Building A Useful Chatbot: Beyond ML and NLP

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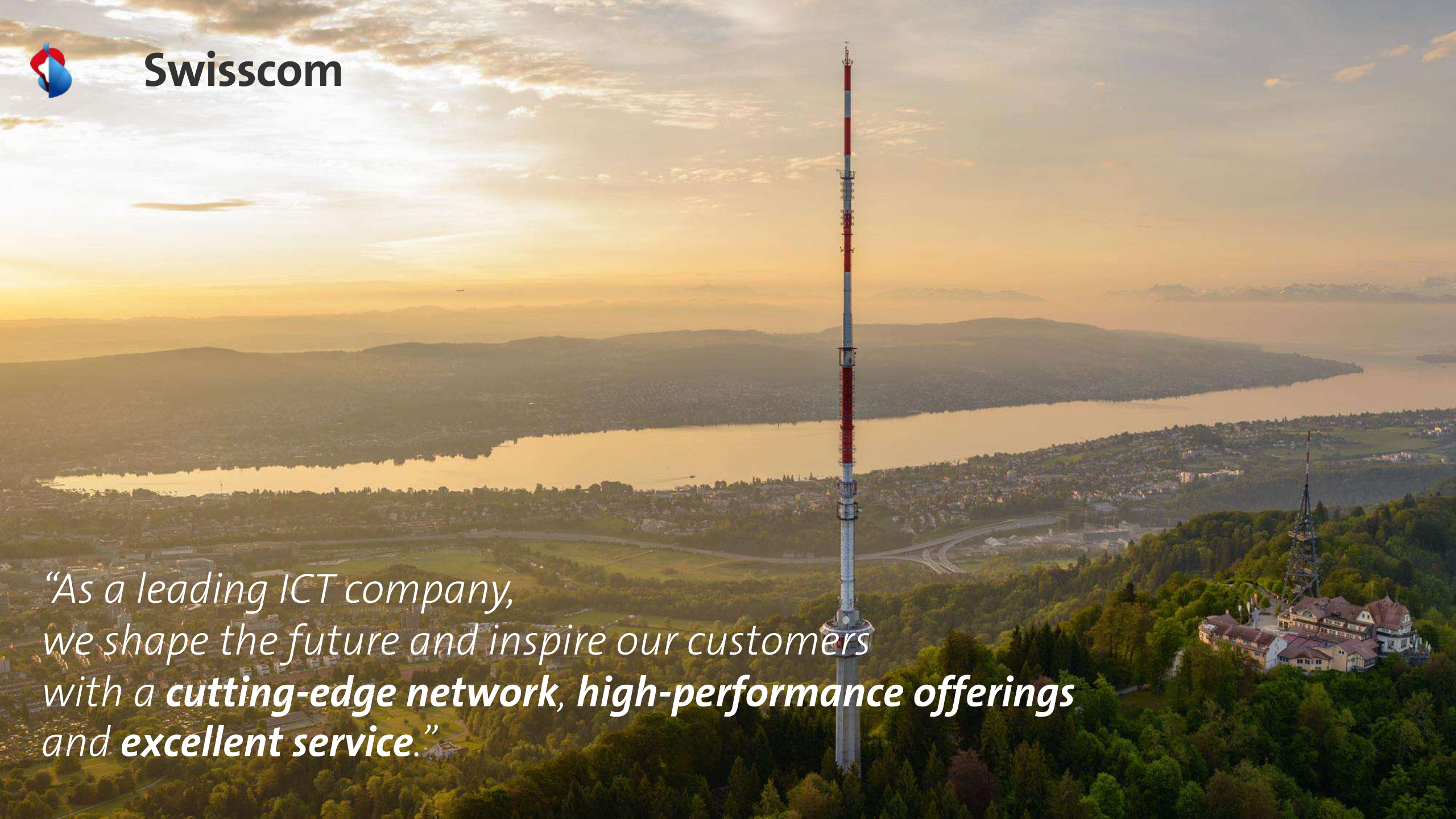
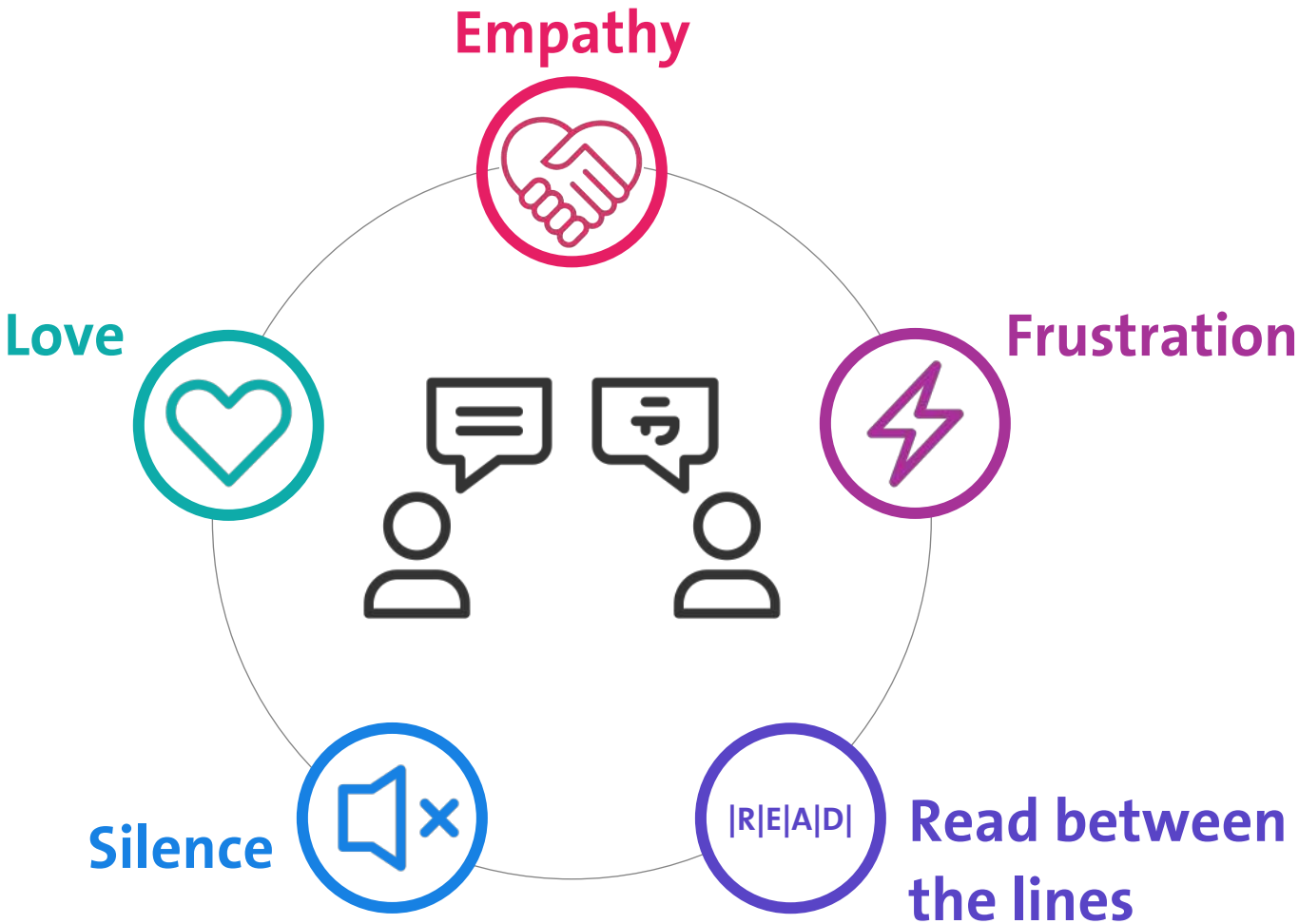
Swisscom

swisscom


Swisscom
*“As a leading ICT company,
we shape the future and inspire our customers
with a **cutting-edge network**, **high-performance offerings**
and **excellent service**.”*

Customer Communication

Communication Is Not Easy



AI and Language

87.2%

GLUE score

- Natural Language Inference
- Question Answering
- Paraphrasing
- Sentiment Analysis
- Acceptability

