PROJECT

TITLE

CHATBOTS

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By

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(Affiliated to Osmania University, Hyderabad)

CHIKKADPALLY HYDERABAD

Department of statistics

Certificate

This is to certify that the project report entitled "**CHATBOT**" being submitted by **ALEKHYA BULUSU** bearing Roll no **1051-20-539-036** in partial fulfillment for the award of the Bachelor Science to the Osmania University is a record of bonafide work carried out by her under my guidance and supervision.

The results embodied in this project report have not been submitted to any other University or Institute for the award of any Graduate.

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I have immense pleasure in expressing my heart full thanks to Almighty god, my family and our principal sir for providing us good moral support throughout my project.

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Finally I thank all the faculty members, classmates and who have helped me in making this project a grand success.

ABSTRACT

A Chatbot, sometimes known as a Chatterbot, is a piece of Software used to conduct text-based or text-to-speech online chat conversations on behalf of real human chat agents. Computer programs known as “Chatbots” are able to converse with users in natural language, discern their intensions, and respond in accordance with predefined rules and data. Chatbot systems often require constant tuning and testing in order to accurately mimic how a human would act as a conversation partner. While some chatbot solutions employ advanced natural language processing, word categorization, and AI, others only scan for broad keywords and construct responses using standard expressions taken from a connected library or database.

Apart from the huge role chatbots play in customer service they are also used in messaging apps, healthcare industry, politics, toys and for malicious purposes as well. Businesses are using chatbots more frequently to automate jobs that don’t require skill-based talent. There are an increasing number of use-cases where chatbot implementation provides businesses with a clear return on investment, especially with customer support being available through messaging applications in addition to phone calls. In particular, the workers at call centers may be vulnerable to chatbots powered by AI.

This study includes building a chatbot with source code, using pytorch and deep learning techniques. The chatbot will be trained on the dataset which contains categories such as pattern and responses. The pattern matches to group the messages utilized by the bots and so it produces an appropriate response to the users. A response is used to classify8 which category the users text belongs to and depending on that, a response from the list of responses which were already present in the code is produced.

This project includes building a chatbot through the following concepts:

- NLP concepts including stemming, tokenization and bag of words.
- Pytorch model
- JSON
- Numpy

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INTRODUCTION

A Chatbot is a computer program that simulates and processes human conversation (either speech or text), allowing humans to interact with digital devices as they were communicating with a real person. Chatbots can be a as simple as rudimentary programs that answer a simple query with a single-line response, or as sophisticated as digital assistants that learn and evolve to deliver increasing levels of personalization as they gather and process the information.

Users in both business-to-consumer (B2C) and business-to-business (B2B) environments increasingly use chatbot virtual assistants reduces overhead costs, uses support staff time better and enables organizations to provide customer service during hours when live agents are not available. Chatbots can live in messaging platforms like slack, Facebook Messenger and Telegram and serve many purposes like ordering products, knowing about weather and managing finance among other things. In everyday life, while we converse, communicate with our friends, families and peers, we become aware of the context of the subject discussed. For instance, when someone says he is reading a book, we will ask him who the author is or if he likes the book or ask him if he had read another book. We respond in the best possible way for the moment. Contextual communication is emerging as the standard of interaction, and chatbots are making their mark by conversing contextually. The dynamic intelligence of chatbots will allow them to converse with users as in a way we converse and communicate in real-life situations. Conversational communication skill of the chatbot will not only make it a trendy and promising technology but also empower them to deliver what we are looking for response in human terms. Though we find chatbots conversing contextually with users, they are yet to communicate contextually on anything and everything that the user chatbot user experience.

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User experience has always been referred to convenient and easy interactions with a product. When the interface connecting man and machine becomes intelligent and conversational, it becomes easy for the user to converse with the machine and get things done on human terms. Chatbot has demonstrated the power and convenience of conversational interfaces. As of now, language is emerging as the interface.

Chatbots have varying levels of complexity, being either stateless or statefull. Stateless chatbots approach each conversation as if interacting with a new user. In contrast, statefull chatbots can review past interactions and frame new responses in context.

Adding a chatbot to a service or sales department requires low or no coding. Many chatbot services providers allow developer to build conversational user interfaces for third party business applications. A critical aspect of chatbot implementation is selecting the right natural language processing (NLP) engine. If the user interacts with the bot through voice, a chatbot requires a speech recognition engine. Business owners also must decide whether they want structured or unstructured conversations. Chatbots built for structured conversations are highly scripted, which simplifies programming but restricts what users can ask. In B2B (business-to-business) environments, chatbots are commonly scripted to respond to frequently asked questions or perform simple, repetitive tasks. Chatbots can enable sales representatives to get numbers quickly.

HISTORY OF CHATBOTS

In 1950, Alan Turing's famous article "Computing Machinery and Intelligence" was published, which proposed what is now called the Turing test as a criterion of intelligence. This criterion depends on the ability of a computer program to impersonate a human in a real-time written conversation with a human judge is unable to distinguish reliability on the basis of the conversational content alone between the program and a real human. The notoriety o Turing's proposed test stimulated great interest in Joseph Weizenbaum's program ELIZA, published in 1966 which seemed to be able to fool users into believing that they were conversing with a real human.

In Artificial Intelligence machines are made to behave in wondrous ways, often sufficient to dazzle even the most experienced observer. But once a particular program is unmasked, once its magic crumbles away; it stands revealed as a mere collection of procedures the observers says to himself “I could have written that”. With that thought, he moves the program in question from the shelf marked “intelligent”, to that reserved for curious. The object of this paper is to cause just such a re-evaluation of the program about to be “explained”. Few programs ever needed it more.

ELIZA’s key method of operation involves the recognition of clue words or phrase in the input, and the output of the corresponding pre-prepared or pre-programmed responses that can move the conversation forward in an apparently meaningful way. Thus an illusion of understanding is generated, even though the processing involved has been merely superficial. ELIZA showed that such an illusion is surprisingly easy to generate because human judges are so ready to give the benefit of the doubt when conversational responses are capable of being interpreted as intelligent.

Interface designers have come to appreciate that human’s readiness to interpret computer output as genuinely conversational even what it is actually based on rather simple pattern-matching can be exploited for useful purposes. Most people prefer to engage with programs that are human like, and this gives chatbot style techniques a potentially useful role in interactive systems that need to elicit information from users, as long as that information is relatively straightforward and falls into predictable categories. Thus, online help systems can usefully employ chatbot techniques to identify the area of help that users require, potentially providing a “friendlier” interface than a more formal search or menu system. This sort of usage holds the prospect of moving chatbot technology from Weizenbaum’s self-reserved for curious to that marked genuinely useful computational methods.

3

TYPES OF CHATBOTS

As Chatbots are still a relatively new business technology, debate surrounds how many different types of chatbots exist and what the industry should call them,

Some common types of chatbots include the following:

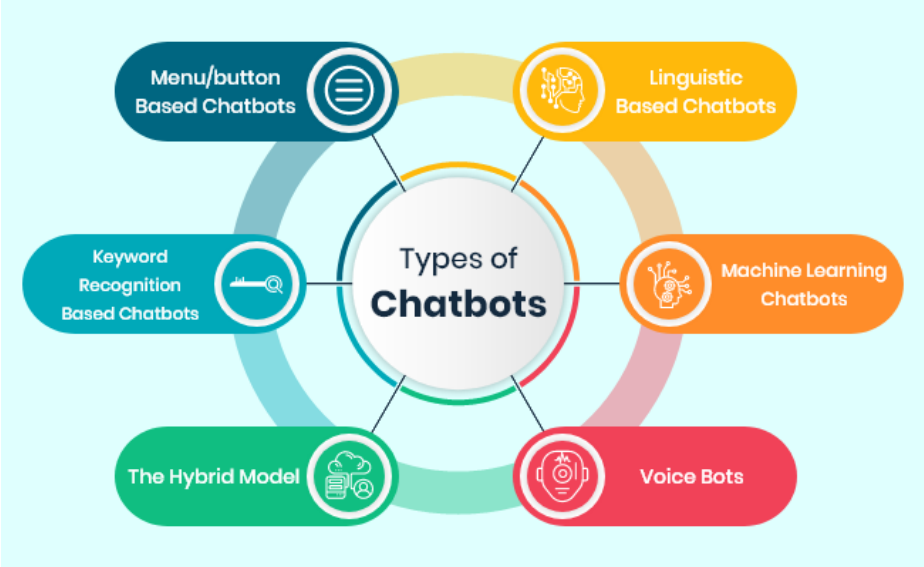


fig-1

SCRIPTED OR QUICK REPLY CHATBOTS

As the most basic chatbots. They act as a hierarchical decision tree. These bots interact with users through predefined questions that progress until the chatbot answers the users question. Similar to this bot is the menu-based chatbot that requires users to make selections from a predefined list, or menu, to provide the bot with a deeper understanding of what the customer needs.

KEYWORDS RECOGNITION-BASED CHATBOTS

Chatbots are a bit more complex; they attempt to listen to what the user types and respond accordingly using keywords from customer responses. This bot combines customizable keywords and AI to respond appropriately. Unfortunately, these chatbots struggle with repetitive keyword use or redundant questions.

HYBRID CHATBOTS

These chatbots combine elements of menu-based and keyword recognition-based bots. Users can choose to have their questions answered directly or use the chatbots menu to make selections if keyword recognition is ineffective.

CONTEXTUAL CHATBOTS

These chatbots are more complex than others and require a data-centric focus. They use Artificial Intelligence (AI) and Machine Learning (ML) to remember user conversations and interactions and use these memories to grow and improve over time. Instead of relying on keywords, these bots use what customers ask and how they ask it to provide answers and self-improve.

VOICE-ENABLED CHATBOTS OR VOICE BOTS

These types of Chatbots are simply knowns as Voice bots. This type of Chatbots is the future of this technology. Voice-enabled chatbots use spoken dialogue from users as input that prompts responses or creative tasks. Developers can create these chatbots using text-to-speech and voice recognition API's, examples include Amazon's Alexa and Apple's Siri.

