

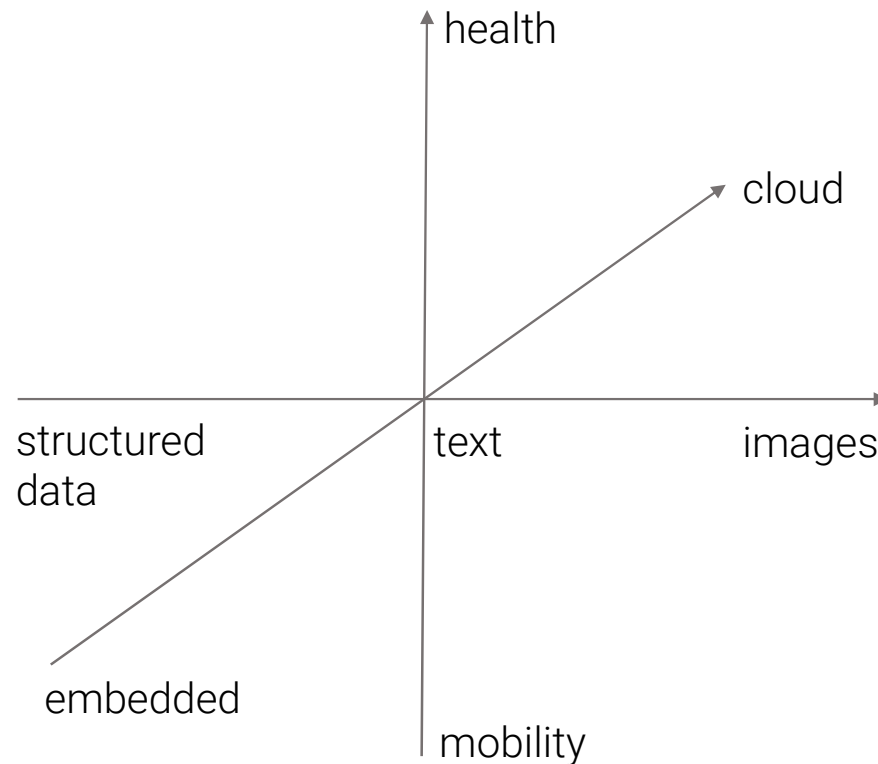
EXB

Towards the Self-Aware Car

History / Claim to Fame:

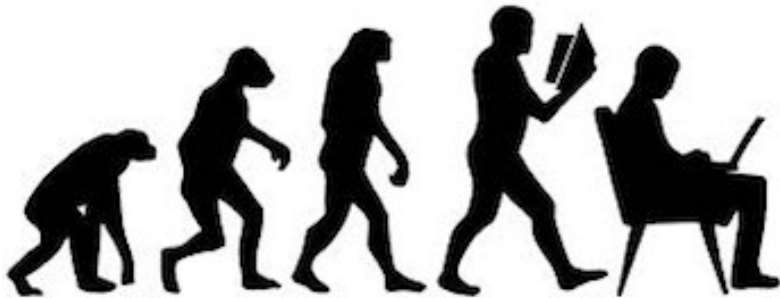
- ExB Labs invented the world's first predictive text input solution.
- The product was sold in an asset deal in 2010 to 2012 to NOKIA.
- 72 languages, 11 patent families, 100 mio phones shipped.
- We know how to:
 - write software in high quality
 - scale linguistics to embedded hardware
 - scale linguistics to many languages

Today, ExB is active along three Axes:



- **Health:** Patient data, anonymisation, encryption etc.
- **Mobility:** Scaling to millions of cars.
- **Text:** Domain independent, short time to market
- **Imaging:** Better interpretation in context of text (e.g. patient record)
- **Embedded:** small scale, low computing power, off-line capable, syncable
- **Cloud:** large scale, millions of documents, users, etc.

Value Proposition *along* the Evolution



The change from the conventional human-driven car to the self-driving car seems to happen faster than expected.

Thus, the **value of interaction** between driver and car has to evolve faster, demanding **new design processes** and **value deployment procedures**.

Iterating User Centered AI *faster*

Today:

- single function design
- low iteration rate
- high costs attached

Tomorrow:

- convergent framework
- high iteration rate
- lower costs



User-facing AI beyond Siri, Cortana et al.