70.5%

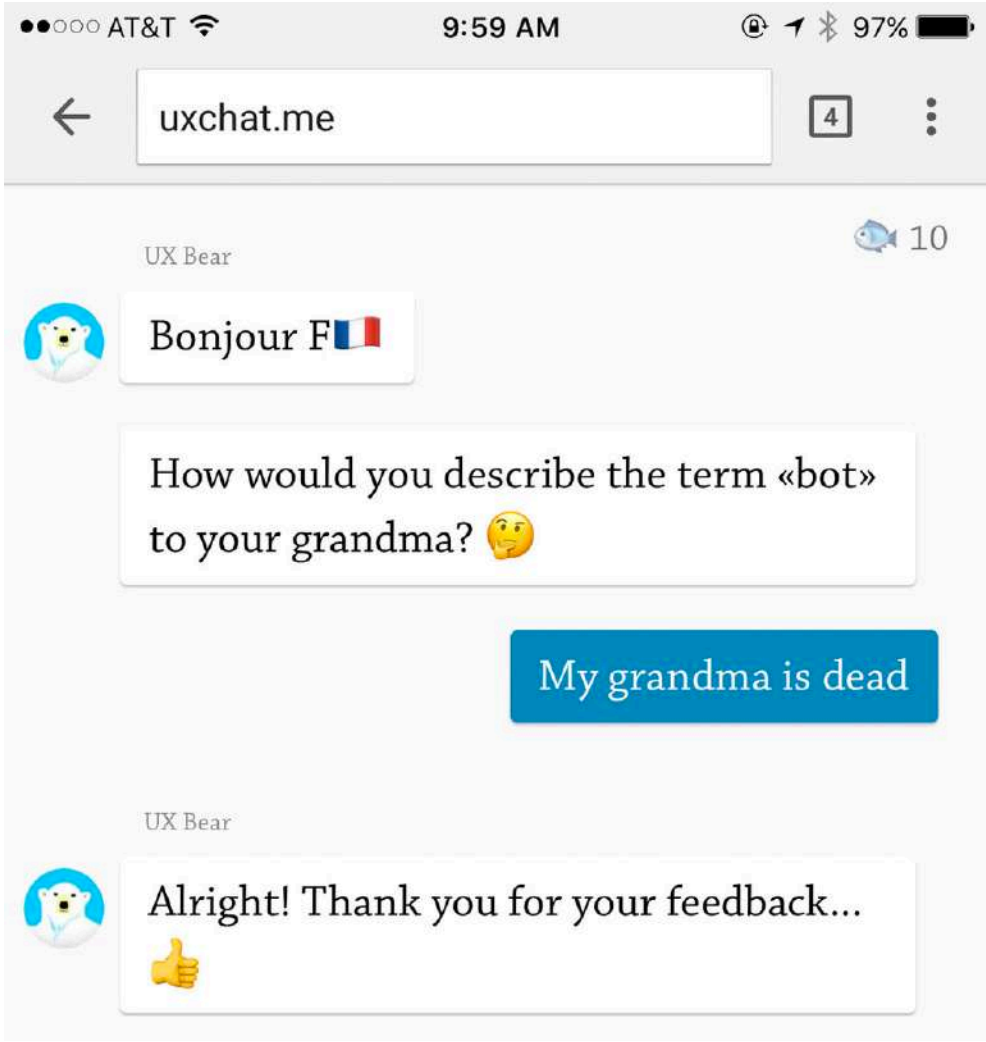
SuperGLUE score

- Natural Language Inference
- Causal Reasoning
- Reading Comprehension
- Word Sense Disambiguation