HOW DOES BUSINESSES USE CHATBOTS?

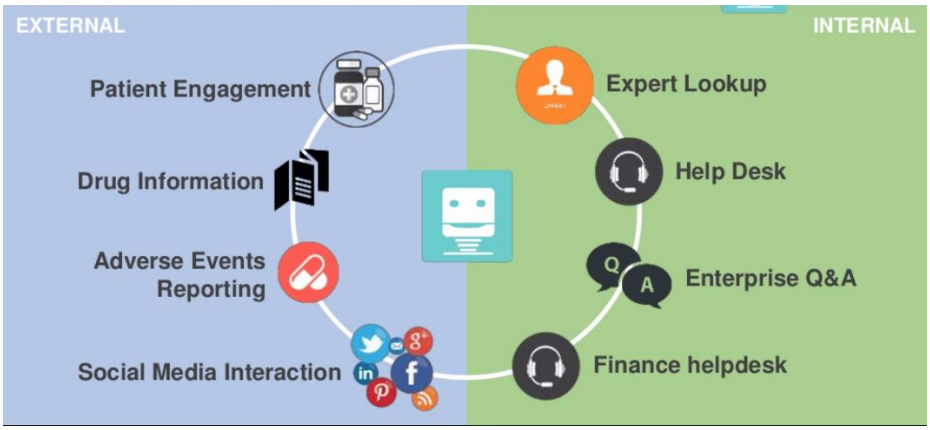


fig-2

Chatbots have been used in instant messaging apps and online interactive games for many years and only recently segued into B2C and B2B sales and services. Organizations can use chatbots in the following ways:

- ONLINE SHOPPING: In these environments, sales teams can use chatbots to answer noncomplex product questions or provide helpful information that consumes could search for later, including shipping price and availability.

- CUSTOMER SERVICE: Service departments can also use chatbots to help service agents answer repetitive requests for example, a service representative might give the chatbot an order number and ask when the order shipped, Generally a chatbot transfers the call or text to a human service agent once a conversation gets too complex.

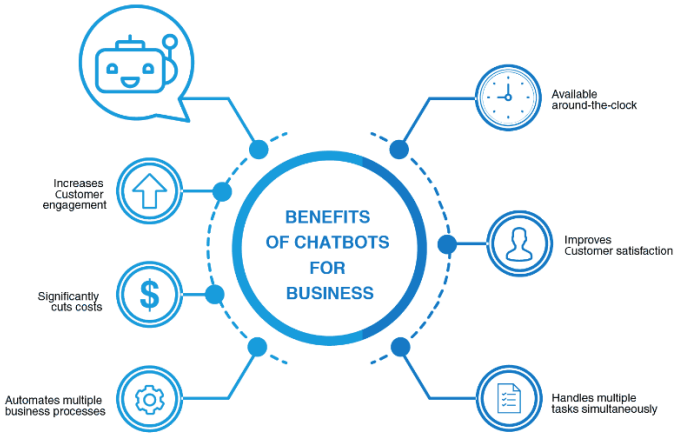
- VIRTUAL ASSISTANTS: Chatbots can also act as a virtual assistant, Apple, Amazon, Google, Microsoft all have forms of virtual assistants. Apps such as Apple's Siri and Microsoft's Cortana, or products, like Amazon Echo with Alexa or Google Home, all play the part of a personal chatbot.

- SOCIAL MEDIA PLATFORMS: Chatbots are dominantly used in social media platforms such as Facebook, Instagram, Twitter, Telegram etc.. these are used for messaging and suggest best suitable replies for the users. This strengthens customers relationships by allowing them to get instant support and information through the channels that are most convenient for them.

- HEALTHCARE: Chatbots can be used in Healthcare by helping the patients avoid unnecessary lab tests and other costly treatments. Instead of having to navigate the system themselves and make mistakes that increase costs, patients can let healthcare chatbots guide them through the system more effectively.

- MARKETING: It is prominently knowns as chatbot marketing it is a way of promoting products and services using a chatbot a computer application that carries conversations with users by a predetermined scenario or with the help of AI

BENEFITS OF CHATBOTS



In addition to chatbots benefits for customer experience, organizations also gain various advantages. Improved customer experience and more satisfied customers due to chatbots increase the likelihood which means that an organization will profit from loyal customers.

- MULTIPLE CONVERSATIONS: Chatbots can converse simultaneously with thousands of customers. This increases business productivity and eliminates wait times.
- COST EFFECTIVE: A chatbot is a faster and cheaper one-time investment than creating a dedicated, cross-platform app or hiring additional employees. In addition, chatbots can reduce costly problems caused by human error. User acquisition costs also decrease with a chatbot's ability to respond within seconds.

- SAVES TIME: Chatbots can automate tasks performed frequently and at specifics times. This gives employees time to focus on more important tasks and prevents customers from waiting to receive responses.

- PROACTIVE CUSTOMER INTERACTION: In the past, organizations relied on passive customer interaction and waited for buyers to reach out first with chatbots, organizations can initiate conversations and monitor how customers use the websites and landing pages. Organizations can then use the information gathered from monitoring to offer specific incentives to buyers, help users navigate the site and answer future questions.

- MONITORS AND ANALYZES CUSTOMER DATA: Chatbots collect feedback from each interaction to help businesses improve their services and products or optimize their websites. Bots can also record user data to track behaviors and purchasing patterns. This information can offer organizations insight into how to better market their products and services, as well as common obstacles that customers face during the buying process.

- IMPROVES CUSTOMER ENGAGEMENT: Most of the companies engage their customers through social media chatbots can make this engagement more interactive. Buyers rarely talk to the people with businesses, so chatbots open a communication channel where customers can engage without the stress of interacting with another person.

- EASES SCALABILITY TO GLOBAL MARKETS: Chatbots can solve customer concerns and queries in multiple languages. Their 24/7 access enables customers to use them regardless of time or time zone.

- EXPANDS THE CUSTOMER BASE: Chatbots can improve lead generation, qualification and nurturing. Chatbots can ask questions throughout the buyer's journey and provide information that may persuade the user and create a lead. Chatbots can then provide potential customer information to the sales team, who can engage with the leads. The bots can improve conversation rates and ensure the lead's journey flow in the right direction i.e towards a purchase.

- MEASURES LEAD QUALIFICATIONS: Chatbots can help sales teams determine a lead's qualifications using identified key performance indicators, such as budget, timeline and resources.

CHALLENGES OF USING CHATBOTS

While chatbots improve customer experiences and benefit organizations, they also present various challenges.

- NEW TECHNOLOGY, NEW OBSTACLES: Chatbot technology is still new and faces obstacles that organizations may not know how to handle. While AI-enabled bots can learn from each interaction and improve their behaviors, this process can cost organizations a lot of money if the initial interactions cause customers to disengage and turn away.

- SECURITY: Users must trust the chatbot enough to share personal data. Therefore, organizations must ensure they design their chatbots to only request relevant data and securely transmit that data over the internet. Chatbots should have secure designs and be able to prevent hackers from accessing chat interfaces.

- VARIETIES IN PEOPLES MESSAGES: This can lead to misunderstood intentions. Chatbots must handle both long and short sentences, as well as chat bubbles with lengthy content versus multiple short submissions.

- USERS CONVERSATIONS: Chatbots can struggle to understand these variations. For example, the user may use slang, misspell words or use acronyms. Unfortunately, NLP is limited and cannot fully resolve this challenge.

- UNPREDICTABLE HUMAN BEHAVIOR: Humans are random and emotions and moods often control user behavior, so users may quickly change their minds. After initially asking for a suggestion, they might want to give a command instead. Chatbots must adapt to and understand this randomness and spontaneity.

- USER SATISFACTION: Users always want the best experiences but are rarely satisfied they always want the chatbot to be better than it currently is this means organizations employing chatbots must consistently update and improve them to ensure users feel like they are talking to a reliable, smart source.

IMPOTANCE OF CHARTBOTS

Organizations looking to increase sales or service productivity may adopt chatbots for time savings and efficiency, as Artificial intelligence (AI) chatbots can converse with users and answer recuring questions.

As consumers move away from traditional forms of communication, many experts expect chat-based communication methods to rise. Organizations increasingly use chatbot-based virtual assistants to handle simple tasks, allowing human agents to focus on other responsibilities. These Digital assistants streamline interactions between people and services, enhancing customer experience. At the same time, they offer companies new opportunities to streamline the customer's engagement process for efficiency that can reduce traditional support costs. A chatbot can enhance and engage customer interactions with less human intervention. It removes the barriers to customer support that can occur when demand outpaces resource. Instead of waiting on hold, customers can get answers to their questions in real time. For companies looking to improve their customer experiences, the addition of chatbots to answer simple questions can improve satisfaction, streamline the customer journey, and provide customer centric support.

- 68% of customers cite 24 hours support
- 64% cite quick answers to simple questions
- 51% cite instant responses

CHATGPT

Chat GPT is a natural language processing tool driven by AI technology that allows you to have human-like conversations and much more with the chatbot. The language model can answer questions and assist you with tasks like composing emails, essays, and code.

A quick scan of the web will show you lots of things that Chat GPT can do. Many of these are unsurprising: you can ask it to write a letter, you can ask it to make up a story, you can ask it to write descriptive entries for products in a catalog. Many of these go slightly (but not very far) beyond your initial expectations: you can ask it to generate a list of terms for search engine optimization, you can ask it to generate a reading list on topics that you're interested in. It has helped to write a book. Maybe it's surprising that Chat GPT can write software, maybe it isn't we've had over a year to get used to GitHub Copilot, which was based on an earlier version of GPT. And some of these things are mind blowing. It can explain code that you don't understand, including code that has been intentionally obfuscated. It can pretend to be an operating system. Or a text adventure game. It's clear that Chat GPT is not your run-of-the-mill automated chat server. It's much more.