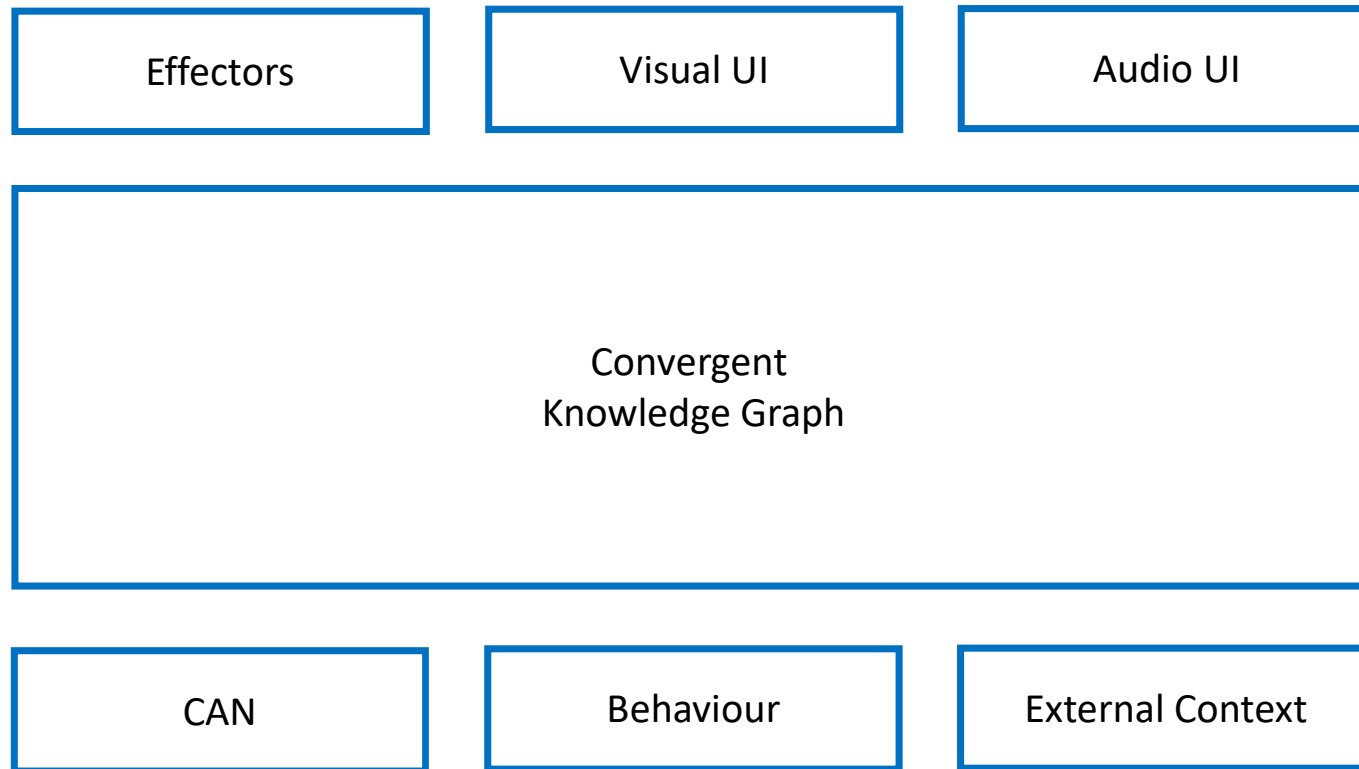


But there's more user relevant data sources:

- such as the car's internal states
- user-facing settings
- user generated data
- sensor data from the user
- as well as external data such as Pols
- the user's calendar.

Today, we neither have decent fusion of information nor a **convergent representational framework**.