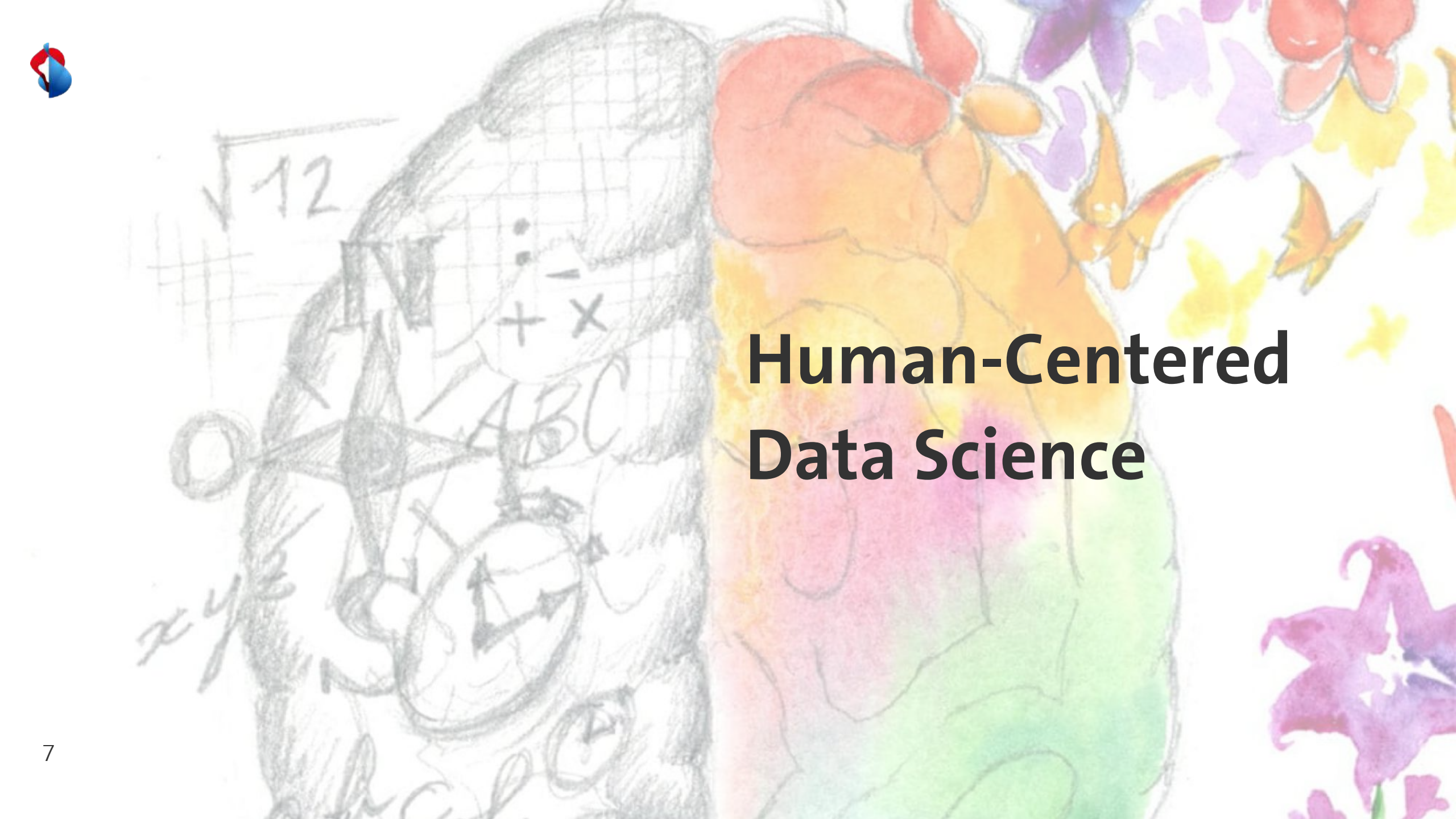
AI and Communication

87.2%
GLUE score

~60%
accuracy

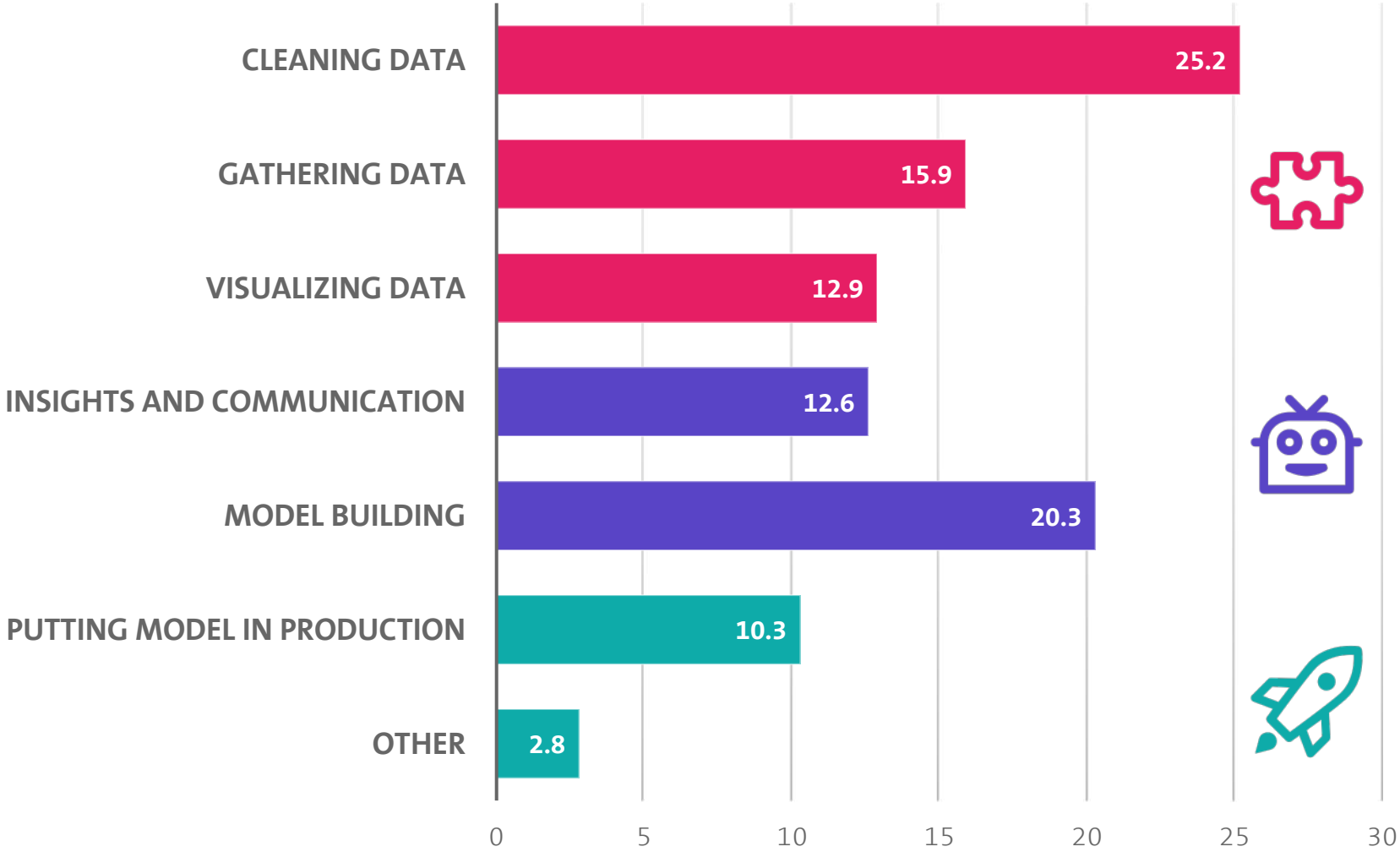


Sources: AI Index Report, 12/2018; “Emotion Detection in Text: a Review”, Seyeditabari et al.



