

Improving Performance on Intent Detection

Maria Crosas

Conversational Artificial Intelligence at Nestle



Today's Agenda

- **Chatbots @ Nestle.** Overview, learnings and use cases
- **Improving our chatbots performance**
 - **Chatbots' core:** The Intent Classification
 - Analysis and Visualization of the **chatbot performance**
 - **Nice-to-have features:**
 - A/B Testing
 - User Feedback
 - **How to improve** your chatbot experience:
 - Artificial utterances
 - Topic extraction



Digital Hub in Barcelona

- Operations started in March 2016
- Scope: B2C and B2E solutions and services to all brands/markets worldwide
 - Cost-efficiency
 - Shared knowledge
- 26 nationalities, around 150 digital experts
- Strong diversity:
 - Gender balance
 - Average age 32

Conversational Artificial Intelligence

20

chatbots live

13

chatbots in progress

+20

languages covered

+85

projects assessed

+30

vendors assessed

Gathering learnings since 2016...



Chatbot unique dialogue

Conversational designer need to build a unique chatbot experience



Strong Natural Language Processing engine

Powerful NLP that conducts proper intent classification and doesn't send all conversations to the default intent



Combination of analytics

Understanding of captured analytics and combination of several sources to get an accurate bot performance



Language database for global solutions

Identify NLP platforms that cover as many languages as possible to train the chatbot



Coverage of consumer channels

Identify NLP platforms that cover as many channels as possible to reach our consumers



Experience integrating with Nestle systems

Identify agencies that have successfully integrated with technologies used within Nestle

... following the below strategy



Build the conversation as a grafo

Create the most natural conversation being able to jump from one topic to another one easily