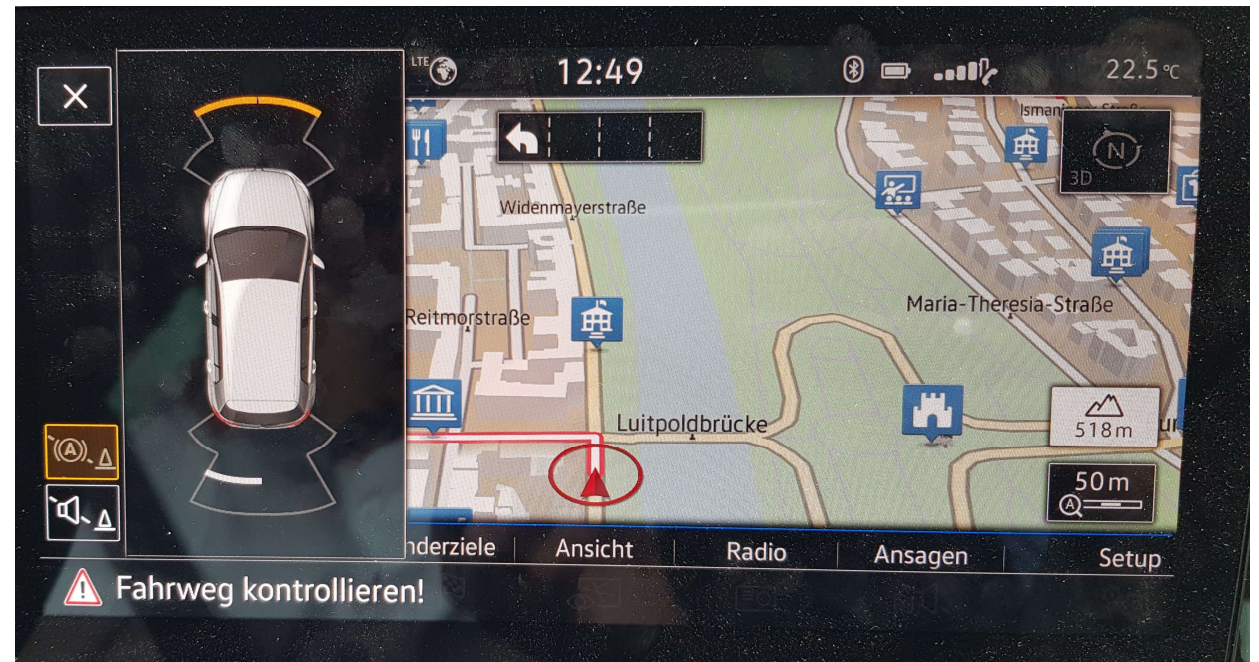
Fighting Combinatorial Explosion



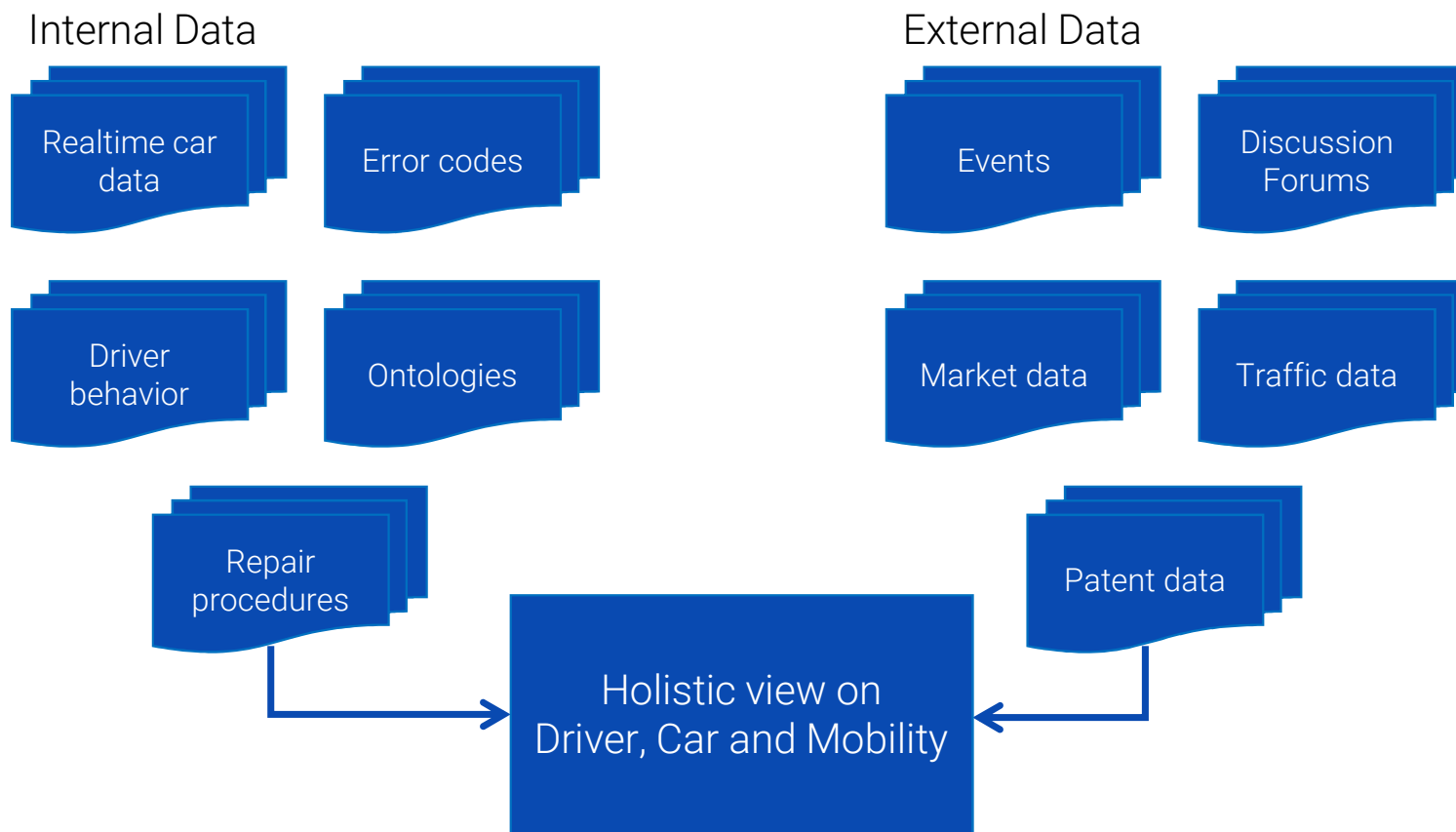
Systematic Data Convergence

Car should know when *not to display* state information.

Example: GPS position / lane and traffic light info should prevent park distance warning.

