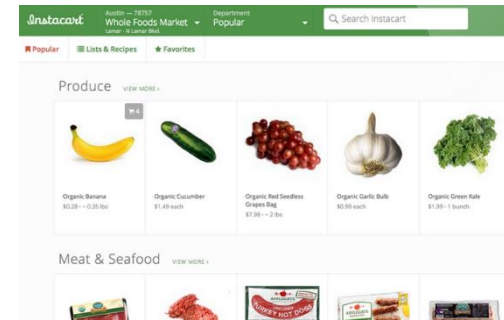
**Snap**  
BY Groupon

- 52M active customers

Source: 1) Groupon Snap, 2) Wikipedia

# Reference Project (3/4): «Instacart» and clones like «Shopwings»

- **Home-Delivery-API:** Instacart (and clones like Shopwings) offer customers to shop remotely at retailers and receive items via same-day delivery
- Will consumers switch? (like they did from J.C. Penney to Amazon)
- Instacart launched in 2012, Shopwings in 2013



Source: Instacart

# Reference Project (4/4): Amazon Fresh and Amazon Dash

- **Home-Delivery-API:** Voice-controlled and barcode-enabled product ordering device
- Amazon Fresh **delivers on the same day**

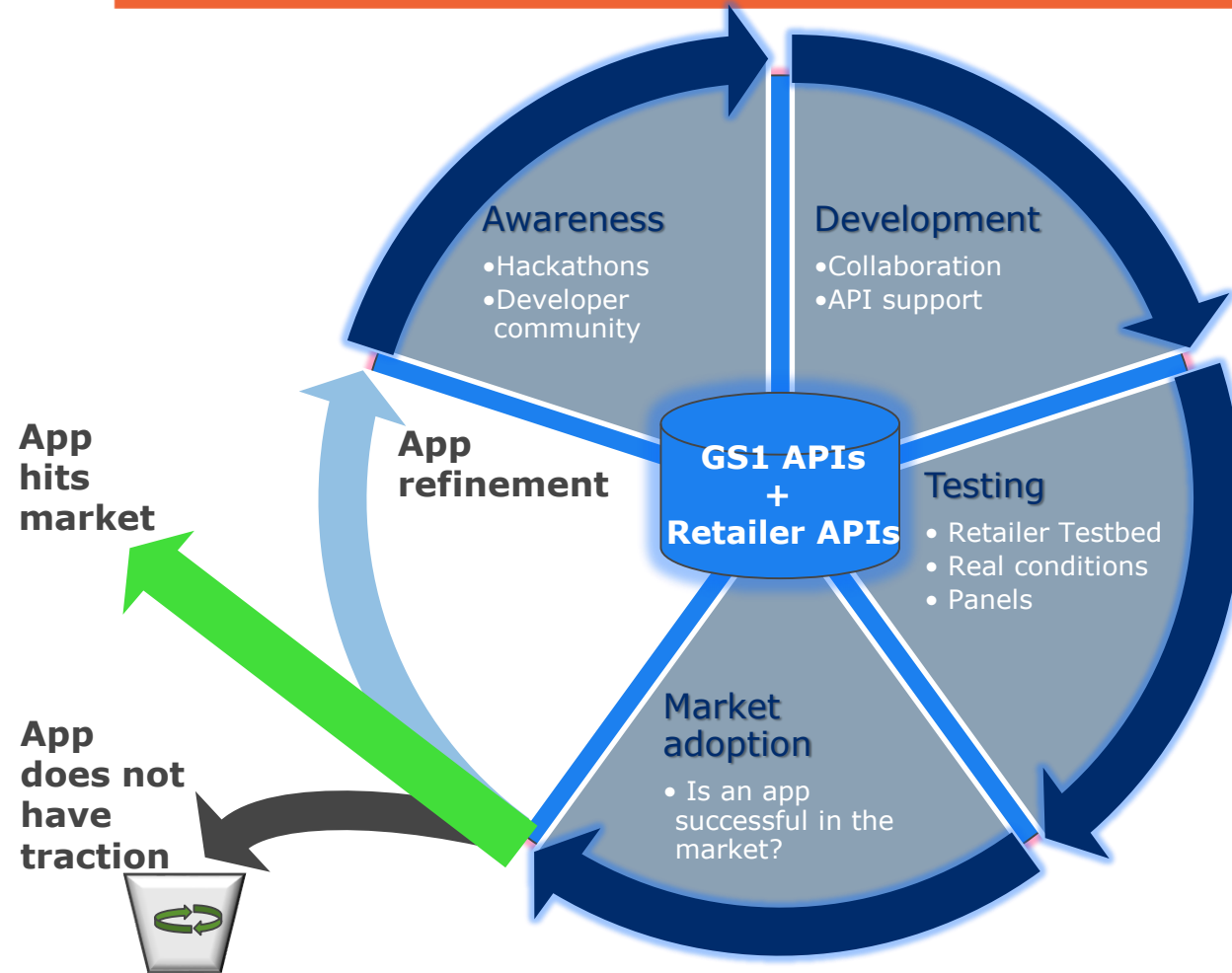


# Motivation:

## **Why APIs are so important:**

- 1) Current data landscape not ready for developers.
- 2) APIs can and will change the way we shop!
- 3) GS1 and its partners – can introduce retail APIs that build the foundation of future applications

