

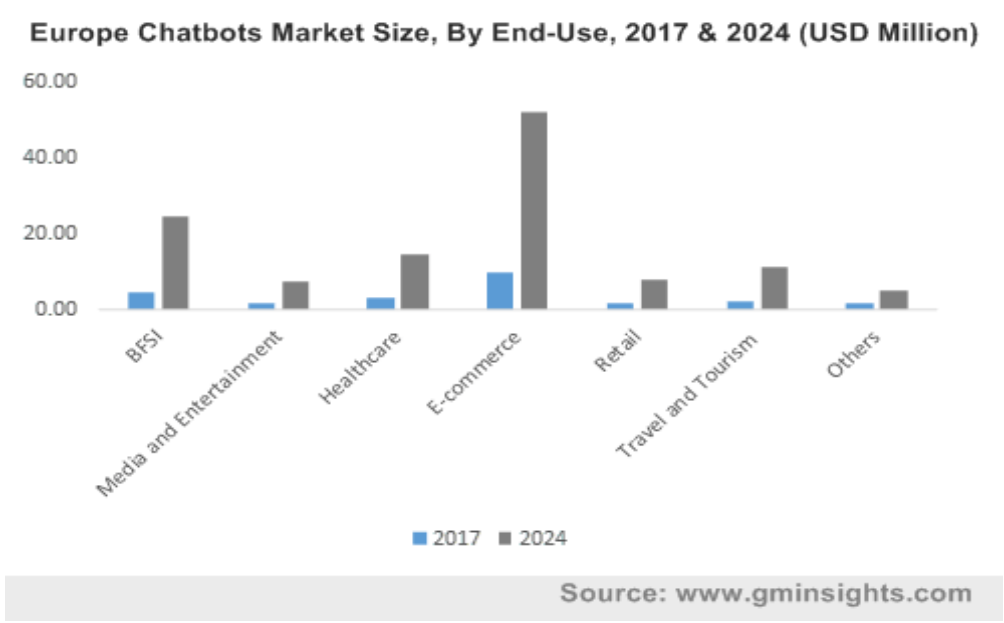
DIALOG



ENGINES

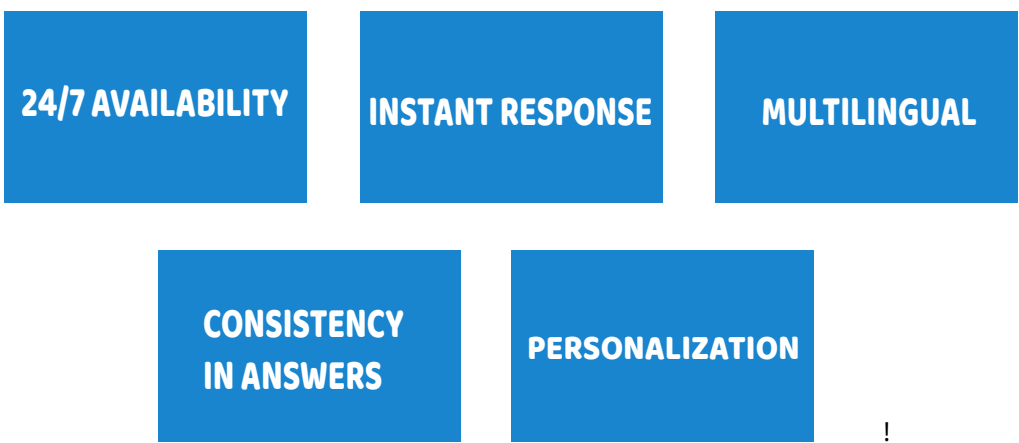
INTRODUCTION:

Chatbots are a dialog engine system built using NLP pipelines that are designed to have human like conversations. Usually, they are developed to successfully carry out redundant and repetitive conversational tasks which don't require human intervention. However, complex bots nowadays can mimic human characteristics and can do complex tasks like interpreting the world for people with compromised vision.