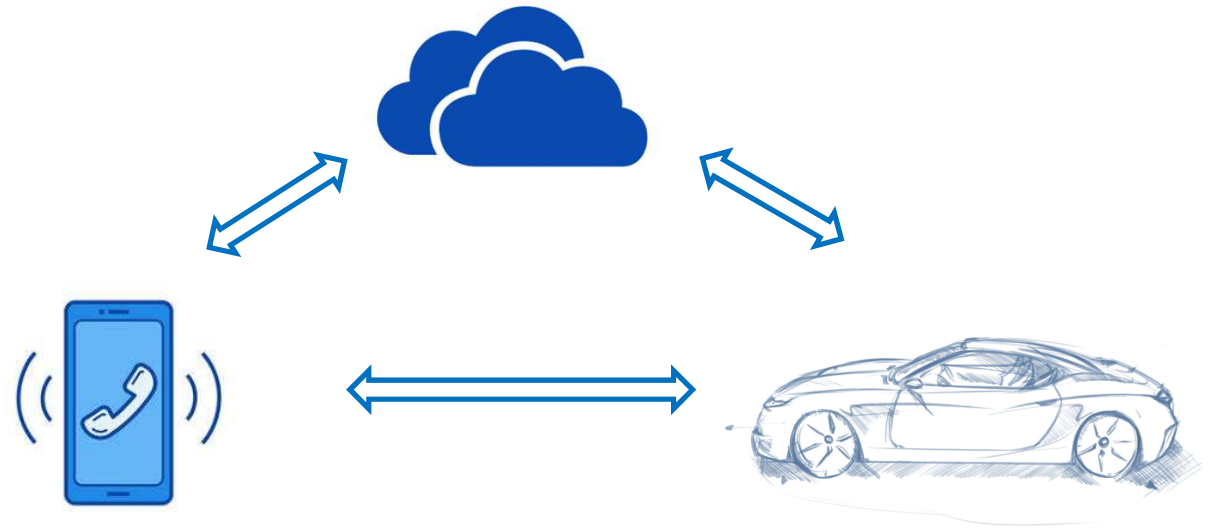


Holistic view on mobility

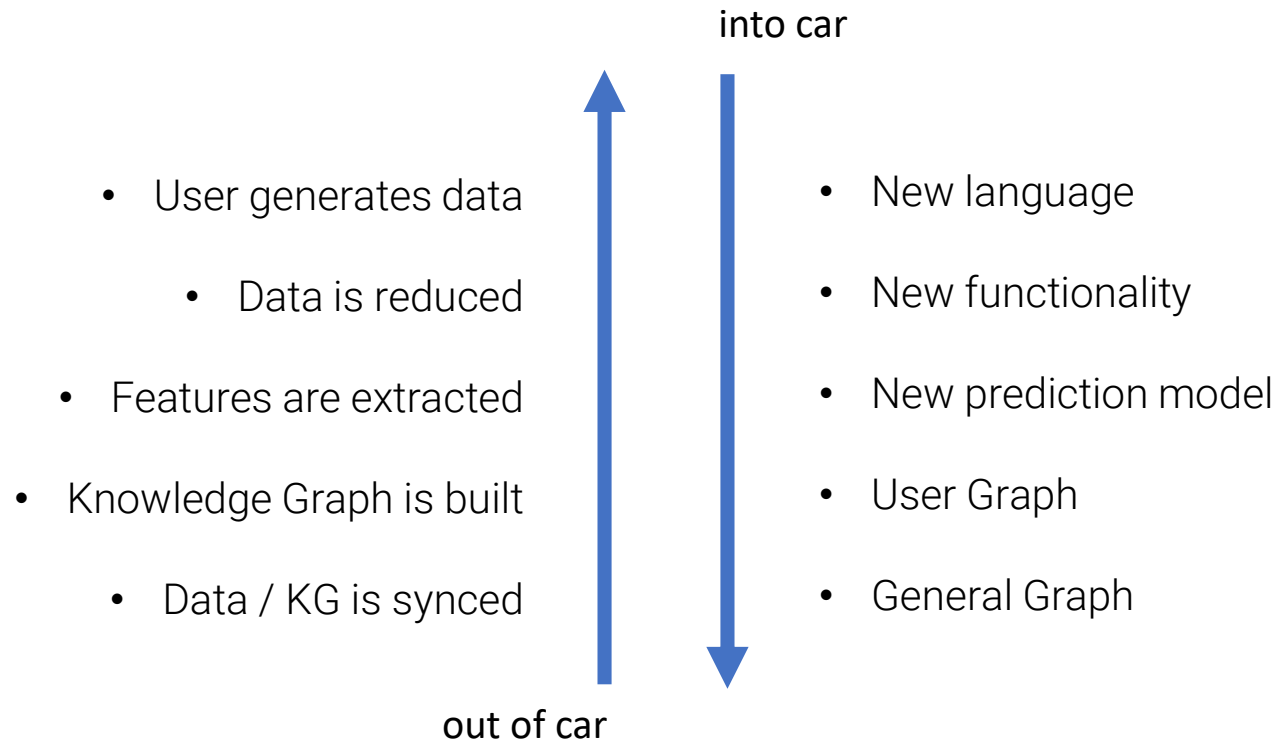


Connecting the Data-Triangle