As NLP agnostic as possible

Currently working with Dialogflow and LUIS mostly



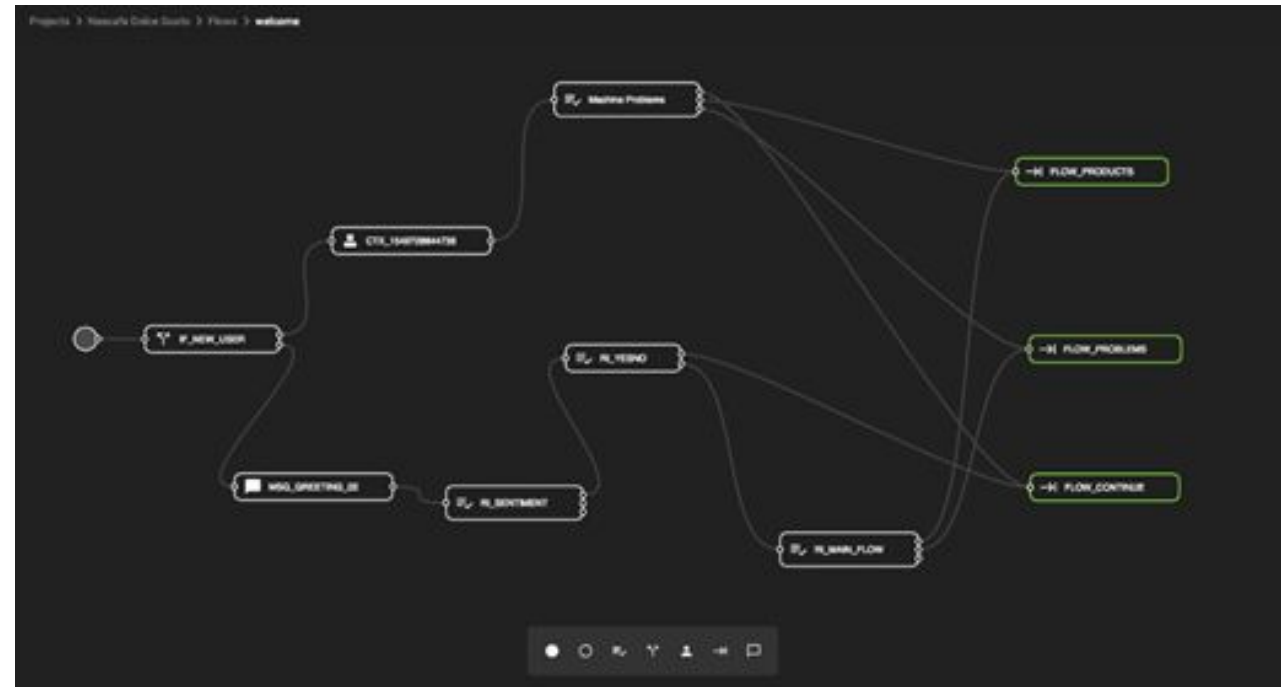
Dashboard with several analytics

Understand user metrics, bot performance, and chatbot intelligence

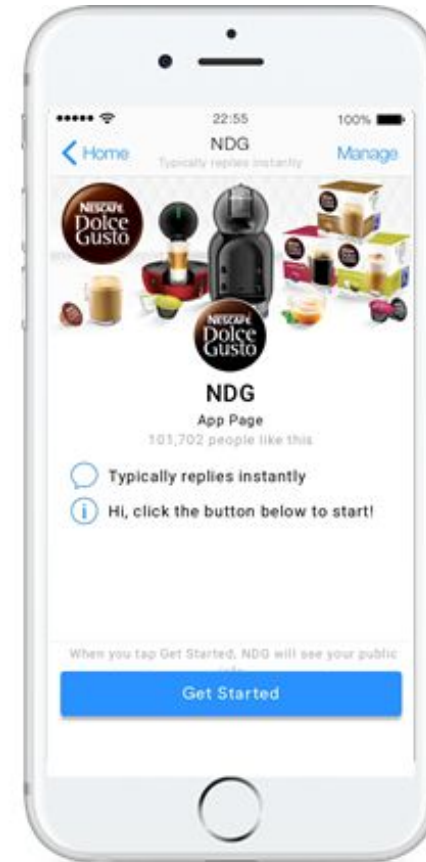
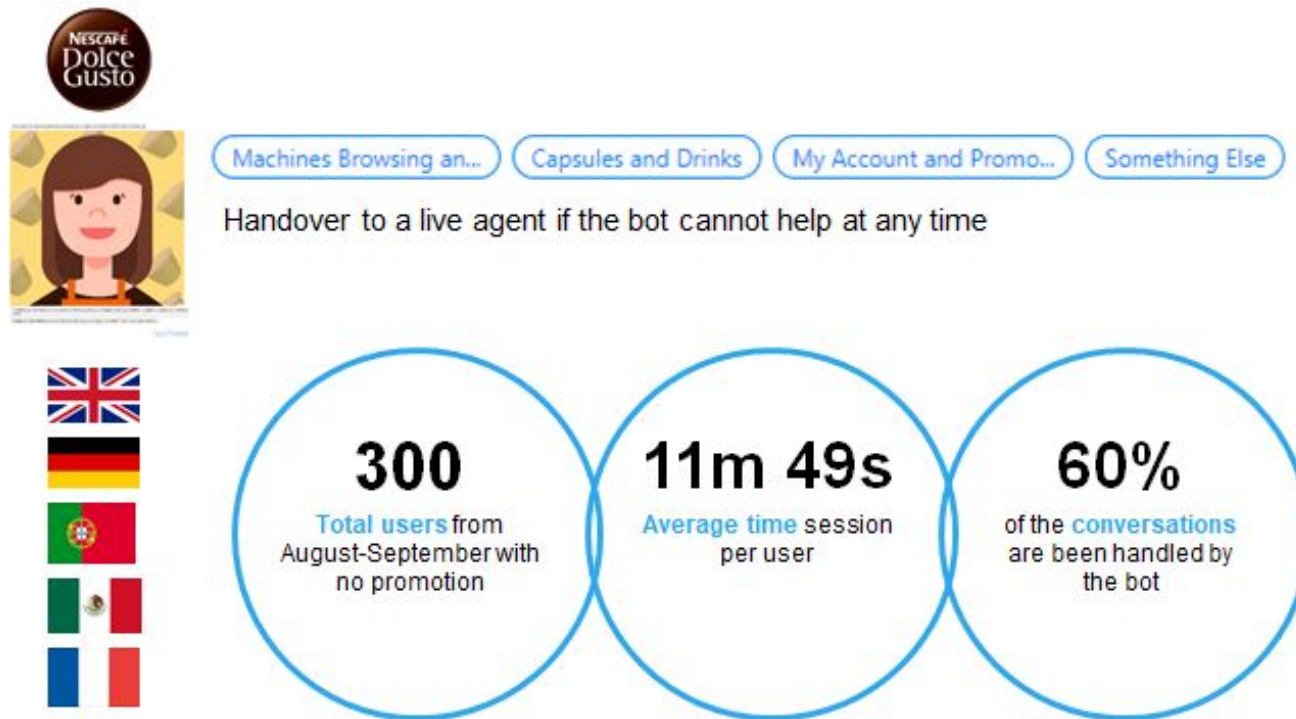


Modular and reusable architecture

Create shared libraries to speed up bot development time to market



Top use cases: Nescafé Dolce Gusto Global Chatbot



Top use cases: Nestlé Infant Nutrition Start Healthy, Stay Healthy



Morning sickness / Ovulation and Fertility / Pregnancy Signs and Symptoms

Handover to an agent if the bot cannot help at any time

9,453

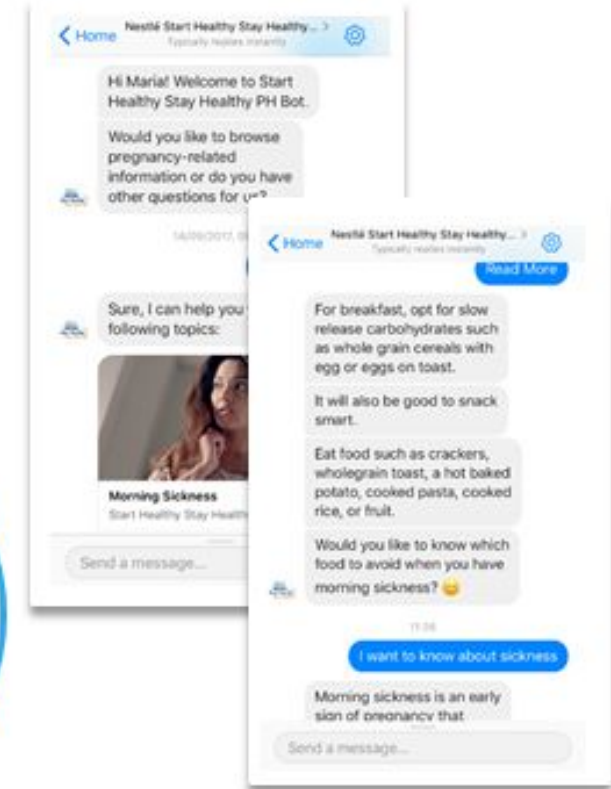
Total users last year
with initial promotion

