

O'REILLY®

Artificial Intelligence Conference

PRESENTED WITH  intel AI

Make AIs talk to each other!

Tobias Martens

London, 16.10.2019

oreillyaicon.com
#OReillyAI

WHOELSE?



Make AIs talk to each other!

Universal Grammar for Conversational AIs

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Mobile: +49 159 0107 9491

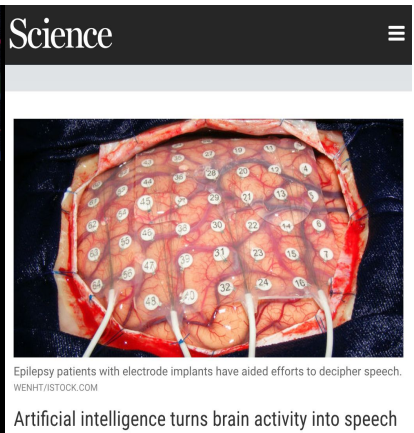
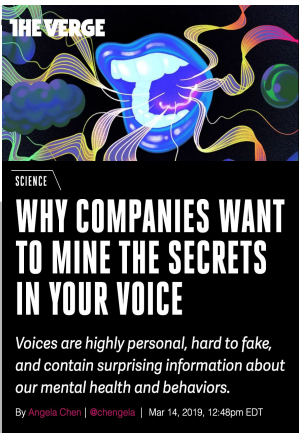
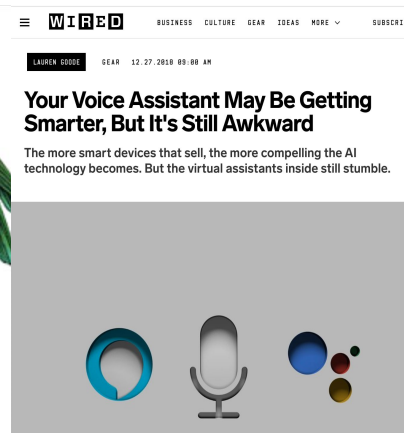
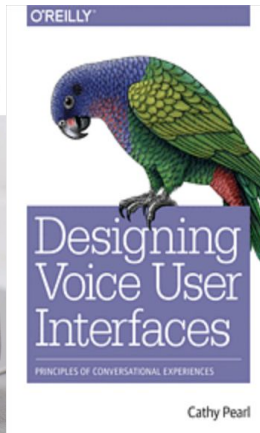
whoelse UG @ Hubraum
Winterfeldstr. 21, 10781 Berlin

New normal: People talk to machines

Google Assistant will now be nicer if you say 'Please' and 'Thank you'

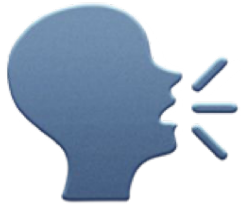
Greg Kumparak @gk / 2:00 pm GMT • November 29, 2018

Comment



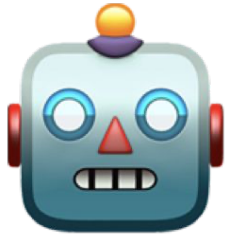
But, it is more complicated..

2025: Every 1st consumer contact will be a bot



Voice becomes UI #1

words replace buttons & keys



85% of all consumer touchpoints

are operated by AIs in 2022

Gartner

1

Part

Natural Language Processing Bias

Every AI interprets human language slightly different

Hey AI, I am hungry, call me a Pizza



Google

The user looks for a pizza



Nuance

The user is in Hungary and searches a pizzeria



Bosch

Sorry, I didn't get it

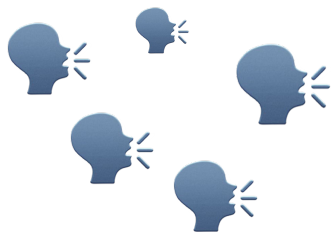


...

*100 AIs =,
100 Opinions*

Problem 1: Niche intelligence

A German AI does not speak Russian or Chinese or (..)



OEM



Problem 2: OEMs must integrate local NLP APIs in every other market

55bn AIs vs. 5bn users - How will they agree?

Your order will be delivered shortly

Are you talking to me?

Sure, no problem

*Pizza, would be great,
what do you think?*

...

Alright

Problem 3: Voice AIs will compete to answer voice requests

Dreaming of: A unified language between AIs



AI, I need a ride to the Airport!

Let us agree, how we tell it to each other!



Solution: The Esperanto of AI - a shared language across NLPs

And we could also use some **privacy!**

Bloomberg

Amazon's "Always on" patent: The future will be recorded, on your smartspeaker



Germany planning to access voice assistant data to tackle crime



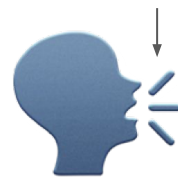
41% of voice assistant users have concerns about trust and privacy, report finds

To do: **Protection of biometric information**

And in the end...

...it's all about **intent!**

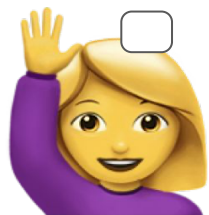
Content of a speech command



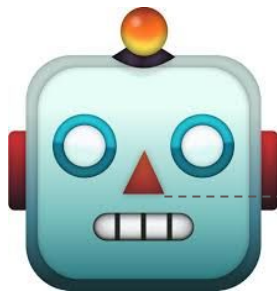
~~How do you say it = Individual syntax, slang, vocabulary~~

Why do you say it = Requested result

whoelse.ai is an API for a simplified language in AI



Voice command

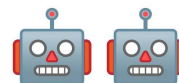


WHOELSE?

User Intent Standard

= Privacy-by-design API to store
& dispatch human language

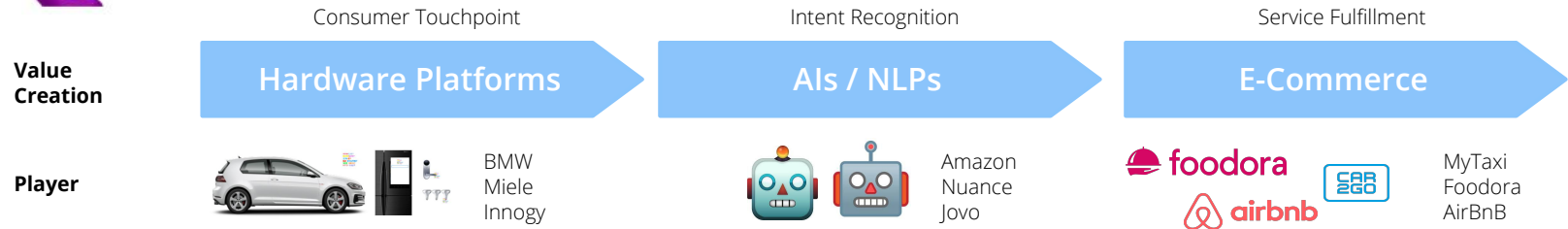
Universal grammar for different NLP ecosystems



To do: Reduce complexity!



