



**Daten und ihre Qualität - die Basis für Sprachassistenten und Chatbots!
Anwendungsbeispiele aus den Regionen Seefeld et al. in Tirol.**

**Alexander Wahler – CEO
25. September 2018, Ostsee NetzwerkTag**

“Automating Customer Communication”

ONLIM at a Glance

Automating Customer Communication

COMPANY OVERVIEW

- Founded in 2015
- Academic Spin-Off
- Team of c. 20 highly experienced AI specialists and data scientists
- Funded by Strategic Investors



PRODUCT OVERVIEW

- One platform to create, manage and distribute content for customer interactions via conversational interfaces (text/ voice)
- Focus on retail, utility, tourism and financial services sectors
- Own knowledge base for dynamic, natural language conversations



Agenda

Part 1 - Artificial Intelligence (Presentation is in English)

- **Intro in AI**
- **Basic underlying technologies for voice assistants and chatbots**
- **Q&A**

Part 2 - Chatbots & Voice Assistants

- **Definition & Overview**
- **Voice is the new search**
- **Use cases and best practices**
- **Dos and Don'ts** when setting up a chatbot project
- **Q&A**

Artificial Intelligence

What is "Intelligence"?

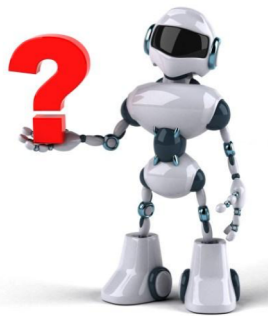


- "Intelligence denotes the ability of an individual to **adapt his thinking to new demands**; it is the common mental adaptability to new tasks and conditions of life" (William Stern, 1912)
- Being "intelligent" means to be able to cognitively grasp phenomena, **being able to judge**, to trade off between different possibilities, or to be able to learn.
- An important aspect of "Intelligence" is the way and efficiency how humans are able to **adapt to their environment or assimilate their environment for solving problems**.
- Intelligence manifests itself in logical thinking, computations, the memory capabilities of the brain, through the application of words and language rules or through the recognition of things and events.
- **The combination of information, creativity, and new problem solutions is crucial for acting "intelligent"**.

Artificial Intelligence

What is “Artificial Intelligence”?

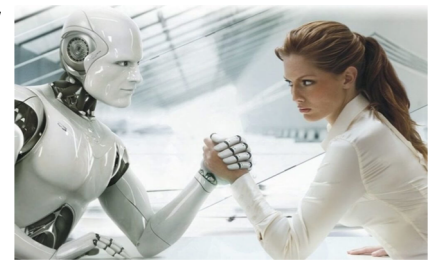
- Many definitions exist, among them:
 - “The study of the computations that make it possible to perceive, reason, and act” (Winston, 1992)
 - “A field of study that seeks to explain and emulate [human] intelligent behaviour in terms of computational processes” (Schalkoff, 1990)
- The goal of AI is thus:
 - **To have computers do things, that, if people did them, we would consider intelligent**
 - **To explain how human intelligence works, and reproduce it in computers**



Artificial Intelligence

Strong vs Weak AI

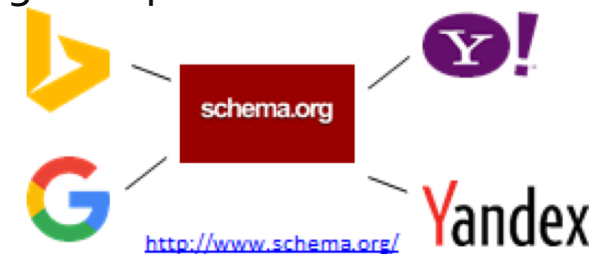
- **Strong AI**
 - Strong AI is centered on coming up with technology that can think and function very comparable to humans.
 - Solve multiple tasks today or in the future and interact with the world better than many humans - General Applications
- **Weak AI**
 - Weak AI, in contrast to strong AI, does not attempt to perform the full range of human cognitive abilities.
 - Can only solve a specific task generally better than humans - Narrow Applications.
 - Machines can be made to act as if they are intelligent. Intelligence can be simulated.



Artificial Intelligence

Semantic Web - schema.org

- **schema.org** is about the use of Semantic Web technologies to publish structured data on the Web and set links between data sources.
- **schema.org** is the defacto standard supported by the major search engines providing a common support for webmasters, search engines and users:
 - Webmasters use one single markup for structured data supported by the major search engines
 - Search engines get the structured information they need to improve search results
 - Users get better search results and better experience on the Web
- Embedded in HTML using (1) Microdata, (2) RDFa or (JSON



```

<div itemscope itemtype="http://schema.org/Movie">
  <h1 itemprop="name">Avatar</h1>
  <div itemprop="director" itemscope itemtype="http://schema.org/Person">
    Director: <span itemprop="name">James Cameron</span>
  </div>
  <span property="genre">Science fiction</span>
  <a href="..">Avatar</a>
</div>
<script type="application/ld+json">
{
  "@context": "http://schema.org/",
  "@type": "Movie",
  "name": "Avatar",
  "director": {
    "@type": "Person",
    "name": "James Cameron",
    "birthDate": "1954-08-16"
  },
  "genre": "Science fiction",
  "trailer": "../movies/avatar-theatrical-trailer.html"
}
</script>

```

Artificial Intelligence

Semantic Web - Google Knowledge Graph

- *"A huge knowledge graph of interconnected entities and their attributes".*

Amit Singhal, Senior Vice President at Google

- *"A knowledge based used by Google to enhance its search engine's results with semantic-search information gathered from a wide variety of sources"*

http://en.wikipedia.org/wiki/Knowledge_Graph

- Based on information derived from many sources including *Freebase, CIA World Factbook, Wikipedia*
- Contains many billion facts and Objects



Artificial Intelligence

Semantic Web - Google: from a Search Engine to Query Answering/Knowledge Engine and beyond

Google 1.0

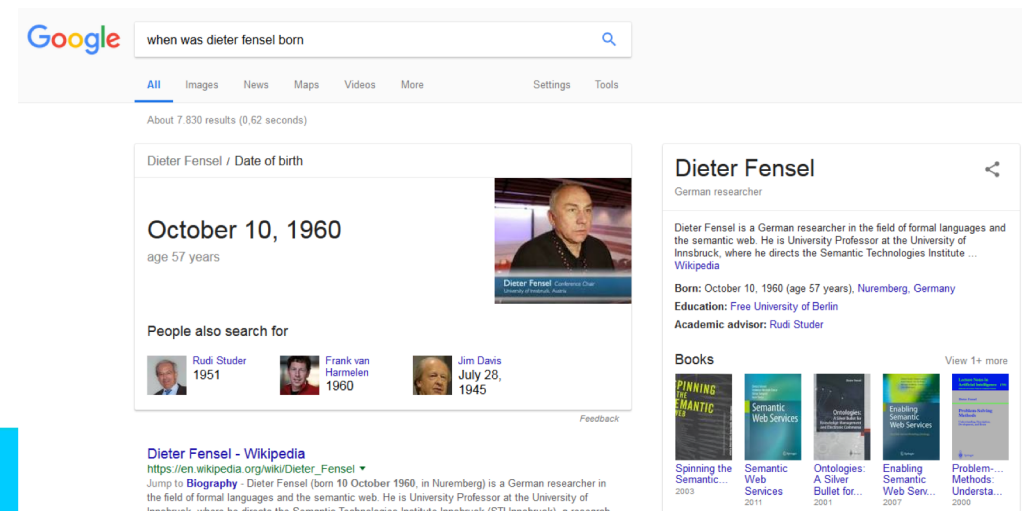
- Search Engine based on statistical analysis of web resources.
- Fast, excellent index of the Web.
- No semantics used.