Human-Centered Data Science

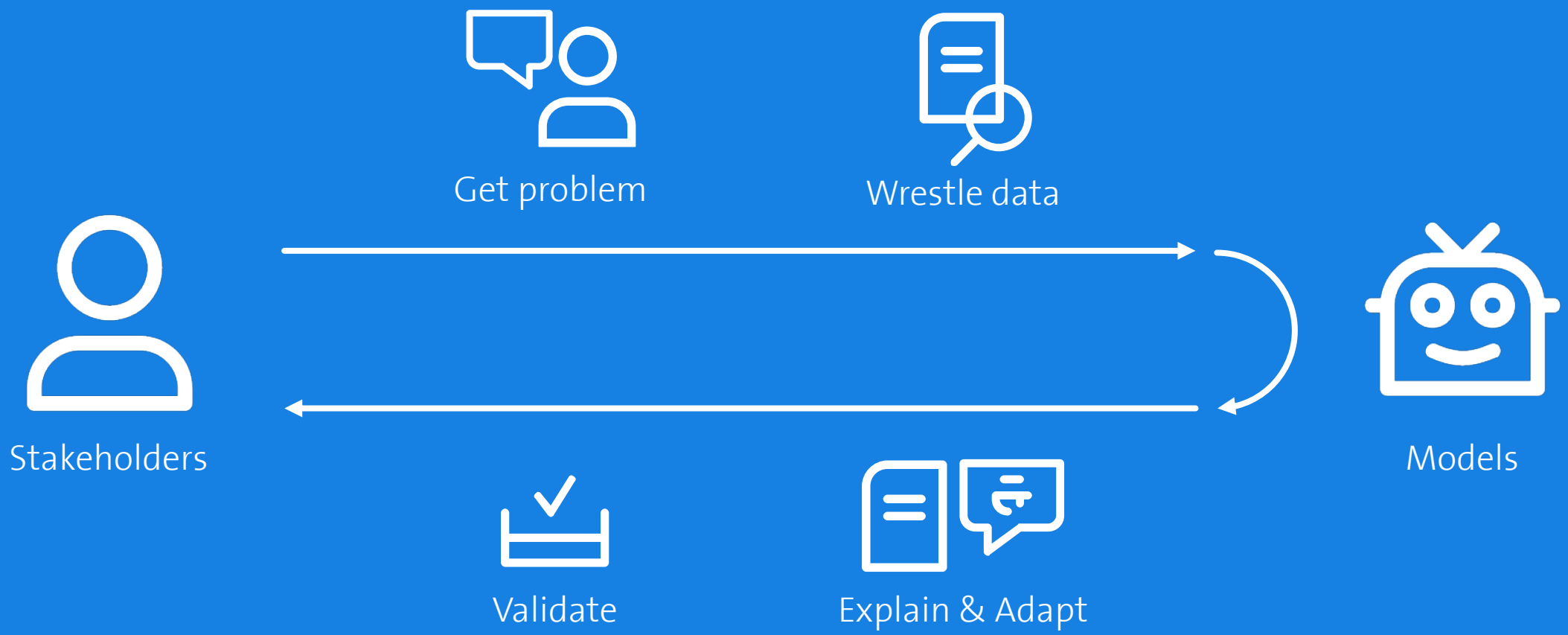
I ❤ Data

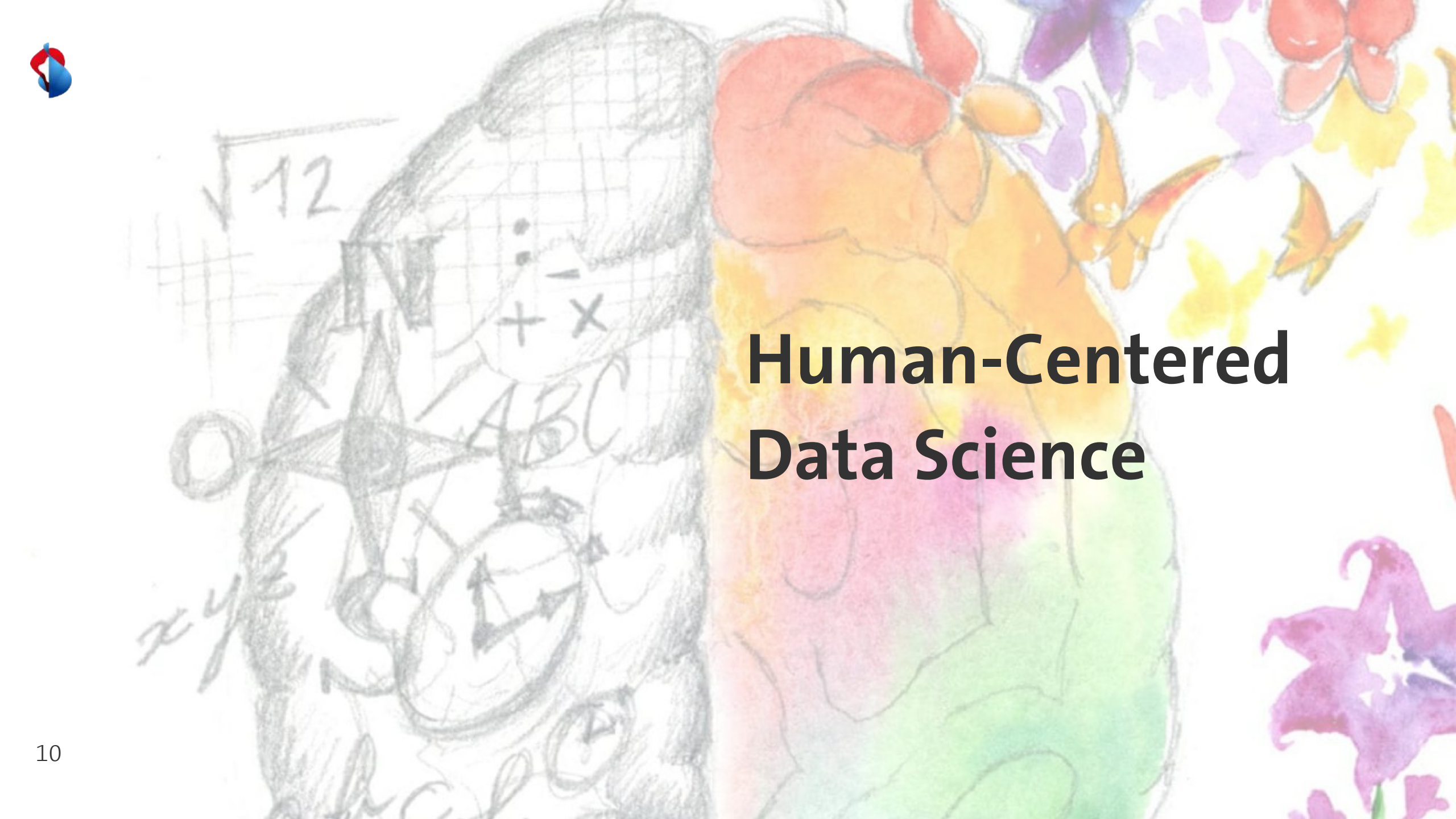


kaggle

Survey 2018

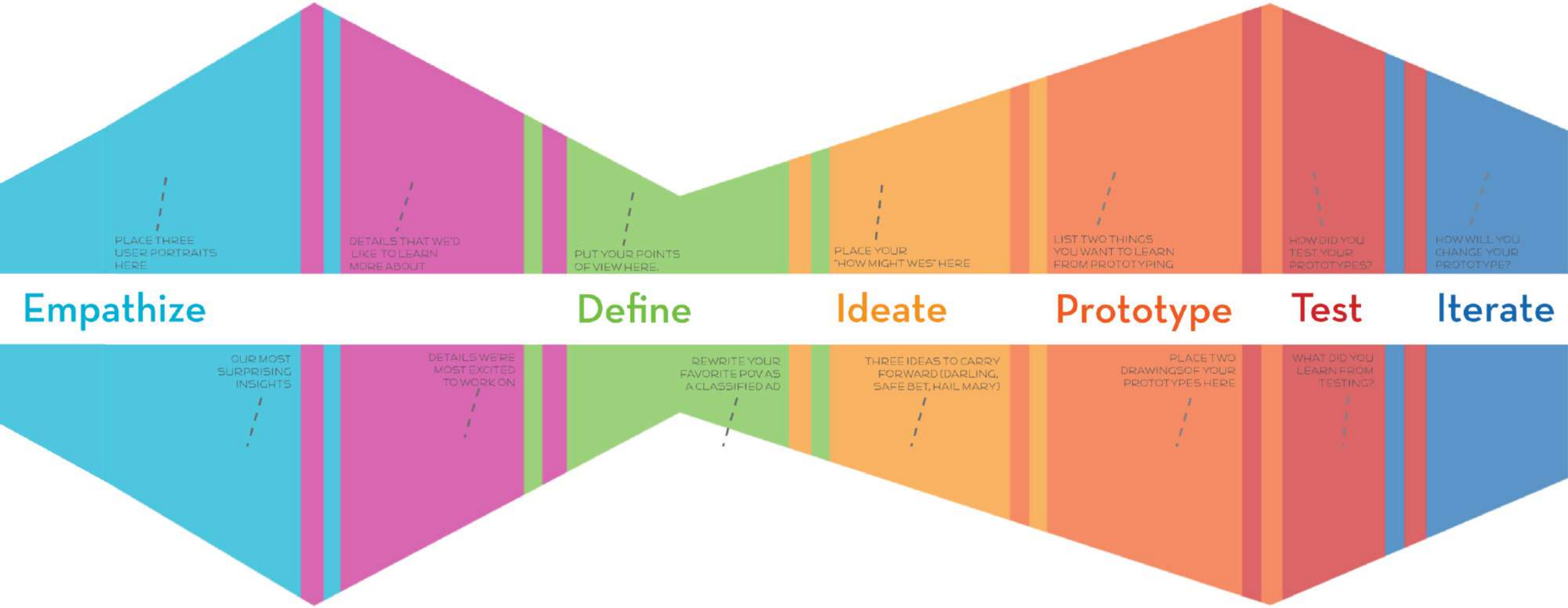
In Other Words...