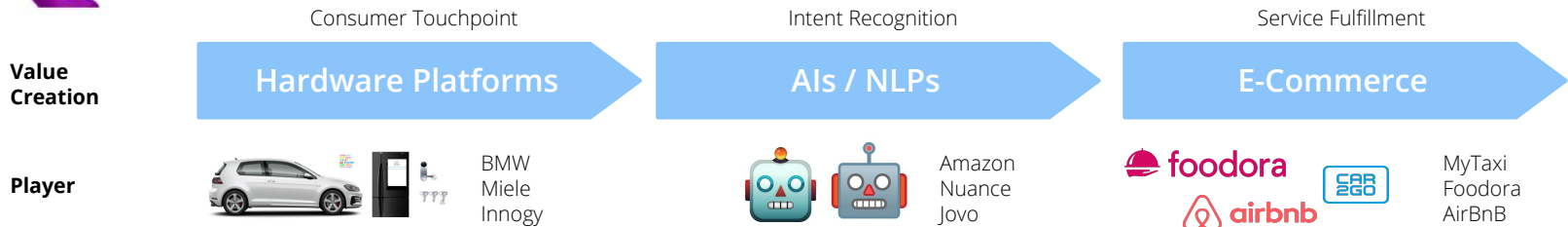
AI, I need a ride to the Airport!



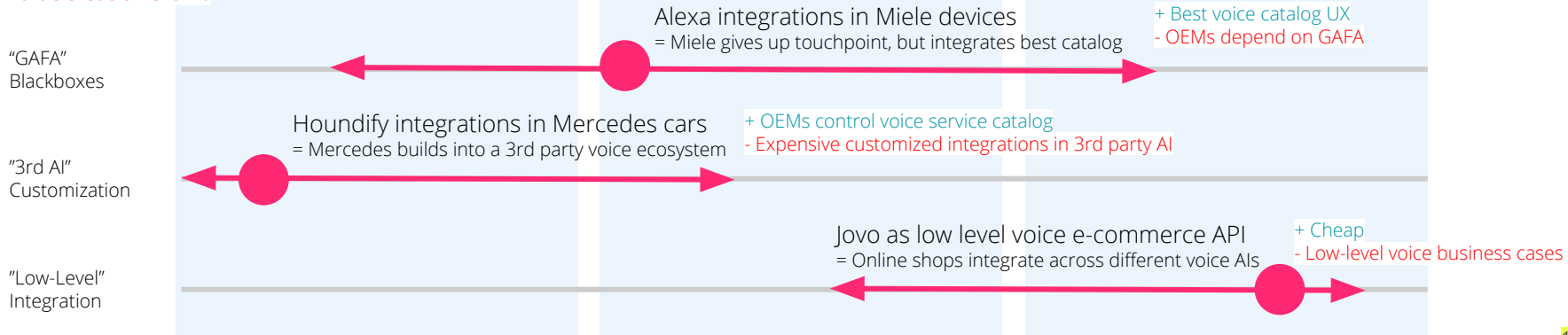
Current siloed ecosystems disappoint



AI, I need a ride to the Airport!



Who controls which part of the value creation chain?



whoelse.ai simplifies NLP APIs



AI, I need a ride to the Airport!

Consumer Touchpoint

Intent Recognition

Service Fulfillment

Value Creation

Hardware Platforms

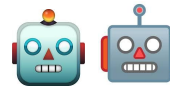
AIs / NLPs

E-Commerce

Player



BMW
Miele
Innogy



Amazon
Nuance
Jovo



MyTaxi
Foodora
AirBnB

WHOELSE?
Taxi
who else?

Proprietary
Universal Language Protocol

DIN
ISO

Industry Standard Initiatives
NLP API Interoperability Specifications

Idea: A new standard to encode intent

Mindmeld



Rasa



Fraunhofer



Houndify



Watson



Mycroft



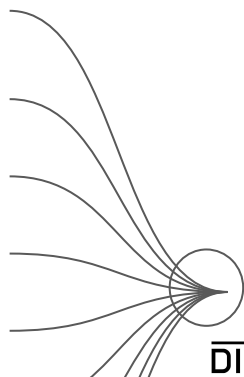
Omnibot



Houndify



Bosch



DIN

**Interoperable NLP
API Specs**
Speech to Text
Recognized Intent
Content
Metadata

WHO ELSE?

SCHOOL who else?	PHONE REPAIR who else?	SCHOOL who else?
HAIRCUT who else?	CYCLE COURIER who else?	HAIRCUT who else?
CYCLE who else?	DELIVERY who else?	CYCLE who else?
FLEA-MARKET who else?	MOVERS who else?	FLEA-MARKET who else?
CINEMA who else?	ACCELERATORS who else?	CINEMA who else?
THEATRE who else?	PHOTOGRAPHER who else?	THEATRE who else?
DOG-SITTING who else?	ASTRONOMY who else?	DOG-SITTING who else?
GARDENING who else?	CHARGING STATION who else?	GARDENING who else?
PAINTER who else?	GAS STATION who else?	PAINTER who else?
TAXI who else?	PAINTER Pizza?	who else?
RIDESHARE who else?	FLAT-SHARE who else?	RIDESHARE who else?
LAUNDRY who else?	CRAFSMA Date?	who else?
SALE who else?	BOOK CLUB who else?	IT HELP who else?
CAR who else?	SPORT Apartment?	who else?
CONCERT who else?	RELIGION who else?	LAUNDRY who else?
BOARD GAME who else?	DATE who? Taxi	who else?
BAND who else?	SCOOTER who else?	CAR who else?
CASH who else?	IN THIS COMPANY who else?	CONCERT who else?
E-SCO who else?	TRAVELLING who else?	BOARD GAME who else?
ACCOUNTANT who else?	DOCTOR who else?	BAND who else?
JANITOR who else?	TAXI who else?	CASH who else?
LEGO who else?	HOTEL who else?	LEGO who else?
KINDERGARTEN who else?	FOUND&LOST who else?	KINDERGARTEN who else?
RENOVATION who else?	SEX who else?	RENOVATION who else?
TIMFRMAN who else?	MUSIC who else?	TIMFRMAN who else?

A language catalog to store intents in a standardized format

Examples

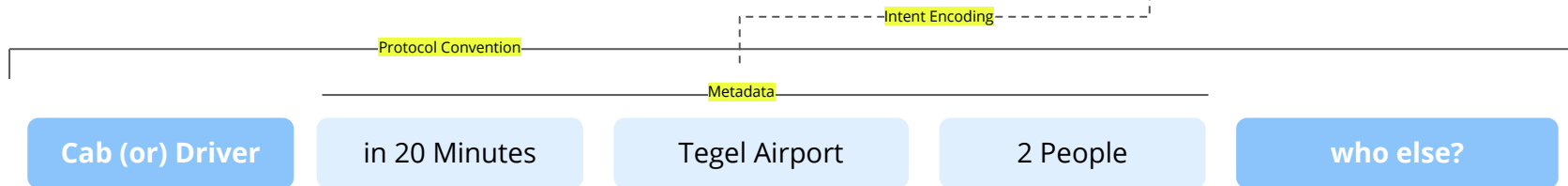
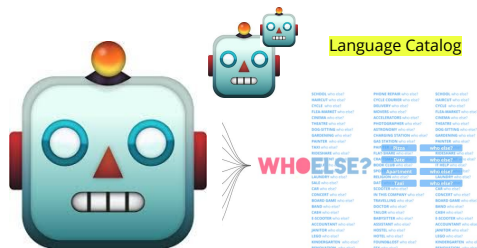
whoelse.ai

Make language storable by a standardized encoding logic



Natural Language Input

Hey AI, um., I need a ride to the Airport.
For me and my friend.
We need to be there at 16:45. Can you do that?