Google 2.0

- Following Web of Data principles.
- Not about documents but objects such as places, people and things that are interlinked
- Objects have structured information, being semantically described

Google 3.0

- Google as an Oracle
- Why waiting for a user query
- Why not simply predict what he needs in a certain moment.



Google Knowledge Graph

Google

Anmelden


Alle Maps Bilder News Videos Mehr Einstellungen Tools

Factual answers




Ungefähr 9.880.000 Ergebnisse (0,59 Sekunden)

Kärnten / Bevölkerung

557.371
2015



Andere suchten auch nach

 Tirol 746.153	 Vorarlberg 388.711	 Klagenfurt am Wörth... 96.640
---	--	---

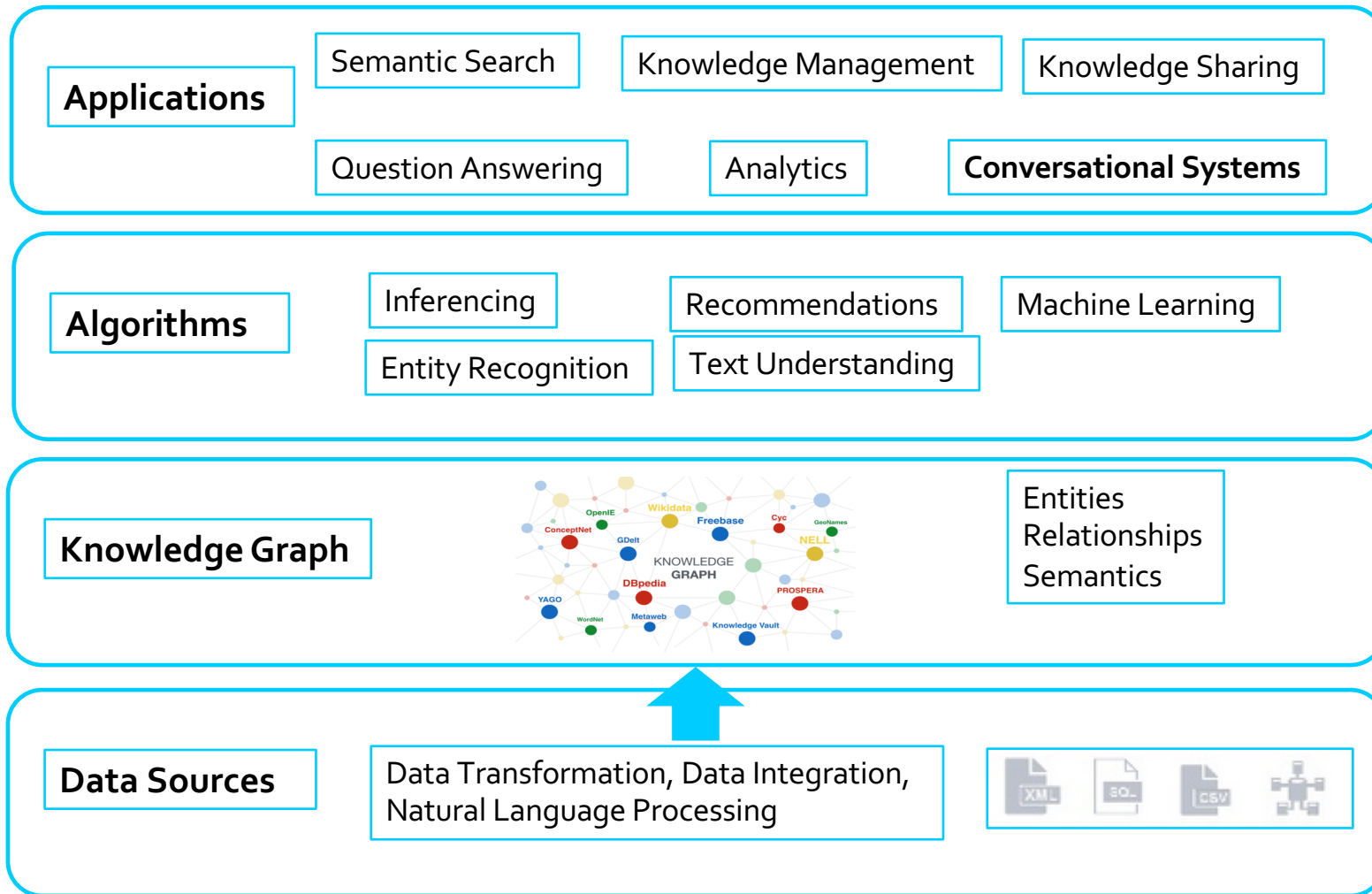


Map data ©2018 GeoBasis-DE/BKG (©2009), Google

Kärnten

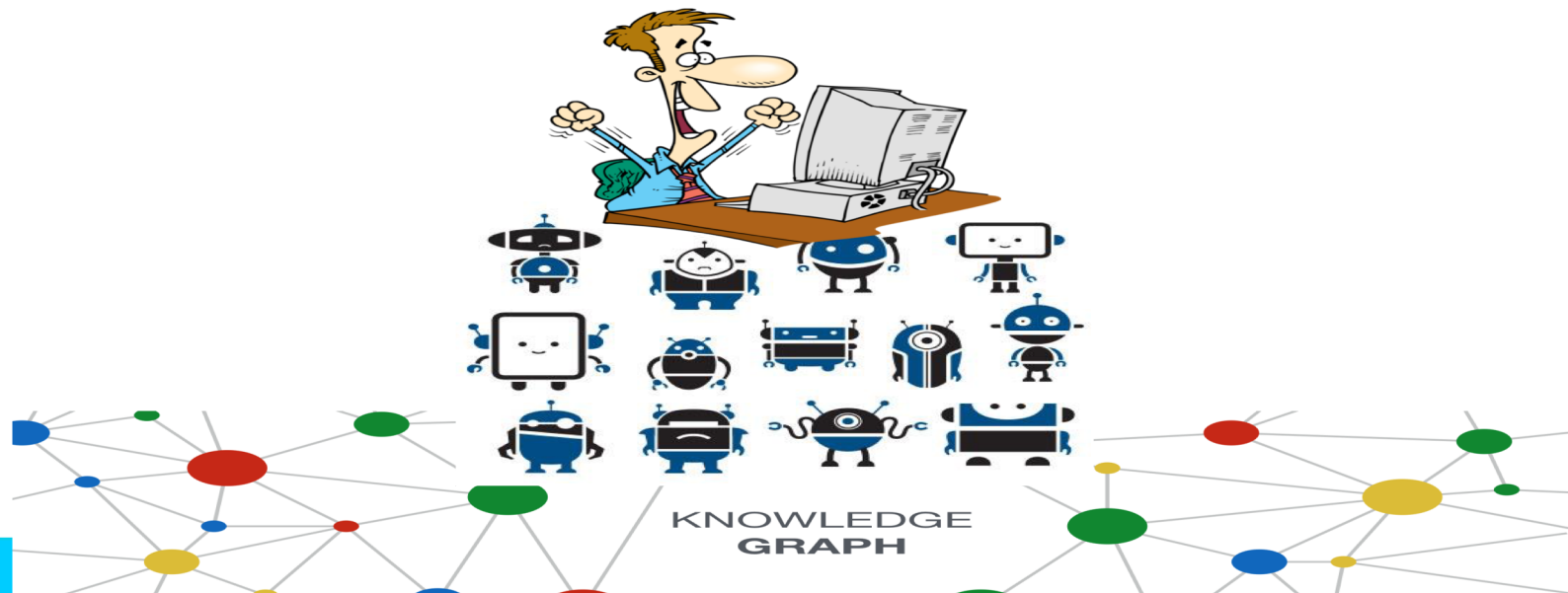
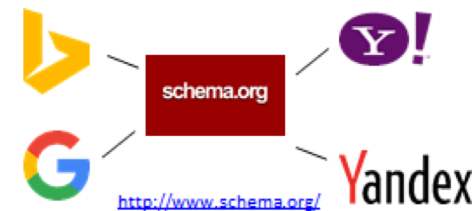
Kärnten ist eine in den Ostalpen gelegene südösterreichische Region, in der sich der höchste Berg Österreichs, der Großglockner, befindet. Sie zeichnet sich durch Alpenseen und Berge sowie mittelalterliche Bauten, wie die Burg Hochosterwitz, aus. Die Hauptstadt von Kärnten, Klagenfurt, liegt am Ufer des riesigen