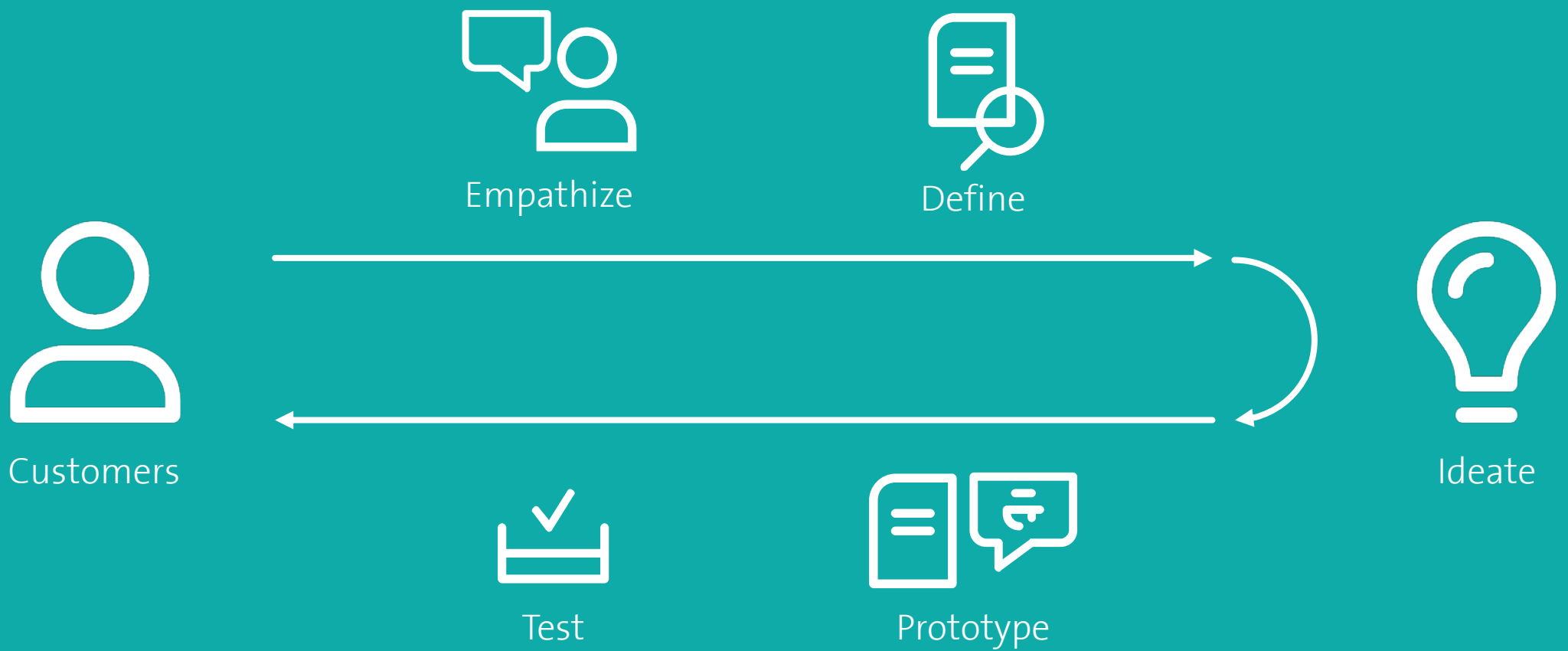


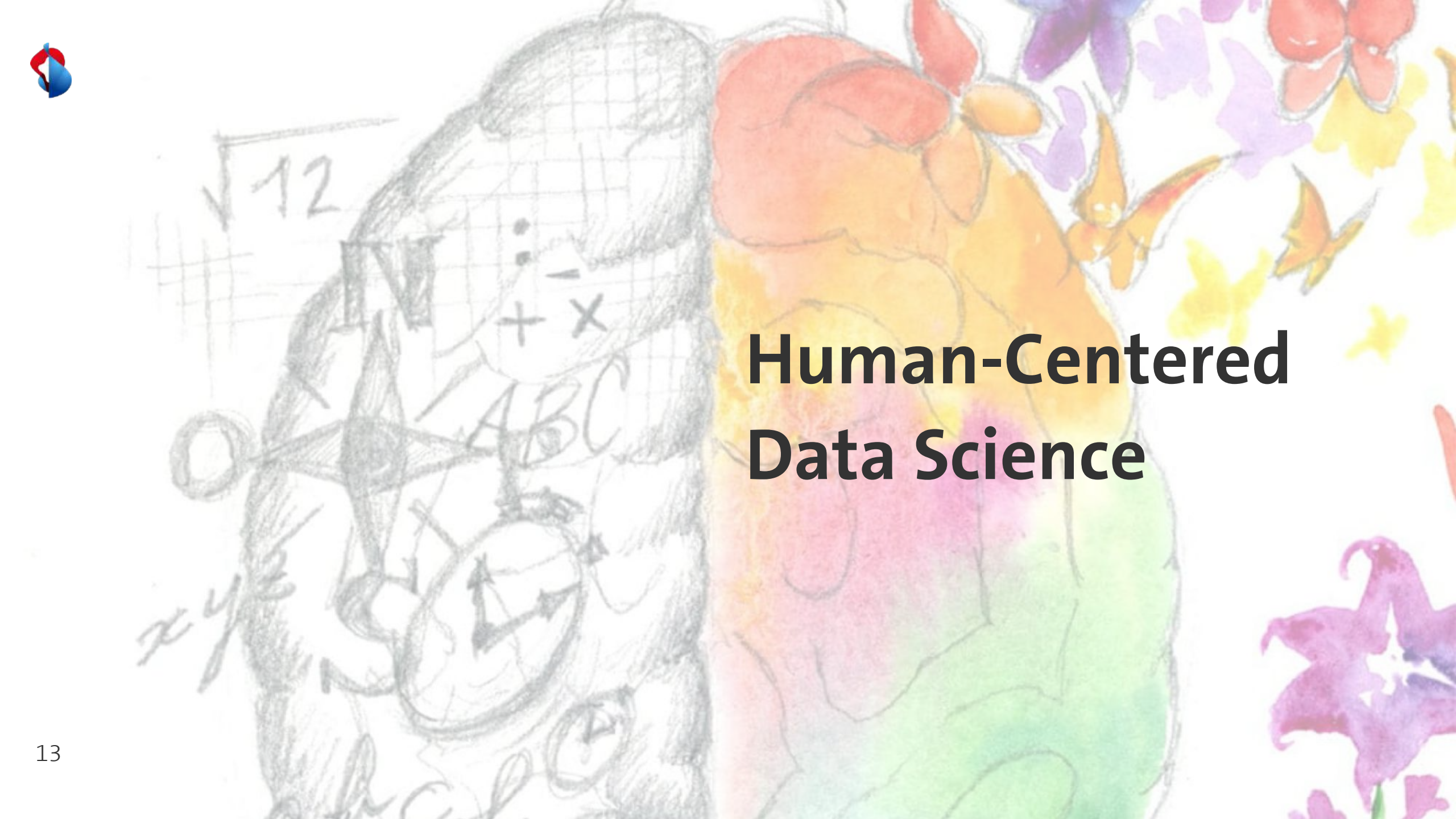
Human-Centered Data Science

Human-Centered Design



In Other Words...





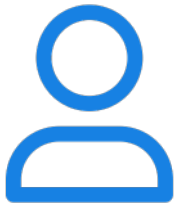
Human-Centered Data Science

What can AI do for Customer Communication ?

Start With The Problem

How can we optimize
customer support costs?

How can we increase
conversion rates?



How can we solve requests
quickly and accurately?

How to help users figure out if
our product fits their needs?

Continue With the Tools: The Bot Anatomy

Continue With the Tools: Bot Architectures

Clickbot

Goal-driven bot

Retrieval bot

Generative bot

Getting Things Done

Providing Information, Chatting

Continue With the Tools: Bot Enablers

Sentence classification

Entity recognition

Inverted Index

Dual Encoder

Text to SQL

Encoder Decoder

Transformer

Knowledge Graph

Dialog Management

FSM

Putting the Pieces Together

Inverted Index | Dual Encoder | **Retrieval bot**

Sentence classification | Entity recognition | **Static flow** | **Goal-oriented bot**

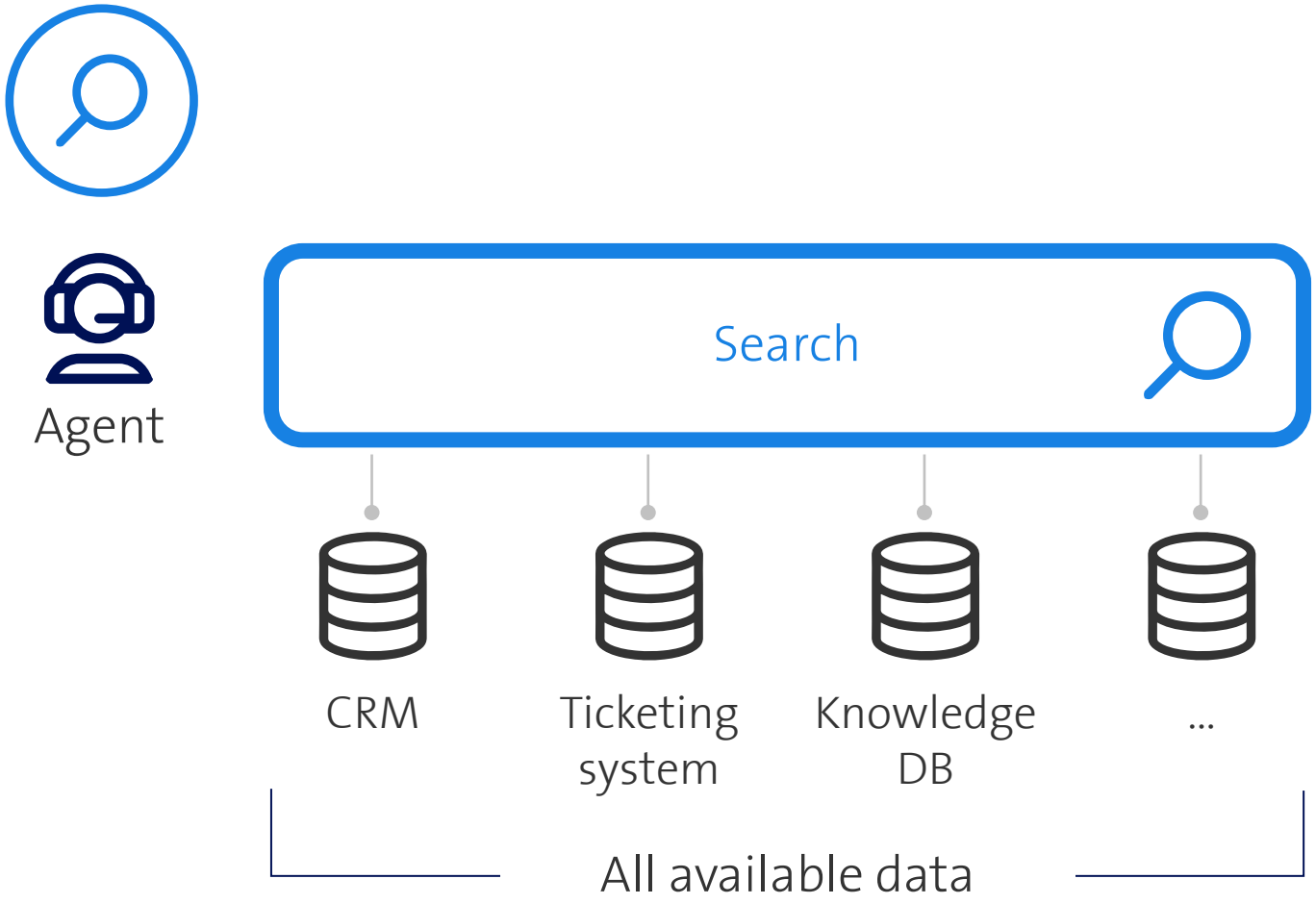
Sentence classification | Entity recognition | Dialog Management | Inverted Index | **Fancy bot**