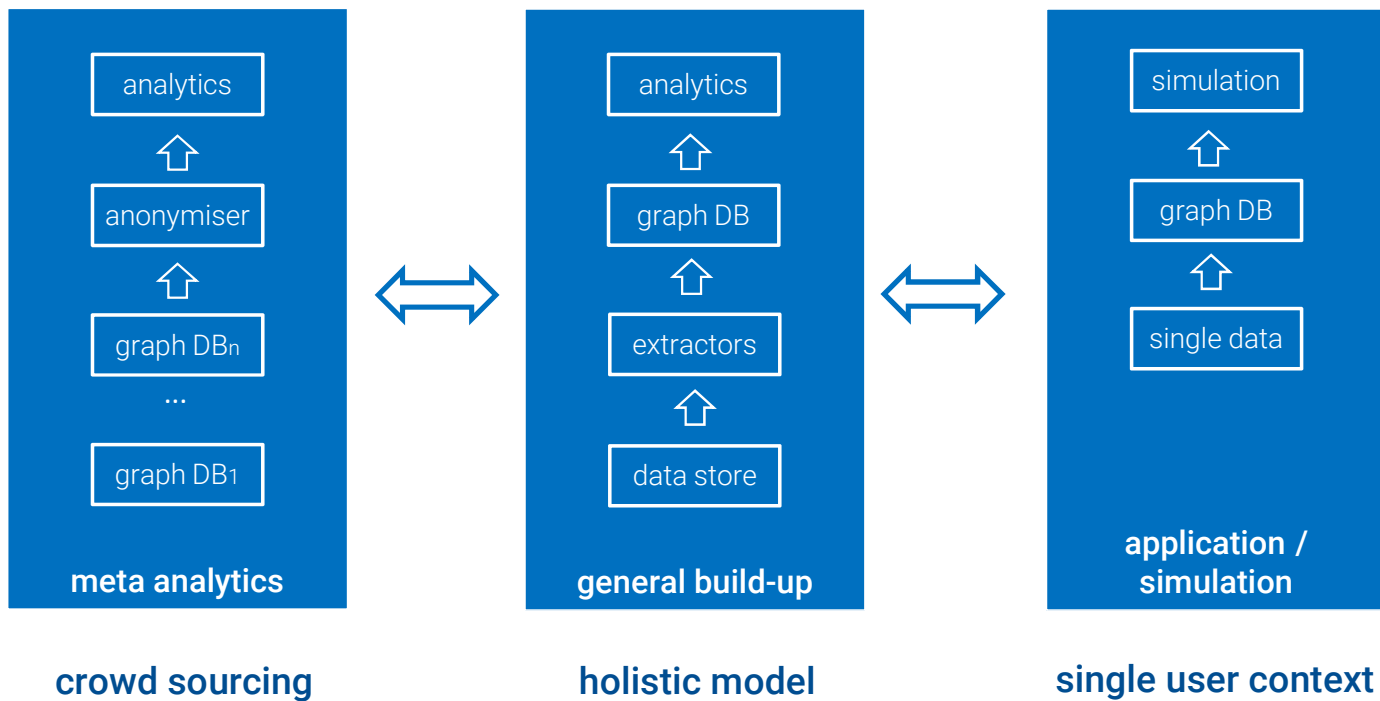
- Extending contextuality
- Transporting user profiles
- Crowd sourcing
- Remote control