WHO ELSE?

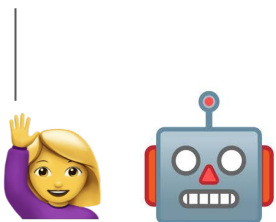
Our APIs enable NLPs to store natural language in a standardized format

LANGUAGE API NLPs request universal grammar to store intents in a standardized format

MARKETPLACE API OEMs can trade intents received by NLP integrations

NLPs create the user experience, we provide the namespace

"Hey AI, who drives to the concert tonight?"

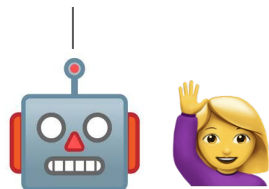


AI Setting

Be entertaining

SCHOOL who else? HAIRCUT who else? CYCLE who else? FLEA-MARKET who else?	PHONE REPAIR who else? CYCLE COURIER who else? DELIVERY who else? MOVERS who else? TIMPERMAN who else?	SCHOOL who else? HAIRCUT who else? CYCLE who else? FLEA-MARKET who else?
Concert	who else?	Concert
TAXI who else? RIDESHARE who else? ADVERTISING who else?	PAINTER who else? FLAT-SHARE who else? PROFESSIONAL who else? TIMPERMAN who else?	TAXI who else? RIDESHARE who else? ADVERTISING who else?
Rideshare	who else?	Rideshare
CAR who else? CONCERT who else? BOARD GAME who else? BAND who else? CASH who else? E-SCOOTER who else? ACCOUNTANT who else? JANITOR who else? LEGO who else? KINDERGARTEN who else? RENOVATION who else? TIMPERMAN who else?	SCOOTER who else? IN THIS COMPANY who else? TRAVELLING who else? DOCTOR who else? TAILOR who else? BABYSITTER who else? ASSISTANT who else? HOTEL who else? HOTEL who else? FOUND&LOST who else? SEX who else? MUSIC who else?	CAR who else? CONCERT who else? BOARD GAME who else? BAND who else? CASH who else? E-SCOOTER who else? ACCOUNTANT who else? JANITOR who else? LEGO who else? KINDERGARTEN who else? RENOVATION who else? TIMPERMAN who else?

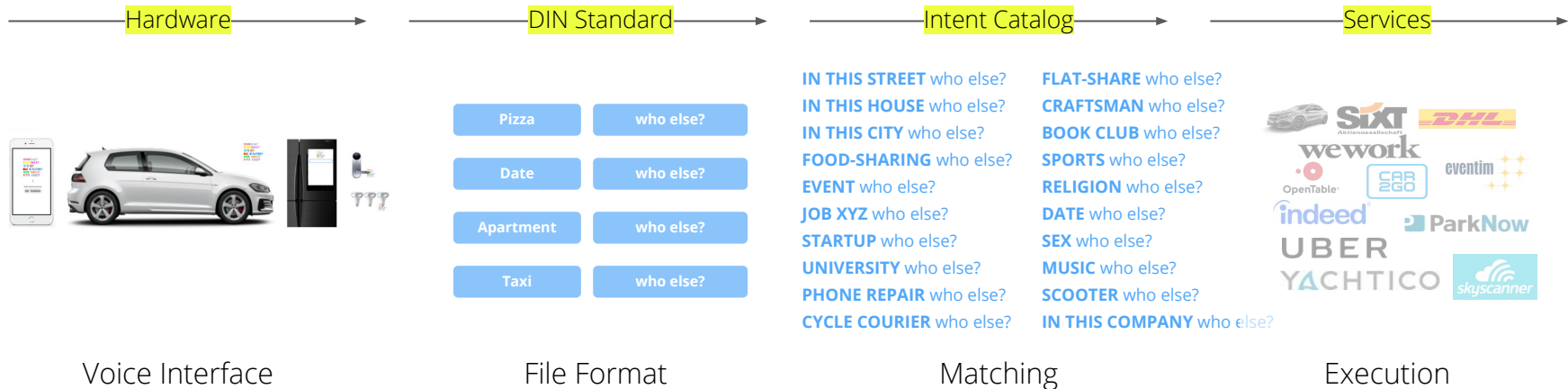
"Melanie, your friend Steffi looks for a ride - should I calculate the route?"



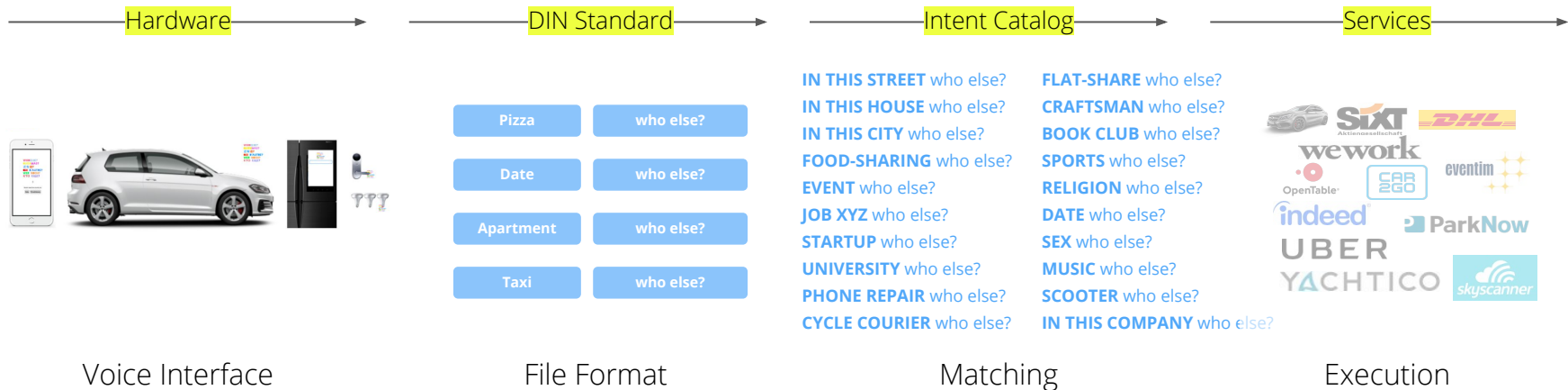
AI Setting

Be very friendly

Summary: Making voice AIs accountable



Summary: Making voice AIs accountable



Dream: fulfilled 😎

Let us agree, how we tell it to each other!