CHATBOT BENEFITS:

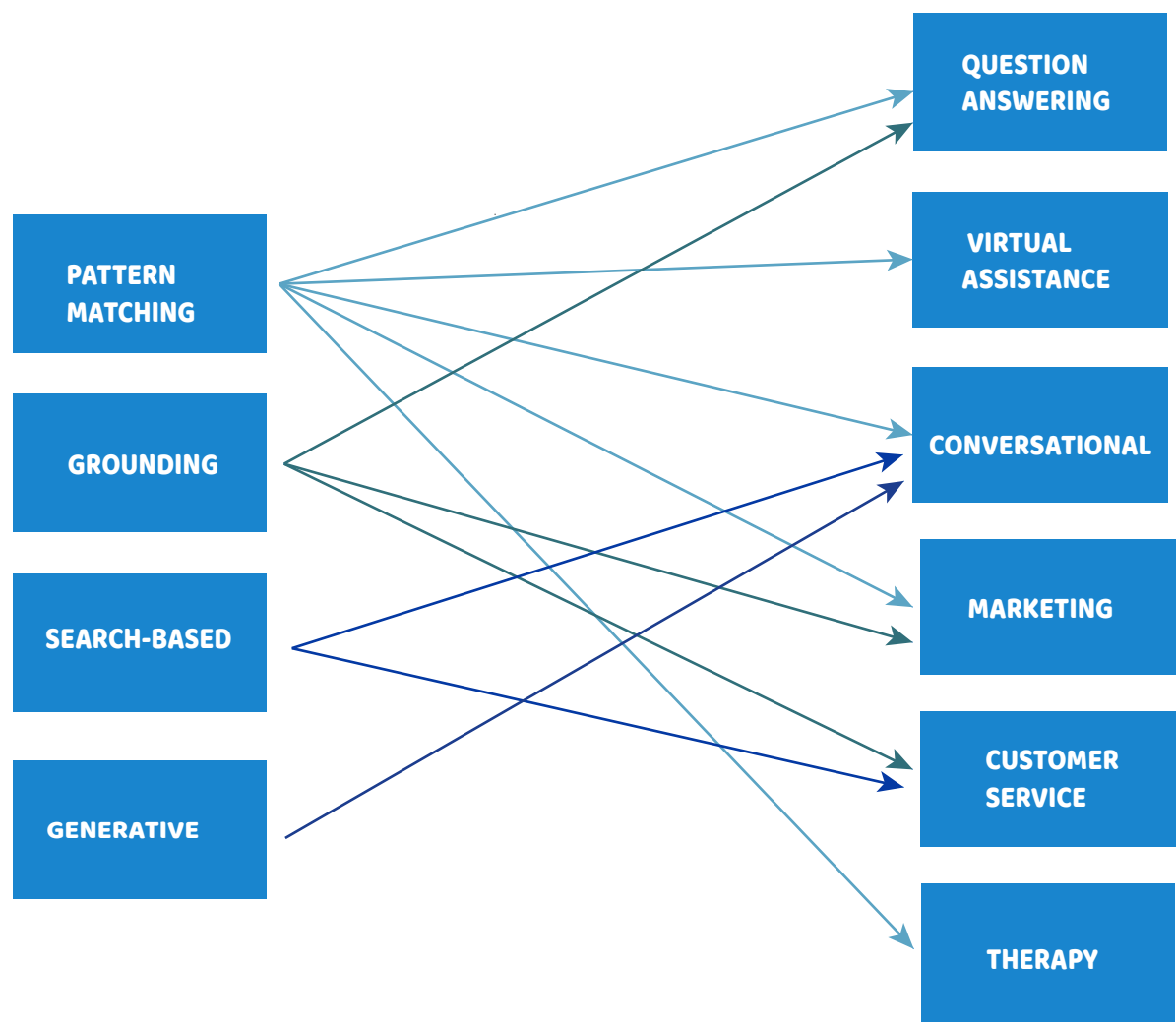
- As opposed to traditional customer service, chatbots are available 24x7 without getting overwhelmed with unusually high number of requests.
- Chatbots can help businesses get more insights on customer behaviour as they usually maintain records of conversations.
- They are applicable across variety of industries like banking, healthcare, tourism, education, etc.



MODERN APPROACHES:

- Approaches used in building different kinds of chatbots nowadays are:
- Pattern Matching: It matches text patterns to classify the input and produce a suitable response.
 - Grounding: It uses logical knowledge graphs to produce a suitable response based on those graphs.
 - Search-based: It works on the basis of information retrieval from a knowledge base as well as previous conversations done within the same context. It accesses its own history of bot-human, human-human, bot-bot conversations to provide a response.
 - Generative: This type of chatbot is not limited by a set of pre-defined responses, It uses generative methods to generate new dialogues based on expansive training data.

