Google Home Midterm Presentation

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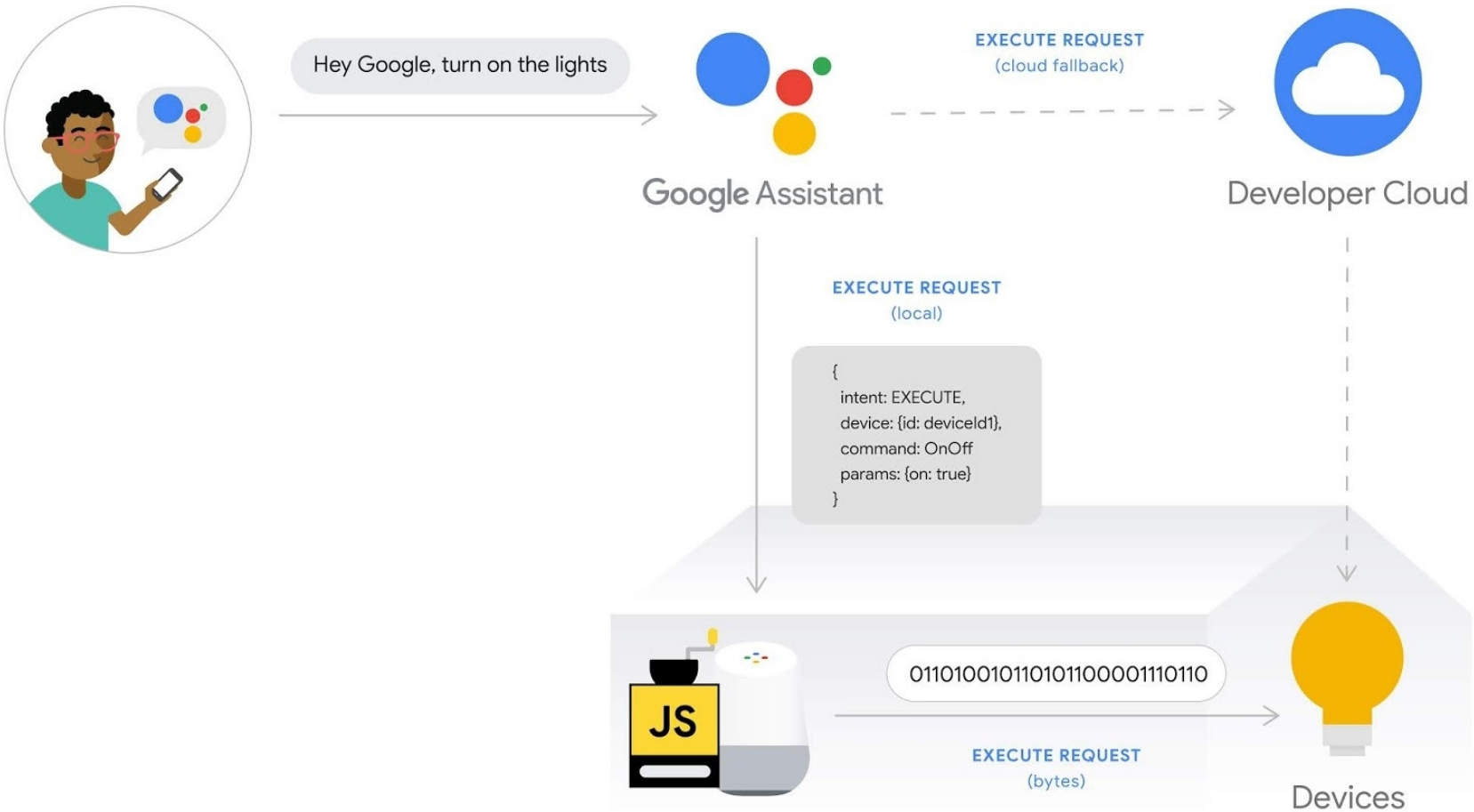
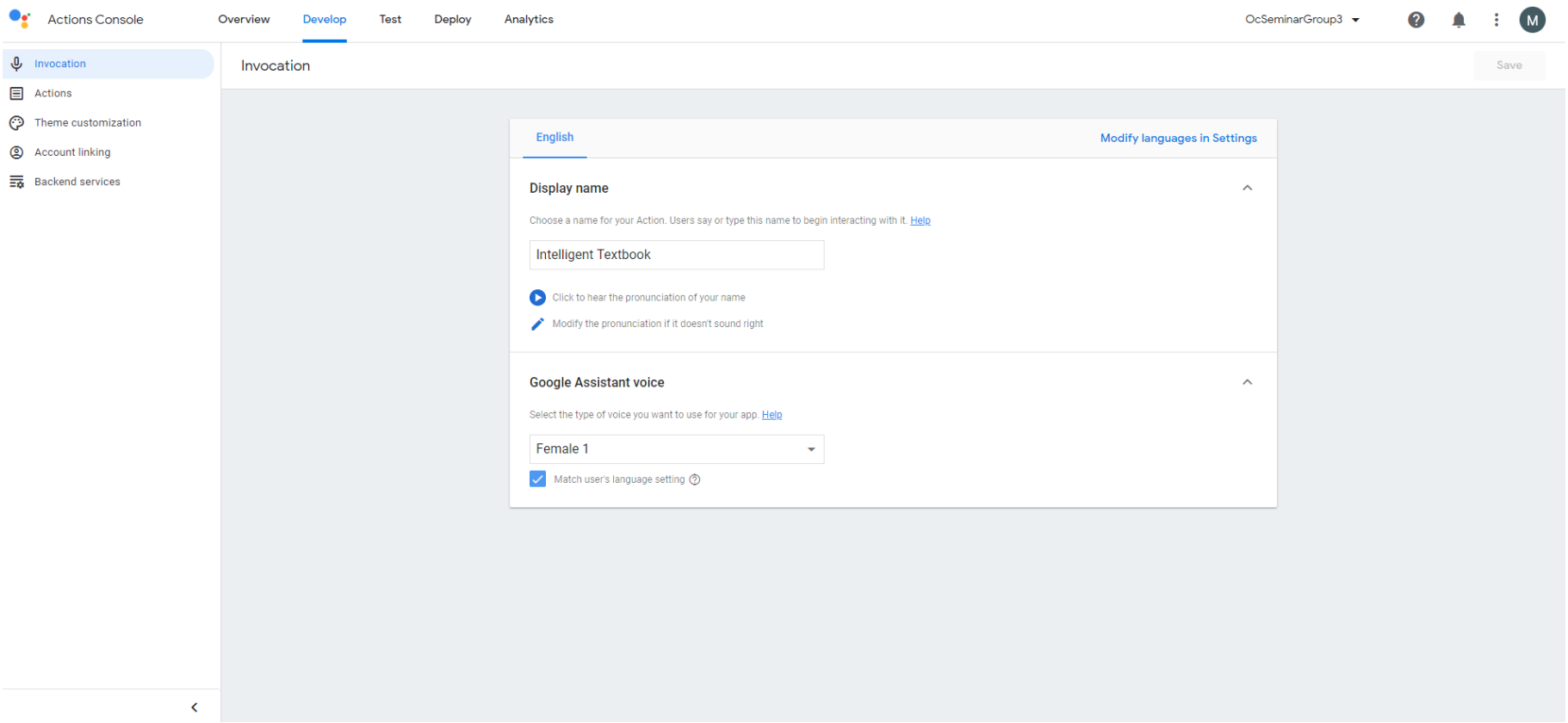
Overview