AI, I need a ride to the Airport!



Is this idea new? Since 3 weeks Amazon is doing it too



Press release

Amazon and Leading Technology Companies
Announce the Voice Interoperability Initiative

September 24, 2019 at 11:04 AM EDT





Share

Amazon, Baidu, BMW, Cerence, ecobee, Microsoft, Orange, Salesforce, SFR, Sonos, Spotify, Sound United, Tencent, Verizon and more to promote customer choice by supporting multiple, interoperable voice services on a single device

With multiple, simultaneous wake words, customers can access multiple voice services by simply saying the corresponding wake word – from Alexa and Cortana to Orange's Djingo, Salesforce's Einstein, and more

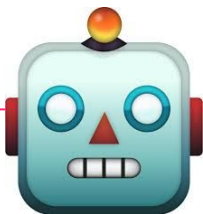
Solutions providers like Intel, MediaTek, NXP and Qualcomm to develop hardware and reference solutions that support multiple wake word engines

Approach: **Trigger words** as namespace

Problem: It is unlikely BMW and Mercedes will agree who owns the user request  **"AI, get me a rideshare!"** 

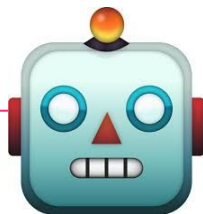
There will always be multiple standards..

Amazon
Consortium



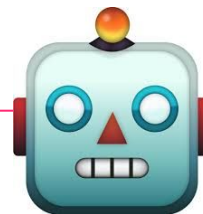
?

Walmart
Consortium



?

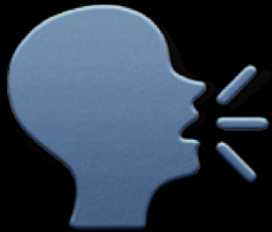
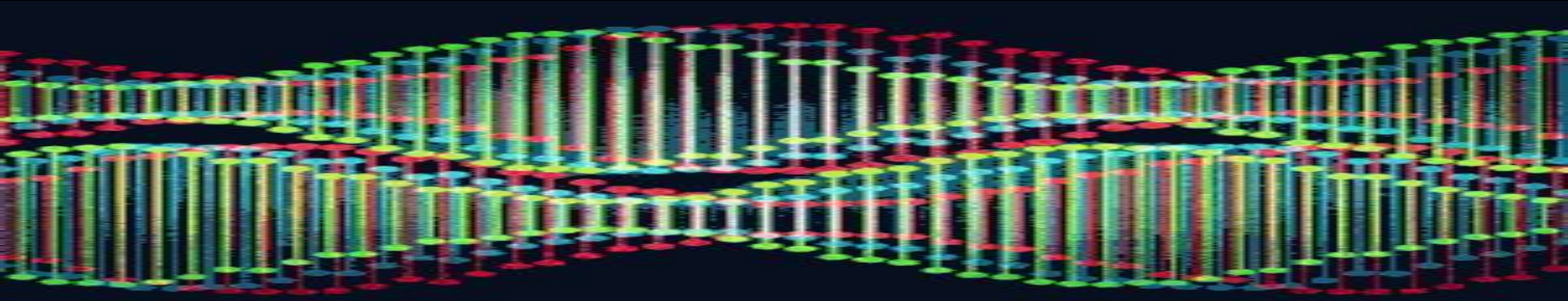
EU Research Funding
Consortium



How will they agree?

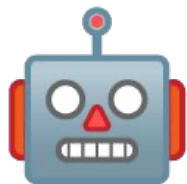
Voice Internet Discoverability

Problem: The average user remembers only 3.7 brands



2/3 of users report problems knowing
what they can ask an AI about

To Do: Find language for AIs all user groups understand

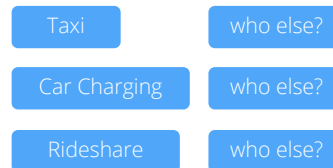


Idea: 1 question, instead many brand names, for all services



Old: Users ask for features and install brands as apps

WHOELSE?
QUIÈNMÀS?
还有谁?
QUI D'AUTRE?
WER NOCH?
KTO EЩЕ?



New: A standardized intent catalog
- the only question a user needs to know

Distribution strategy: Be(come) verb!

“Brands that become language: The oldest challenge of technology marketing” New York Times, 2016

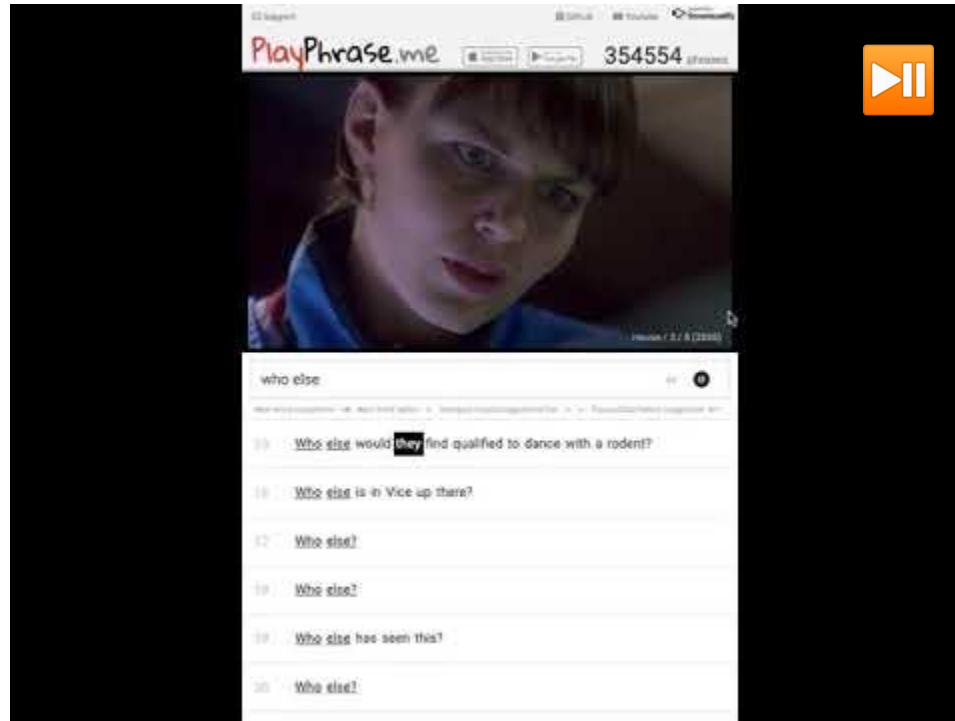
YOU SHOULD TWEET THAT!
LET ME **GOOGLE** IT!
I'M GOING TO **BING** HIM!
THAT MOMENT IS **INSTAGRAMMABLE**!
I'M GOING TO **TUMBLE** THAT!
DO YOU WANT TO **SKYPE**?
YOU SHOULD **FACEBOOK** THAT!
I'M GOING TO **PHOTOSHOP** YOUR PHOTO!

