Foodie: A Smart Conversational Agent

An initial exploration on the usage of conversational platforms in the cognitive era

Abstract

Meet Foodie Fooderson. He'll answer the most pressing question of everyday life: "What should I cook today?"
Mr. Fooderson is a conversational agent. Conversational agents make use of chat, messaging and other natural language interfaces, such as voice to interact with people, brands or services. This is an application that makes use of IBM Watson's natural language understanding to interact with users about their dietary preferences and suggests recipes. It does so by recognizing the user's intents and returning relevant context. It integrates with the Spoonacular API, which provides a large collection of recipes, ingredients, nutrients and other grocery related data.

> **"We are moving from us having to learn how to interact with computers to computers learning how to interact with us."**
>
> — Sean Johnson

Background

Conversational Models

- Retrieval Based:
  - Use a repository of predefined responses - heuristic to pick an appropriate response input and context
  - They do not respond well to unseen data.
- Generative:
  - Deep learning, machine translation.
  - Generate responses from scratch
  - Extensive training data, prone to errors

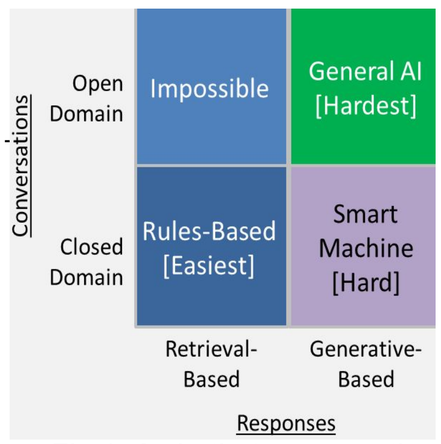

Fig 1. A chatbot conversation framework [3]

Advantages of using a conversational interface

- Enables users to get more out of their technology.
- Reduces user effort and error in the completion of tedious tasks.
- Provides users with quick access to information, especially when information has to be collated from different sources.
- Conversational Platforms: IBM Watson, amazon alexa, api.ai, wit.ai

Under the Hood

- #Intents
  - Determine the purpose of arbitrary user input
  - Example: "**I'm feeling hungry**" is classified under the intent **#start_cooking**
- @Entities
  - Keyword identification
  - Example: "**I want to eat a french breakfast**" identifies
    - @cuisine = french
    - @mealType = breakfast
- Dialog
  - Possible flows of a conversation via **nodes**
  - **Nodes** are triggered by conditions
- Context
  - Mechanism for passing information between the dialog and the application

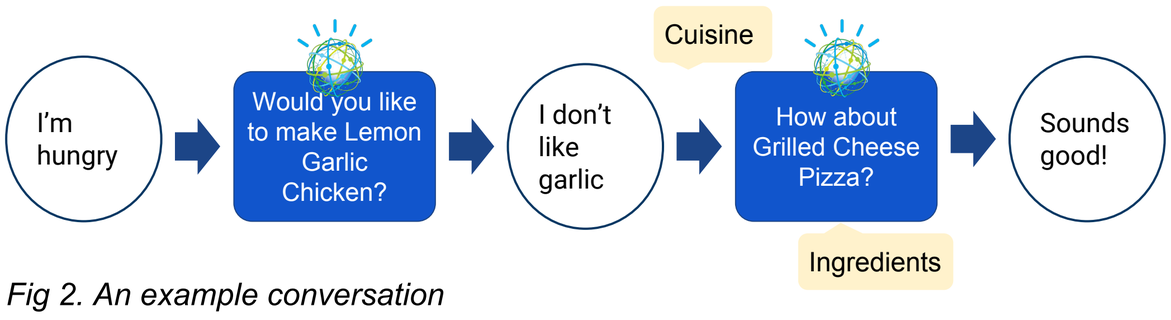

Fig 2. An example conversation

Implementation

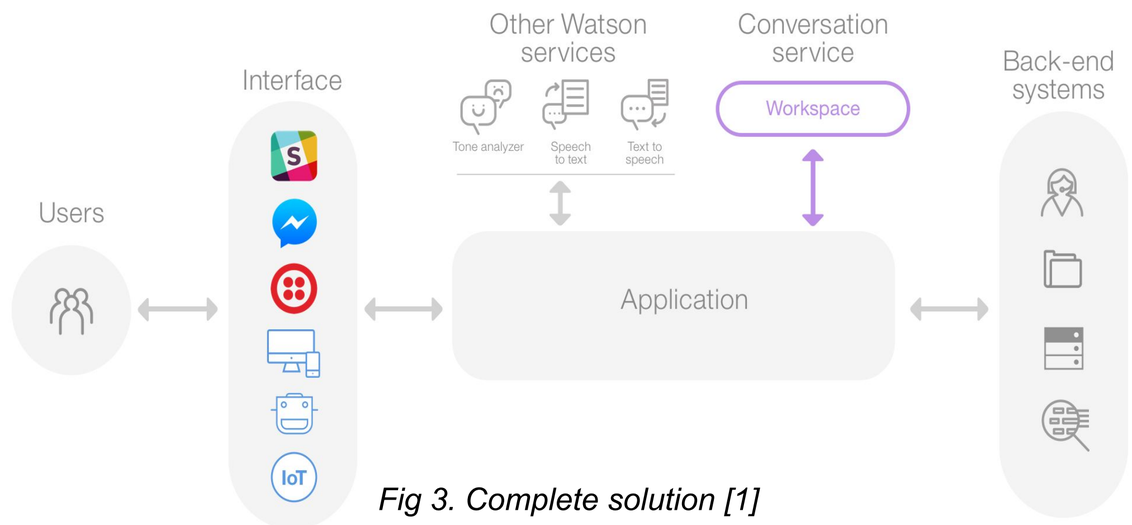

Fig 3. Complete solution [1]

- Input to the application is ideally via a hybrid interface. This input serves as a request to the conversation engine which responds by returning the user's context. Contextual information is parsed by the application which sends out specific requests to the Spoonacular API based on the intent of the user.
- Features:
  - Recommend recipes based on user's dietary preferences, cuisines, ingredients
  - Get nutrition information for recipes
  - Set and update the user's dietary goals

Future Work

- Integrating the application with a hybrid interface.
- Improving failure management
- Making responses better by exploiting of the personal context of a user
- Incorporating user goals for recipe suggestions
- Integrating Smart Fridges for suggesting recipes based on ingredients available

Conclusions

- This application made use of Watson Conversation to search for recipes via the Spoonacular API.
- Simple conversations where there is a sequential flow of dialog are easy to build, but it isn't the conversation users would expect.
- Ability to have more complex conversations is what makes an application robust.
- With the rise of smart devices in the cognitive era, it is wise to have hybrid interfaces.

References

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