Build Your Next Chatbot Using Dialogflow and Node.js

Zahidul Islam | zahid@voicefirstdesign.com
LinkedIn: https://www.linkedin.com/in/zahiduli/

"By 2020, the average person will have more conversations a day with bots than they do with their spouse"

Heather Pemberton Levy | GARTNER

Agenda

- What is a Chatbot?
- Types of Chatbot/Evolution
- Chatbot ecosystem
- Dialogflow 101
- DIY - Workshop
- Q&A

Chatbot === Agent === Bot

A **Chatbot** is a program/agent that use conversation as a means for human computer interaction.

Types of Chatbot

Rules based

- Specialized and understand a fixed set of commands
- Typically user initiated

ML/AI based

- NLP powered
- Highly personalized
- Able to learn over time
- Has a Brain

Chatbot ecosystem

- General AI agents
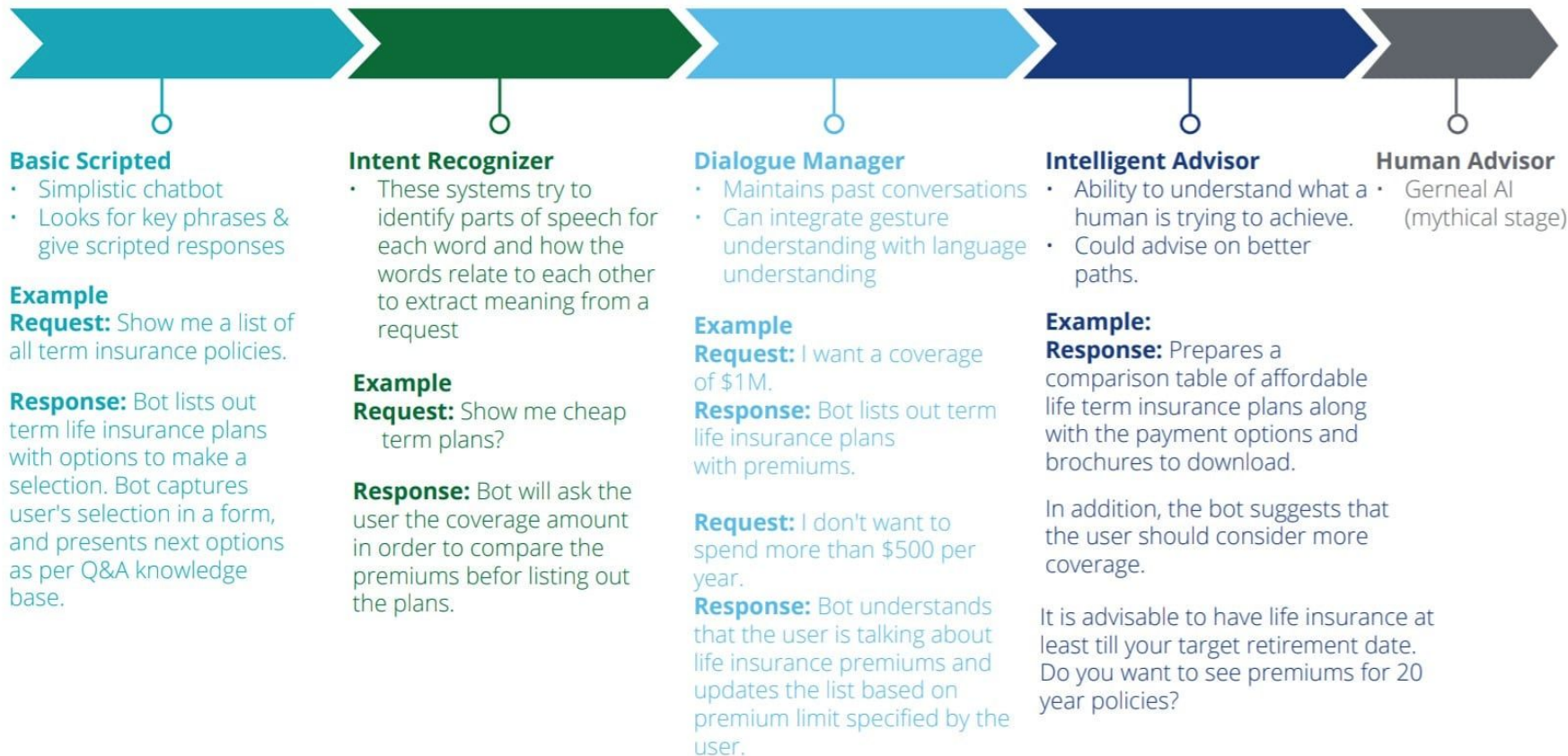- Messaging Platforms
- NLU as-a-service platform
- Bot frameworks