HISTORY OF CHAT-GPT

Chat GPT is an artificial intelligence (AI) chatbot developed by open AI and launched in November 2022. It is built on top of open AI's GPT-3.5 and GPT-4 families of large language models (LLM) and has been fine-tuned (an approach to transfer learning) using both supervised and unsupervised learning techniques.

Chat GPT was launched as a prototype on November 30,202. It garnered attention for its detailed responses and articulate answers across many domains of knowledge. Its uneven factual accuracy, however, has been identified as a significant drawback following the release of Chat GPT, open AI's valuation was estimated at US$ 29 Billion in 2023.

The original release of Chat GPT was based on GPT-3.5. A version based on GPT-4, the newest open AI model was released on March 14,2023 and is available for paid subscriptions on a limited basis.

FEATURES OF CHAT-GPT

Although the core function of a chatbot is to mimic a human conversationalist, Chat GPT is versatile. For example, it can write and debug computer programs; mimic the style of celebrity CEOs and write business pitches, compose music, teleplays, fairy tales, and student essays; answer test questions (sometimes, depending on the test, at a level above the average human test-taker); write poetry and song lyrics; emulate a Linux system; simulate an entire chat room; play games like tic-tac-toe; and simulate an ATM. Chat GPT& training data includes man pages and information about internet phenomena and programming languages, such as bulletin board systems and the Python programming language. In comparison to its predecessor, Instruct GPT, Chat GPT attempts to reduce harmful and deceitful responses. In one example, whereas Instruct GPT accepts the premise of the prompt &quot Tell me about when Christopher Columbus came to the U.S. in 2015& quot; as being truthful, Chat GPT acknowledges the counterfactual nature of the question and frames its answer as a hypothetical consideration of what might happen if Columbus came to the U.S. in 2015, using information about the voyages of Christopher Columbus and facts about the modern world including modern perceptions of Columbus, actions. Unlike most chatbots, Chat GPT remembers previous prompts given to it in the same conversation. Journalists have speculated that this will allow Chat GPT to be used as a personalized therapist. To prevent offensive outputs from being presented to and produced from Chat GPT, queries are filtered through the Open AI & quot Moderation endpoint & quot; API (a separate GPT-based AI and potentially racist or sexist prompts are dismissed. In March 2023, Open AI announced it would be adding support for plugins for Chat GPT This includes both plugins made by Open AI, such as web browsing and code interpretation, as well as external plugins from developers such as Expedia, Open table, Zapier, Shopify, Slack and Wolfram.

LIMITATIONS OF CHAT-GPT

Chat GPT has multiple limitations. Open AI acknowledges that Chat GPT &quot sometimes writes Possible sounding but incorrect or nonsensical answers & quot, this behavior is common to large language models and is called &quot, hallucination& quot;. The reward model of Chat GPT, designed around human oversight, can be over-optimized and thus hinder performance, in an example of an optimization pathology known as Goodhart law. Chat GPT has limited knowledge of events that occurred after September 2021.

In training Chat GPT, human reviewers preferred longer answers, irrespective of actual comprehension or factual content. Training data also suffers from algorithmic bias, which may be revealed when Chat GPT responds to prompts including descriptors of people. In one instance, Chat GPT generated a rap indicating that women and scientists of color were inferior to white and male scientists.

ALTERNATIVE FOR CHAT-GPT

1. GOOGLE BRAD

Google Bard is Google's answer to Chat GPT. It is an experimental AI conversational service that's powered by Google's LAMDA (Language Model for Dialogue Applications). The simple explanation is that Bard is another AI Chatbot that is like Chat GPT. According to Google's FAQ page on Bard, LAMDA has been fed trillions of words. This helps it predict responses and enables it to maintain a conversation.

But, like Chat GPT, Bard is not all-knowing. In fact, Bard showcased its extraordinary capacity to get things wrong in a Google Bard demo that caused the company's stock to plummet By billions of dollars overnight. So, like any chatbot, you have to be careful about some of the information that Bard produces.

2. MICROSOFT BING CHAT

Microsoft Bing's new chat, codenamed Sydney, is making waves in the AI marketplace. This just goes to show that Google is not the only one who is working to penetrate the AI market. Microsoft has also introduced an upgraded version of Bing, utilizing an upgraded version of Chat GPT Microsoft also claims that this new version is even more accurate and faster than before.

3. JASPER.AI

Jasper.AI is a conversational AI platform that operates on the cloud and offers powerful natural language understanding (NLU) and dialog management capabilities Like Chat GPT, it can provide writing inspiration, support for creating articles, and assist marketing teams in developing effective ad copy and generating images.Jasper.ai uses Open's GPT-3.5 in combination with internal NLU models, and it is particularly useful for customer service, sales, and marketing-related tasks.

4. CLAUDE

Anthropic has recently launched Claude, which is a next-generation AI assistant capable of performing a wide range of conversational and text-processing tasks The development of Claude is based on Anthropic research into training AI systems to be helpful, honest, and harmless. Claude can help with use cases such as summarization, search, creative and collaborative writing, Q&A, coding, and more. It is available through a chat interface and API in their developer console. Anthropic offers two versions of Claude: Claude and Claude Instant, with the latter being a lighter, less expensive, and faster option. The company has partnered with several brands, including Quora, Juni Learning, Notion, and DuckDuckGo.

5. CHAT SONIC

Chat Sonic is a Chat GPT alternative with factual content-creation capabilities. Its page claims that it is powered by Google Search, meaning it can help you potentially create content with accurate, information about trending topics and current events in real time. I say “claimed” because Chat GPT is based on Open AI’s GPT-3 language model, which has only been trained on information data sets up to 2021. So, it seems that claims like this could be wrong about the capabilities of such applications – unless Chat Sonic has introduced a brand-new process that processes current information inside its software and if not, it is grossly overstating what the application can do.

6. NEEVA AI

As another Chat GPT alternative, Neeva AI is a proprietary search engine that creates a unique experience that merges Chat GPT and other specific language models. It also enhances the experience with current data and the accuracy and precision provided by the Neeva search engine. This system can look through many millions of pages to create a thorough response that’s also appended by sources that are relevant to the project. The company claims that Neeva AI guarantees a browsing experience that’s free of trackers and ads. It also provides references in the search results, so you can verify the source of the information.

7. YOU CHAT

You.com has introduced You Chat, an AI search assistant that allows users to have human-like conversations right in their search results. You Chat is a Chat GPT-like AI assistant that provides real-time data and cites sources to offer increased accuracy and relevance. With You Chat, users can ask complex questions, solve problems using logical reasoning, learn new languages, and create content in any language.

8. PERPLEXITY

Perplexity AI's conversational search engine enables users to get answers to questions on any number of topics. It uses Open AI's GPT-3.5 API and, unlike Chat GPT, responds by citing sites and sources from around the web. It also offers users follow-up questions to dive deeper into a particular topic.

9. CHARACTER. AI

While Chat Sonic has a "personas feature" built in, it's just a feature. With Character.AI, this tool zeroes in on AI personalities entirely to provide chat-like experiences using AI characters. You can choose from a variety of characters to chat with different types of personalities from Mario to Tony Stark. This is akin to the tone of voice feature that is provided in Jasper.ai, but on an entirely different level. It's also something that's more for entertainment rather than for real automation value. Nevertheless, if you're looking for an AI experience that's different than what's currently on the market, this is something you may be interested in.

10. ELICIT

Elicit is a platform that calls itself an AI research assistant, meaning it can help assist with research and other tasks. Its primary ability is a feature it calls Literature Review. The way this works is that when you submit a query, elicit will provide summaries from relevant research papers and documents related to your question. It's very efficient in generating helpful summaries of information while prioritizing the veracity and accuracy of the source. With Elicit, you can access a massive publication collection that is relevant to your query quickly. It also can answer research questions.

FUTURE SCOPE OF CHAT- GPT

There are so many wide-ranging applications for the use of Chat GPT that it is impossible to know them all at any given time. New applications and processes are being released at a lightning pace, leaving creators to wonder if there is an end to the Chat GPT boom. Some have even heralded the rise of Chat GPT as the end of SEO. As many times as somebody has claimed that SEO is dead, they have been proven wrong. And this remains true with the arrival of Chat GPT in the marketplace. While Chat GPT can be used for some things, it cannot replace a real SEO professional. There is still too much analysis and creativity required that a human mind could do, but Chat GPT cannot. And those who are claiming otherwise are kidding themselves. First, Chat GPT cannot write error-free content without factual errors. If you're writing a piece of content for a specific industry that requires specialized knowledge, you must also possess that knowledge yourself so you can verify and check that Chat GPT is correct. Chat GPT cannot create more sophisticated SEO strategies. Chat GPT cannot come up with a complete response that answers the question, "What happened to my website when the Google update hit last month?" It might create a very rough approximation based on already written articles, but it's not going to diagnose and figure out that issue for you.

CHAT- GPT EFFECT ON JOBS

Robots taking over the world is an overused, almost eye-roll-inducing sci-fi trope at this point. And yet, some workers are starting to fear that might be their reality. As Chat GPT and other generative AI tools become mainstream, workers have growing concerns that these potentially helpful tools will encroach on their job responsibilities and potentially put them out of work. Fact is that these technologies are already hitting the workplace. Even though Open AI only launched Chat GPT in November 2022, 74% of employed Americans familiar with Chat GPT have used the technology for work-related tasks, according to a recent survey of nearly 4,000 U.S. adults fielded by The Harris Poll on behalf of Fortune.

likely to rise as over half of workers (56%) report their companies have already implemented discussions about using Chat GPT. Although the current iterations routinely offer inaccurate information and stodgy responses to creative prompts, it's only a matter of time before these issues fade. That worries Americans, though many are divided on what they think the result will be. About 40% of workers who are familiar with Chat GPT are concerned the artificial intelligence chatbot will replace their jobs entirely, while 60% are optimistic that generative AI will make them more productive at their jobs according to the Harris survey. Just over a third of workers (38%) worry the technology may not replace them but will make them less useful in the workplace.