WHOELSE?
QUIÈNMÀS?
还有谁?
QUI D'AUTRE?
WER NOCH?
KTO ЕЩЕ?

who else? questions:

Popular language as a standardized
voice command

Popular language: A brand everybody knows already



Advantage: A self-explanatory name & question

Old: People learned brands

 **airbnb** Apartment = AirBnB

 **tinder.** Date = Tinder

 **MonkeyParking** Parking space = Parking Monkey

 **DELIVEROO** Food delivery = Deliveroo

 **Care.com** Nursing = Care dot Com

New: People learn 1 kind of question & know how to anticipate every other question

WHOELSE?
QUIÈNMÀS?
还有谁?
QUI D'AUTRE?
WER NOCH?
KTO ЕЩЕ?

Apartment who else?

Date who else?"

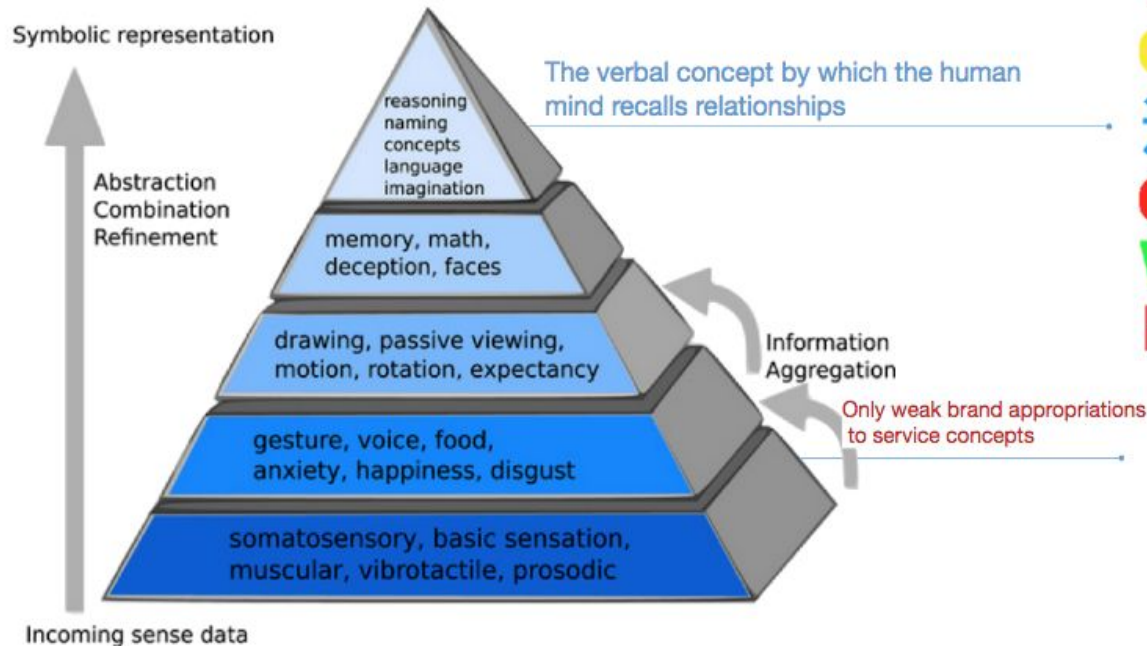
Parking space who else?

Food delivery who else?

Nursing who else?

Secret sauce: Naming is the file-system of human thought

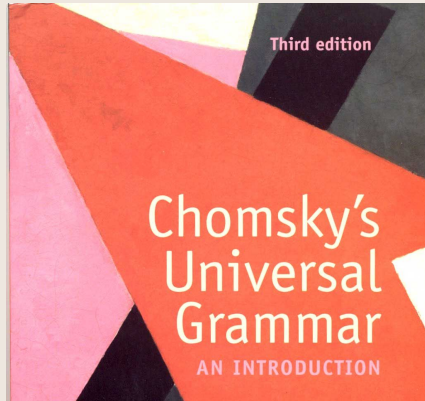
Illustration: Ray Kurzweil - Memory Abstraction Levels



WHOELSE?
QUIÈNMÀS?
还有谁?
QUI D'AUTRE?
WER NOCH?
KTO EЩЕ?



Scientific background: who else? is a Universal Grammar



Universal Grammar describes that certain semantics are “hard-wired” in the human mind

Phrases and semantic rules everybody knows and automatically responds to

Communities: People interact by **who else?** questions

Bianca Praetorius
September 10 at 2:20pm · Berlin · 🌐

Ouh! Just got approved to come and watch Elon Musk talking to Sigmar Gabriel about the future of economy **Who else** is going there tomorrow?

Martin Venzky-Stalling with Duangrit Bunnag and 2 others.
March 25 · 🇯🇵

😅 missed out on reserving my ticket for Burning Man, but guess there will be more opportunities.... **who else** is going?

Sebastian Feldmann
April 17, 2015 · 🇪🇺

@startsummit 15, **who else** is here?

Michael Köhler added 3 new photos — at Berlin Airport.
July 15, 2014 · Berlin, Germany · 🌐

Picking up my friend Rodrigo at the airport in Berlin. **Who else** might be landing? #siegerflieger #LH2014 #captainboldt

Dennis Hoenig-Ohnsorg
8 mins · 🌐

So excited! I will be speaking at the first www.intrapreneurshipconference.com in Germany! **Who else** will be there? #IntraPreneurship #Munich #Zalando

Alexander Peiniger
February 4 at 5:25pm · Cologne · 🌐

Just bought tickets for the Web Summit in Lisbon in November. **Who else** will be there?

Web Summit | Where The Tech World Meets
It's been called 'the best technology conference on the planet'. But we just think it's different. And that difference works for our attendees, ranging from Fortune 500...

Movie Pilot Superheroes
Who else always forgets Scarlett Johansson was in Eight Legged Freaks?

"who else"

Top Tweets All Tweets

El Señor - Essai @MMBM_LOAC · 22s
Who else is seeing Buhari for the bastard that he is??? Good thing una eyes no colour blind again...

In reply to nabs
apple sauce @kranbarry · 26s
@nyeongjae WHO ELSE WOULD IT BE???

meegs @yabitchfitz · 28s
who else wants to go skydiving without their parachute 🤔😂

Lords0ulfod @s0ul_food_ · 31s
Couldn't go to any battles concert but Pouya comin to town **who else** fuckin with it?!?!
06/25/2016

"wer noch"

Top Tweets All Tweets

Der Ziegenhainer @jailhunter1 · 23m
hna.de/lokales/schwal...
Wer noch ein Zimmer sucht? ?