What can we do with Knowledge Graphs?

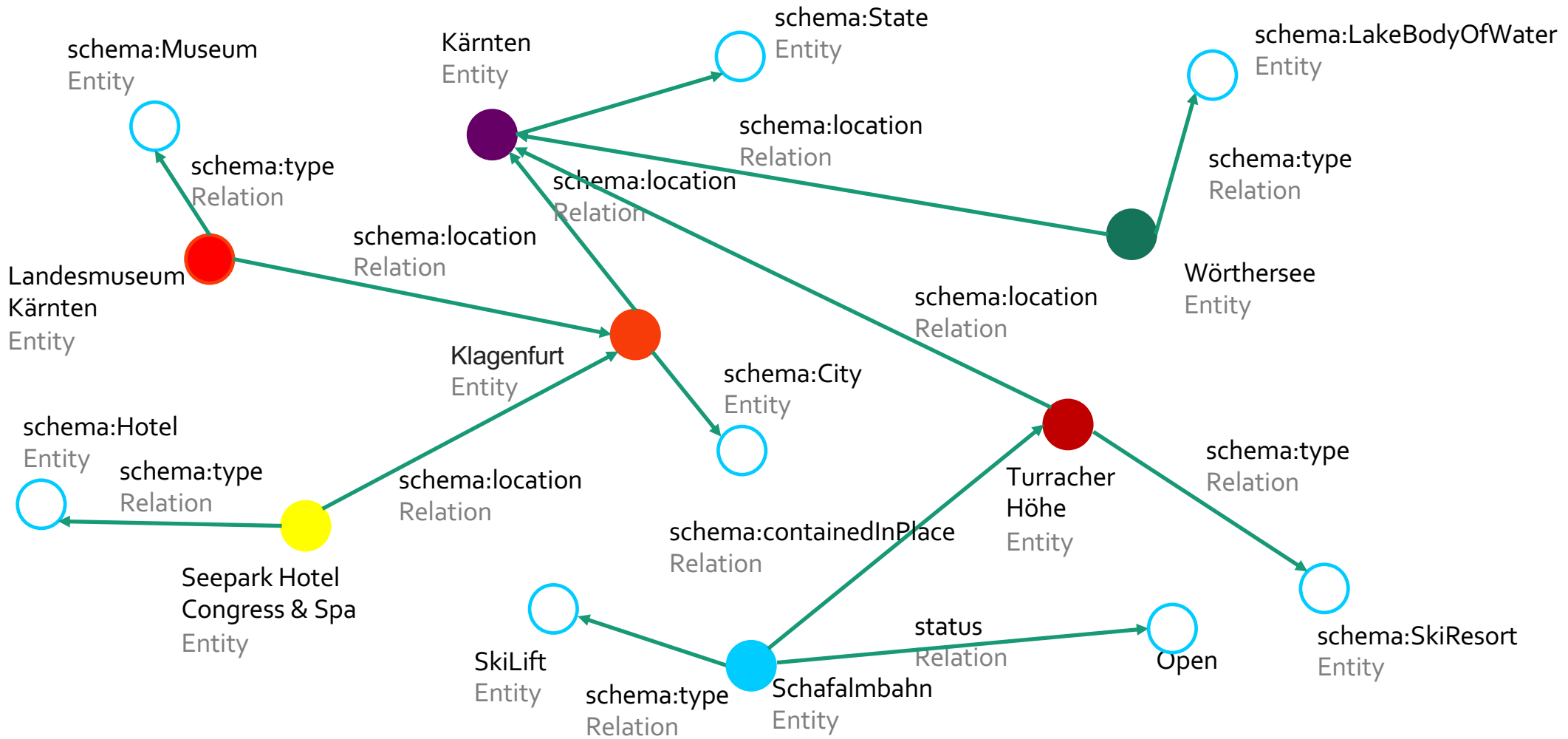


Why Knowledge Graphs can enable better chatbots?

- Conversational systems need structured, formal representation of data to “understand” what the data is about
 - Ontologies e.g. schema.org provide the means to formally describe data
- If data is understood, conversational systems can provide high quality answers – more precise, more personalized answers



Example: Kärnten Knowledge Graph (tiny part ;)