- Founded by Google in 2016
- Development through Googles developer console and Dialogflow
- Creating skills pretty easy
- No programming skills required

Execution Path



Developer Console



Developer Console cont'd

- Gives an overview of your skill
- Specifies general settings
- Gives the user the ability to test their skill
- Deployment of the skill

Dialogflow

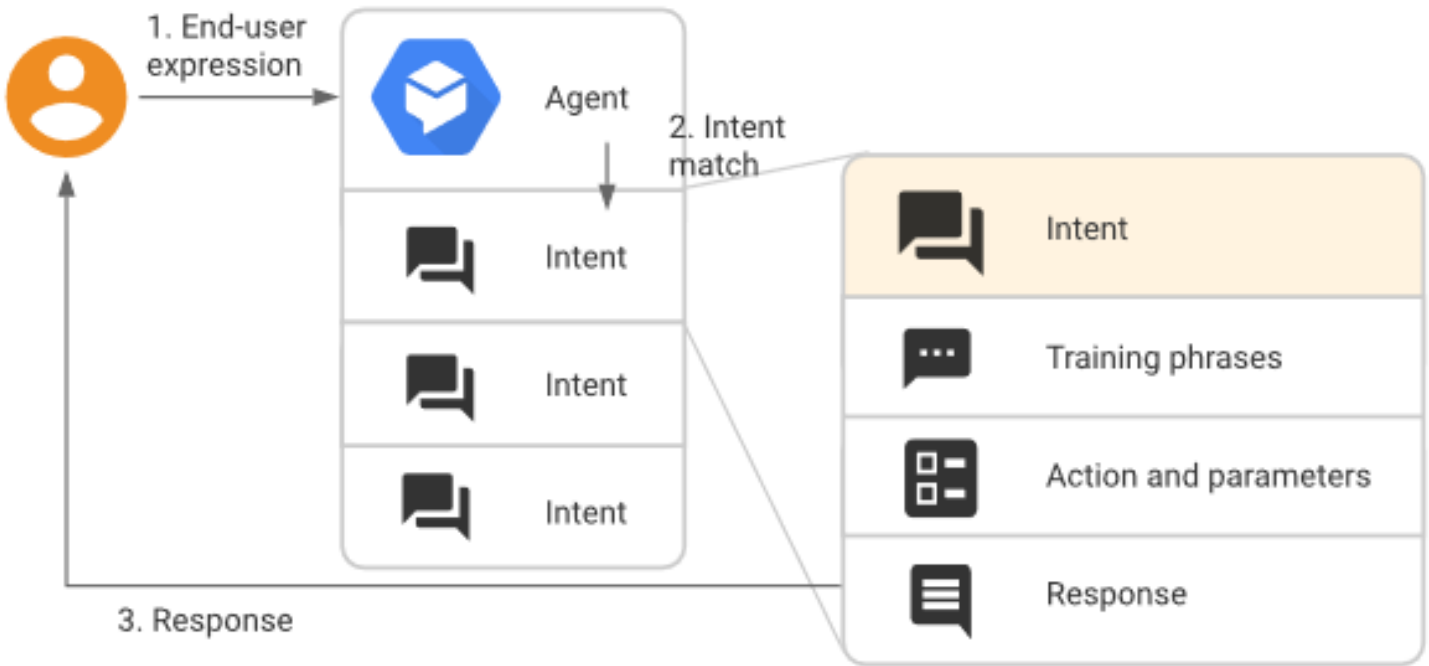
- Service developed and provided by Google
- Natural language tool to create conversational user interfaces for apps, chatbots, etc.
- By adding 'Training phrases' Dialogflow automatically trains the machine learning model