Bilanz: Im Knast in Ziegenhain sind noch Zi...
hna.de

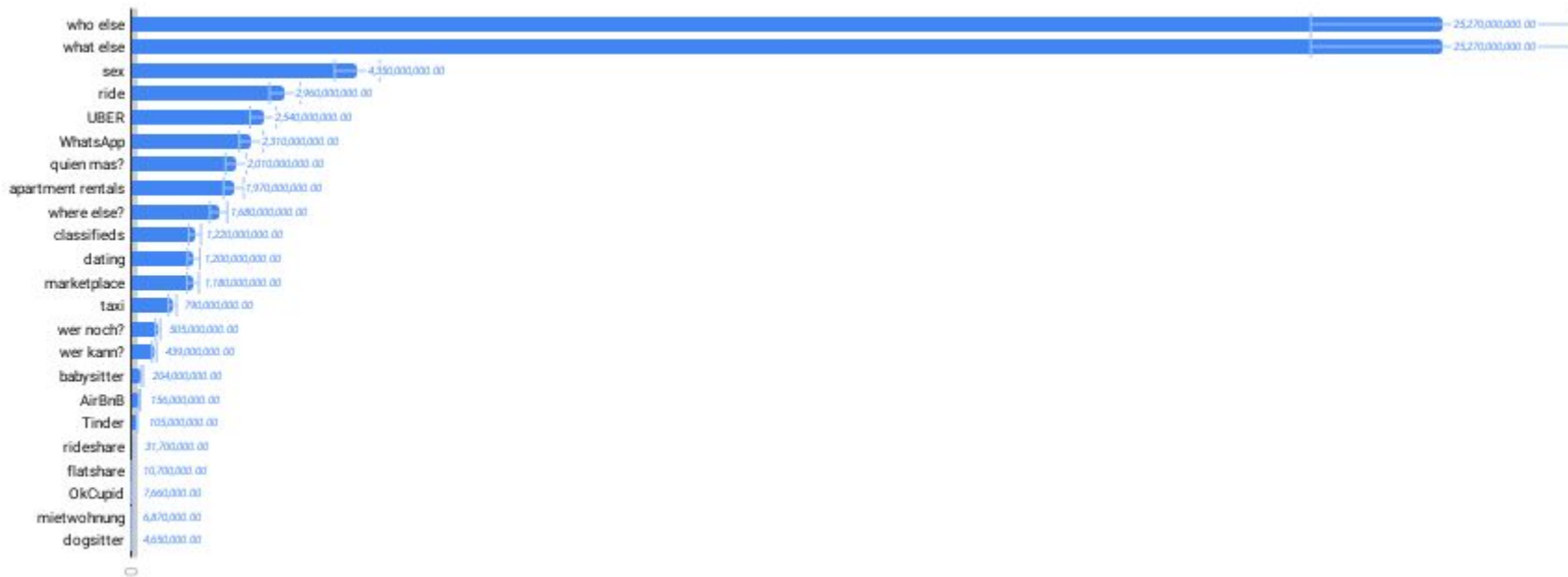
Annalena Dziemba @Anna_101003 · 37m
Ich gucke gerade BTN 😊 **Wer noch?**

In reply to Love, Beats & HB
Fade @fading2015 · 42m
@LoveBeatsHB hat wer noch die alte Admin Liste?

FeelsPrüfungenMan @H3ndriHey · 51m
Stream startet um 20:00! 😊 **Wer noch** schnell n paar Hennys fürs die Giveaways sammeln will --> PennyBot

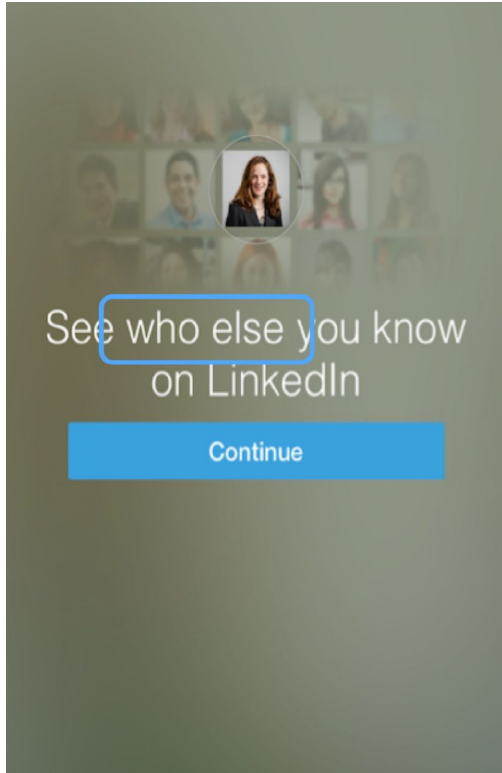
Google SERPs: Webpages speak with users by who else?

Google Results for Search Query "How often do websites mention the term who else?"



SERPS

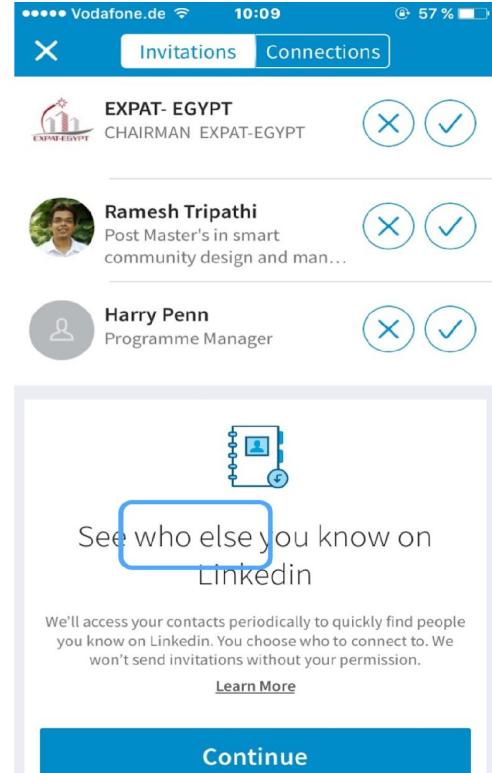
UX design: who else? is used as navigation element



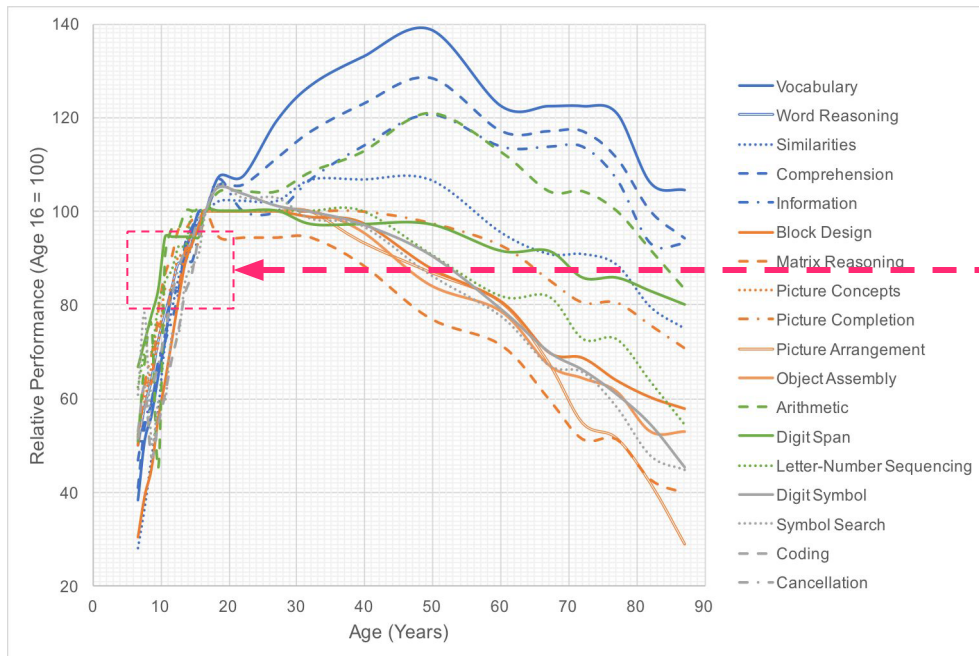
Text anyone in your phone

Your contacts will be continuously synced so that you can see who else is on Messenger. Syncing your contacts helps friends connect on Facebook, too. [Learn More.](#)