Artificial Intelligence

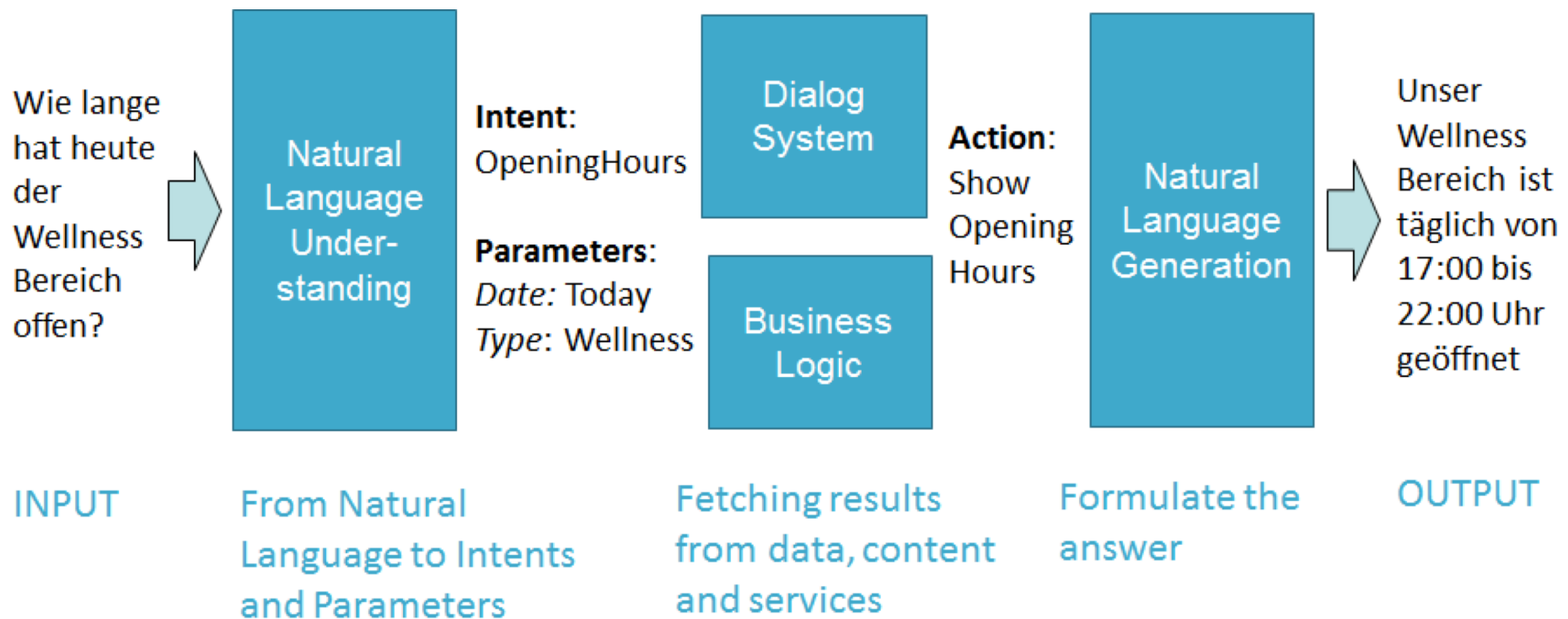
Natural Language Processing

- **Natural Language Processing** is the AI subfield concerned with processing and understanding of speech or written language.
- Early applications include question-answer systems, natural-language based access to databases or speech-based control of robots.
- Three main subfields: *language understanding*, *language generation*, and *machine translation*
- Application areas: Tools for inter-human communication, tools for text generation or text correction (i.e. identification of grammatical errors based on language models), information classification or filtering, or human-machine communication.



Artificial Intelligence

Underlying technologies for Chatbots



Our technology in action

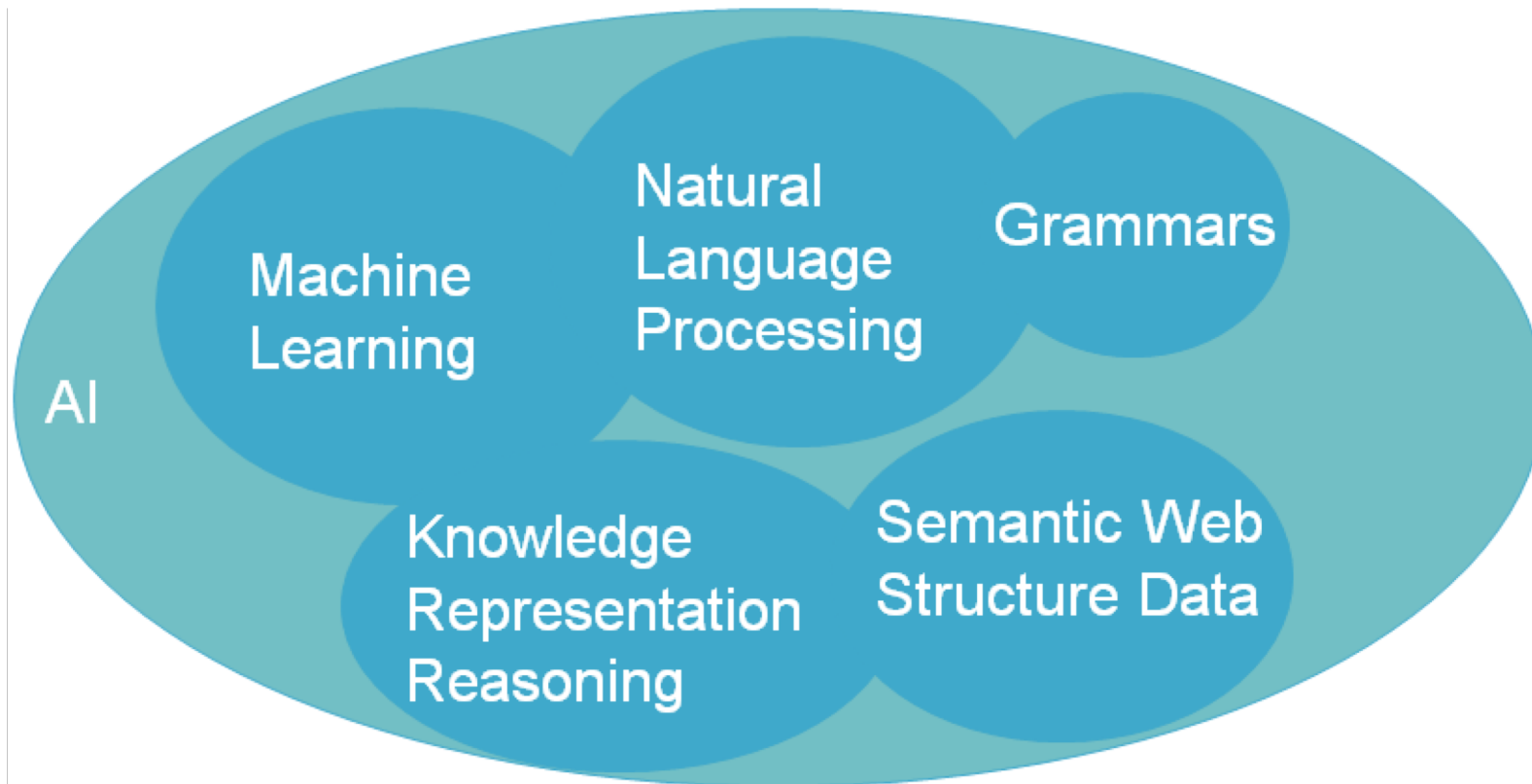


Our secret AI mix and assets:

- Semantic models for machine understanding of data
- Data Knowledge Graphs of our customer data
- Own rule based reasoning tool to optimize natural language dialogues

Artificial Intelligence

Underlying technologies for Chatbots



Agenda

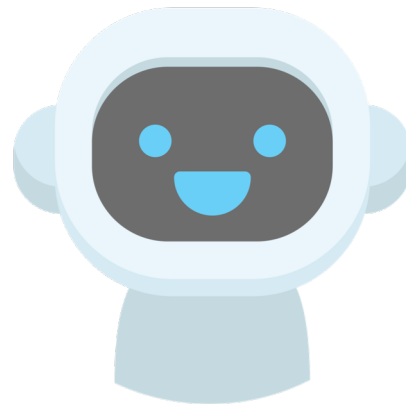
Part 1 - Artificial Intelligence (Presentation is in English)

- AI definition, AI history
- Overview of AI subfields
- Examples of well known AI systems
- Basic underlying technologies for voice assistants and chatbots
- Q&A

Part 2 - Chatbots & Voice Assistants

- **Definition & Overview**
- **Voice is the new search**
- **Use cases and best practices**
- **Dos and Don'ts** when setting up a chatbot project
- **Q&A**

A **chatbot** (also known as a **talkbot**, **chatterbot**, **Bot**, **IM bot**, **interactive agent**, or **Artificial Conversational Entity**) is a computer program or an artificial intelligence which conducts a conversation via **auditory** or **textual** methods.



There is a shift on the horizon ...

...the rise of conversational interfaces

Like there was with the internet 20 years ago.