Future employment is a big part of the growing concerns around this form of AI. About 42% of Americans worry that Chat GPT will make it harder for them to find a new job. More than 7 in 10 believe that it's likely AI technology will replace roles with a heavy focus on skills like data entry and processing, media and communications, coding, and even hiring-related tasks., according to researchers. Jobs heavy in programming and writing skills are the most susceptible to being impacted by GPT technologies, while jobs centered in science and critical thinking are less likely to be affected, the research found.

Chat GPT concludes its answer saying that the impact of Al technologies like Chat GPT on jobs in India or any other country will depend on factors like government policies, industry adaptation, workforce skills, and education systems. It suggests that emphasizing on reskilling and upskilling, as well as fostering a culture of lifelong learning, can help individuals adapt to the changing job market and capitalize on new opportunities created by Al advancements.

18

OVERVIEW OF LITERATURE

- https://chatbotsmagazine.com/design-framework-for-chatbots-aa27060c4ea3
- https://chatbotsmagazine.com/contextual-chat-bots-with-tensorflow-4391749d0077

  https://pub.towardsai.net/build-chatgpt-like-chatbots-with-customized-knowledge-for-your-websites-using-simple-programming-f393206c6626

- https://www.researchgate.net/publication/360620158_ARTIFICIAL_INTELLIGENCE_CHATBOT_USING_PYTHON#:~:text=Abstract,blends%20the%20response%20with%20

The above links contain information, basic terminology, steps to design data frames, Algorithms to develop a contextual chatbot with TensorFlow, using simple python code to answer the queries of the users, importance of speech recognition library to recognize the voice input of the users. Chatbots is a simple implementation of a voice assistant that can perform a few basic tasks. It can be improved by adding more features and making it more robust to handle a wider range of inputs.

This includes Python code. It uses speech recognition to understand the voice input, and text-to-speech to output responses. The chatbot has several features such as greeting the user, telling the time, searching on Google and YouTube, and fetching weather information. The chatbot uses the speech recognition library to recognize speech from the microphone input, and the pyttsx3 library to convert text into speech. It also uses play sound and gets libraries to play audio files and convert text to speech, respectively. The person class is used to store the user's name and age, which can be set using the set Name and set Age methods. There exists function is used to check if any of the given terms are present in the user's input.

The speak function takes a string as input and converts it to speech using the pyttsx3 library.
The take Command function uses the speech recognition library to listen to the microphone and recognize speech input. It returns the recognized speech as a string.
The respond function takes the recognized speech as input and generates a response based on the keywords present in the speech. It can greet the user, tell the time, search on Google and YouTube, and fetch weather information. Overall, this chatbot is a simple implementation of a voice assistant that can perform a few basic tasks. It can be improved by adding more features and making it more robust to handle a wider range of inputs.

We presented a method for creating chatbots powered by GPT-3 that can be integrated into websites and "trained" with customized information (with these quotes, I mean that this is not formal training but just few-shot learning). The result of the example presented here is a quite "intelligent" chatbot with a nice GUI, much like Chat GPT's, that can respond to a wide range of questions and topics, including some highly specific ones that regular GPT-3 will not know about.

Chatbots built in this way can understand and respond to human language, with three key improvements over my previously described chatbot: the ability to selectively extract information from user-customized paragraphs, the ability to continue a fluent conversation, and integration with a nice chat-like GUI.

SOFTWARE REQUIREMENTS

- **Python**

  Python is a high-level, general-purpose, and very popular programming language. Python programming language (latest Python 3) is being used in web development, Machine Learning applications, along with all cutting-edge technology in Software Industry. Python language is being used by almost all tech-giant companies like – Google, Amazon, Facebook, Instagram, Dropbox, Uber… etc.

  Python is currently the most widely used multi-purpose, high-level programming language, which allows programming in Object-Oriented and Procedural paradigms. Python programs generally are smaller than other programming languages like Java. Programmers must type relatively less and the indentation requirement of the language, makes them readable all the time.

- **NLP (Natural language processing)**

  Natural Language Processing (NLP) is a field of Artificial Intelligence (AI) that deals with the interaction between computers and human languages. NLP is used to analyze, understand, and generate natural language text and speech. The goal of NLP is to enable computers to understand and interpret human language in a way that is similar to how humans process language.

It involves analyzing, understanding, and generating human language data, such as text and speech has a wide range of applications, including sentiment analysis, machine translation, text summarization, chatbots, and more. Some common tasks in NLP include

NLP techniques are used in a wide range of applications, including:

Speech recognition and transcription

Language translation

Text summarization

Sentiment analysis

- **TensorFlow**

  TensorFlow is a free and open-source software library for machine learning and artificial intelligence. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.

  TensorFlow was developed by the Google Brain team for internal Google use in research and production. The initial version was released under the Apache License 2.0 in 2015. Google released the updated version of TensorFlow, named TensorFlow 2.0, in September 2019.

  TensorFlow can be used in a wide variety of programming languages, including Python, JavaScript, C++, and Java. This flexibility lends itself to a range of applications in many different sectors.

- **Pytorch**

  PyTorch is an open-source deep learning framework built to be flexible and modular for research, with the stability and support needed for production deployment. PyTorch provides a Python package for high-level features like tensor computation (like NumPy) with strong GPU acceleration and Torch Script for an easy transition between eager mode and graph mode. With the latest release of PyTorch, the framework provides graph-based execution, distributed training, mobile deployment, and quantization.

- **NumPy**

  NumPy is a general-purpose array-processing package. It provides a high-performance multidimensional array object, and tools for working with these arrays. It is the fundamental package for scientific computing with Python. It is open-source software.

- **Speech Recognition**

  Speech Recognition is a technology that allows computer to understand and interpret human speech. It involves the use of algorithm and machine learning models to analyze audio signals and convert them into text or commands that can be processed by a computer.

- **Keyboard Library**

  A keyboard library for chatbots is a software Library that provides a graphical user interface for users to interact with a chatbot using buttons and menu instead of typing out their queries.

- **PyWhatkit**

  It is a valuable tool for Chatbot developers who want to enhance the functionality and user experience of their chatbot application. By using PyWhatkit chatbots can perform a wide range of tasks, from simple information to retrieval to more complex and interactive features.

- **Date-Time Library**

  This is a inbuilt Python Library that provides functionality for working with dates and times. The datetime library is a powerful and versatile tool for chatbot development and it can be used to create chatbots that can interact with users.

- **JSON**

  JSON (JavaScript Object Notation) is an open standard file format and data interchange format that uses human-readable text to store and transmit data objects consisting of attribute–value pairs and arrays (or other serializable values). It is a common data format with diverse uses in electronic data interchange, including that of web applications with servers.

  JSON is a language-independent data format. It was derived from JavaScript, but many modern programming languages include code to generate and parse JSON-format data. JSON filenames use the extension (.json)

- **Visual studio**

  Visual Studio Code, also commonly referred to as VS Code,[9] is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux and macOS.[10] Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add functionality.

- **Jupyter Notebook**

  Jupyter Notebook is the original web-based application for creating and sharing computational documents. It offers a simple streamlined, document-centric experience. A jupyter notebook has two components a front-end web page and a back-end web page allows data scientists to enter programming code or text. The browser then passes the code to the back-end kernel which runs the code and returns the results.

OVERVIEW OF TECHNOLOGY

- **Machine Learning**

Machine Learning is the field of study that gives computers the capability to learn without being explicitly programmed. ML is one of the most exciting technologies that one would have ever come across. As it is evident from the name, it gives the computer that makes it more like humans: The ability to learn. Machine learning is actively being used today, perhaps in many more places than one would expect.

Machine learning is data driven technology.

Machine Learning is the field of study that gives computers the capability to learn without being explicitly programmed. ML is one of the most exciting technologies that one would have ever come across. As it is evident from the name, it gives the computer that makes it more like humans: The ability to learn. Machine learning is actively being used today, perhaps in many more places than one would expect.

Machine learning is data driven technology.

There are two types of Machine Learning Techniques

- Supervised Learning
- Unsupervised Learning

Machine Learning consists of different Algorithms and these Algorithms are classified based on the type of Learning Technique that is Supervised and Unsupervised.

1. ARTIFICIAL NEURAL NETWORK

Neural networks, also known as artificial neural networks (ANNs) or simulated neural networks (SNNs), are a subset of machine learning and are at the heart of deep learning algorithms.

Their name and structure are inspired by the human brain, mimicking the way that biological neurons signal to one another. Artificial neural networks (ANNs) are comprised of a node layers, containing an input layer, one or more hidden layers, and an output layer.

2. NAÏVE BAYES CLASSIFIER

   Naïve Bayes algorithm is a supervised learning algorithm, which is based on Bayes theorem and used for solving classification problems. It is mainly used in text classification that includes a high-dimensional training dataset. Naïve Bayes Classifier is one of the simple and most effective Classification algorithms.

3. SUPPORT VECTOR MACHINE (SVM)

   Support Vector Machine or SVM is one of the most popular Supervised Learning algorithms, which is used for Classification as well as Regression problems. However, primarily, it is used for Classification problems in Machine Learning. The goal of the SVM algorithm is to create the best line or decision boundary.

4. K-MEANS CLUSTERING

   K-Means Clustering is an unsupervised learning algorithm that is used to solve the clustering problems in machine learning or data science. In this topic, we will learn what is K-means clustering algorithm, how the algorithm works, along with the Python implementation of k-means clustering.

5. LINEAR REGRESSION

   Linear regression is one of the easiest and most popular Machine Learning algorithms. It is a statistical method that is used for predictive analysis. Linear regression makes predictions for continuous/real or numeric variables such as sales, salary, age, product price, etc. Linear regression algorithm shows a linear relationship between a dependent (y) and one or more independent (y) variables, hence called as linear regression.

6. LOGISTIC REGRESSION

Logistic regression is one of the most popular Machine Learning algorithms, which comes under the Supervised Learning technique. It is used for predicting the categorical dependent variable using a given set of independent variables. Logistic regression predicts the output of a categorical dependent variable. Therefore, the outcome must be a categorical or discrete value.

