

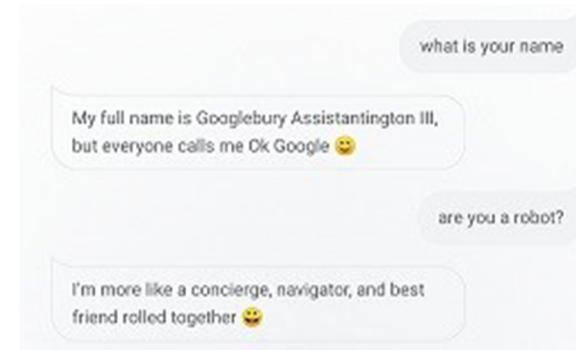
Chatbots

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Introduction



A chatbot is an artificially intelligent software which can chat with a user in natural language through the means of messaging applications, websites or a phone call. From a historic view, chatbots are the most advanced form of communication between humans and machines.



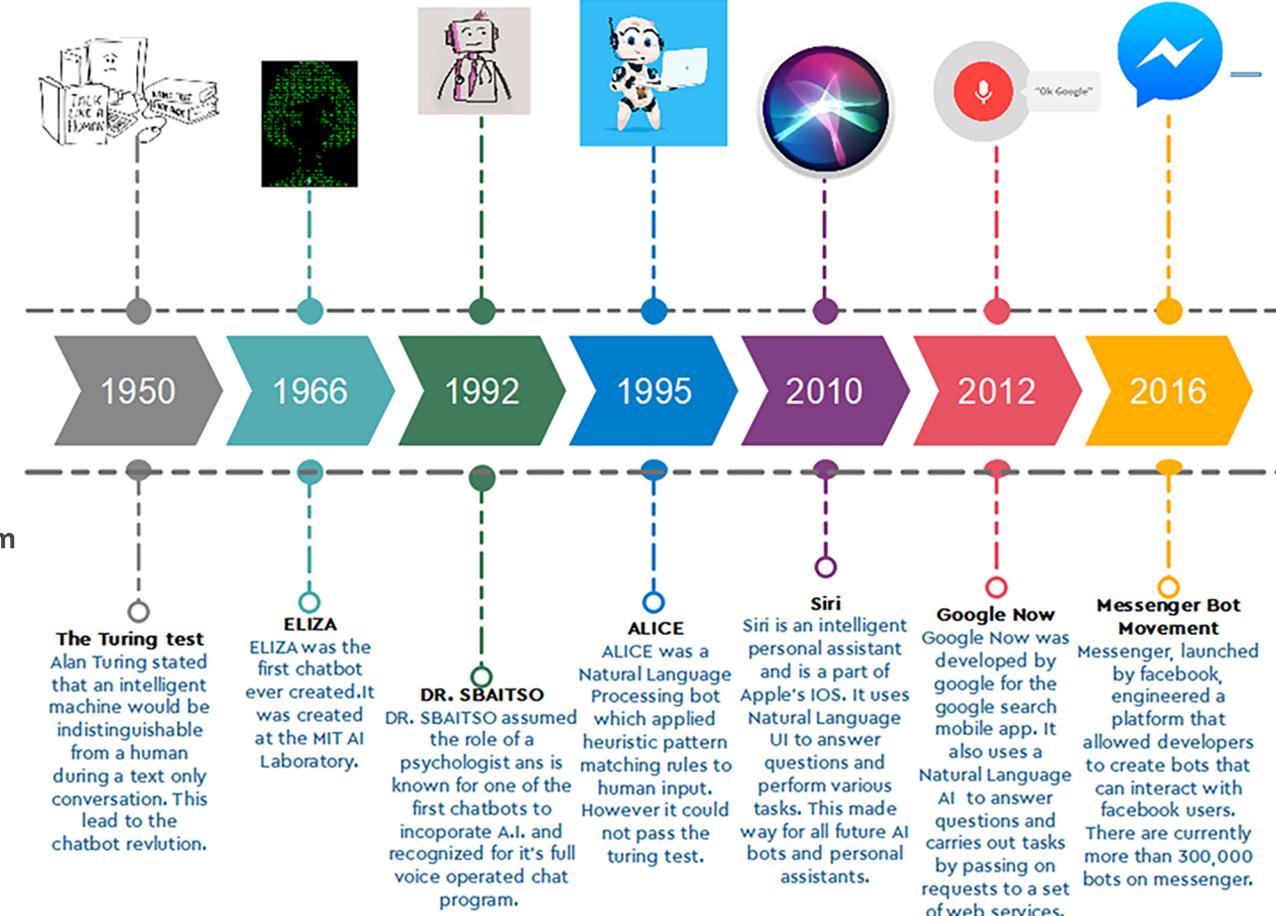
However, from a technical perspective, chatbots can be viewed as the advanced version of Question/Answering system with techniques of ML and NLP at its core. Integrating NLP in chatbot means making the chatbot more human. NLP provides the ability to train our chatbot for all different types of interactions it will go through. Training means providing examples of content which the chatbot might encounter in the future. Along with that, using NLP chatbots implement pattern matching to perform text classification and generate a suitable response.