Or with apps 10 years ago

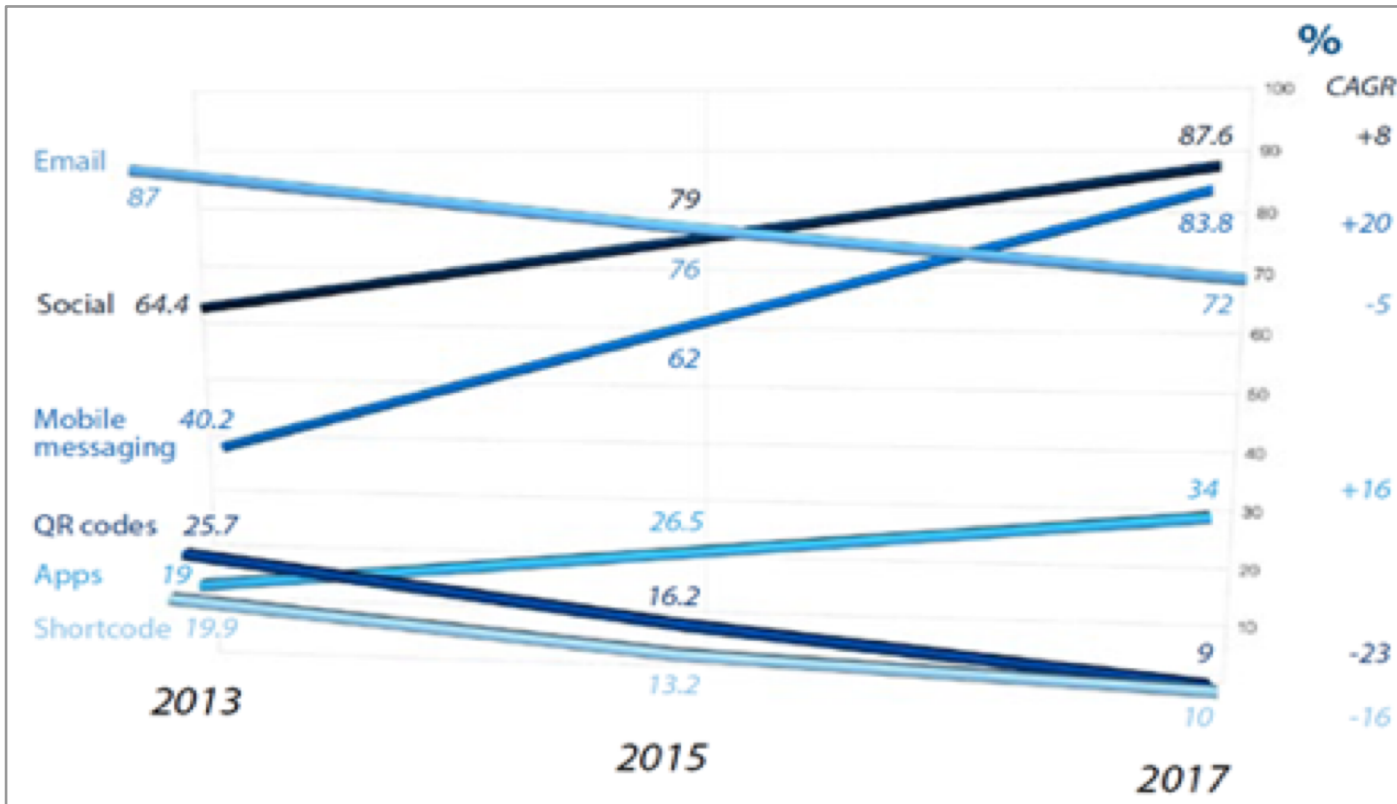


kik.



There is a shift on the horizon ...

Why now?

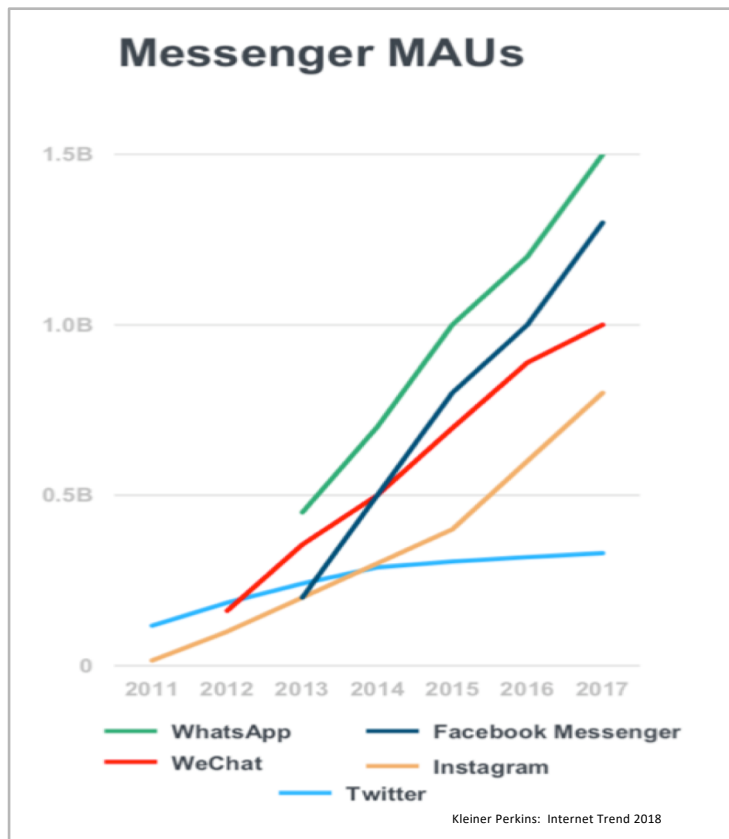


- Mobile messaging has become more and more important
- Fastest growing communication channel between businesses and users

Mobilesquared: compound Annual Growth Rate of 20% for mobile messaging

There is a shift on the horizon ...

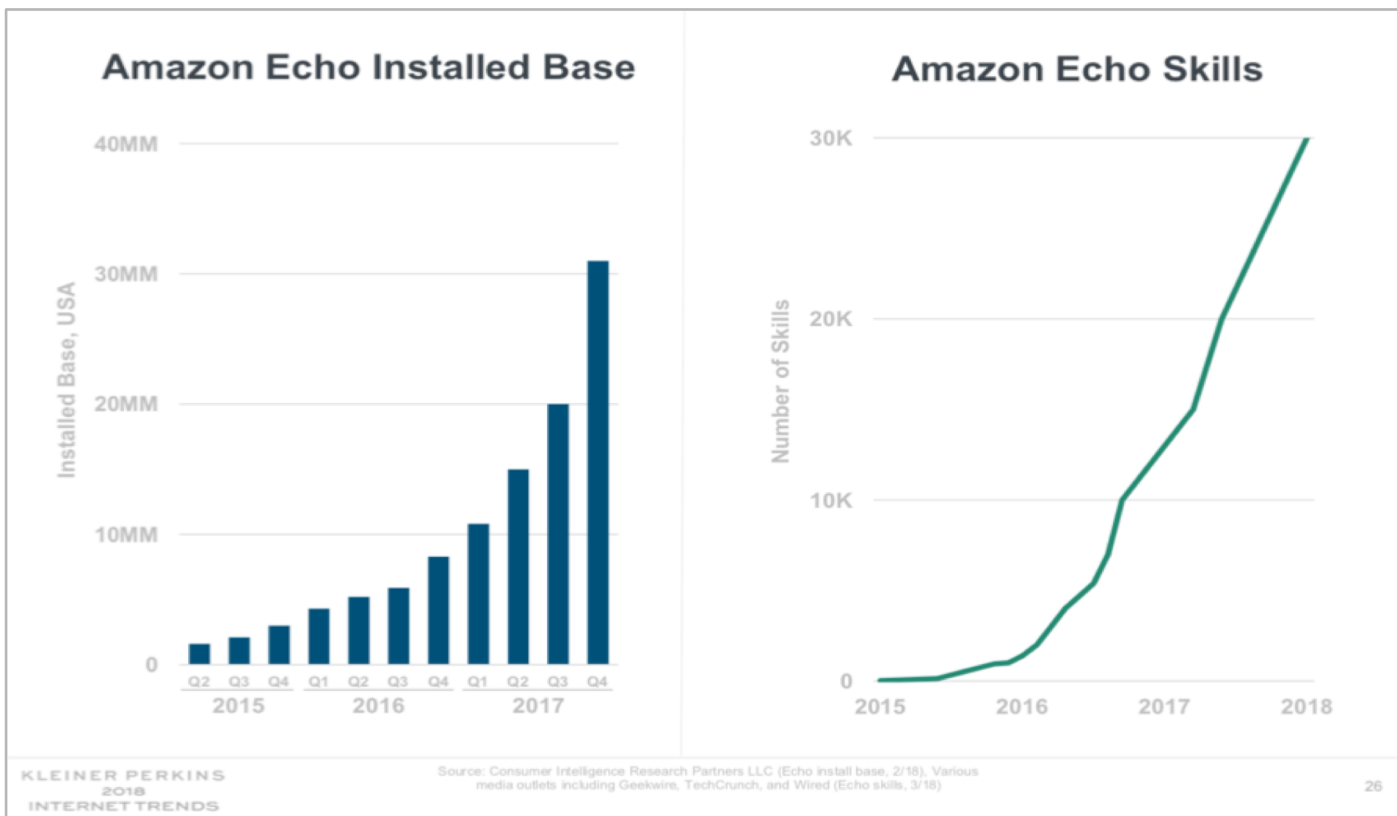
Why now?