Dialogflow cont'd

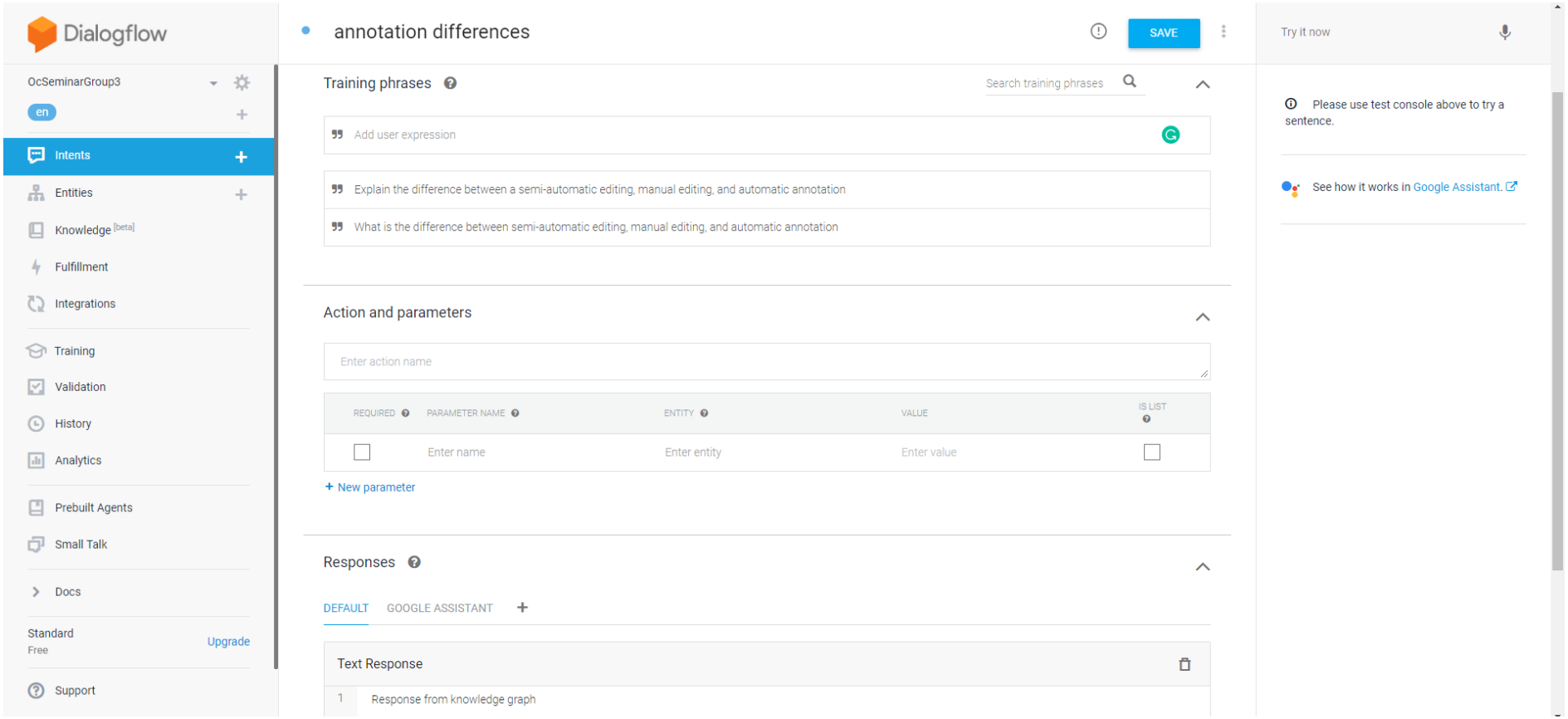
Concepts

- Intents
  - Each intent describes an intent a user might have
  - E.g. check prices, get opening hours or book a repair
  - By communicating with the interface, Dialogflow classifies the user's intent and performs the associated action
  - An intent can require some parameters such as a date in order to book a repair
- Entities
  - Each intent parameter has a type and therefore belongs to an entity
  - There are predefined system entities for dates, colors, addresses, etc.
  - Define entities to make Dialogflow 'understand' your vocabulary
  - E.g. Entity 'bike-type' with the instances road bike and mountain bike
- Knowledge Base
  - Complement defined intents
  - Used to find automated responses

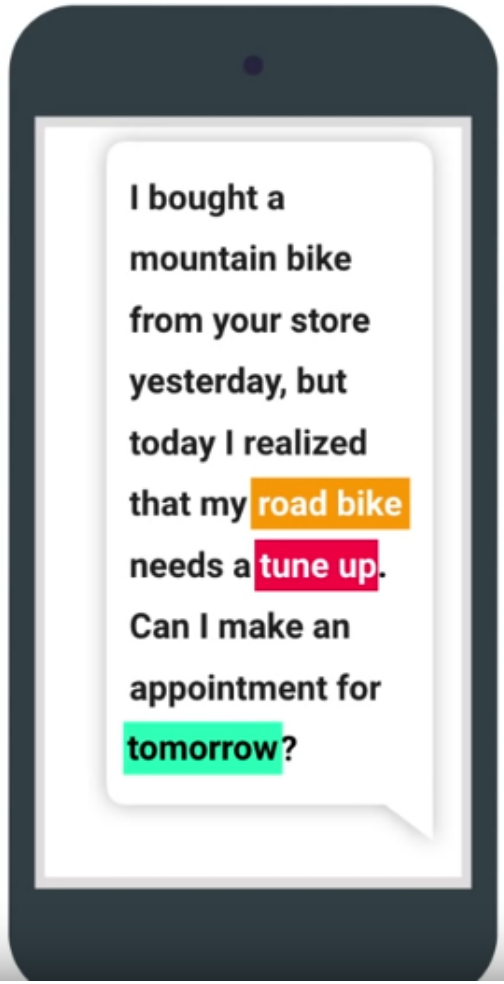
Intents


1. End-user expression
Agent
2. Intent match
Intent
Intent
Intent
Intent
Training phrases
Action and parameters
Response
3. Response