- **Structured Query Language (SQL)**

SQL is a standard database language used to access and manipulate data in databases. SQL stands for Structured Query Language. SQL was developed by IBM Computer Scientists in the 1970s. By executing queries SQL can create, update, delete, and retrieve data in databases like MySQL, Oracle, PostgreSQL, etc. Overall SQL is a query language that communicates with databases. The DBMS processes the SQL query retrieves the requested data and returns it to us. Rather, SQL statements describe how a collection of data should be organized or what data should be extracted or added to the database.

In common usage, SQL encompasses DDL and DML commands for create, updates, modified or other operations on database structure. SQL also differs from other computer languages because it describes what the user wants the computer to do rather than how the computer should do it. (In more technical terms, SQL is a declarative or descriptive language rather than a procedural one.) SQL contains no IF statement for testing conditions, and no GOTO, DO, or FOR statements for program flow control. Rather, SQL statements describe how a collection of data is to be organized, or what data is to be retrieved or added to the database. The sequence of steps to do those tasks is left for the DBMS to determine.

- **NoSQL**

  NoSQL is a type of database management system (DBMS) that is designed to handle and store large volumes of unstructured and semi-structured data. Unlike traditional relational databases that use tables with pre-defined schemas to store data, NoSQL databases use flexible data models that can adapt to changes in data structures and are capable of scaling horizontally to handle growing amounts of data. The term NoSQL originally referred to "non-SQL" or "non-relational" databases, but the term has since evolved to mean "not only SQL," as NoSQL databases have expanded to include a wide range of different database architectures and data models.

- **Deep Learning**

  Deep learning is a branch of machine learning which is based on artificial neural networks. It is capable of learning complex patterns and relationships within data. In deep learning, we don't need to explicitly program everything. It has become increasingly popular in recent years due to the advances in processing power and the availability of large datasets. Because it is based on artificial neural networks (ANNs) also known as deep neural networks (DNNs). These neural networks are inspired by the structure and function of the human brain's biological neurons, and they are designed to learn from large amounts of data. The key characteristic of Deep Learning is the use of deep neural networks, which have multiple layers of interconnected nodes. These networks can learn complex representations of data by discovering hierarchical patterns and features in the data. Deep Learning algorithms can automatically learn and improve from data without the need for manual feature engineering.

  Deep Learning has achieved significant **s**uccess in various fields, including image recognition, natural language processing, speech recognition, and recommendation systems. Some of the popular Deep Learning architectures include Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Deep Belief Networks (DBNs).

CODING

```
Pip install speechRecognition
```

Comment :- This library is used to develop a voice recognition chatbot, it gives better results by identifying the spoken languages and act accordingly to users queries.

```
Pip install keyboard
```

Comment:- This library is used to provide Graphical user interface (GUI) for the users to interact with the chatbot using buttons and menu.

```
Pip install pyautogui
```

Comment:- Pyautogui is a python library that allows mouse and keyboard control, it can also read the text on screen by this it enables the chatbot for text-recognition.

```
Pip install pyttsx3
```

Comment:- This library helps chatbot to convert the text into speech, it is a python library

```
Pip install Wikipedia
```

Comment:- Wikipedia is a useful tool which helps the chatbot to get the information to the quires asked by the users.

```
Pip Install pywhatkit
```

Comment:-using pywhatkit chatbots can perform a wide range of tasks, from simple information retrieval to more complex and interactive features, this can also be used to enhance the user experience.

```
Pip install datetime
```

Comment:- It is a powerful and versatile tool in making a perfect chatbot , chatbots can interact with the users based on a wide range of date and time information.

```
Pip nstall googletrans
```

Comment:- this library is used to create a chatbot that can communicate with the users in multiple languages ,which strengthens the interaction between the users and chatbot.

```
Pip install Beautifulsoup4
```

Comment:- This library is used to extract data from web pages and use it to create chatbot responses.

GreetMe

```
import pyttsx3

import datetime

engine = pyttsx3.init("sapi5")

voices = engine.getProperty("voices")

engine.setProperty("voice", voices[0].id)

engine.setProperty("rate",200)

def speak(audio):

    engine.say(audio)

    engine.runAndWait()

def greetMe():

    hour  = int(datetime.datetime.now().hour)

    if hour>=0 and hour<=12:

        speak("Good Morning,sir")

    elif hour >12 and hour<=18:

        speak("Good Afternoon ,sir")

else:

       speak("Good Evening,sir")

 speak("Please tell me, How can I help you ?")
```

Comment:- This block of code we have created a function called greetMe, used for Greeting the user according to time, when the code is executed.

Dictapp

```
import os

import pyautogui

import webbrowser

import pyttsx3

from time import sleep



engine = pyttsx3.init("sapi5")

voices = engine.getProperty("voices")

engine.setProperty("voice", voices[0].id)

engine.setProperty("rate",200)

def speak(audio):

    engine.say(audio)

    engine.runAndWait()


dictapp={"commandprompt":"cmd","paint":"paint","word":"winword","excel":"excel","chrom
e":"chrome","vscode":"code","powerpoint":"powerpnt"}

def openappweb(query):

    speak("Launching, sir")

    if ".com" in query or ".co.in" in query or ".org"

in query:query = query.replace("open app","")

        query = query.replace("jarvis","")
```

```
        query = query.replace("launch","")
        query = query.replace(" ","")
        webbrowser.open(f"https://www.{query}")
    else:
        keys = list(dictapp.keys())
        for app in keys:
            if app in query:
                os.system(f"start {dictapp[app]}")


def closeappweb(query):
    speak("Closing,sir")
    if "one tab" in query or "1 tab" in query:
        pyautogui.hotkey("ctrl","w")
        speak("All tabs closed")
    elif "2 tab" in query:
            pyautogui.hotkey("ctrl","w")
            sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        speak("All tabs closed")
    elif "3 tab" in query:
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
```

```
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        speak("All tabs closed")
elif "4 tab" in query:
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
       sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        speak("All tabs closed")
    elif "5 tab" in query:
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
```

```
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        sleep (0.5)
        pyautogui.hotkey("ctrl","w")
        sleep(0.5)
        pyautogui.hotkey("ctrl","w")
        speak("All tabs closed")
else:
        keys = list(dictapp.keys())
        for app in keys:
                if app in query:
                        os.system(f"taskkill /f /im {dictapp[app]}.exe")
```

Comment:- This code we created two functions openappweb and closeappweb is used to give the access for using Apps present in the user system.

Keyboard

```
from pynput.keyboard import Key,Controller

from time import sleep

keyboard = Controller()

def volumeup():

    for i in range(5):

        keyboard.press(Key.media_volume_up)

        keyboard.release(Key.media_volume_up)

        sleep(0.1)

def volumedown():

     for i in range(5):

        keyboard.press(Key.media_volume_down)

        keyboard.release(Key.media_volume_down)

         sleep(0.1)
```

Comment:- This block of code we have created two functions Volumeup and Volumedown which give access to the users Keyboard for Volume and Controls according to the user command.

Chatbot Code

```
from bs4 import BeautifulSoup

import pyttsx3

import requests

import speech_recognition

import pyautogui

import datetime

import os

import pandas

import wikipedia

import webbrowser

import pywhatkit



for i in range(3):

    a = input("Enter Password to open CHATBOT :- ")

   pw_file = open("password.txt","r")

    pw = pw_file.read()

    pw_file.close()

    if (a==pw):
```

```
            print("WELCOME SIR ! PLZ SPEAK [WAKE UP] TO LOAD ME UP")
            break
elif (i==2 and a!=pw):
        exit()
 elif (a!=pw):
        print("Try Again")
engine = pyttsx3.init("sapi5")
voices = engine.getProperty("voices")
engine.setProperty("voice", voices[0].id)
rate = engine.setProperty("rate",170)
def speak(audio):
    engine.say(audio)
    engine.runAndWait()


def takeCommand():
    r = speech_recognition.Recognizer()
    with speech_recognition.Microphone() as source:
        print("Listening.....")
        r.pause_threshold = 1
```

```
    r.energy_threshold = 300
        audio = r.listen(source,0,4)
 try:
        print("Understanding..")
        query  = r.recognize_google(audio,language='en-in')
        print(f"You Said: {query}\n")
    except Exception as e:
        print("Say that again")
        return "None"
return query
if __name__ == "__main__":
    while True:
        query = takeCommand().lower()
        if "wake up" in query:
            greetMe()
  while True:
                query = takeCommand().lower()
                if "sleep" in query:
```

```
    speak("Ok , You can call me anytime")
     break
elif "hello" in query:
                speak("Hello, how are you ?")
            elif "i am fine" in query:
                speak("that's great")
            elif "how are you" in query:
                 speak("Perfect")
            elif "thank you" in query:
                speak("you are welcome")
# Temperature
          elif "temperature" in query:
                search = "temperature "
                url = f"https://www.google.com/search?q={search}"
                r  = requests.get(url)
                data = BeautifulSoup(r.text,"html.parser")
                temp = data.find("div", class_ = "BNeawe").text
                speak(f"current{search} is {temp}")
```

```
# Weather
            elif "weather" in query:
                search = "temperature"
                url = f"https://www.google.com/search?q={search}"
                r  = requests.get(url)
                data = BeautifulSoup(r.text,"html.parser")
                temp = data.find("div", class_ = "BNeawe").text
                speak(f"current{search} is {temp}")
    # TIme
            elif "the time" in query:
                strTime = datetime.datetime.now().strftime("%H:%M")
                speak(f"The time is {strTime}")
    # Sleep OR Quit
            elif "finally sleep" in query:
                speak("Going to sleep,sir")
                exit()
    # Open and Close apps/websites
```

```
            elif "open app" in query:
                openappweb(query)
        elif "close app" in query:
                closeappweb(query)
    # Youtube Controls like Play, Pause , Mute , Volume up and down
            elif "pause" in query:
                pyautogui.press("k")
                speak("video paused")
            elif "play" in query:
                pyautogui.press("k")
                speak("video played")
            elif "mute" in query:
                pyautogui.press("m")
                speak("video muted")
elif "volume up" in query:
                speak("Turning volume up,sir")
                volumeup()
elif "volume down" in query:
                speak("Turning volume down, sir")
```

```
                volumedown()
        elif "shutdown the system" in query:
      speak("Are You sure you want to shutdown")
       shutdown = input("Do you wish to shutdown your computer? (yes/no)")
        if shutdown == "yes":
            os.system("shutdown /s /t 1”)
      elif shutdown == "no":
                break
# Open any app
            elif "open" in query:
                query = query.replace("open","")
                query = query.replace("jarvis","")
                pyautogui.press("super")
                pyautogui.typewrite(query)
                pyautogui.sleep(2)
                pyautogui.press("enter")
         # Screenshot
            elif "screenshot" in query:
                import pyautogui
```

```
    im = pyautogui.screenshot()
     im.save("ss.jpg")
  # Click Photos
              elif "click my photo" in query:
                  pyautogui.press("super")
                  pyautogui.typewrite("camera")
                  pyautogui.press("enter")
                  pyautogui.sleep(2)
                  speak("SMILE")
                  pyautogui.press("enter")
# Change Password
          elif "change password" in query:
                  speak("What's the new password")
                  new_pw = input("Enter the new password\n")
                  new_password = open("password.txt","w")
                  new_password.write(new_pw)
                  new_password.close()
                  speak("Done sir")
```

```
  speak(f"Your new password is{new_pw}")
 elif "quit" in query:
          exit()
  elif "exit" in query:
         exit()
# Search Now
elif "google" in query:
                import wikipedia as googleScrap
                query = query.replace("jarvis","")
                query = query.replace("search","")
                query = query.replace("google","")
                speak("This is what I found on google")
                 try:
                    pywhatkit.search(query)
                    result = googleScrap.summary(query,1)
                     speak(result)
 except:
    speak("No speakable output available")
```

```
elif "youtube" in query:
            speak("This is what I found for your search!")
            query = query.replace("search","")
            query = query.replace("play","")
            query = query.replace("youtube","")
            query = query.replace("chatbot","")
            web  = "https://www.youtube.com/results?search_query=" + query
            webbrowser.open(web)
            pywhatkit.playonyt(query)
            speak("Done, Sir")
      elif "wikipedia" in query:
              speak("Searching from wikipedia....")k
              query = query.replace("wikipedia","")
              query = query.replace("search","")
             query = query.replace("jarvis","")
             results = wikipedia.summary(query,sentences = 2)
             speak("According to wikipedia..")
             print(results)
```