- Facebook Messenger and WhatsApp are the most popular messengers
- 1.5 Billion active users per month
- Facebook officially opened FB Messenger for bots in April 2016
- In May 2018 there were 300.000 bots implemented on FB Messenger

There is a shift on the horizon ...

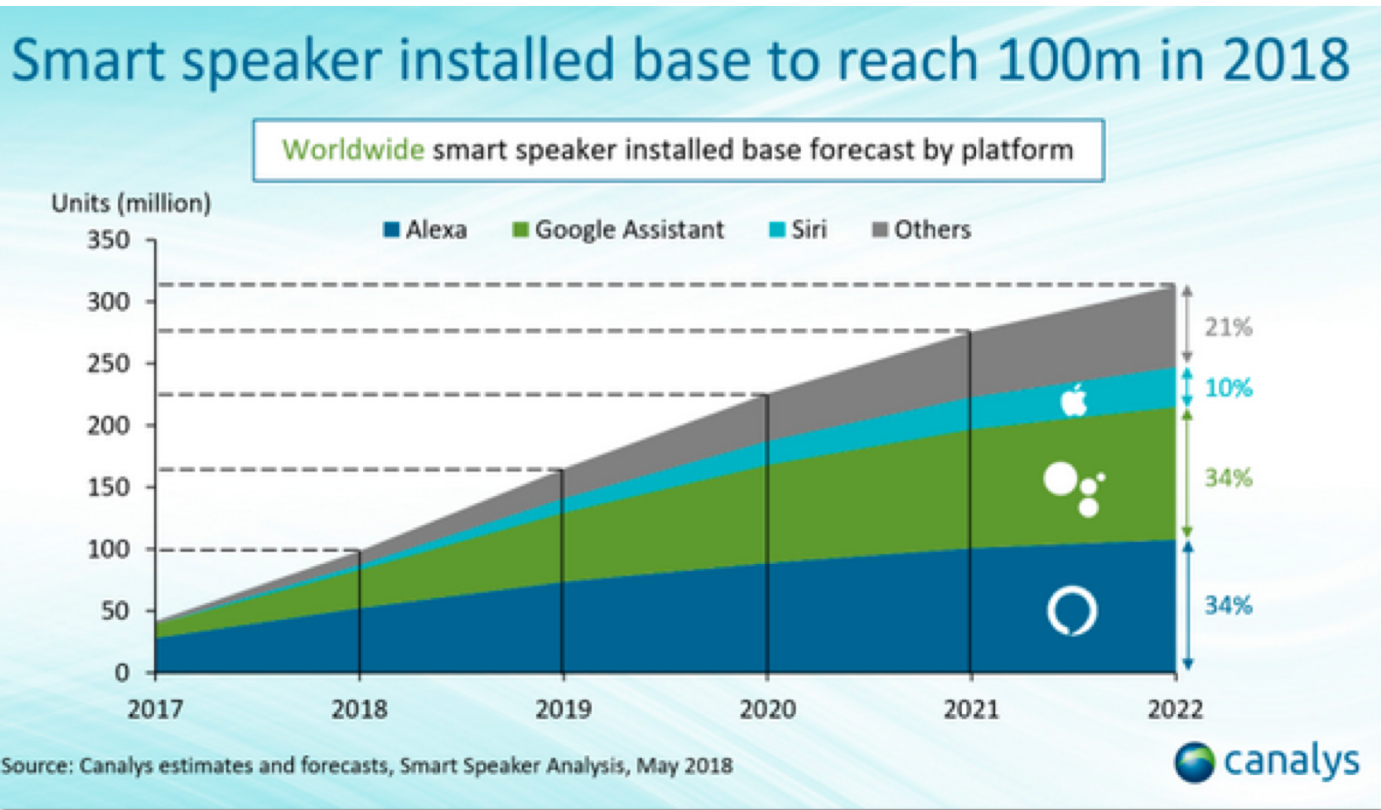
Why now?



- fast growing
- devices & Skills
- huge 4th quarter in 2017

There is a shift on the horizon ...

Why now?



- 1st quarter Google home has outpaced Amazon Alexa
- voice & screen combinations are becoming more and more popular
- user behavior will change dramatically
 - voice is 40x more action-oriented than search*
 - 200x more conversational than search*

*according to a Google survey presented on Tuesday at VentureBeat's TRANSFORM Conference