Intents cont'd



Entities



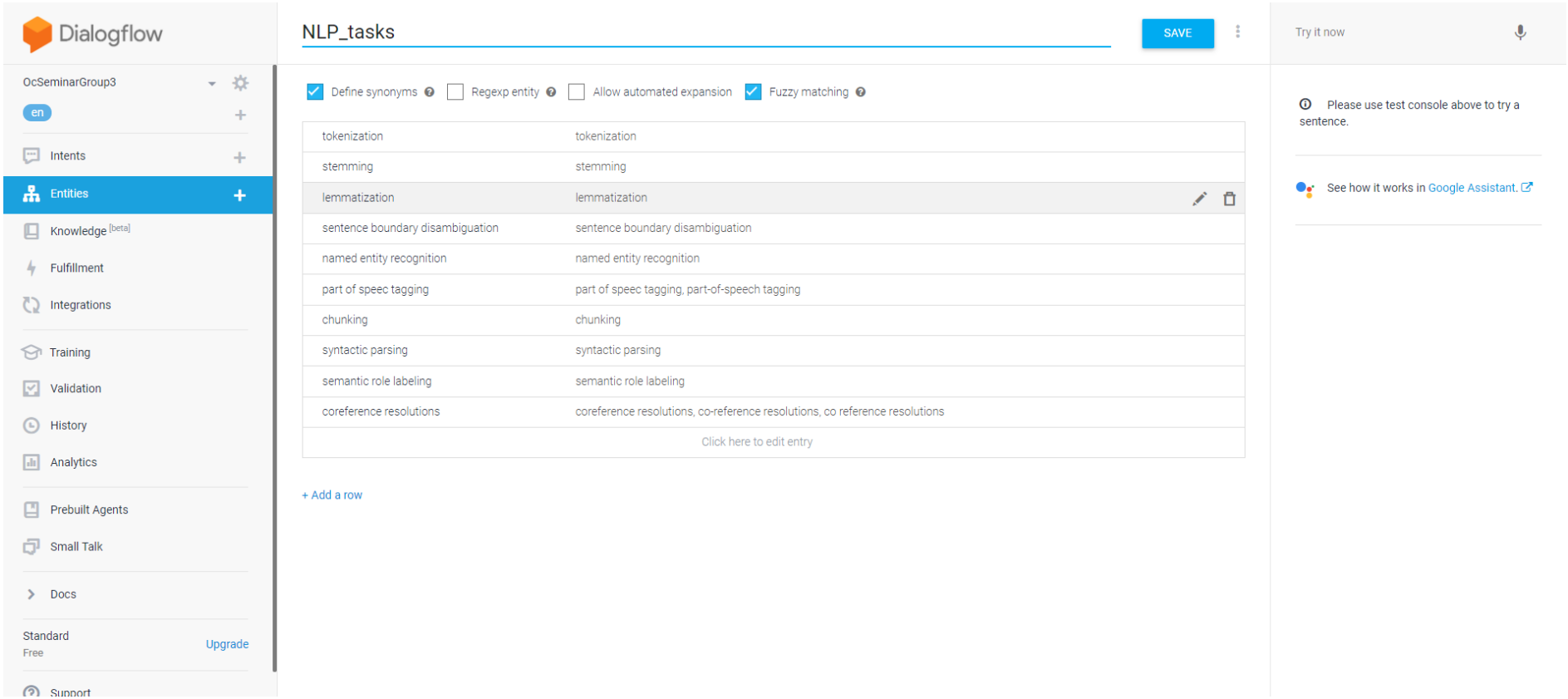
road bike
tune up
tomorrow
2017-11-09

System entities
@sys.time
@sys.date

Developer entities
@service-option
- Tune up
- Repair
- Tire change
- Upgrade

@bike-type
- Road bike
- Mountain bike
- Beach cruiser
- Racing bike
- Fixed gear bike
- Cross bike