23%

Retention analysis

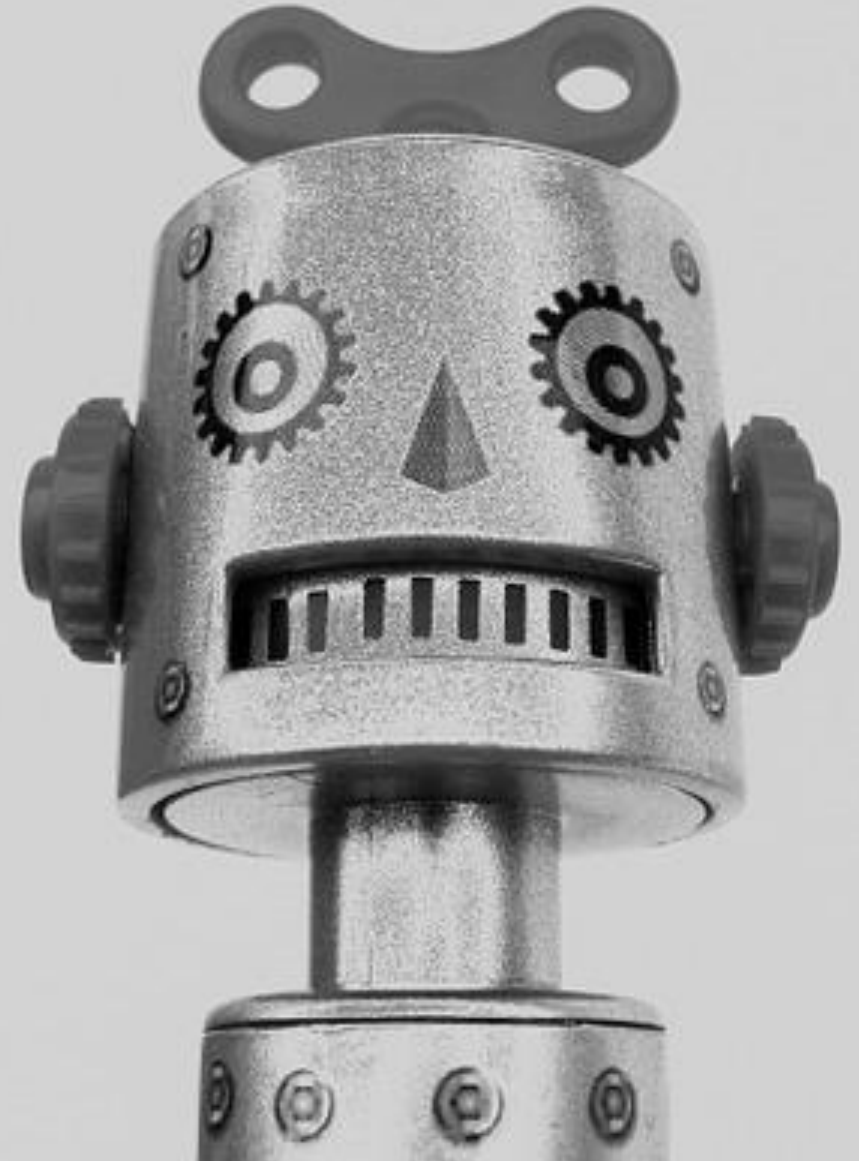
21m 23s

Average conversation
time



How? Improving our chatbot performance

1. **Chatbots' core:** The Intent Classification
2. **Analysing and visualising** chatbot performance
3. **Nice-to-have features:**
 - A/B Testing
 - User Feedback
4. **How to improve** your chatbot experience:
 - Artificial utterances
 - Topic extraction



1. Understanding consumers' language and their needs



Being good at the basics

- Ability to understand human conversations
- Predict what users want (intents)



