**Eliza** is one of the first natural language processing computer program created in 1964 by Joseph Weizenbaum. It was developed at the MIT Artificial Intelligence Laboratory.

Eliza simulated the chatbot experience by using a “pattern matching” and substitution methodology. It has no built-in framework for contextualizing events.

**Cleverbot** developed British AI scientist by Rollo Carpenter in 1997–1998. It is a webapp uses AI to strike conversation with humans.

Mitsuku— 2002, DialoGPT— 2019 developed by Microsoft. It is trained on data gathered from 147 million Reddit comment chains.

In 2020 google developed state of art chatbot called Meena which address challenges in current chatbots.

**Closed-Domain / Rule Based**

**Not Conversational**

**Not Multi-turn**

Meena is a multi-turn, open-domain chatbot based on Transformer seq2seq architecture trained in an end-to-end fashion. It's huge in size comprising of 2.6B parameters and was trained on 300GB+ text data.

Blender — 2020

They have used is used core natural language processing and fuzzy logic.

AI is technology that Enable machines to interact with human naturally.

Intelligent mechanism of imitating real-life human conversations which is built on the foundation of machine learning (ML), and natural language processing (NLP).

Application:-

Customer Support, Suggest products

e-Commerce

Set price alerts, Order physical goods, Reserve services, Track orders

Travel

Vacation planning, Reservations -> air and train, Queries & complaints

Finance

Information service -> Most banks chatbots are capable of informing users about their balances, recent transactions, credit card payment dates, limits and so on.

Money transfer: Chatbots can easily handle money transfers via SMS, Facebook messenger or other popular chat platforms

Bill payments:

Healthcare

Handling healthcare & insurance coverage related inquiries

Diagnosis: can serve as a medical assistant by gathering information via conversation with the patients.

Therapy: Since therapy is almost completely text-based. Schedule Appointments

Hospitality

Reservations & handling menu related questions

Insurance

Agent inquiry handling, Customer inquiry handling

Media

News delivery -> catboats can be built to deliver only summaries of news.

HR

Recruiting chatbots -> allows HR team to automate the communication with job applicants.

Onboarding chatbots -> answers new employees’ questions and facilitates the on boarding process

The conversational AI market size is set to grow from $4.8 Billion in 2020 to a staggering $13.9 Billion by 2025

**Slide 2 ->**

Chatbots and Virtual Assistants despite having similar technical foundations, differ in their functionality

They can answer only those queries that they have been programmed for and can fail if the query is other than the ones they have learnt.

Virtual Assistants are developed to perform activities based on the inputs that they receive from the user that are not necessarily pre-programed

 Chatbot communication is traditionally text driven, audio and pictures can also be used for interaction. Virtual Assistants on the other hand are primarily operated through verbal commands

Chabot -> EVA by HDFC, ILA by SBI

Virtual Assistant -> Siri by Apple, Google Assistant by Google, Alexa by Amazon etc.

They serve a general purpose and are linear, and do not carry context from one conversation to the next. These assistants use ASR and NLP, but have simple dialog management.

Slide 3 ->

Leval1 -> Notification Assistant -> Simple notification, alert message on messaging apps.

Level2 -> FAQs Assistant ->

Level3 Contextual AI Assistant -> They can keep the context of what has been said before , gracefully handles unexpected conversation turns , drive the conversation when user drifts from regular conversation path and improve over time.

**User:**    What was my income in August?  
**Agent:**  Your income in August was $2345.  
**User:**    Ok. How about September?  
**Agent:**  Your income in September was $4567.  
**User:**    What were my expenses in July?  
**Agent:**  Your expenses for July were $123.  
**User:**Ok thanks.

Level4: Personalize AI Assistants:-It will remember your preferences.

Level 5: There will be group of AI assistant that know every customer personally and eventually run large parts of company operations lead generation, marketing, HR, finance.

Slide 4:-

First, the application receives the information input from the human, which can be either written text or spoken phrases. If the input is spoken, ASR, also known as voice recognition, is the technology that makes sense of the spoken words and translates then into a machine readable format, text.

Second, the application must decipher what the text means. It uses Natural Language Understanding (NLU), which is one part of Natural Language Processing (NLP), to understand the intent behind the text.

Next, the application forms the response based on its understanding of the text’s intent using Dialog Management. Dialog management orchestrates the responses, and converts then into human understandable format using Natural Language Generation (NLG), which is the other part of NLP.

The application then either delivers the response in text, or uses speech synthesis, the artificial production of human speech, or text to speech  to deliver the response over a voice modality.

Last, but not least, is the component responsible for learning and improving the application over time. This is called machine or reinforced learning, where the application accepts corrections and learns from the experience to deliver a better response in future interactions.