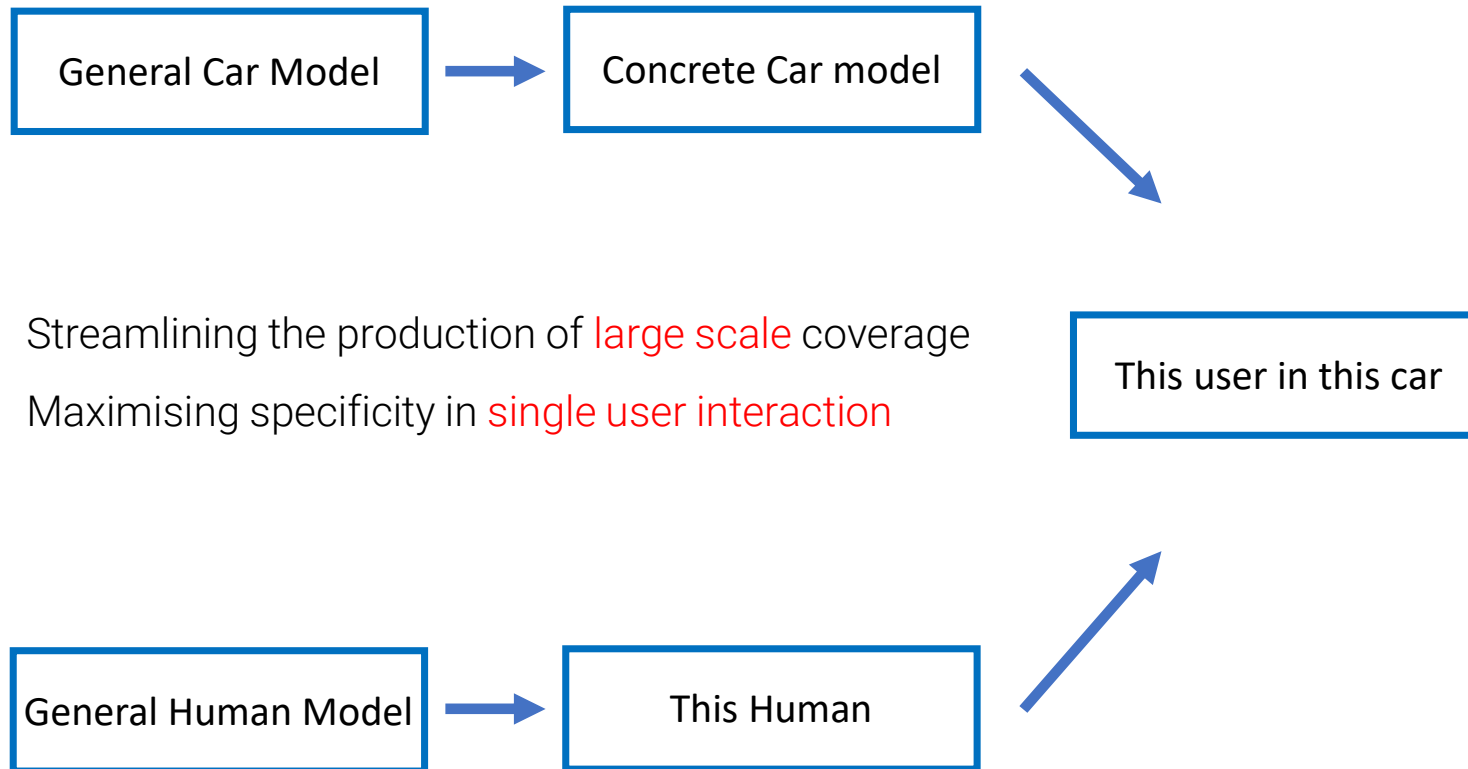
Edge vs Cloud sync



Bootstrapping Datamodels



Knowledge Cascade



Machines' self awareness

Today, the car doesn't know "what / who" it is and what state it is in.

This kind of introspection is important to actually establish a **meaningful conversation** about its state with the user.

Wolfsburg, 09. April 2018

Intensiveres Kundenerlebnis:

Marke Volkswagen schafft neuen Bereich Holistic User Experience (HUX)

- Neuer Bereich unter Leitung von Dr. Matthias Erb steuert Zusammenspiel von Technischer Entwicklung, Design, Baureihen und Vertrieb
- Klare Ausrichtung von Produkten und Dienstleistungen auf intuitive Bedienbarkeit für Kunden an allen Touch Points

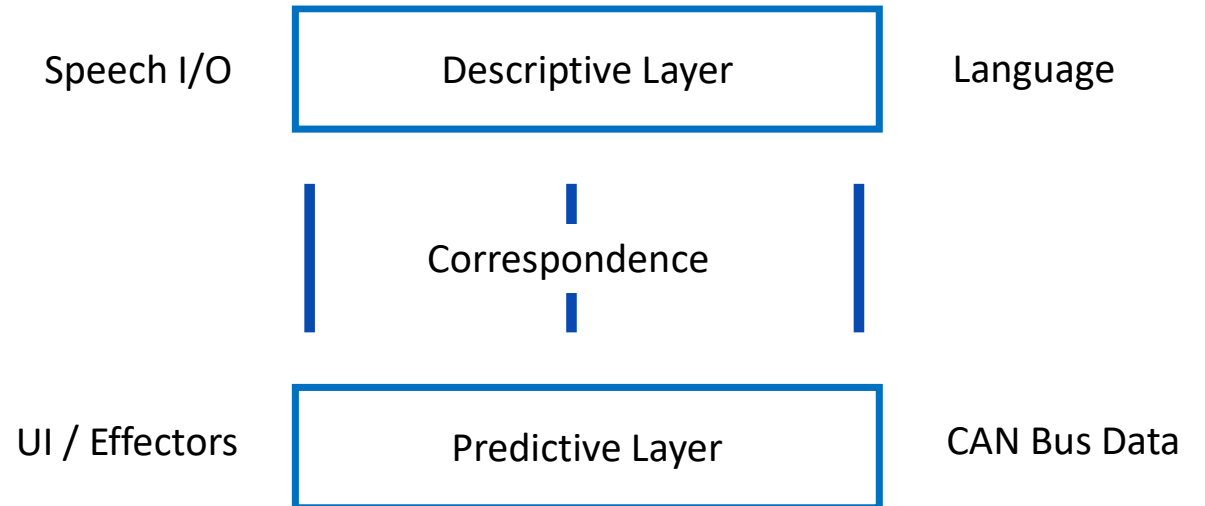


Dr. Matthias Erb, Leiter Holistic User Experience (HUX).

Volkswagen richtet sich konsequent darauf aus, der kundenorientierteste Mobilitätsanbieter zu werden. Darum gründet die Marke den neuen Bereich Holistic User Experience (HUX) unter Leitung von Dr. Matthias Erb. In seiner neuen Funktion berichtet er direkt an den Vorstandsvorsitzenden der Marke Volkswagen, Dr. Herbert Diess.