Sync Contacts



Hypotheses: Life-long memorability



WHOELSE?
QUIENMAS?
还有谁?
QUI D'AUTRE?
WER NOCH?
KTO ESZE?

Language learned at younger ages and
always faster recalled

Usability: The fastest, yet most explicit way to ask an AI



Hey Siri, I need a Taxi here.

t = 2.4 seconds

vs.

Taxi who else?

t = 0.8 seconds

Why should you be nice to an AI?

You know Siri doesn't care how friendly you ask..

Users learn to speak with AIs in a faster way

1. DISCOVERY *Implicit* who else? queries



Hey fridge, I want to order a Pizza!

WHO ELSE?
QUEL MARI?
还有谁?
QUI D'AUTRE?
WER NICHT?
KTO ELLER?

Pizza

who else?



Ahhhh... the fridge works by *who else?* questions...

2. USER ADOPTION *Explicit* who else? queries



Hey fridge, find a Taxi who else?

WHO ELSE?
QUEL MARI?
还有谁?
QUI D'AUTRE?
WER NICHT?
KTO ELLER?

Taxi

who else?



Effect: More attention = More people will learn talking to AIs



Oh, I relate to that!

Hamilton Anthony, Madsy Helms and 10 others like Airbnb.

Airbnb
Sponsored · 🌐
Unforgettable trips start with Airbnb. Book unique experiences and homes in 191 countries.

Uber
Sponsored · 🌐
Earn up to \$16/hour in fares driving in Los Angeles and make your own schedule. Partner with uberX! Click below and apply now!

Deliveroo - Restaurant Food Delivery
Sponsored · 🌐
Empty fridge? We've got your back. Get your favourite meals delivered in under 32 minutes.

Old: Many brands acquire users in many niches

whoelse.ai
Sponsored

Speak with AIs in a simple language!

Date	who else?
Apartment	who else?
Wedding	who else?
Babysitter	who else?

.. the only question I need to know!

1 question for all AIs
Join the future of voice-based Internet services: Start speaking with AIs in simple language now

INSTALL WHOELSE.AI TODAY

👍👎👏 20 562 Comments 24 Shares

Like Comment Share

New: 1 brand acquires users across for many niches

3

Part

Towards Voice Internet

Role-model: Bookkeeping systems

Balance sheet / profit and lost item	Program linkage	4 Revenues	Balance sheet / profit and lost item	Program linkage	4 Revenues
Sales		4860 Income from real estate	Other operating income (TC)	SB	4929 Income from reversal of replacement reserve under R.6.6 EStR
	LI	AM 4861 Rental and lease income, VAT-exempt s. 4 no. 12 UStG			4930 Income from reversal of provisions
	LI	AM 4862 Rental and lease income, 19% VAT			4932 Income from remission of liabilities
		R 4863 (reserved account) -64			4935 Income from reversal of tax reserve
	EUR LI	AM 4865 Revenue from sales of current assets, 19% VAT, section 4(3) sentence 4 EStG		SB	4936 Income from reversal of tax reserves (investment reserves under s. 7g(2) EStG)
	EUR U	AM 4866 Revenue from sales of current assets, VAT-exempt, section 4 no. 8 ff UStG in conjunction with section 4(3) sentence 4 EStG		SB	4937 Income from reversal of accelerated tax depreciation
	EUR LI&K	AM 4867 Revenue from sales of current assets, VAT-exempt, section 4 no. 8 ff UStG in conjunction with section 4(3) sentence 4		CR	4938 Income from reversal of tax reserve under s. 4g EStG
				SB	4939 Income from reversal of tax reserves under s. 52(16) EStG
					4940 Allocated expenses each
Other operating income (TC)					
	GK				

DATEV Account Chart

Standard Chart of Accounts (SKR 04)

Valid for 2018



TAXI who else?
 RIDESHARE who else?
 APARTMENT who else?
 IT HELP who else?
 CLEANER who else?
 LAUNDRY who else?
 SALE who else?
 CAR who else?
 CONCERT who else?
 BOARD GAME who else?
 BAND who else?
 CASH who else?
 HOBBY who else?
 SKILL XYZ who else?
 SALE who else?
 LOAN who else?
 REFUGEE who else?
 GYM who else?
 CLOTHING who else?
 SCHOOL who else?
 HAIRCUT who else?
 CYCLE who else?
 FLEA-MARKET who else?
 CINEMA who else?
 THEATRE who else?
 DOG-SITTING who else?

WHO ELSE?
 QUIEN MÁS?
 还有谁?
 QUI D'AUTRE?
 WER NOCH?
 KTO ELLE?

IN THIS STREET who else?
 IN THIS HOUSE who else?
 IN THIS CITY who else?
 FOOD-SHARING who else?
 EVENT who else?
 JOB XYZ who else?
 STARTUP who else?
 UNIVERSITY who else?
 PHONE REPAIR who else?
 CYCLE COURIER who else?
 DELIVERY who else?
 MOVERS who else?
 ACCELERATORS who else?
 PHOTOGRAPHER who else?
 FLYING WIFE who else?
 CRAFTSMAN who else?
 SPORTS CLUB who else?
 SPORTS who else?
 RELIGION who else?
 DATE who else?
 SEX who else?
 MUSIC who else?
 SCOOTER who else?
 IN THIS COMPANY who else?
 TRAVELLING who else?
 DOCTOR who else?

Advantage: You change the accountant

Advantage: You change the AI

Goal: Create cross-language NLP interoperability



“Hey Alexa, I want to travel from Berlin to Hamburg with a rideshare. Can you find a driver today?”

EN	Carsharing	Berlin	Hamburg	07-05-2017	who else	?
FR	Partage de voiture	Berlin	Hamburf	07-05-2017	qui d'autre	?
CN	Qíchē gòngxiǎng	Bóllín	Hnbào	07-05-2017	shuí hái	?