The Problem

How can we solve requests

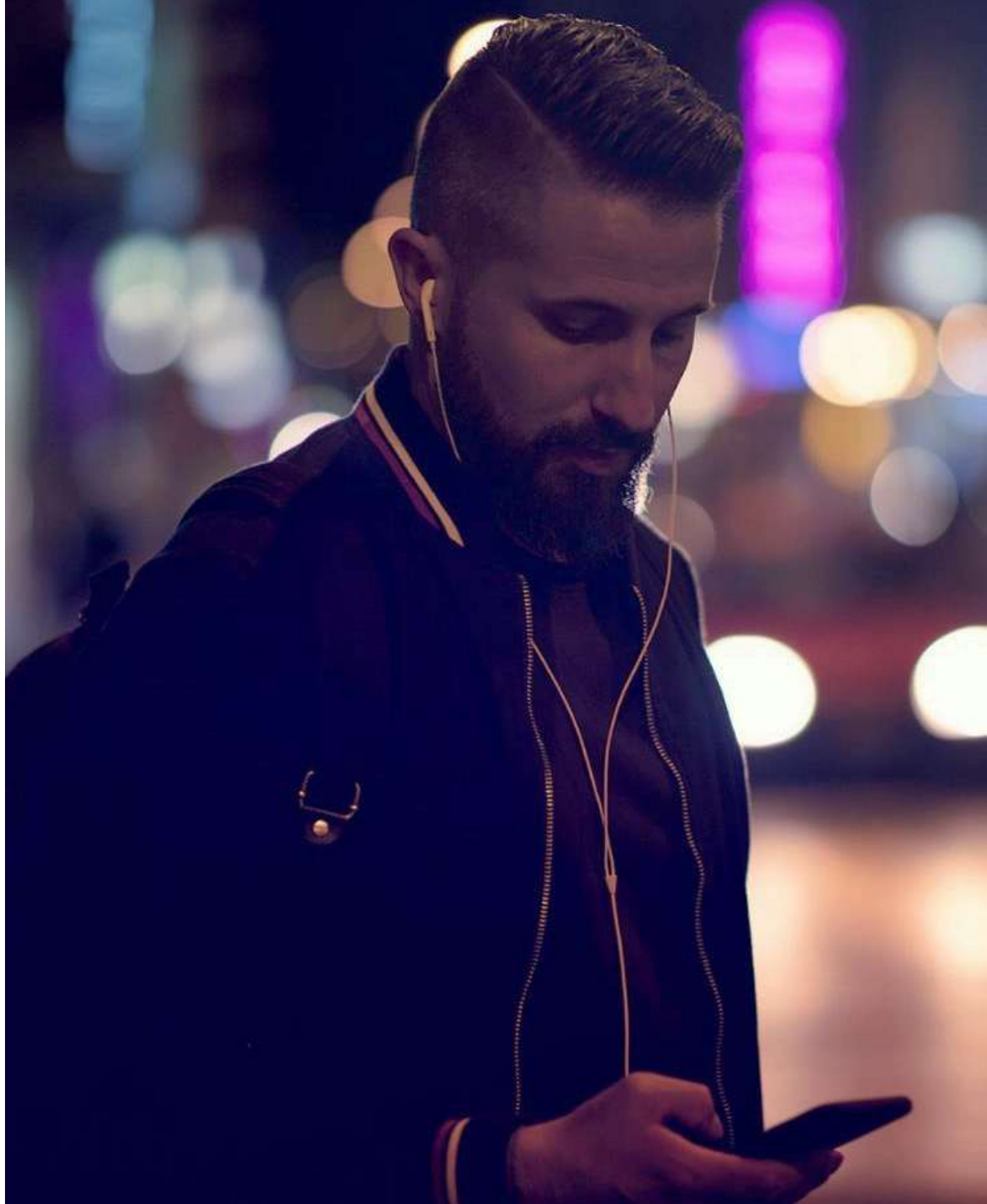
quickly and accurately?

Search


Agent
Search
CRM
Ticketing system
Knowledge DB
...
All available data

Helps for Some Requests

- We can propose useful answers most of the time
- This results in a speedup of the agent's workflow



First Assessment

What can the bot do?

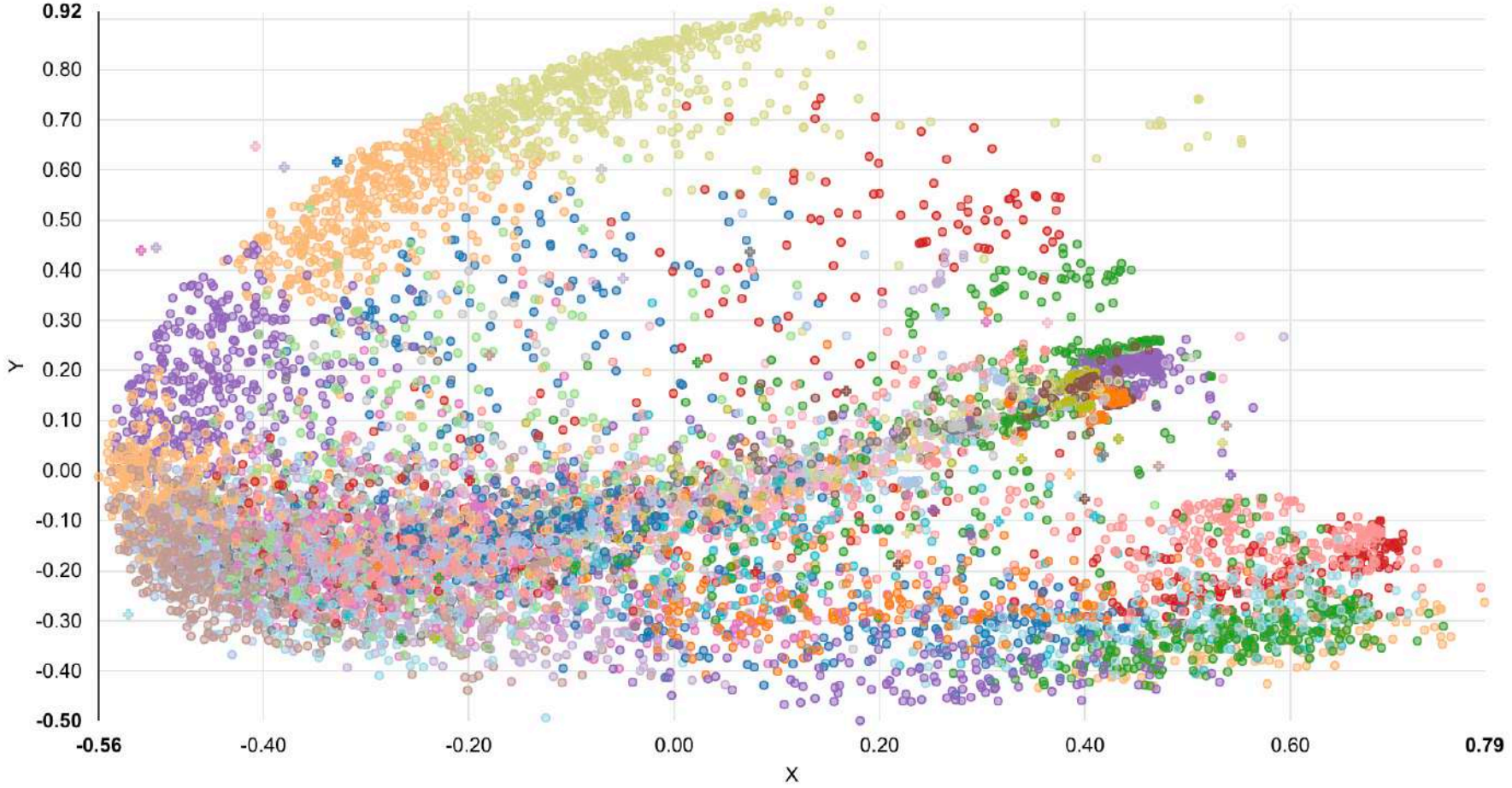
Why should I use the bot vs other options?