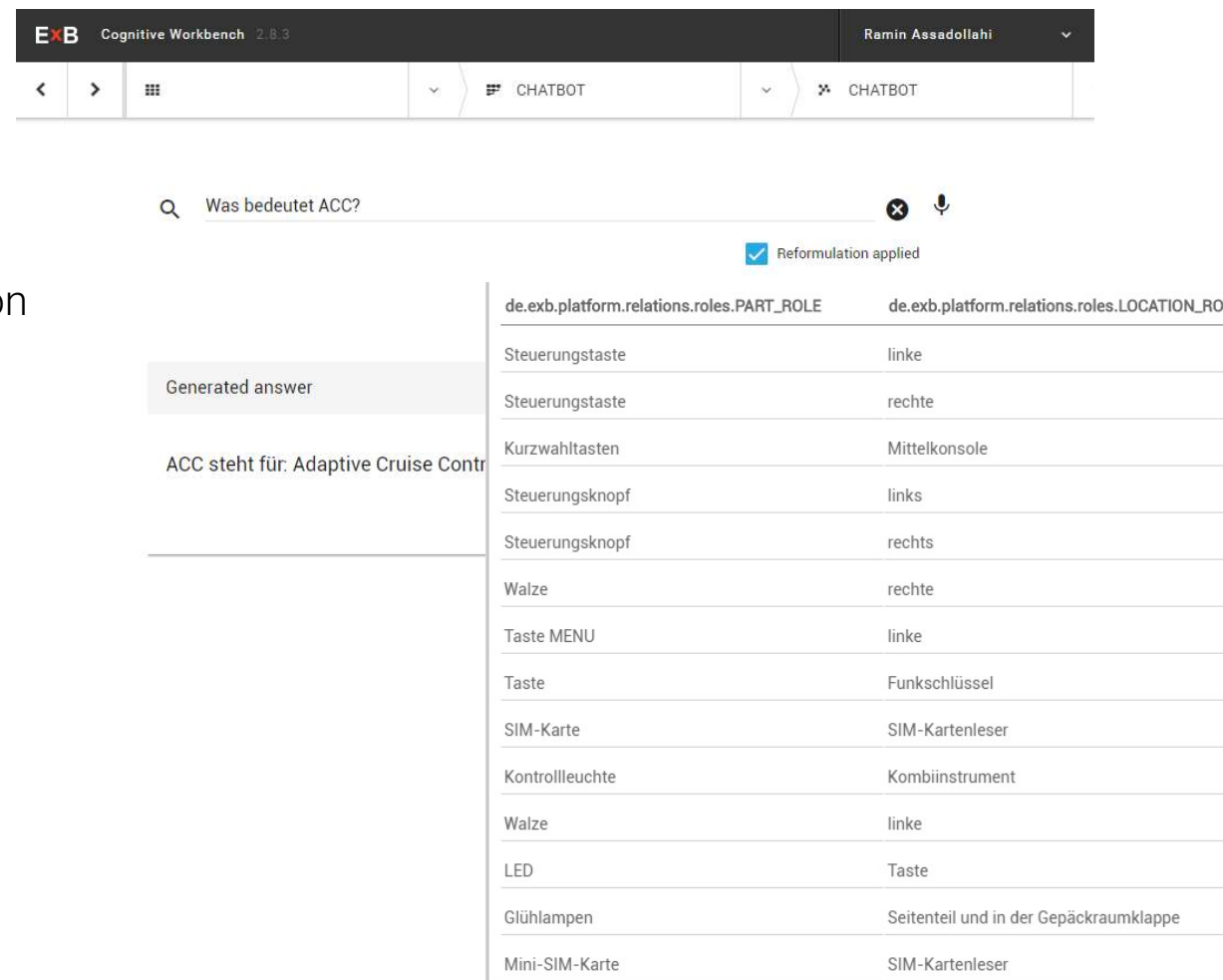
Die Zahl der Berührungspunkte zwischen Volkswagen und seinen Kunden wird in den kommenden Jahren weiter steigen. Diese so genannte „Touch Points“ sind im Auto, rund um das Auto, sowie auf Apps und Webseiten im Internet.

Concrete Self Awareness



Automatically generated Chatbots

- Step 1: Question Answering purely via sentence extraction from manuals.
- Step 2: Improvements through Named Entity Recognition and Relation Extraction



EXB Cognitive Workbench 2.8.3 Ramin Assadolahi

CHATBOT CHATBOT

Was bedeutet ACC?

Reformulation applied

Generated answer

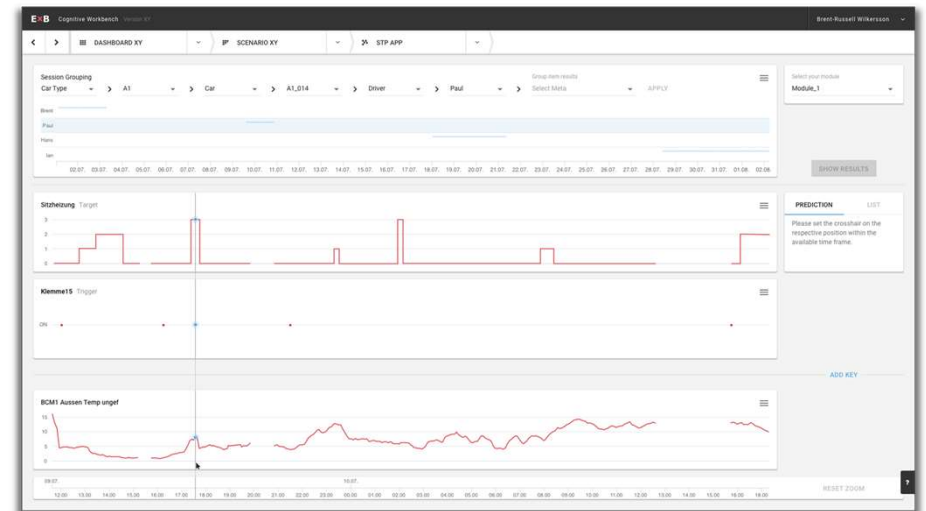
ACC steht für: Adaptive Cruise Contr

de.exb.platform.relations.roles.PART_ROLE	de.exb.platform.relations.roles.LOCATION_RO...
Steuerungstaste	linke
Steuerungstaste	rechte
Kurzwahltasten	Mittelkonsole
Steuerungsknopf	links
Steuerungsknopf	rechts
Walze	rechte
Taste MENU	linke
Taste	Funkschlüssel
SIM-Karte	SIM-Kartenleser
Kontrollleuchte	Kombiinstrument
Walze	linke
LED	Taste
Glühlampen	Seitenteil und in der Gepäckraumklappe
Mini-SIM-Karte	SIM-Kartenleser

Contextual, structured data prediction

- applications and calls predicted on phones
- media consumption and calls predicted in cars
- effector prediction in cars

- learning 1: one platform can increase quality in all use cases
- learning 2: there are subgroups of customers, we should address their needs



Car at the doctor's

Repair reports have a language of their own including different syntax and many different acronyms.