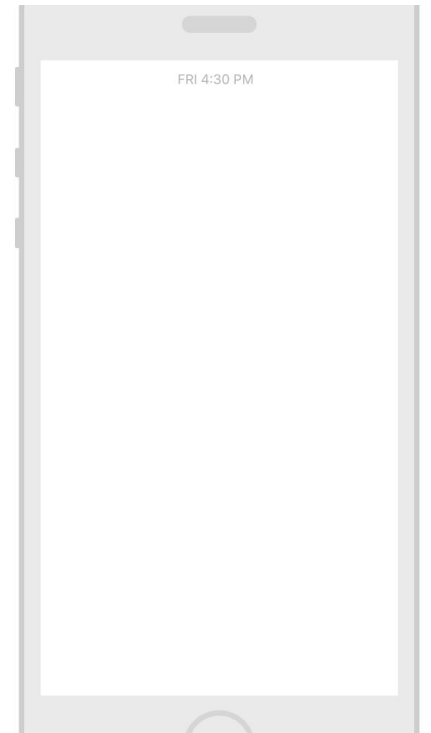
What do we need

- Accurate Natural Language Processing engine



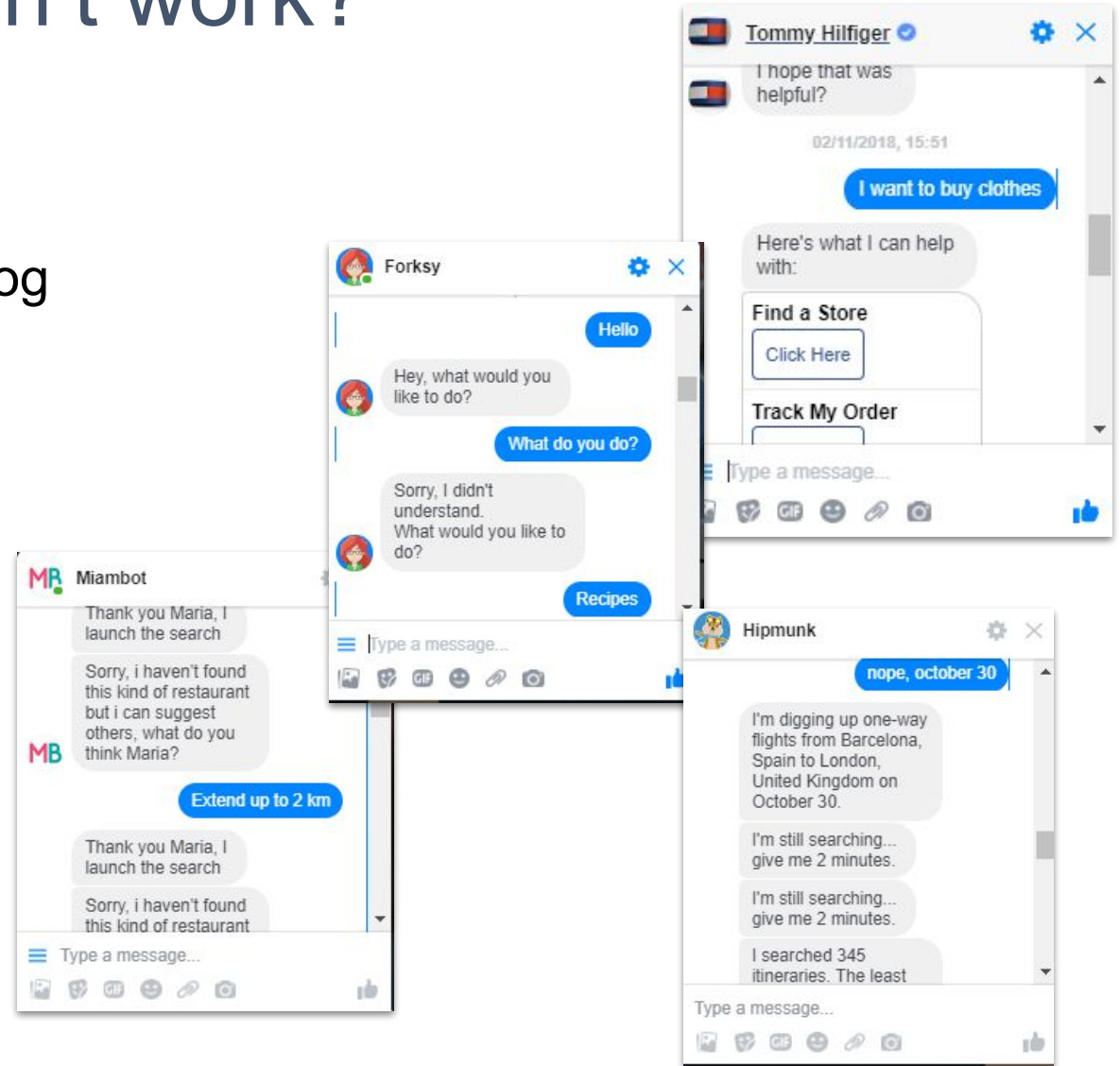
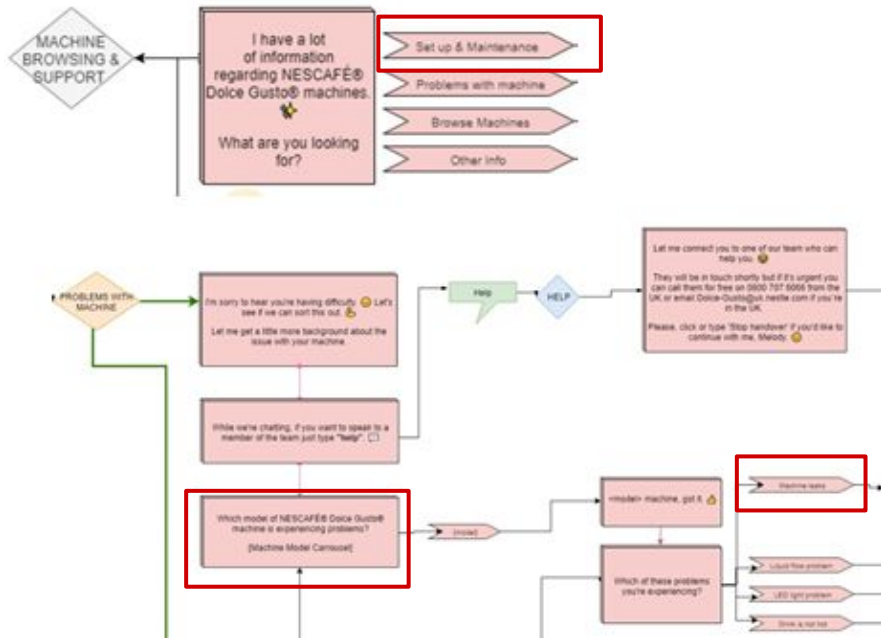
How can we achieve that

- Training set (bot dialog)
- Correct classification of intents
 - Complex task: depends on NLP engine & training set
- Train the NLP