amazon alexa

IS THE NEXT

SEARCH ENGINE



Gary Vaynerchuk

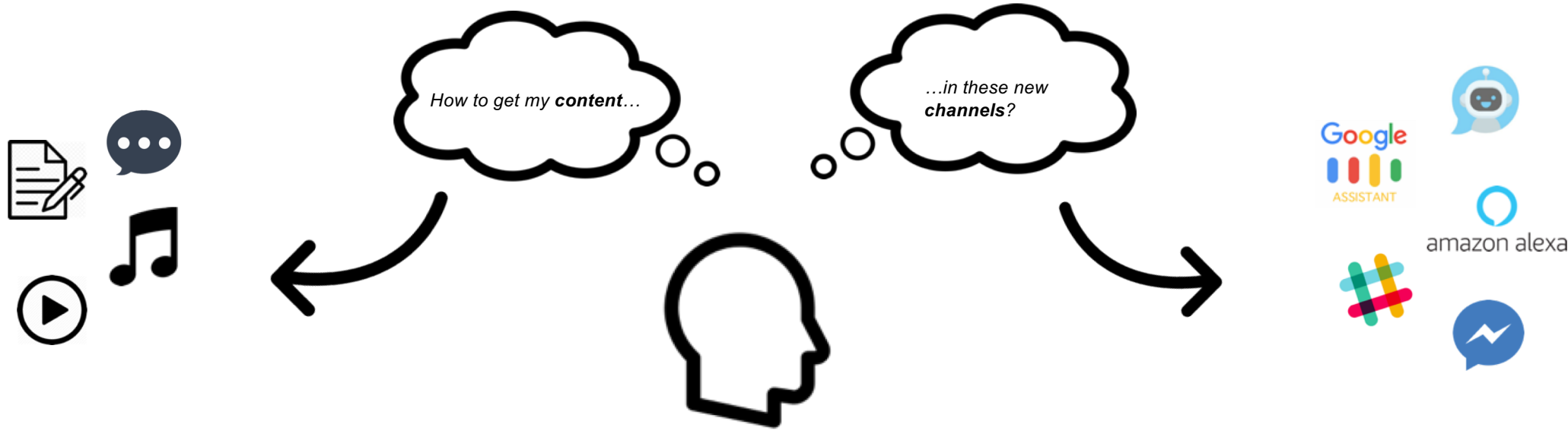
- transitioned his father's local liquor store into one of the first wine e-commerce platforms resulting in growing the family business from \$3-60MM in sales during a 5-year period
- meanwhile he is running the agency "VaynerMedia" with more than 600 employees and more than \$ 100 MM revenue
- key note speaker, visionair, entrepreneur

Challenges ...

IN 2020...

50% OF ALL SEARCHES WILL BE DONE BY VOICE ASSISTANTS
30% OF ALL SEARCHES WILL BE DONE WITHOUT A DESKTOP

Bots, Mobile and Voice-assistants



Source: e.g. Cognizant Insights

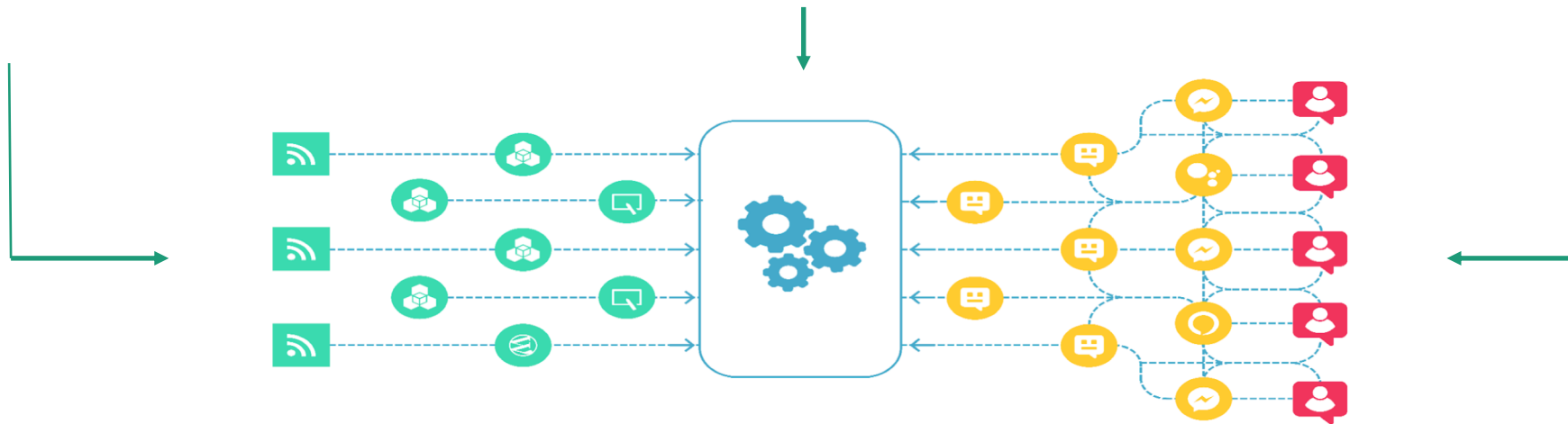
So what could you do?

MANAGING CUSTOMER INTERACTION

Create content or connect data sources

Matching natural language with data

Multichannel voice / text platform



Conversational Interface platforms should cover



Multichannel

One platform for channels as messengers, websites or artificial assistants



Artificial Intelligence

No 1:1 relations between answers and questions for better results



Easy Handling

Adoption of Content,



Data Agnostic

External data sources as CRM or PIM should be connected



Knowledge Base

Knowledge bases enable better dynamic conversations in natural language

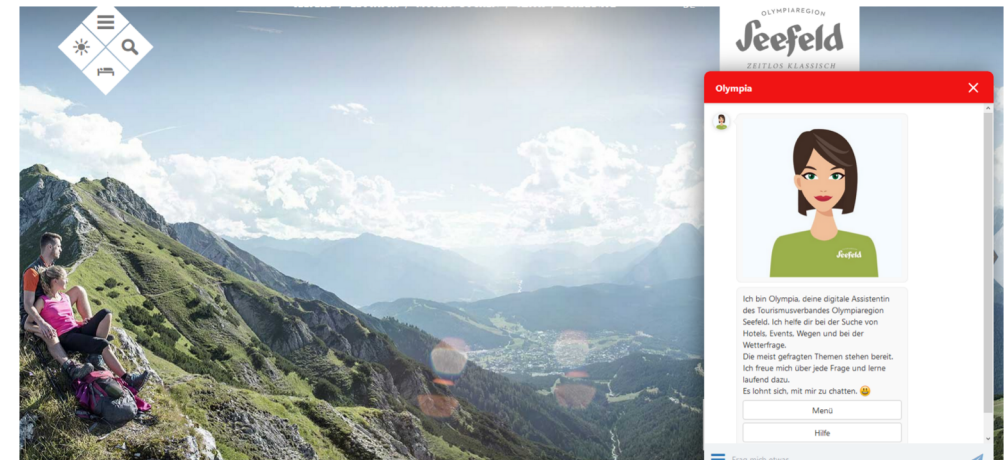
Examples of Chatbot-Solutions

Some of our, but also other, chatbot solutions



- Website and FB Messenger Bot
- 20.000 conversations so far
- fully integrated in customer service organisation
- customer service bot

- Website, FB Messenger and Amazon
- 150 - 200 conversations / day
- provides information about the region
- external data sources such as weather or touristic data included



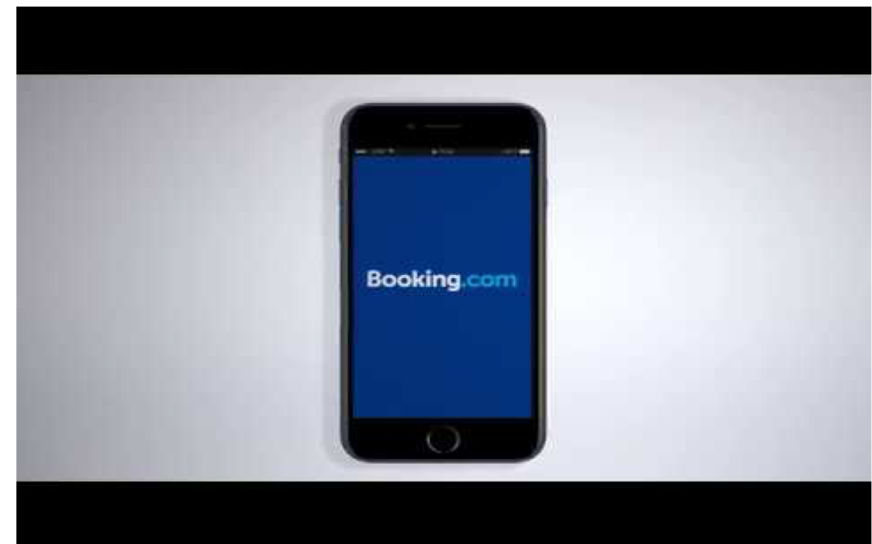
Examples of Chatbot-Solutions

Some of our, but also other, chatbot solutions



- guiding users through the Amtrak website
- 25% more bookings on the website
- 1 Mio savings in customer support from their call centers