Entities cont'd



Knowledge Base

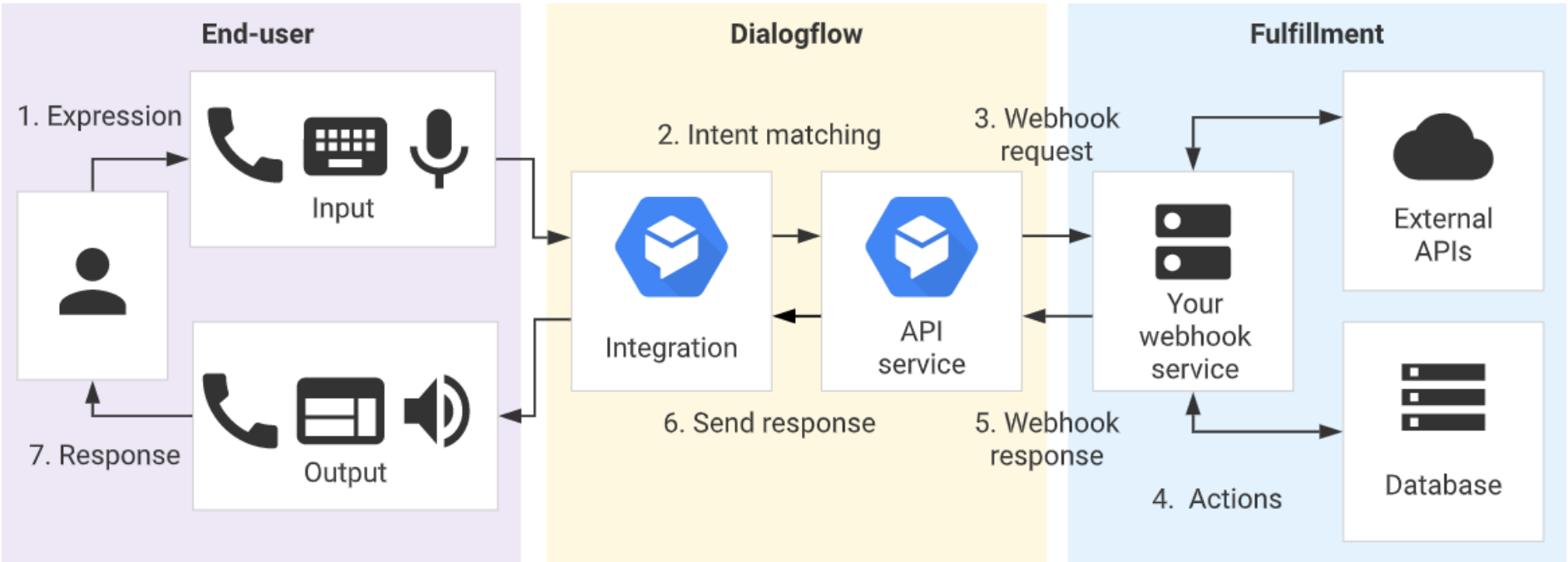
Problem

We need to somehow add the Knowledge Base from Group 1 into our skill.

Solution

There is a Knowledge Base feature which is already implemented in Dialogflow. However here we only can use documents like texts or csv files or pdfs. So we are not exactly sure how to handle this at the moment.

Fulfillment



Connecting to our GraphDB

Problem

Dialogflow doesn't allow direct connection to a database like Mycroft etc.

Solution

- Dialogflow sends a webhook request message that contains information about the matched intent, the action, the parameters, and the response defined for the intent.
- Our service then performs the needed database query.
- Our service sends back a webhook response containing the response to be sent to the end-user.

Webhook Service

Features

- Supports Mutual TLS authentication.
- Body of request and response is a simple JSON object.
- Supports contexts and sessions, follow-up events and custom payloads.
- Response can be a text, card, event or a Google Assistant response.

Limitations

- Response must occur within 10 seconds for Google Assistant applications or 5 seconds for other application, else it will timeout.
- The response must be less than or equal to 64 KiB in size.

Compatible Devices

Compatible Devices cont'd

Google Smart Home

- Google & IoT Devices
  - Accessing to third-party IoT devices through Google Assistant
  - Use *Actions* as Natural Language Understanding
  - Communication between *Google Assistant* and IoT devices handled via cloud services.
  - *Home Graph* to store information of connected devices

Device Types & Traits

- Various device types (air purifier to yogurt maker)
- Capabilities of a device $\Rightarrow$ traits

Sample Trait Schema

Device	Device type	Suggested device traits

Light	`action.devices.types.LIGHT`	`action.devices.traits.OnOff`
		`action.devices.traits.Brightness`
		`action.devices.traits.ColorSetting`