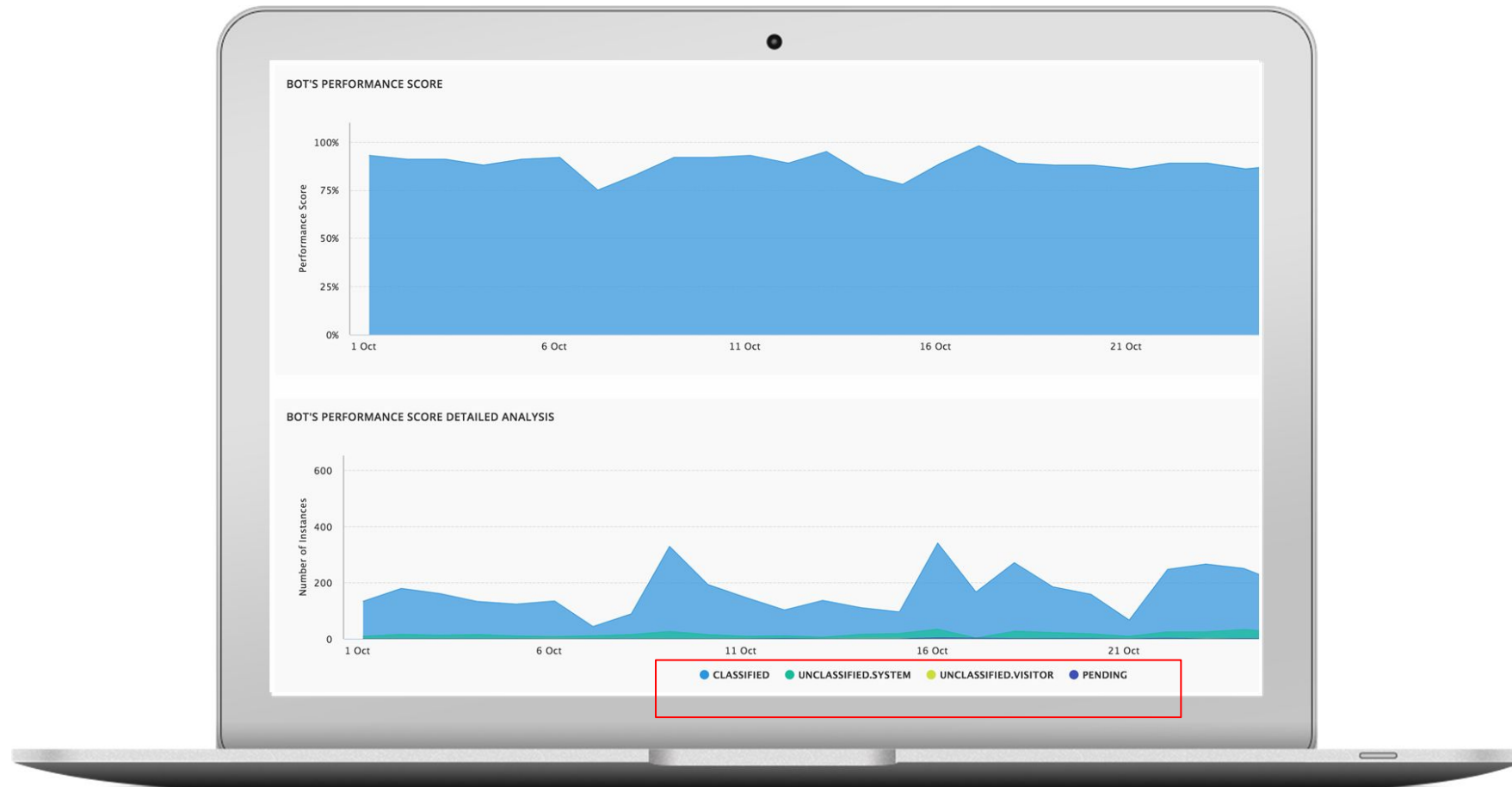


What happens if it doesn't work?