- Helps guests regarding bookings
- on website & FB
- goal is to reduce interactions between guest and host



Chatbot use cases in various verticals

... and there are many more of course

- **Retail**

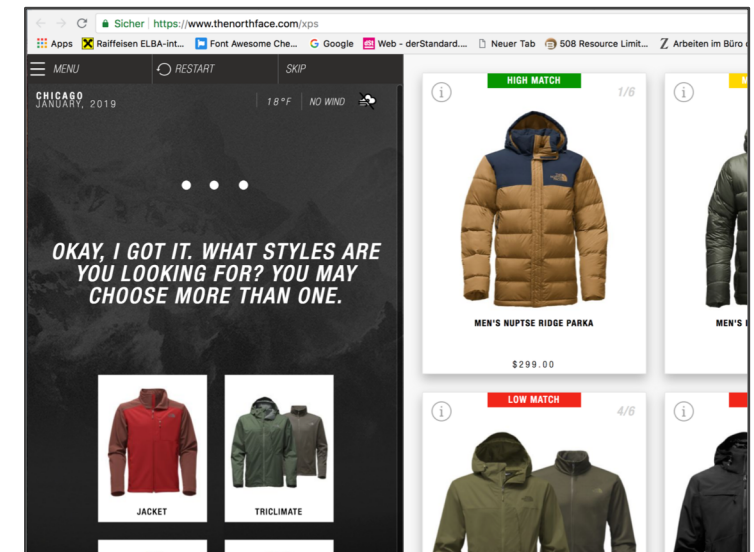
- 24/7 customer service
- product finder and personal styling
- voice assistant in-store shopping experience
- increasing customer loyalty

- **Finance**

- 24/7 customer service
- product information (banking, insurance)
- stock market prices
- financial advisor

- **Travel**

- information bots for DMOs (destination marketing organisations)
- concierge bots in hotels
- availabilities, pricing information > direct booking



Our recommendations for chatbot projects

Are based on the experiences of 20 “live” bots and from about 1 Mio messages provided

- Find the right use case
- Get the experts on the table
- Narrow and deep instead of wide and flat
- Be clear and transparent
- Be prepared for the time after launch



- **What is a Google Assistant Action, What is a Amazon Alexa Skill?**
- **Do I need a Skill or Action or will Amazon and Google do everything for me?**
- **How do I get my data in Google Assistant or Amazon Alexa?**
- **Relationship Linked Open Data and Voice Assistants?**
-

- Chatbot seefeld.com
- Chatbot serfaus-fiss-ladis.at
- Chatbot outdooractive: <https://bot-demo.onlim.com/widget/outdoor-assistent/>
- Alexa Skill SFL
- Alexa Skill seefeld
- Onlim Multichannel Management Platform

Standardized Projects

Analyse

- Selection of intents for assistant
- Selection of channels
- Kick-Off Workshop
- Requirements
- Project plan
- Dialogue examples

Implement

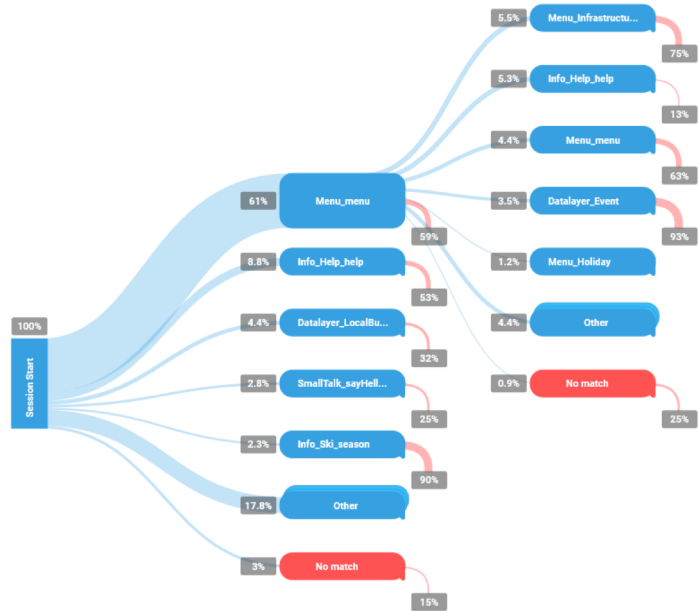
- Chatbot framework
- Static answers / questions
- Dynamic matching
- Data modelling
- Integration external sources
- Bot Management System
- Example questions
- Human Switch
- Training
- Tests
- Going Live

Operate

- Operating
- Maintenance
- Hosting
- Support
- Bot Management System
- Optimization

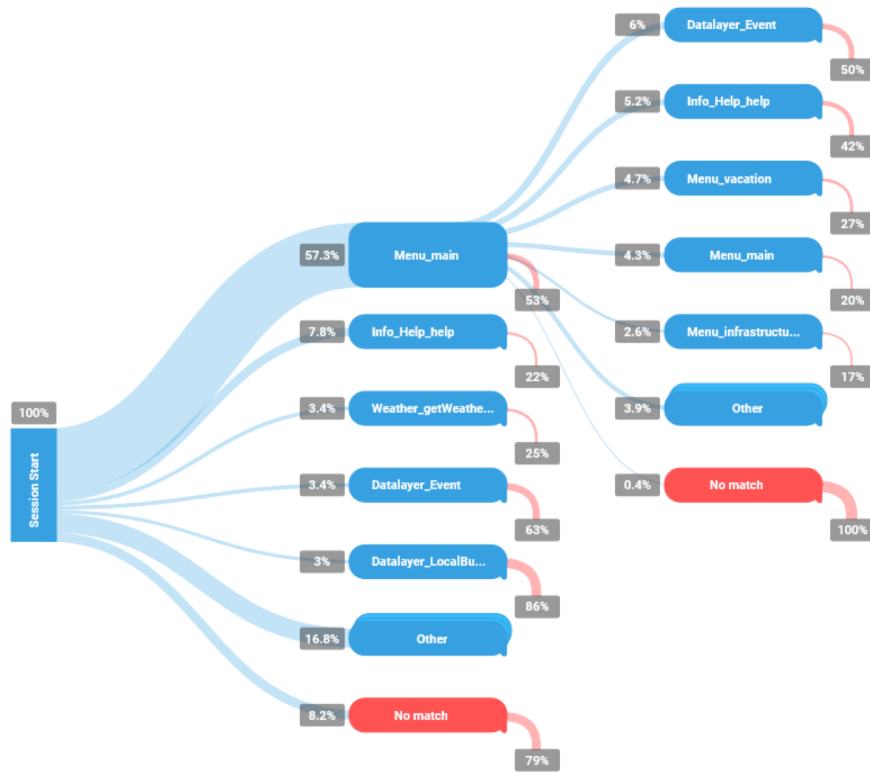
Statistics of our running bots

Session flow



Statistics of our running bots

Session flow



Alexander Wahler

alexander.wahler@onlim.com



Onlim.com



@onlim_com



Onlim GmbH



@onlim_com



@onlim.io