Comment:- In the Final code of the chatbot, we imported all the libraries like Beautifulsoup pyttsx3, requests, speech_recognition, pyautogui, datetime, os, pandas, Wikipedia, webbrowser, pywhatkit.

Then created a for loop condition to check the password. Then created the engine for chatbot using googles sapi5 and then added the voice of the bot. Then created a speak function for bot to speak and TakeCommand function for taking user command using speech recognition library.

Lastly created a while loop for the code using if-else condition, for all the functions created before like greetme, openappweb , closeappweb, volume up, volume down, temperature, time.

In this code we have given some limited features like access to open apps present in the user system, searching from webbrowsers, taking screenshot, taking a photo through the user system camera, temperature/weather according to google, IST time, Youtube Controls like Play, Pause , Mute , Volume up and down, the user can even shutdown the system, the user can Search anything on google, youtube, Wikipedia.

The user can change the password using command, given access to the password file location.

```
In [1]: pip install SpeechRecognition

        Requirement already satisfied: SpeechRecognition in c:\users\alekh\anaconda3\lib\site-packages (3.10.0)
        Requirement already satisfied: requests>=2.26.0 in c:\users\alekh\anaconda3\lib\site-packages (from SpeechRecognition) (2.28.1)
        Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\alekh\anaconda3\lib\site-packages (from requests>=2.26.0->Spee
        chRecognition) (1.26.14)
        Requirement already satisfied: certifi>=2017.4.17 in c:\users\alekh\anaconda3\lib\site-packages (from requests>=2.26.0->SpeechR
        ecognition) (2022.12.7)
        Requirement already satisfied: idna<4,>=2.5 in c:\users\alekh\anaconda3\lib\site-packages (from requests>=2.26.0->SpeechRecogni
        tion) (2.10)
        Requirement already satisfied: charset-normalizer<3,>=2 in c:\users\alekh\anaconda3\lib\site-packages (from requests>=2.26.0->S
        peechRecognition) (2.0.4)
        Note: you may need to restart the kernel to use updated packages.
```

```
pip install keyboard

Requirement already satisfied: keyboard in c:\users\alekh\anaconda3\lib\site-packages (0.13.5)
Note: you may need to restart the kernel to use updated packages.
```

```
pip install pynput
```

```
Requirement already satisfied: pynput in c:\users\alekh\anaconda3\lib\site-packages (1.7.6)
Requirement already satisfied: six in c:\users\alekh\anaconda3\lib\site-packages (from pynput) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

```
pip install pyttsx3
```

```
Requirement already satisfied: pyttsx3 in c:\users\alekh\anaconda3\lib\site-packages (2.90)
Requirement already satisfied: pypiwin32 in c:\users\alekh\anaconda3\lib\site-packages (from pyttsx3) (223)
Requirement already satisfied: pywin32 in c:\users\alekh\anaconda3\lib\site-packages (from pyttsx3) (305.1)
Requirement already satisfied: comtypes in c:\users\alekh\anaconda3\lib\site-packages (from pyttsx3) (1.1.14)
Note: you may need to restart the kernel to use updated packages.
```

```
pip install wikipedia
```

```
Requirement already satisfied: wikipedia in c:\users\alekh\anaconda3\lib\site-packages (1.4.0)
Requirement already satisfied: requests<3.0.0,>=2.0.0 in c:\users\alekh\anaconda3\lib\site-packages (from wikipedia) (2.28.1)
Requirement already satisfied: beautifulsoup4 in c:\users\alekh\anaconda3\lib\site-packages (from wikipedia) (4.11.1)
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pip install googletrans
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pip install BeautifulSoup4
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Enter Password to open CHATBOT :- Aurora
WELCOME SIR ! PLZ SPEAK [WAKE UP] TO LOAD ME UP
Listening.....
Understanding..
You Said: wake up

Listening.....
Understanding..
You Said: play techno Gamers on YouTube

Listening.....
Understanding..
Say that again
Listening.....
Understanding..
Say that again
Listening.....
Understanding..
Say that again
Listening.....
Understanding..
You Said: play techno Gamers on YouTube

Listening.....
Understanding..
You Said: Gamers on YouTube

Listening.....
Understanding..
Say that again
Listening.....
Understanding..
You Said: pause

Listening.....
Understanding..
You Said: pause

Listening.....
Understanding..
You Said: play

Listening.....
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Listening.....
Understanding..
You Said: Close tab