- Poor and robotic conversation
- 'Natural' conversation vs guided dialog

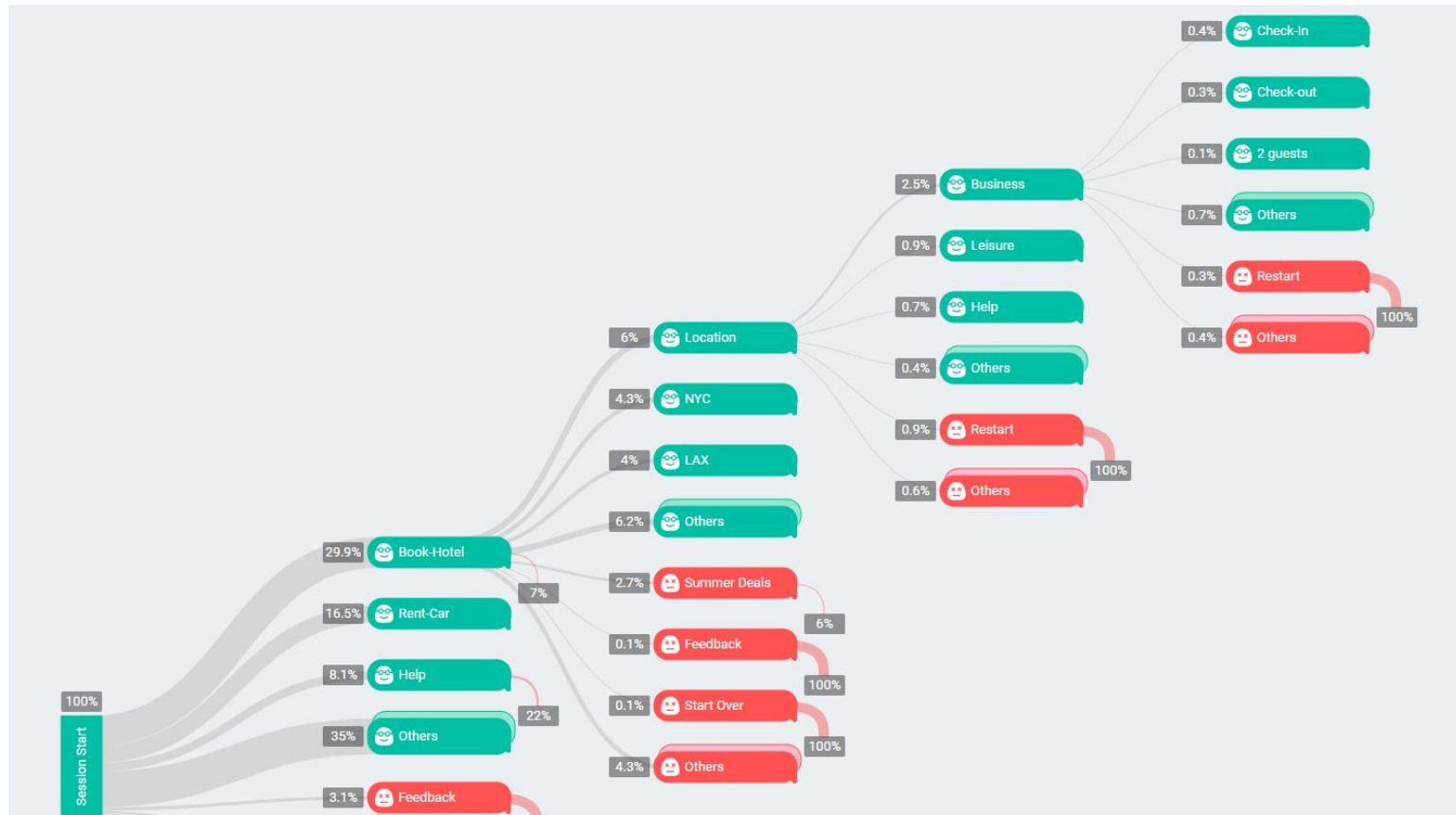


2. Most technologies are able to classify the chatbots' intents...



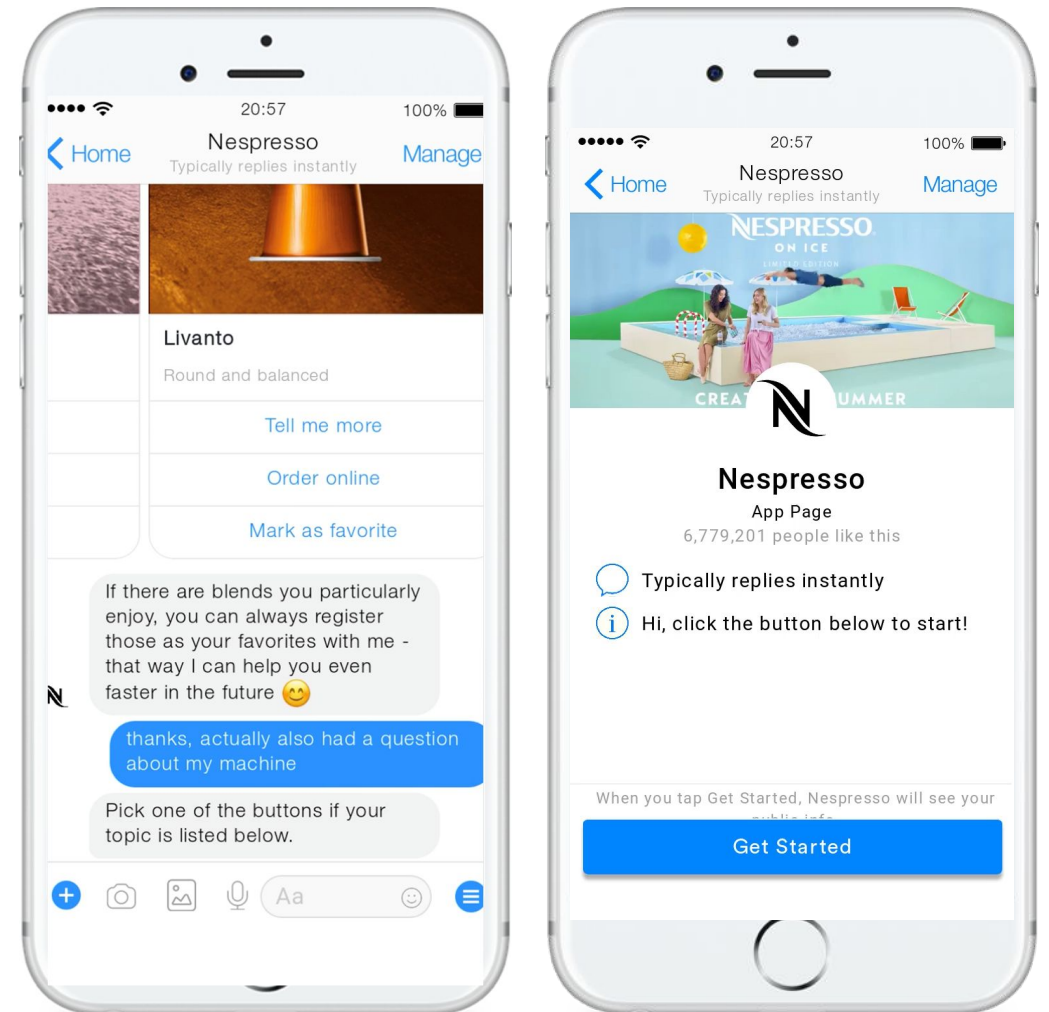
... but is this enough to analyse and visualise the bot performance?

- A few platforms actually allow you to see the **correct classification** Challenge