Image source: https://blog.aimultiple.com/chatbot-ecosystem/

General AI agents with platforms
Developer access available now or announced

| Siri Apple | Now Google | Alexa/Echo Amazon | Cortana Microsoft | Viv Viv Labs |

Messaging platforms

| iMessage Apple | Messenger Facebook | WhatsApp Facebook | Slack | WeChat Tencent | Kik |

| Allo Google | Telegram | Twilio | Line Naver | Skype Microsoft |

Generalized natural language and AI-as-a-service platforms

| Cloud Platform Speech & NL APIs Google | Watson Conversation IBM | Alexa Voice Service Amazon | LUIS Microsoft | Cognitive Services Microsoft |

Bot frameworks and deployment platforms

| Wit.ai Facebook | BotKit Howdy | Chatfuel | Automat | Bot Framework Microsoft |

| Api.ai Google | Pandorabots | MindMeld | Gupshup | Sequel |

Evolution of Chatbot

So let's take a look at the evolution of chatbots
Evolution of a chatbot

Basic Scripted
- Simplistic chatbot
- Looks for key phrases & give scripted responses

Example
Request: Show me a list of all term insurance policies.

Response: Bot lists out term life insurance plans with options to make a selection. Bot captures user's selection in a form, and presents next options as per Q&A knowledge base.

Intent Recognizer
- These systems try to identify parts of speech for each word and how the words relate to each other to extract meaning from a request

Example
Request: Show me cheap term plans?

Response: Bot will ask the user the coverage amount in order to compare the premiums befor listing out the plans.

Dialogue Manager
- Maintains past conversations
- Can integrate gesture understanding with language understanding

Example
Request: I want a coverage of $1M.
Response: Bot lists out term life insurance plans with premiums.

Request: I don't want to spend more than $500 per year.
Response: Bot understands that the user is talking about life insurance premiums and updates the list based on premium limit specified by the user.

Intelligent Advisor
- Ability to understand what a human is trying to achieve.
- Could advise on better paths.

Example:
Response: Prepares a comparison table of affordable life term insurance plans along with the payment options and brochures to download.

In addition, the bot suggests that the user should consider more coverage.

It is advisable to have life insurance at least till your target retirement date. Do you want to see premiums for 20 year policies?

Human Advisor
- Gerneal AI (mythical stage)

When a chatbot is better than web/app?

- You have a question, and you want an answer
- Your messaging app is always open
- Your internet connection is slow or unstable
- You don't know which system has the information you need
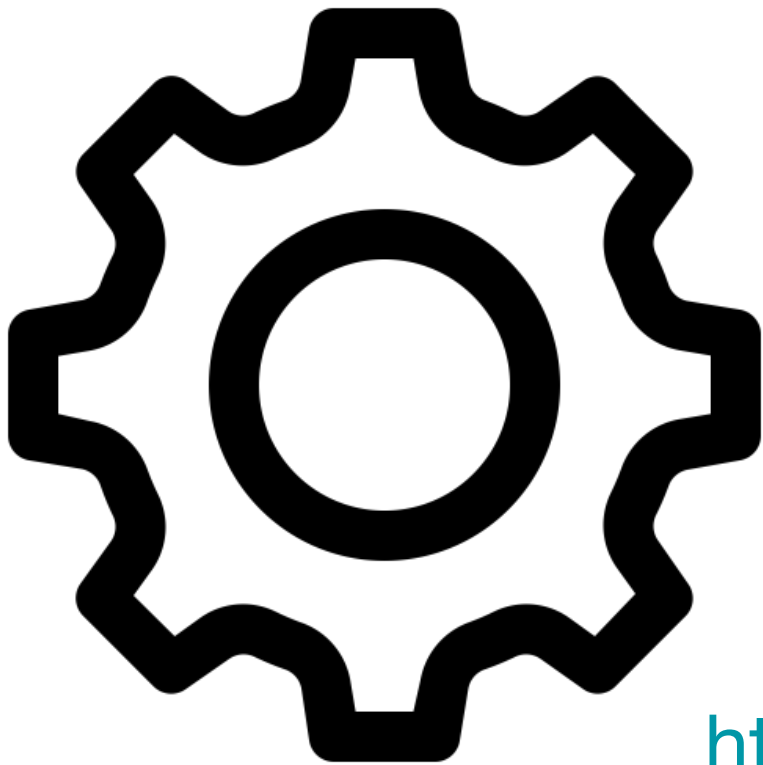- You need push notifications
- Your hands aren't available