References

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- <https://chatbotsmagazine.com/a-visual-history-of-chatbots-8bf3b31dbfb2>
- <https://expertsystem.com/chatbot/>



A Brief History



Applications

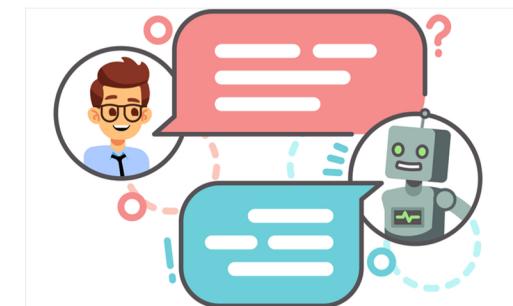


- 1. Messaging Apps and Virtual Assistants:** Statistics show that in the recent years, the use of messaging apps has surpassed the use of social media. Hence, integrating a chatbot in such messaging applications makes it user-friendly for the user and its main advantage is that it is accessible 24/7.
- 2. Customer Service:** Many companies believe in giving the best customer service possible. Until the use of chatbots training and monitoring employees was a very tedious job, but by implementing chatbots results show higher customer satisfaction with significant cost reduction.
- 3. Healthcare:** One field which requires 24/7 support is that of healthcare. Be it scheduling a doctor's appointment or providing medical information or as simple as reminders for taking medicines. A chatbot can easily handle all this without the use of extra human effort.
- 4. E-commerce:** E-commerce sites want users to have the best experience possible. Chatbots can help achieve this very easily. Some of these tasks includes suggesting products based on the customer's preference. Other than that it can be used to set price alerts, send information regarding discounts and offers, etc.

Role of NLP in Chatbots

Combination of steps are taken by chatbots to convert customers speech or text into proper format to select the relevant answer.

- 1. Sentiment Analysis** – This tries to understand if the chat should be forwarded to some human agent.
- 2. Tokenization** – String of words are divided into tokens that are useful for the application.
- 3. Named Entity Recognition** – The chatbot tries to search for classes of different types of words such as product name or user details.
- 4. Normalization** – To clearly understand what the user is trying to convey, the chatbot tries to process the text to find usual spelling errors and typing mistakes. This also gives the chatbot a more human-like effect.
- 5. Dependency Parsing** – The chatbot tries to find phrases related to user's input by searching for verbs, nouns, and common phrases to understand what the user is trying to say.



Limitations of chatbots

- 1) Firstly, a chatbot's efficiency is highly dependent on techniques used for language processing which makes the chatbots vulnerable to different accents and grammatical errors.
- 2) Although chatbots can help save us lot of money in the long run, the installation and maintenance of a chatbot is quite expensive.
- 3) Unlike human interactions, chatbot interactions are not capable enough to solve multiple queries simultaneously.
- 4) A technological limitation might be the limited size of the database which stores the chatbot responses.
- 5) Most chatbots have the tendency of being too repetitive while dealing with similar-worded issues.
- 6) As chatbots have poor conversational understanding and lack human emotions, they are not reliable when it comes to decision making.