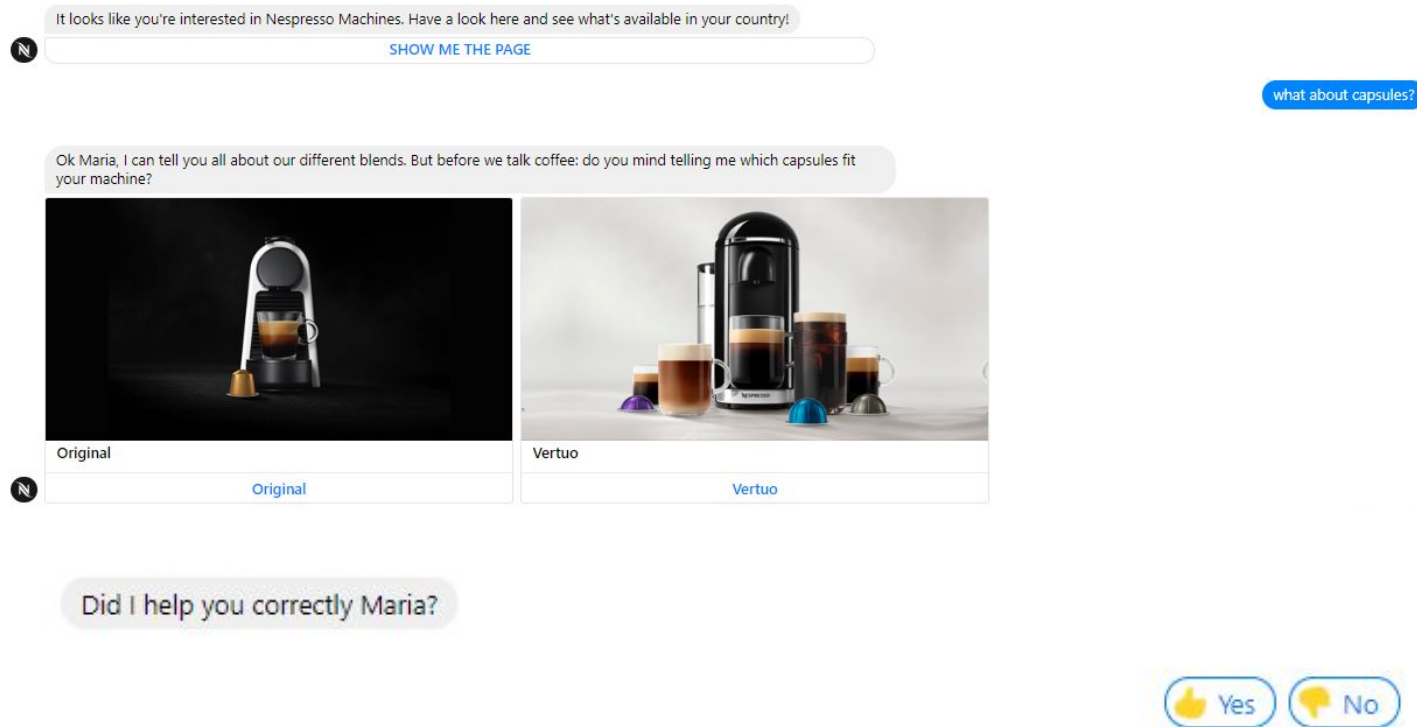
3. Nice to have feature: **A/B Testing**

- Train Natural Language Processing (i.e. MS Luis)
- Present two models to consumers
- See which one is performing better
- Outcome: Better trained NLP



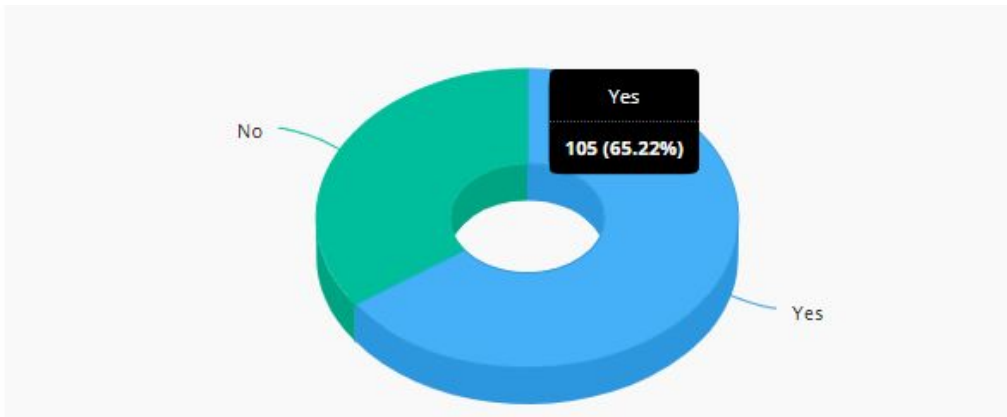
3. Nice to have feature: **User Feedback**

- Occasionally, include a feedback question to see if the bot is being **helpful**



3. Nice to have feature: **User Feedback**

- Add this to your **metrics dashboard**
 - Add this to the existing bot performance metric
 - Create a separate metric
 - Track if the intent classification is working properly



4. How to Improve your Chatbot: Artificial Utterances

Natural Language Generation services

- Create hundred of relevant sentences and automatically tag these with the intents and entities the bot must recognize

How can it help?

- Saving time on the pre-implementation
- Increasing effectiveness on the training and performance phase

how can I descale the machine?

how can I descale a machine?

how can I descale the nespresso?

how can I descale a nespresso?

how do I descale my machine?

how do I descale my nespresso?

how do I descale the machine?

how do I descale a machine?

how do I descale the nespresso?

how do I descale a nespresso?