The bot can crack jokes, but not solve my problem!?

How fast does the bot solve the problem?

What Are Other Types of Requests ?

- Hundreds of classes

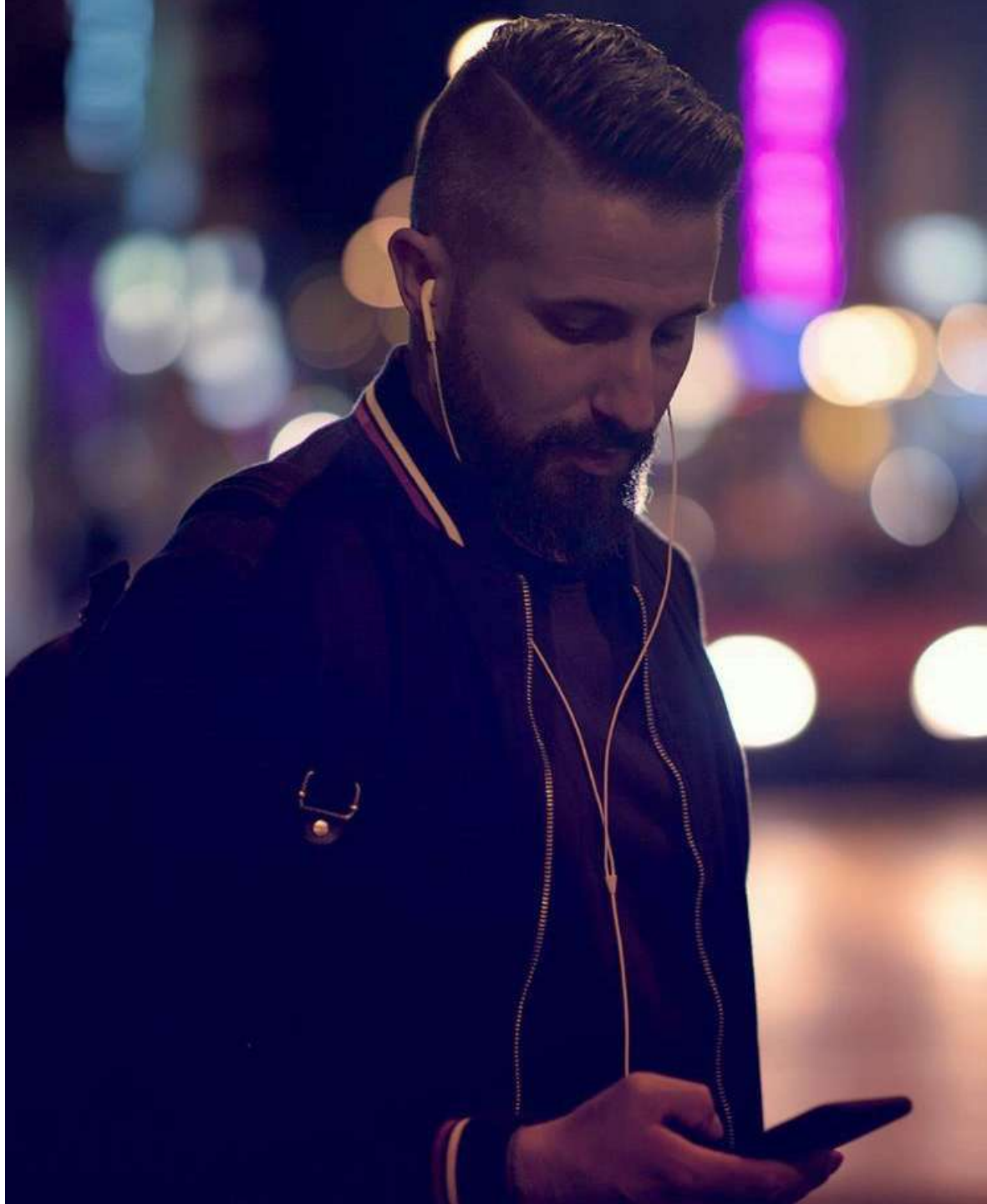


What About Transactional Requests ?

Hi, I would like to order a 32GB iPhone in gray without a phone contract, how much is it?

Hi, this will cost you xxx CHF.

Actually I might want a pink one with 64GB. What is the price difference?



Training for goal-driven bots

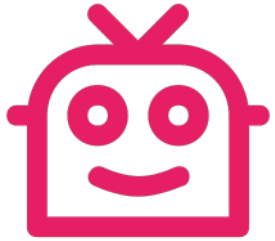
Intent

Entities

Buy
a white iPhone.

Send me
a new SIM card to my home address.

Subscribe to
a mobile plan from next week.



I need to transfer
my TV subscription to my daughter.

Upgrade
my roaming plan for Asia.

Buy me a Samsung tablet
with a mobile plan.

Second Assessment

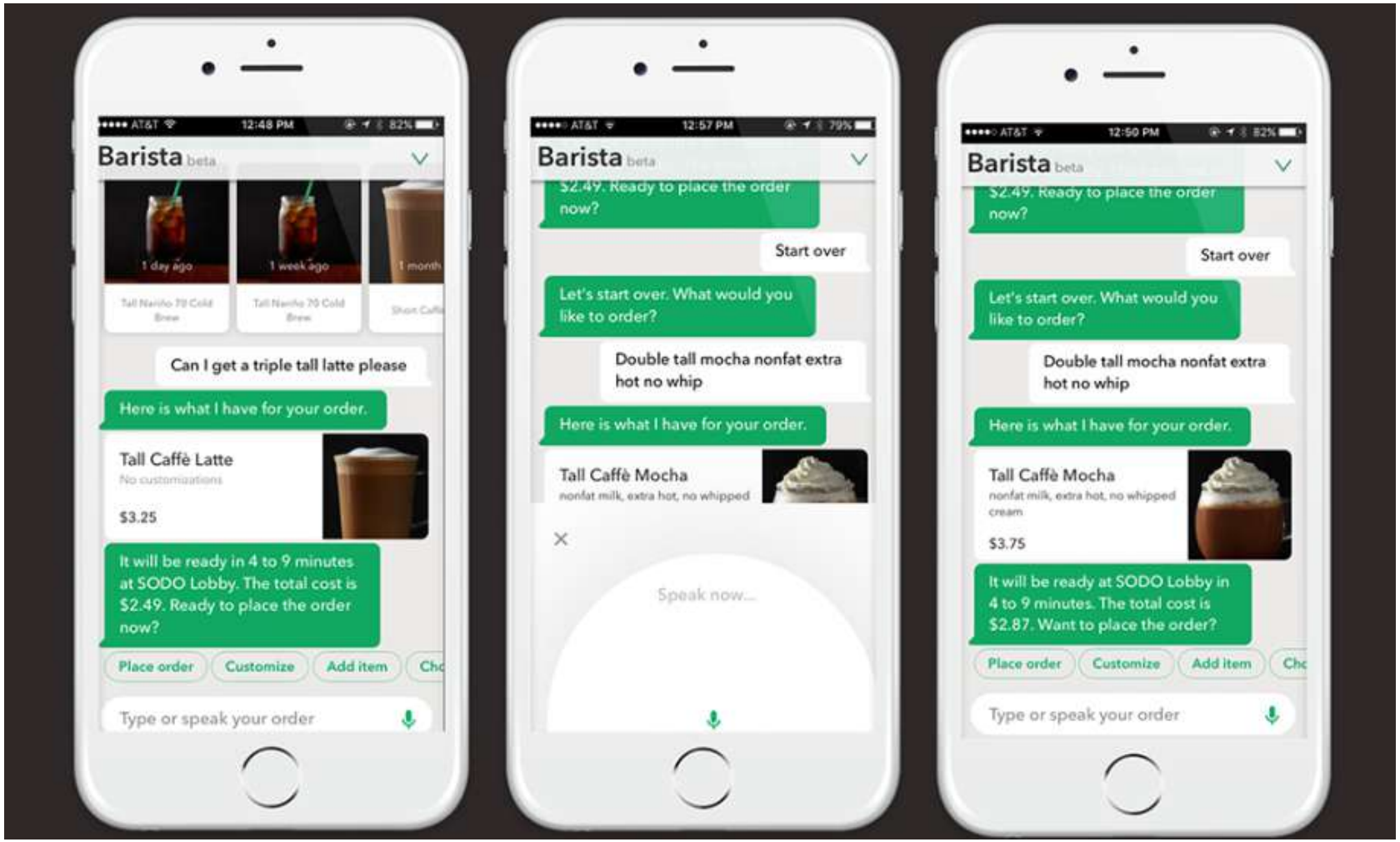
What can the bot do?