Can a computer decipher these?

[CMP] C/S ABS & BRAKE LIGHT ON [CAU] DRB COD FOR R SENSOR OPEN
TESTED SENSOR FOUND TO BE SHORTED [COR] REPLACED REAR ABS
SENSOR CODE STILL THERE CHKED WIRNG FOUND WIRE PUSHED OUT
AT CONNECTOR UNDER L F WHEEL REPAIRED RED AND VIOLET WIRE.

Linguistic Extraction of: Components, Symptoms, Correction Measures, Places



Usage Scenarios: Mobility

- Extraction of dynamic Geo related data (e.g. events, building sites)
- Here & Now of Apps & Contacts (contextual prediction of user activity)

- CAN bus data/sensor vs Driver/actor prediction
- Driver behaviour adaption

- causality extraction (structured data): repaired part vs error code
- causality extraction (unstructured data): car repair comments, forum data

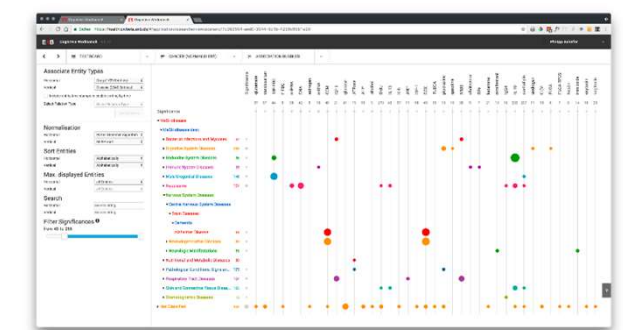
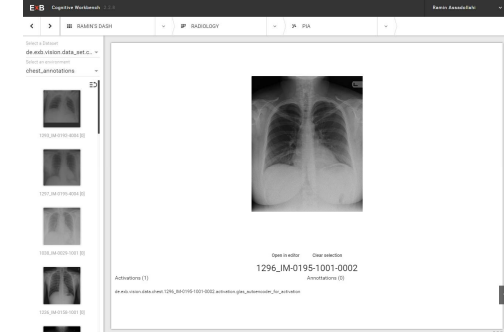
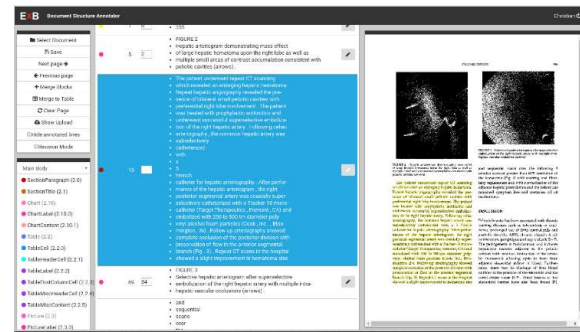
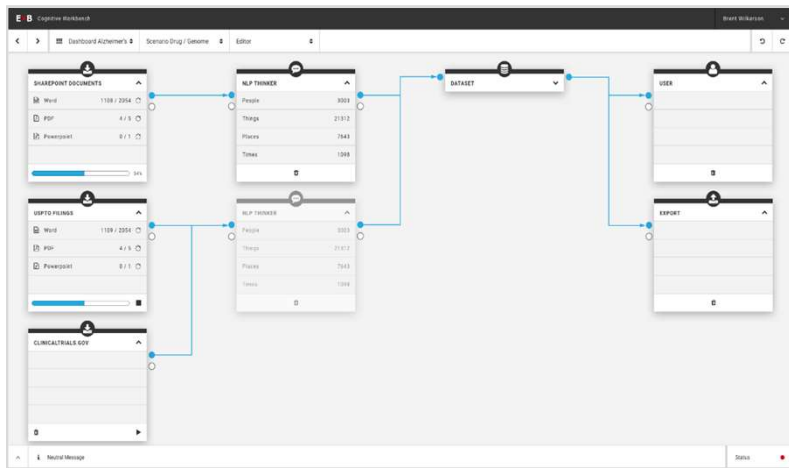
Extensions

- increase coverage of seat heating to include AC, seat massage, seat ventilation
- converge rain sensor, wiper, windshield ventilation / heating, incl. defrost in winter
- travel route, temperatures, velocity, residual energy, charging stations
- start with the descriptive convergence of chat vs system state (system can explain itself)



Cognitive Workbench

Simple, flexible configuration of an AI and iterative validation of ideas for everybody.



1: IMPORT 2: ANALYSE 3: VISUALISE 4: SHARE

EXB

Dr. Ramin Assadollahi
assadollahi(at)exb.de

Architecture