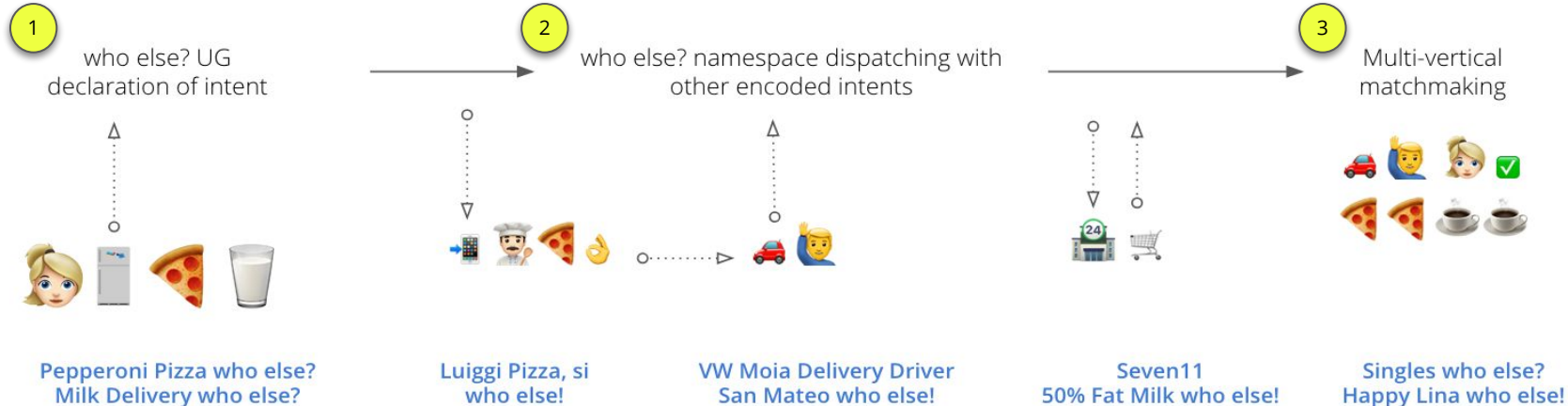
“I am looking for a room to stay in London next week, for 2 people, to stay 7 days, I pay upto 500 Euro”

EN	Apartment	London	01-05-2017	07-05-2017	2 adults	500 €	who else	?
ES	Apartmento	Londres	01-05-2017	07-05-2017	2 adultos	500 €	quién más	?
DE	Wohnung	London	01-05-2017	07-05-2017	2 Erwachsene	500 €	wer noch	?

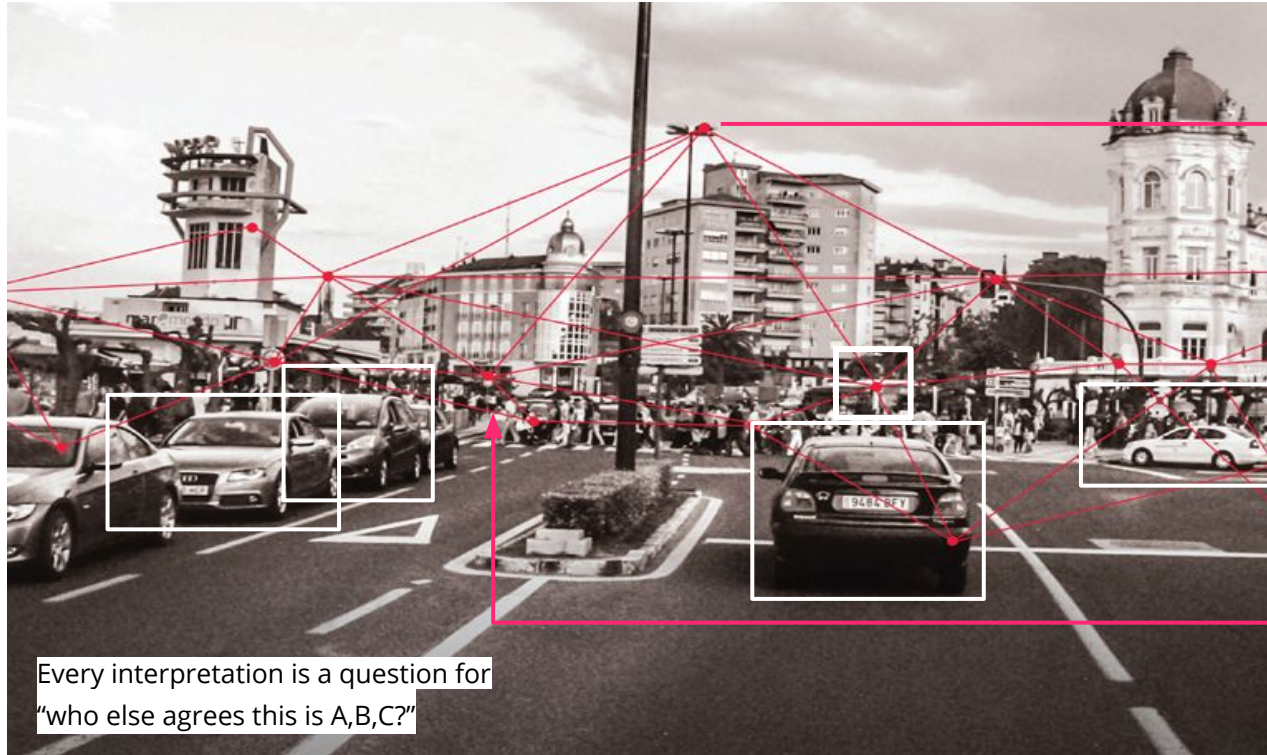
A standardized language for voice-enabled supply chains

9:20pm

"Hey you, Bosch Fridge, I want to order a Pizza with Pepperoni, and milk for my coffee tomorrow - can you deliver in 30 minutes?"



Vision: Annotation of everything



Car Recognition AI

VW	Car	who else?
BMW	Car	who else?
Renault	Car	who else?
Honda	Car	who else?

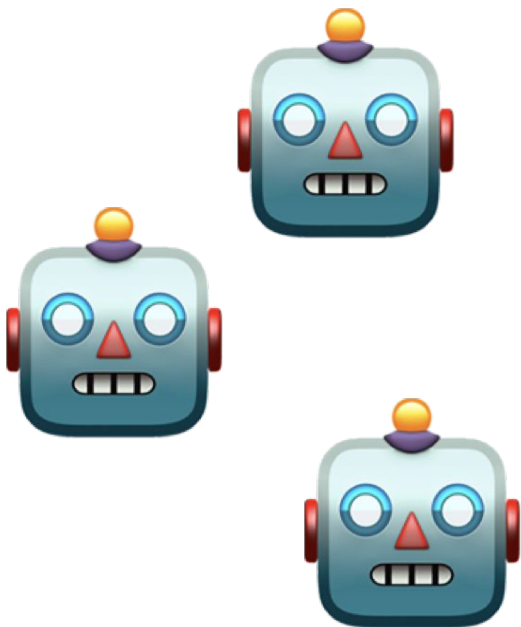


Data Federation AI



Traffic Control AI

Next Steps: Complete standards and launch pilots



1. Continue **DIN, ISO, IEEE (..)**
Standardization Work

Join our NLP interoperability initiatives!

2. **Open Source Pilots**
of Language Namespace

Let us build Voice Internet services together!