Why should I use the bot vs other options?

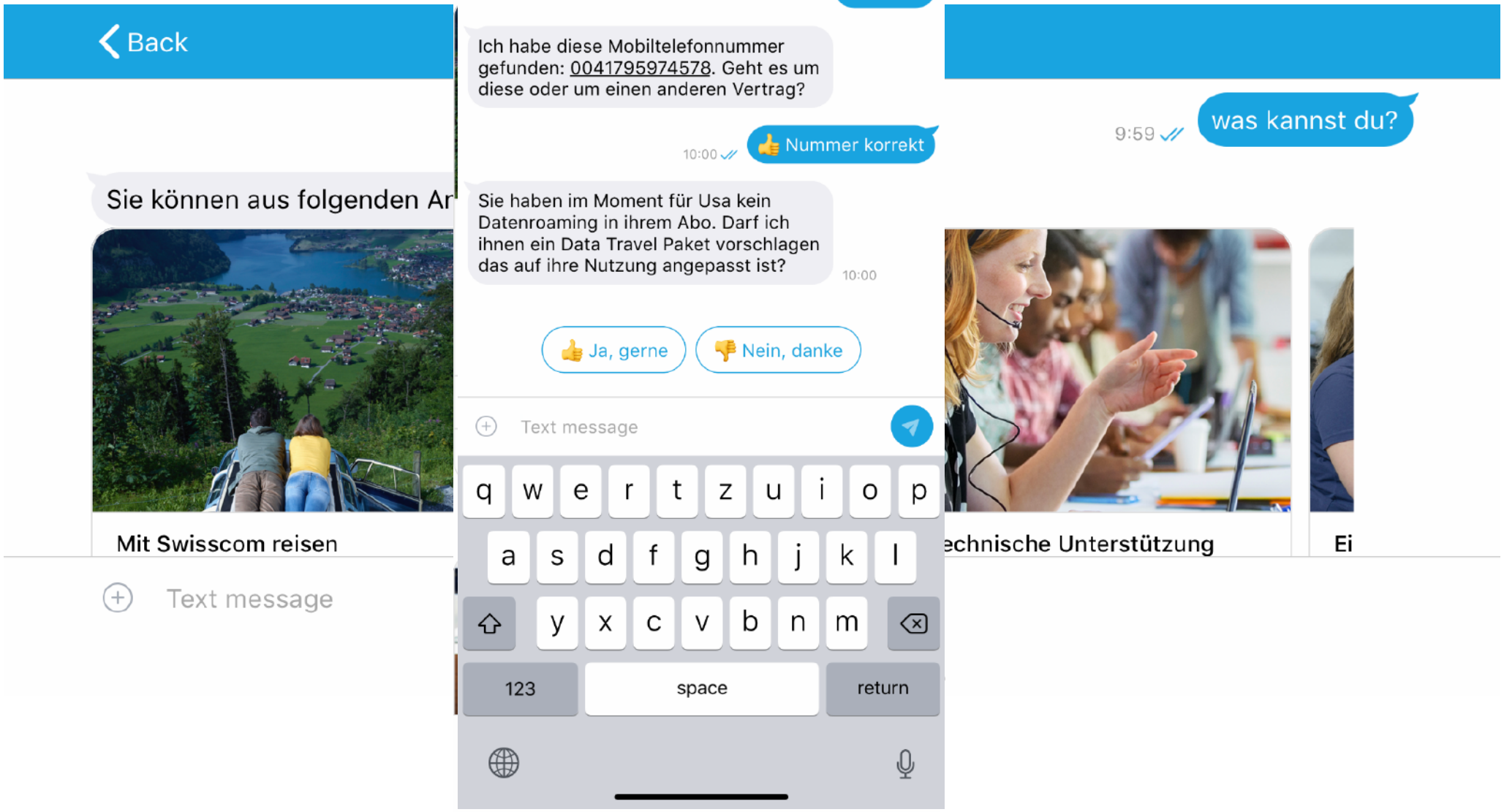
The bot can crack jokes, but not solve my problem!?

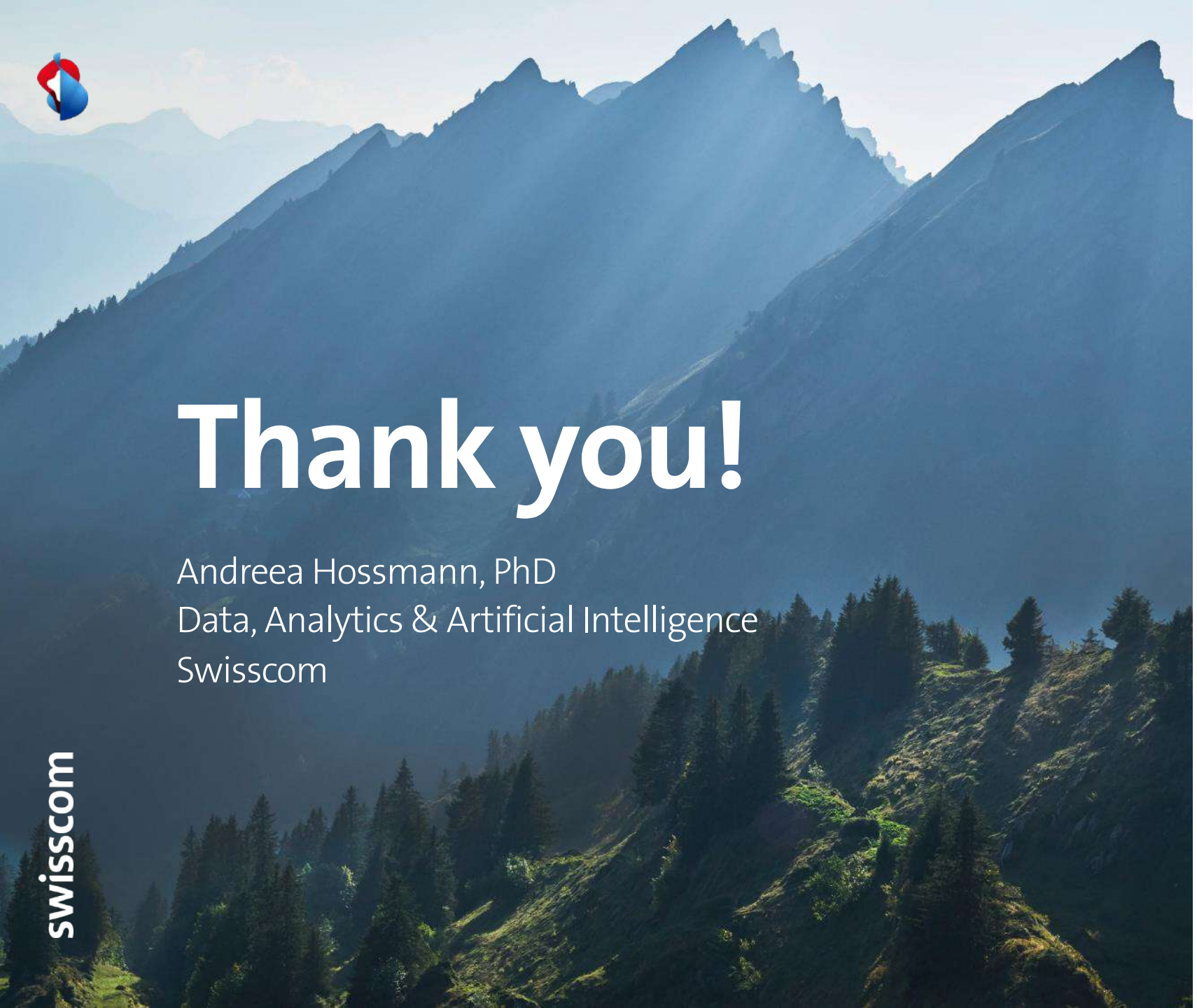
How fast does the bot solve the problem?

Examples – Starbucks



Examples – Swisscom





Thank you!

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