# In order to be successful in leveraging APIs, GS1 must be present in the development scene



- Circle of API-based application innovations shall be iterated many times within a year
- Keep refining until applications hit market successfully

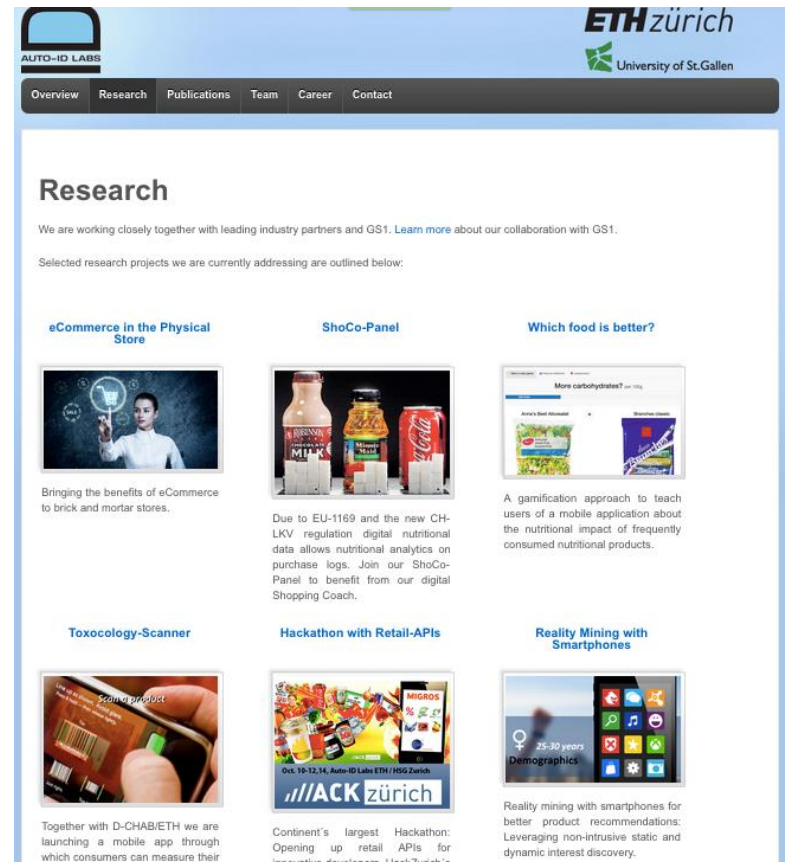
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# Master thesis offer

- If you want to work on Retail Data please feel free to apply
- Nutrition,
- Mobile Couponing,
- Apps,
- Transaction data,
- Recommender systems,
- ...



The screenshot shows the website of AUTO-ID LABS, a research group at ETH Zürich and the University of St. Gallen. The website has a blue header with the logo and navigation links: Overview, Research, Publications, Team, Career, and Contact. The main content area is titled "Research" and features a grid of six research projects, each with a title, a representative image, and a brief description.

**Research**

We are working closely together with leading industry partners and GS1. [Learn more](#) about our collaboration with GS1.

Selected research projects we are currently addressing are outlined below:

- eCommerce in the Physical Store**  
Bringing the benefits of eCommerce to brick and mortar stores.
- ShoCo-Panel**  
Due to EU-1169 and the new CH-LKV regulation digital nutritional data allows nutritional analytics on purchase logs. Join our ShoCo-Panel to benefit from our digital Shopping Coach.
- Which food is better?**  
A gamification approach to teach users of a mobile application about the nutritional impact of frequently consumed nutritional products.
- Toxicology-Scanner**  
Together with D-CHAB/ETH we are launching a mobile app through which consumers can measure their
- Hackathon with Retail-APIs**  
Continent's largest Hackathon: Opening up retail APIs for
- Reality Mining with Smartphones**  
Reality mining with smartphones for better product recommendations: Leveraging non-intrusive static and dynamic interest discovery.

# Discussion, Q&A!



Sources: Auto-ID Labs ETH / HSG