Listening.....
Understanding..
You Said: close app

Listening.....
Understanding..
You Said: close app close one tab
```

Chatbot commonly used in artificial intelligence

Artificial intelligence chatbots can help you increase sales, improve customer satisfaction, and save you time. They provide human-like help without the need to forward your site's visitor to the representative until a complex issue comes up. Sounds too good to be true? Get your AI chatbot right away and automate all repetitive tasks!

- Chatbot Artificial intelligence is the ability to simulate human intelligence in machines programmed to perform tasks that typically require human intelligence.

- Chatbot Artificial Intelligence (AI) involves the development of algorithms that enable computer applications to understand and learn from data and make decisions based on that specific data. These algorithms adapt and improve over time, becoming more efficient and effective as they process more data.

- Chatbot Artificial Intelligence (AI) is rapidly transforming various industries, and education is no exception. The application of Chatbot Artificial Intelligence (AI) in the education sector is changing and leveraging new technology in the way we teach and learn, and it can improve the quality of education while making it more accessible and affordable.

- Chatbot Artificial Intelligence (AI) transforms how we live, work, and learn. CHATGPT has crossed 1 million users just in 5 days. Technology is changing fast and in education, Chatbot Artificial Intelligence (AI) has the potential to improve the quality of education while making it more accessible and affordable.

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- We have discussed this in detail in our previous blog post on what Chatbot Artificial Intelligence (AI) is and some of the benefits of artificial intelligence chatbots and use cases in our present life.

INSTANCES:

I **. Personalized learning :**

One of the essential benefits of Chatbot Artificial Intelligence (AI) in education is personalized learning. AI-powered educational platforms can analyse student data and provide customized learning experiences that cater to each student's strengths, weaknesses, and learning styles. Chatbot Artificial Intelligence (AI) algorithms can also track student progress and provide real-time feedback, making it easier for educators to identify areas where students need additional support.

II. Intelligent Tutoring Systems:

Intelligent tutoring systems can be hosted on public cloud services such as Google Cloud (GCP) and IBM Cloud. These cloud services provide advanced machine learning and natural language processing capabilities to support intelligent tutoring systems.

III. **Content Creation:**

AI-powered content creation can be integrated with public cloud services such as GCP and AWS. These cloud services provide scalable and secure infrastructure to support content creation

Iv.**Facial Recognition:**

AI-powered facial recognition can be integrated with public cloud services such as AWS and GCP. These cloud services provide advanced machine-learning capabilities to support facial recognition.

v. **Intelligent delivery content:**

Chatbot Artificial Intelligence AI-powered educational platforms can also provide intelligent content delivery. These platforms can analyse student data and provide relevant content and resources to support student learning.

Chatbot Artificial Intelligence (AI) algorithms can also adapt the delivery of content based on student progress and performance, ensuring that each student receives the appropriate level of instructions

What is chatbot machine learning?

If you've heard about chatbots and how they work, then you probably know about machine learning as well. Quite precisely, machine learning is an integral part of what makes chatbot function 24/7/365. There is no wonder that machine learning is the future of chatbot.

A chatbot developed using machine learning algorithms is called chatbot machine learning. In such a case, a chatbot learns everything from its data and human-to-human dialogues, the details of which are fed by machine learning codes.

Thanks to machine learning, chatbots can now be trained to develop their consciousness, and you can teach them to converse with people as well. One of the general reasons why chatbots have made such prominence in the market is because of their ability to drive a human to human conversations. However, all the tricks pulled up a chatbot depends on the datasets and algorithms used. The more datasets you have, the better is the effectiveness of machine learning and the more conversational chatbot you'll develop.

Interpretation

A chatbot is a computer program that uses artificial intelligence (AI) and natural language processing (NLP) to understand customer questions and automate responses to them, simulating human conversation.

.The value of chatbots

Chatbots can make it easy for users to find the information they need by responding to their questions and requests—through text input, audio input, or both—without the need for human intervention.

Chatbot technology is almost everywhere these days, from the smart speakers at home to messaging applications in the workplace. The latest AI chatbots are often referred to as "virtual assistants" or "virtual agents." They can use audio input, such as Apple's Siri, Google Assistant and Amazon Alexa, or interact with you via SMS text messaging. Either way, you're able to ask questions about what you need in a conversational way, and the chatbot can help refine your search through responses and follow-up questions.
Featured products

How chatbots work

Historically, chatbots were text-based, and programmed to reply to a limited set of simple queries with answers that had been pre-written by the chatbot's developers. They operated like an interactive FAQ, and while they worked well for those specific questions

and answers on which they had been trained, they failed when presented with a complex question or one that hadn't been predicted by the developers.

Over time, chatbots have integrated more rules and natural language processing, so end users can experience them in a conversational way. In fact, the latest types of chatbots are contextually aware and able to learn as they're exposed to more and more human language.

Today's AI chatbots use natural language understanding (NLU) to discern the user's need. Then they use advanced AI tools to determine what the user is trying to accomplish. These technologies rely on machine learning and deep learning—elements of AI, with some nuanced differences—to develop an increasingly granular knowledge base of questions and responses that are based on user interactions. This improves their ability to predict user needs accurately and respond correctly over time.

For example, if a user asks about tomorrow's weather, a traditional chatbot can respond plainly whether it will rain. An AI chatbot, however, might also inquire if the user wants to set an earlier alarm to adjust for the longer morning commute (due to rain).

Common chatbot uses

Consumers use AI chatbots for many kinds of tasks, from engaging with mobile apps to using purpose-built devices such as intelligent thermostats and smart kitchen appliances. Business use is equally varied. Marketers use AI chatbots to personalize customer experiences, IT teams use them to enable self-service, and customer contact CENTER rely on chatbots to streamline incoming communications and direct customers to resources.

Conversational interfaces can vary, too. AI chatbots are commonly used in social media messaging apps, standalone messaging platforms, or applications on websites. Some

typical use cases include:

- Finding local restaurants and providing directions
- Defining fields within forms and financial application
- Getting answers to healthcare questions and scheduling appointments
- Receiving general customer service help from a favourite brand
- Setting a reminder to do a task based on time or location
- Displaying real-time weather conditions and relevant clothing recommendations

Benefits of chatbots

The latest AI chatbots process the data within human language to deliver highly personalized experiences, creating clear benefits for businesses and customers.

Improve customer engagement and brand loyalty

Before the mature e-commerce era, customers with questions, concerns or complaints had to email or call a business for a response from a human. But staffing customer service departments to meet unpredictable demand and retraining staff to provide consistent replies to similar or repetitive queries, day or night, is a constant and costly struggle for many businesses.

Today, chatbots can consistently manage customer interactions 24x7 while continuously improving the quality of the responses and keeping costs down. Chatbots automate workflows and free up employees from repetitive tasks. A chatbot can also eliminate long wait times for phone-based customer support, or even longer wait times for email, chat and web-based support, because they are available immediately to any number of users at once. That’s a great user experience—and satisfied customers are more likely to exhibit brand loyalty.

Reduce costs and boost operational efficiency

Staffing a customer support centre day and night is expensive. And for some departments, such as human resources, it might not be possible. Industries have been created to address the outsourcing of this function, but that carries significant cost. It also reduces control over a brand's interaction with its customers.

A chatbot, however, can answer questions 24 hours a day, seven days a week. It can provide a new first line of support, supplement support during peak periods, or offer an additional support option. At the very least, using a chatbot can help reduce the number of users who need to speak with a human, which can help businesses avoid scaling up staff due to increased demand or implementing a 24-hour support staff.

Challenges of developing a chatbot

Despite their popularity, several challenges need to be considered when designing AI-assisted chatbots. These are:

- Misspellings
- Synonyms
- Slangs and abbreviations
- Punctuations
- Homophones
- Sarcasm
- Idioms

Understanding NLP chatbots:

An chatbot is built using NLP which deals with enabling computers to understand text and speech the way human beings can.

The challenges in natural language, as discussed above, can be resolved using NLP. It breaks down paragraphs into sentences and

sentences into words called tokens which makes it easier for machines to understand the context.

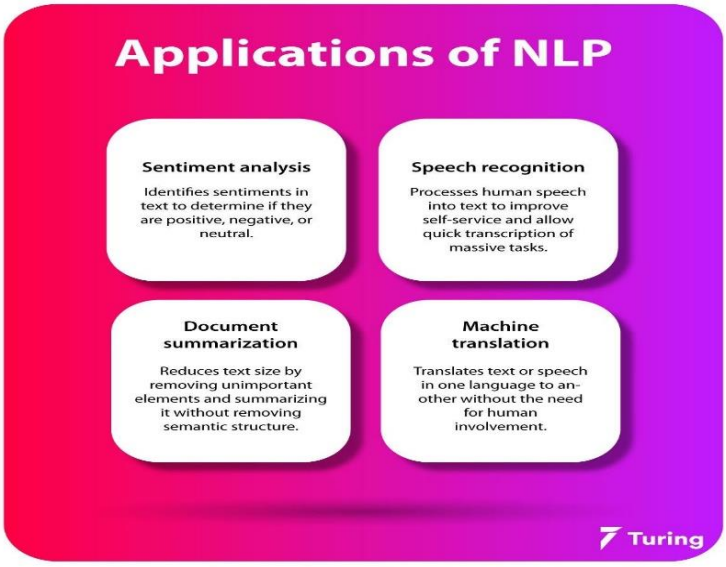

fig-3

Popular NLP tools

Some popular tools for implementing NLP tasks are listed below:

. Natural Language Toolkit (NLTK)

. Spacy

. Sentence Transformers

Chatbot in python