Fan	`action.devices.types.FAN`	`action.devices.traits.FanSpeed`
		`action.devices.traits.OnOff`
		`action.devices.traits.Modes`
		`action.devices.traits.Toggles`

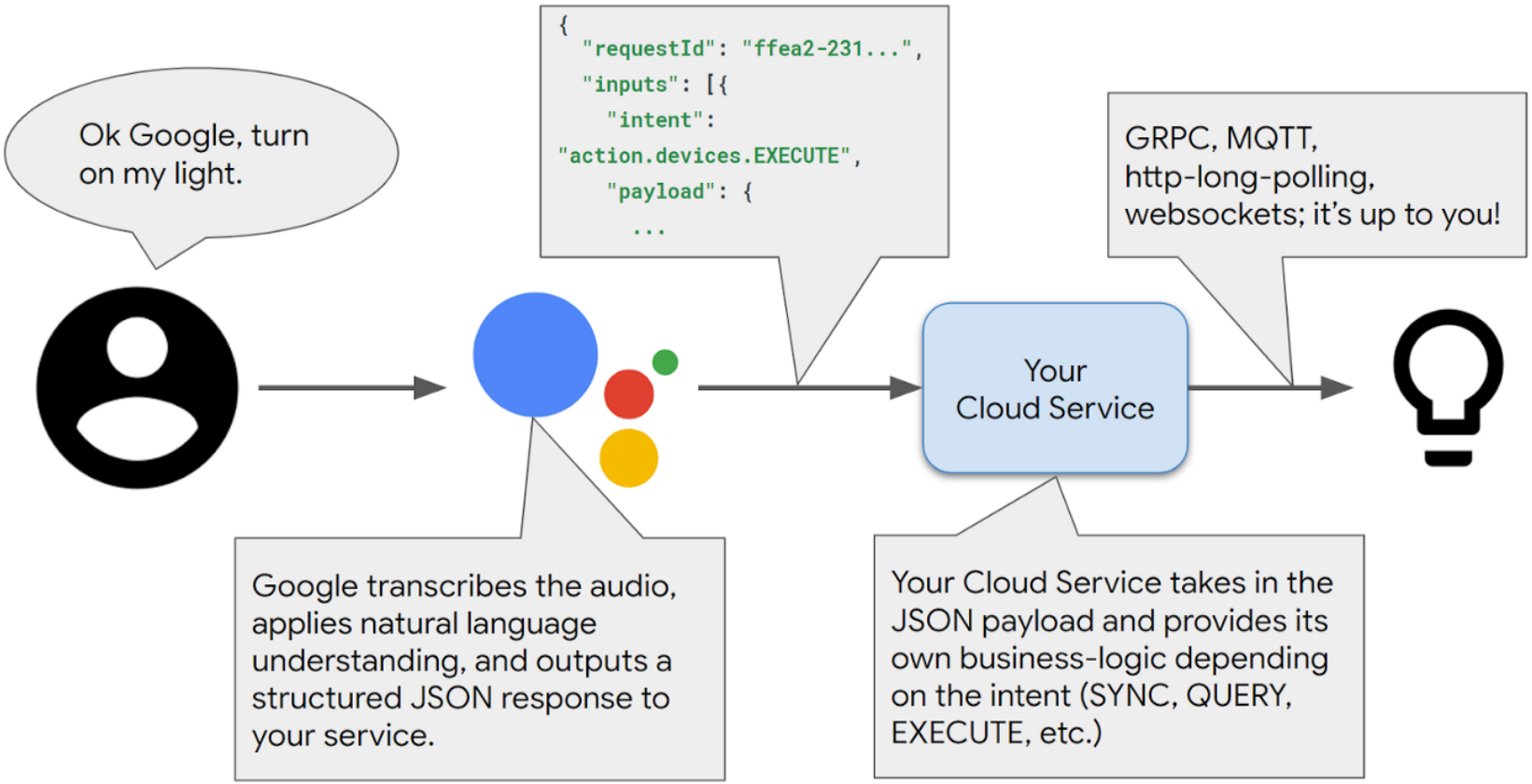
Life Cycle

A user sets up their devices in the Home App for the first time.

A user issues commands to their device.

User throws away their device and no longer uses Google Assistant.

Communication



Live Demo

Thank you for your attention!