When an web/app is better than a chatbot

- You're not sure what you're looking for

- You need long-form content

- You want to "see what's happening"

- You need a full graphical user interface

Dialogflow 101

Setup

https://cloud.google.com/free/
https://dialogflow.com/

Key concepts

- Agents
- Intents
- Entities
- Contexts
- Events
- Fulfillment

Agent

- A dialogflow module which apply NLU (Natural language undersing) to transform user request into machine readable actionable data.

Intent

- What user want.
- Mapping between what a user says and what action chatbot should take.
- **Example**: I want to book a room for two nights in San Francisco
- **Intent**: hotel-booking

Entities

- Used to pick out specific pieces of information that user mention
- **Example**: I want to book a room for two nights in San Francisco
- **Entities**: number of room: 1, stays: 2 nights, city: San Francisco

Context

- Way to add memory to your chatbot
- Allow agent to carry information from one intent to another.
- Two type of context
  - Output context
  - Input context

Events

- Allow you to invoke intents based on something that has happened (event) instead of what a user communicates.

Fulfillment

- Code that's deployed as a webhook that lets your Dialogflow agent call business logic on an intent-by-intent basis.
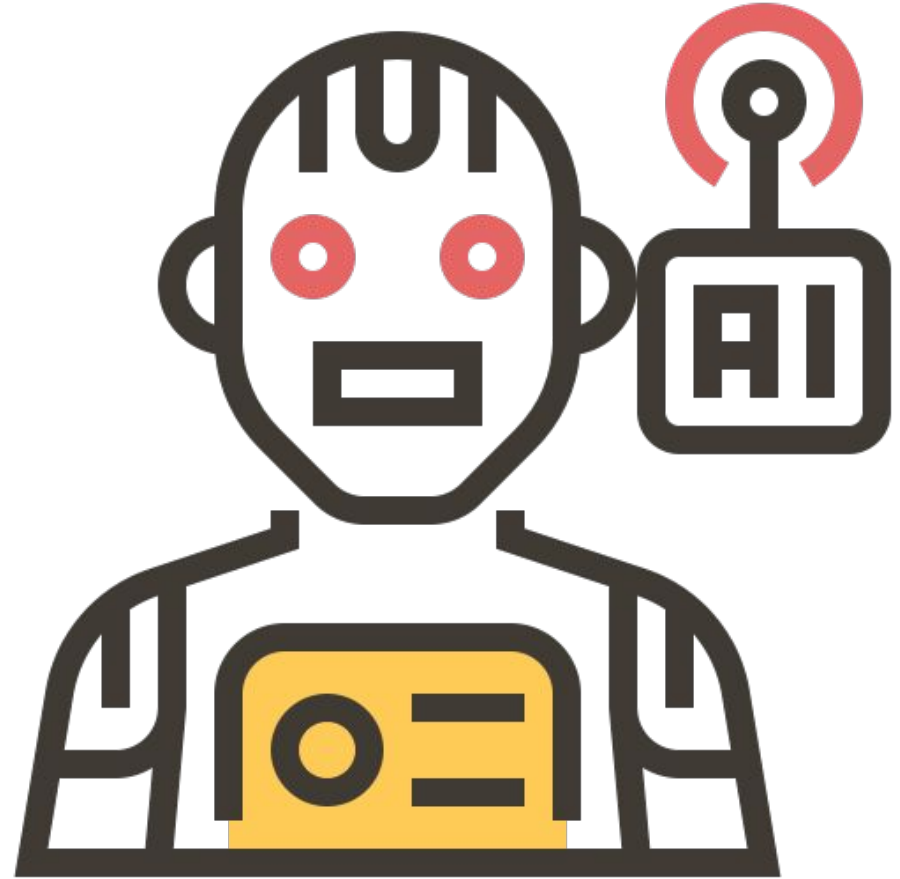
How Chatbot works