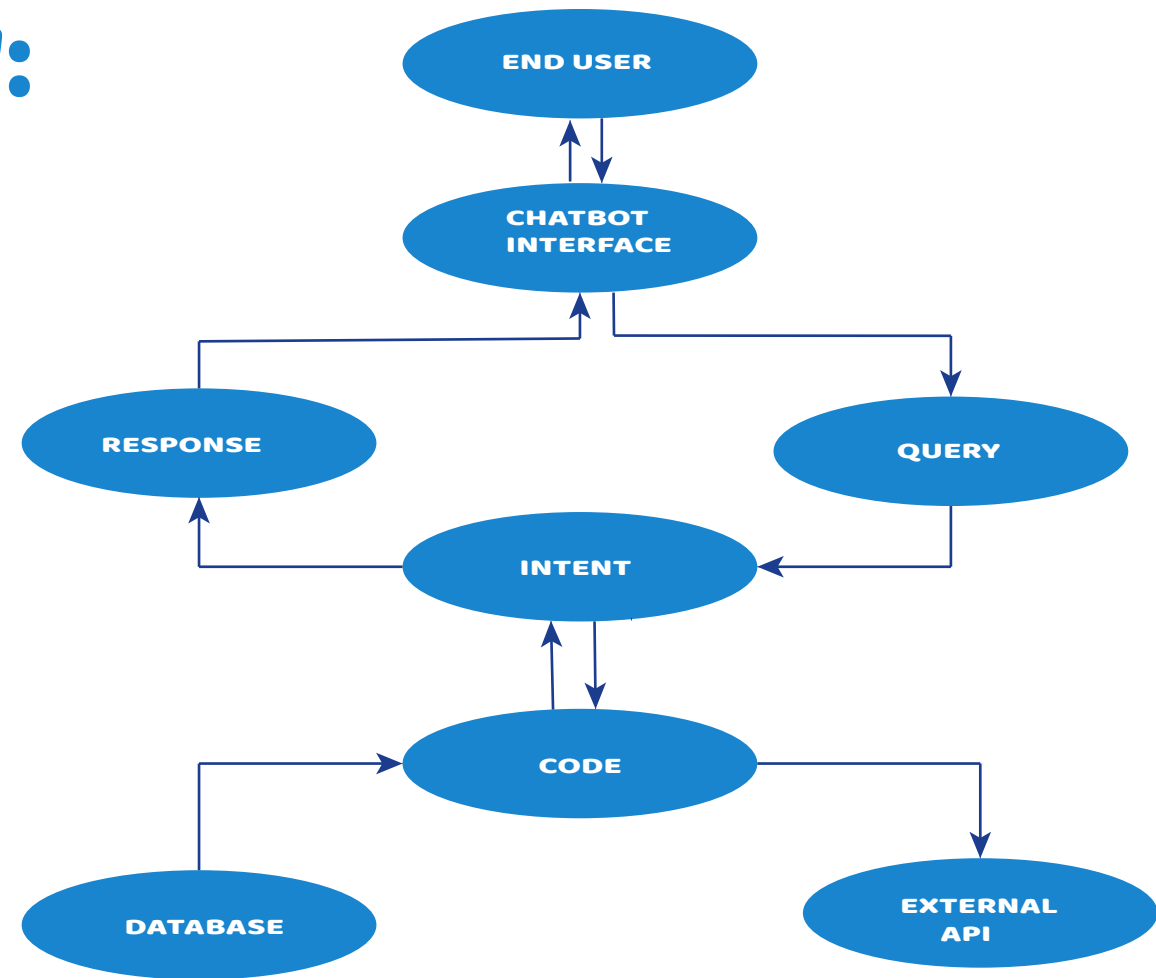
List of applications that combine multiple approaches to build a chatbot system:



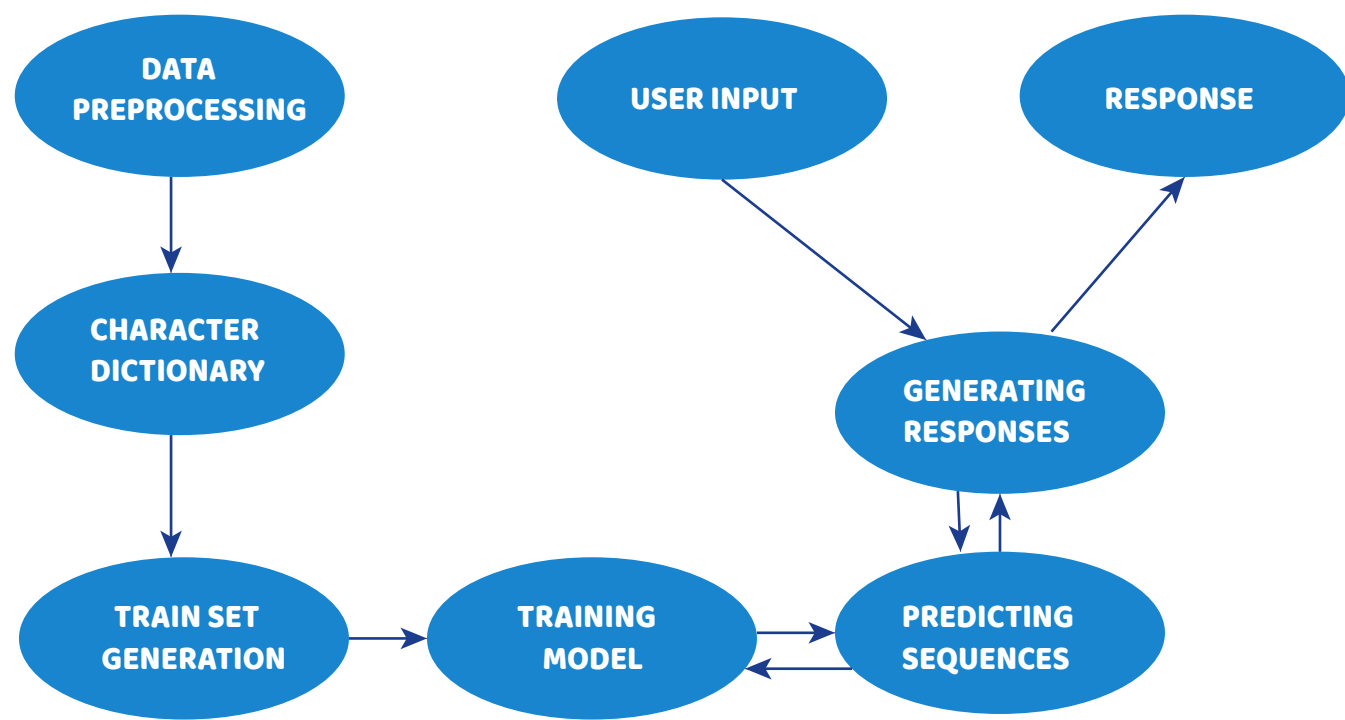
Source: Natural Language Processing in Action, Second Edition. (2022). Manning.

DIALOGFLOW:

Dialogflow is a natural language processing (NLP) platform that can be used to build conversational applications and experiences for end-users in various languages and on multiple platforms. It gives you an easy to use interface to quickly build rule based chatbots.



GENERATIVE CHATBOT:



Deep learning models helps in building corpus based chatbots that allow us to have human-like conversations.

Using sequence to sequence model we can build generative chatbots that can be further enhanced using attention mechanisms.

DIALOGFLOW VS GENERATIVE CHATBOT:

- Software like Dialogflow is beneficial for beginners or users with no coding experience, as it has a GUI that allows the users to design a chatbot with minimal coding. Generative chatbot has to be coded entirely and are for experienced users.
- Generative chatbots provide more flexibility in terms of choosing a corpus, training methods, ML models usage. Dialogflow is more like a black box when it comes to training the model because the end user cannot customize the training methods used.
- Chatbots built using deep learning models are taxing on the resources as they require a good GPU. Dialogflow is much more scalable as it is hosted on the cloud so there's no dependency on the user's machine.

LIMITATIONS:

- Currently it is difficult to develop a chatbot that consistently replies in a fashion that is more human and less artificial. Many chatbot developers spend a significant amount of time attempting to make their bots conversational skills as human as possible
- For many narrowed applications, a developer may be able to create a passable chatbot without a large dataset, but for more advanced conversational bots it may require an overwhelmingly large data set to reach a point where conversation feels consistently natural
- Even very advanced chatbots may only have a handful of ways to respond to similar queries. Since a bot does not use common sense, responses can be limited unless specifically curated by the developer
- Ambiguity in text is a prevailing issue in the field of natural language processing. Training a chatbot to deal with sarcastic or similar responses can be near impossible with current methods.

CONCLUSION:

Chatbots are an extremely useful tool that are revolutionizing businesses globally. With advancements in the field of AI and machine learning, chatbots are becoming complex and more capable of performing difficult tasks. Frameworks like Dialogflow allow users to build proficient chatbots in very little time and deploy it immediately and deep learning models help in building a generative chatbots which mimics the characteristics of humans to a tee!

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