how to descale my machine

how to descale my nespresso

how to descale the machine

how to descale a machine

how to descale the nespresso

how to descale a nespresso

I need to know how to descale my machine

I need to know how to descale my nespresso

I need to know how to descale the machine

I need to know how to descale a machine

I need to know how to descale the nespresso

I need to know how to descale a nespresso

I want to know how to descale my machine

I want to know how to descale my nespresso

I want to know how to descale the machine

I want to know how to descale a machine

I want to know how to descale the nespresso

I want to know how to descale a nespresso

I need to know how I can descale my machine

I need to know how I can descale my nespresso

I need to know how I can descale the machine

I need to know how I can descale a machine

I need to know how I can descale the nespresso

I need to know how I can descale a nespresso

I need to know how can I descale my machine

I need to know how can I descale my nespresso

I need to know how can I descale the machine

I need to know how can I descale a machine

I need to know how can I descale the nespresso

I need coffee

I need capsules

I need coffee capsules

I need more capsules

I need more coffee

I need more coffee capsules

I need some capsules

I need some coffee

I need some coffee capsules

I want coffee

I want capsules

I want coffee capsules

I want more capsules

I want more coffee

I want more coffee capsules

I want some capsules

I want some coffee

I want some coffee capsules

give me coffee

give me capsules

give me coffee capsules

give me more capsules

give me more coffee

give me more coffee capsules

give me some capsules

give me some coffee

give me some coffee capsules

send coffee

send capsules

send coffee capsules

send me coffee

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send me more capsules

send me more coffee

send me more coffee capsules

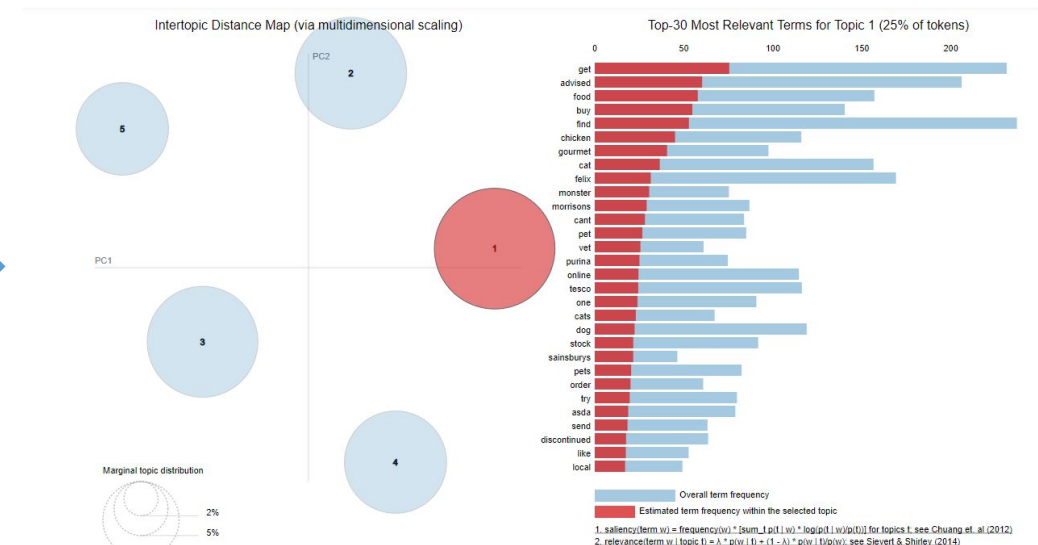
send me some capsules

send me some coffee

4. How to Improve your Chatbot: Topic Extraction

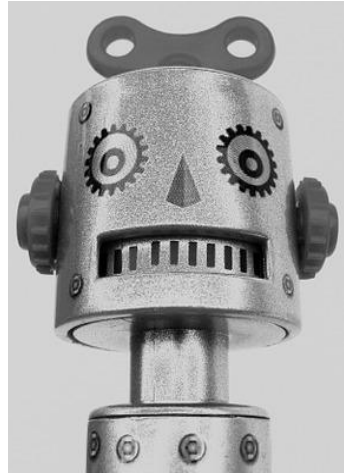
- Default intent -> Conversations that the bot hasn't understood
- Review **millions of conversations** (text) can be tedious for one person
- Clean the text and extract keywords: Identify what **people are talking about**

Telephone	was on adventuros website and BUY NOW wasn't working where can I get them from? ADV morrisons asda and sainsburys all purchasing from us checked BUY NOW button and is working ok just now, lots of online stores to purchase from too	Purina Products/PetCare/Dog Snacks/PURINA/ADVENTUROS/Adventuros Nuggets 90g - Boar Flavour
Telephone	my yorkie likes the Adventuros strips and nuggets, but my local shops don't seem to have very many packs, when i go in there are only a few on the shelves ADV we are selling the treats to all supermarkets, maybe ask in store what day they have deliveries also if not many packs on shelf ask in store as they may have more in the stock room	Purina Products/PetCare/Dog Snacks/PURINA/ADVENTUROS/Adventuros Strips 90g - Venison flavour
Contact Us/Website	Do you still have the product = false Do you still have the packaging = false Bakers complete flavour = Chicken pack size = Any Please tell us more about your experience Complete meaty meals ie meaty chunks have gone from shelves. My two wee yorkies have been eating them for all their lives 11 years and wont eat any other dog food. I'm worried sick. The chucks were the only food soft enough for their miniature teeth. Consumer wants to receive marketing communications from Nestlé Purina Petcare (UK) Ltd = true Consumer wants to receive marketing communications from Nestlé UK and associated group of companies = true	Purina Products/PetCare/Dry Dog/BAKERS/BAKERS ADULT NAC MEATY MEALS Chicken 2.7kg (Delisted wk16 2018)
Contact Us/Website	Please tell us more about your experience = i have a question about your Meaty Meals Adult Small Dog Dry Food. My dog evie is 7 years old, shes a jack russel and shes the most hypo dog you can imagine, but she also loves her bakers meaty meals food. I have been looking in all the different shops around my town and when i travel out of my town, i look in other shops to see if you guys did it in other flavours. I like to treat her now and then by getting her different dinners but she doesn't like the crunchy bits you get in the compete dry food ones. So if you could possibly tell me if you do Meaty Meals Adult Small Dog Dry Food in other flavours apart from Chicken, that would be great. thank you :) Consumer wants to receive marketing communications from Nestlé Purina Petcare (UK) Ltd = true Consumer wants to receive marketing communications from Nestlé UK and associated group of companies = true	Purina Products/PetCare/Dry Dog/BAKERS/BAKERS SMALL DOG NAC MEATY MEALS Beef 1kg (Launch wk23 2018)
Contact Us/Website	Please tell us more about your experience = I wonder if you can help me, We have a 5 and half month German Shepherd puppy who we put onto Bakers Complete Chicken and Veg puppy food. On the advice of our vet we	



How can this help me?

- Discover new use cases
- Add new flows
- Add new features
- Redefine some intents
- ...



Thank you!

Questions?