Image source: https://www.brihaspatitech.com/blog/how-make-chatbot-google-dialogflow/

Workshop

https://github.com/Zahidul-Islam/businessofbots
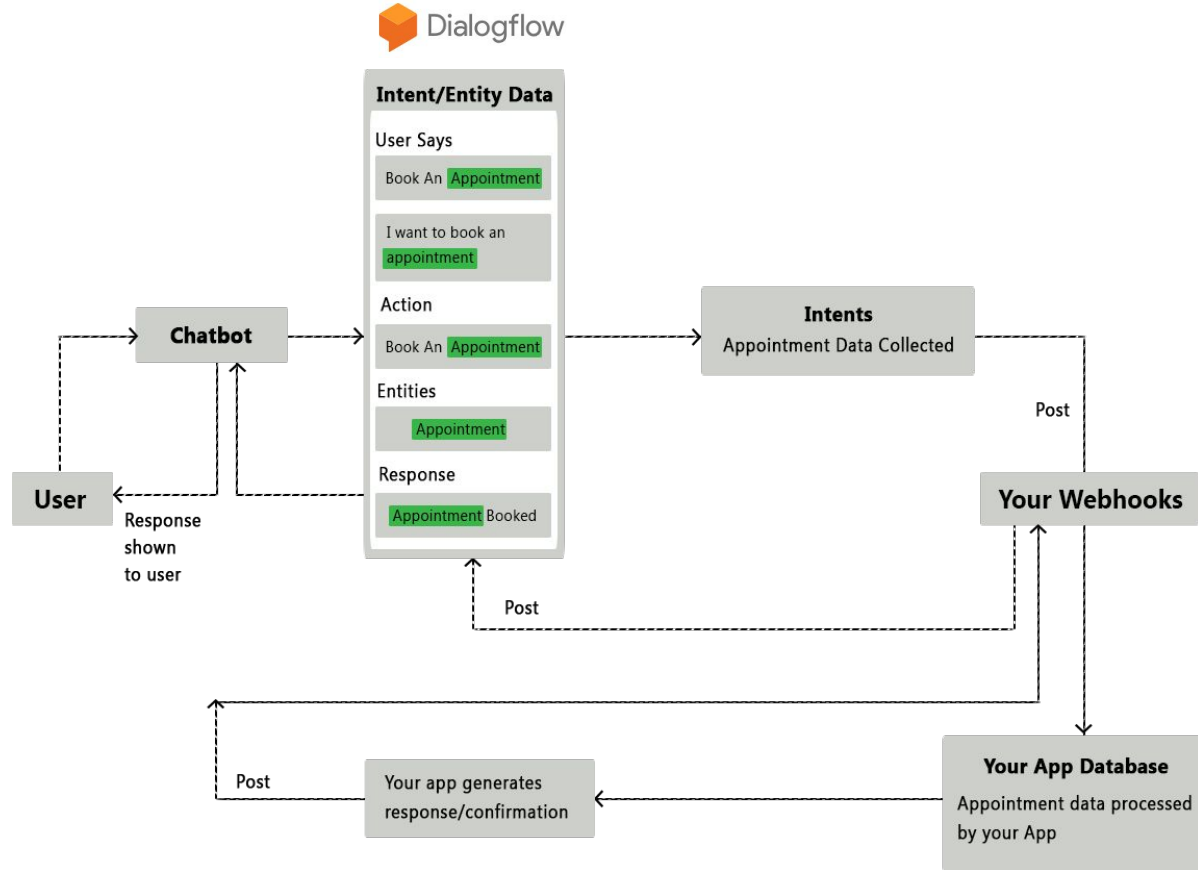
Let's build a Chatbot

Some Agent Ideas

- **Pizza Ordering Chatbot**

  This agent will help take an order for a Pizza. The entities that you can model are Pizza Crust (thick, thin, etc), Toppings (use multiple toppings like mushrooms, capsicum, olives, etc), Size (Small, Medium, Large) and so on.

- **Weather Chatbot**

  Make an API call from fulfillment to give user's relevant information like the weather

- **Resume Chatbot**

  Answer questions related to your work experience, education, skills etc

Demo

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