A chatbot is an artificial intelligence based tool built to converse with humans in their native language. These chatbots have become popular across industries, and are considered one of the most useful applications of natural language processing. In this guide, you will learn to build your first chatbot using Python.

chatbot using the python programming language. We will not use any external chatbot packages. The whole project will be written in plain Python. This is a great way to understand how chatbots actually work. Learning behind the scenes will also give us an insight into the chatbot packages. some Chatbot building platforms in the introduction section

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- **Introduction**
- **Step 1 — User Templates**
- **Step 2 — Chatbot Responses**
- **Step 3 — Response Function**
- **Step 4 — Relation Function**
- **Step 5 — Send Message Function**
- **Final Step — Testing the Chatbot**
- **Video Demonstration**

CONCLUSION

selecting a chatbot platform can be straightforward and the payoff can be significant for companies and users. Providing customers with a responsive, conversational channel can help your business meet expectations for immediate and always-available interactions while keeping costs down.

For example, an e-commerce company could deploy a chatbot to provide browsing customers with more detailed information about the products, highlight differences between models, and offer additional user guides and how-to videos. Likewise, the HR department in an enterprise organization may ask a developer to find a chatbot that can give employees 24/7 access to information about benefits and facilitate navigating that information — all without having to speak with someone in person.

Comparison

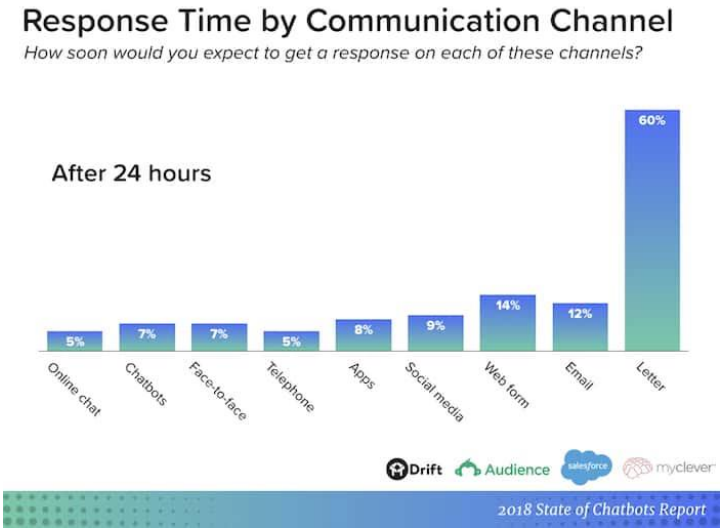
CHATBOTS VS OTHER COMMUNICATION CHANNELS

While not all consumers are ready to trust chatbots entirely, most still acknowledge that chatbots are poised to provide several benefits that can enhance their online experiences. And it's clear that one of the major benefits consumers see when it comes to using chatbots is speed: They believe that chatbots & conversational AI will be able to respond to their inquiries more quickly.

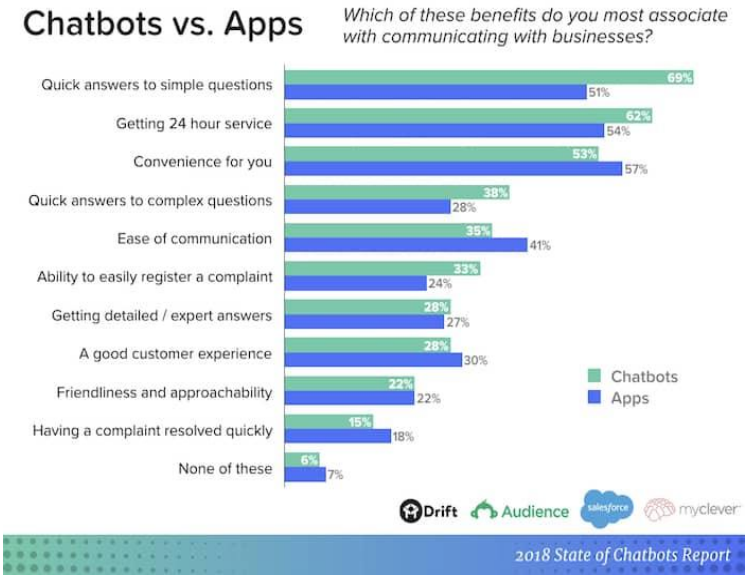
From a business perspective, there's a massive upside to providing speedy response times. As research from Inside sales and the Harvard Business Review shows, even if you wait just five minutes to respond after a lead first reaches out, there's a 10x decrease in your odds of actually getting in touch with that lead. After 10 minutes, there's a 400% decrease in your odds of qualifying that lead.

So as part of our survey, we wanted to see how expected response times for chatbots compared to expected response times for other communication channels.

RESPONSE TIME BY COMMUNICATION CHANNEL – MORE THAN 24 HOURS



Chatbot vs app:



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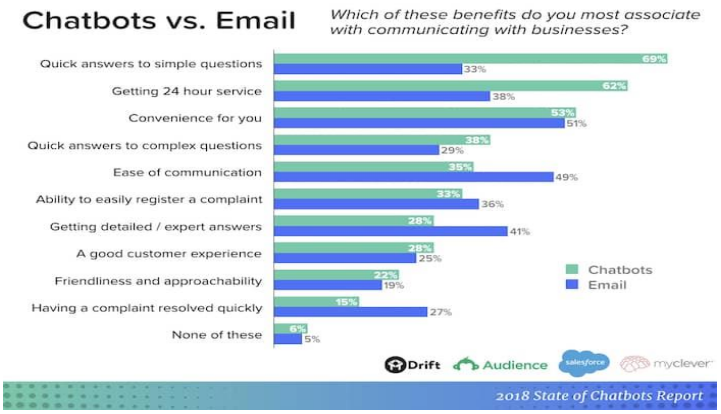
Chatbot vs email:



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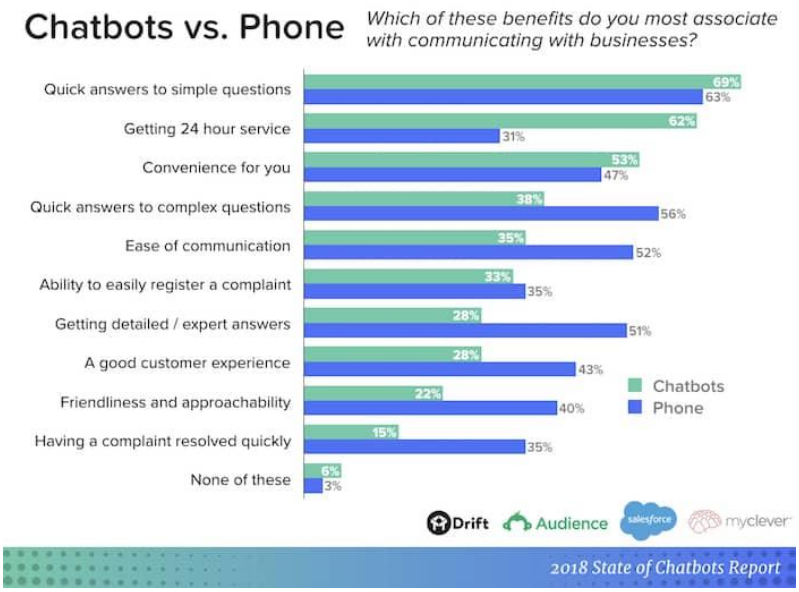
Chatbot vs phone



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These days, consumers expect to be able to find the information they're looking for online quickly and easily. And when a business can't provide that type of experience, they become frustrated. Chatbots are poised to ease these frustrations by providing the real-time, on-demand approach that consumers are seeking out.

The top three potential benefits of chatbots that consumers reported in our survey:

1. 24-hour service (64%)
2. Instant responses (55%)
3. Answers to simple questions (55%)

And that's true across all age groups. It's not just Millennials who see the potential benefits of chatbots. In fact, Baby Boomers were 24% more likely to expect benefits from chatbots in five of the nine categories we looked at compared to their Millennial counterparts.

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However, chatbots — like all technologies — aren't without their limitations: 43% of consumers said they prefer dealing with an actual person (that was the number one potential barrier to using chatbots). That being said, 34% of consumers also predicted that they would use chatbots for getting connected with a human. So, it doesn't have to be either/or. As a business, you can use chatbots to supplement your human workforce (not replace them).

Compared to other business communication channels, chatbots scored the second-highest when it came to consumers expecting instant responses, only losing out to online chat. But by using chatbots in combination with online chat, businesses can deliver a level of real-time service that they'd be unable to achieve using either technology on its own.

And while chatbots can't replace phone or email when it comes to providing in-depth answers to technical questions (some things will always require a human touch), they are poised to become the new apps. As you saw in the previous section, chatbots outperformed apps in the following five benefits categories:

1. Quick answers to simple questions (Chatbots, 69% | Apps, 51%)
2. Getting 24-hour service (Chatbots, 62% | Apps, 54%)
3. Quick answers to complex questions (Chatbots, 38% | Apps, 28%)
4. Ability to easily register a complaint (Chatbots, 38% | Apps, 28%)
5. Getting detailed / expert answers (Chatbots, 28% | Apps, 27%)

There's been a lot of hype around chatbots recently, and ultimately, we see chatbots as a technology that can help bridge the gaps between business communication channels, and that can help deliver a better, speedier online experience to consumers.

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Best practice and tips for chatbot:

1.Understand the impact AI has on the customer experience**.** Like many buzzwords, AI gets thrown around, so figure out where and how AI is used.

It should be helping understand what customers are trying to do and making sense of the various ways that can be expressed as well as helping manage conversations in a natural, non-robotic way. The goal is to get the customer to the information they need without running into any dead ends. Without this, it's just another FAQ.

2.Ask what it takes to **build, train and improve your chatbot over time.** Despite the hype, AI doesn't come knowing everything you need it to do, so get a clear sense of what intents (goals) or prebuilt content comes out-of-the-box and what you need to create yourself. Some chatbots offer the ability to use historical chatlogs and transcripts to create these intents, saving time. Those using machine learning can also automatically adjust and improve responses over time.

3.Look for ways to connect to, not replace, existing investments**.** Often, emerging channels or technologies seem like they will replace established ones. But instead, they become just another medium for an organization to manage. A chatbot that connects to these channels and customer case systems can provide the best of both worlds: Modernizing the customer

experience while more accurately routing users to the information and individuals that can solve their problems.

4.Determine if the chatbot meets your **deployment, scalability and security requirements,** Every organization and industry has its own unique compliance requirements and needs, so it's important to have those criteria clearly defined. Many chatbots are delivered via the cloud to draw on the learnings and outcomes from other customer conversations, so if you require an on-premises solution or a single tenant environment, the list of available providers is much shorter. It's also important to understand if and how your data is used, as it can have major impacts in highly regulated industries.

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What Chatbot Trends Might We Expect for 2023 And Beyond

Chatbots are certainly gaining traction as helpful customer service tools around the globe. Used to automate conversations and answer customers' questions, they can free up human agents' time to tackle more complex tasks. We're seeing organizations of all sizes adopting chatbot technology - big businesses, small online stores, tech startups, and even local governments are increasingly getting on board.

From conversational interfaces powered by natural language processing to AI-driven virtual customer assistants, advances in this technology have made it much more accessible and viable for companies of all sorts. With so much potential on offer and cost savings to be had, it's not hard to see why chatbots are gaining popularity - and why their usage is only set to grow from here on out.

The future of chatbots is transforming the way businesses interact with their customers. From handling customer inquiries and offering real-time support to providing personalized product recommendations, chatbots are becoming increasingly important for all types of businesses in the digital age.

With continued advancements in AI and machine learning technology, it's clear that chatbot usage is only going to continue to increase across industries.

At Onix, we have more than 20 years of experience investigating and developing chatbot technology
With a variety of 'conversational marketing' techniques being used, such as the voice-assisted Amazon Alexa and chatbots in Messenger, it will be interesting to see how this technology will develop. Let's look at what is the future of chatbots that may likely take the stage soon and how chatbots will be used.

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- **Better use of Machine Learning**

Modern chatbots are evolving into what scientists initially wanted them to be: they actually learn over time. This learning occurs mainly through human interaction, but that's not the only option. Chatbots also collect so-called training data and can be connected to open-source data (like wiki QA Corpus or Ubuntu Dialogue Corpus) to create a fuller picture. Chatbots use this during a live chat as a reference. The more data that comes in, the more capable chatbots can process and understand. They work smoothly and efficiently, their reactions become increasingly personalized, and operational time becomes shorter. It is quite likely that AI chatbots will become fully capable of assisting with the user's needs at nearly every stage of the customer experience. This means much less generic and useless information is communicated.

Human-like chatbots

As technology advances, it has become increasingly commonplace to see chatbot utilization not just in customer service industries but in various businesses. By 2023, market analysts expect chatbots to be integral to every industry as consumers continue to expect 24/7 customer service. But instead of simple bots offering pre-programmed answers or scripts, these modern chatbots are expected to use natural

language processing and hold conversations that closely mimic human interaction. With the expected growth of AI-driven digital assistants, rise in consumer expectations and need for automation efficiency, businesses' average conversational AI investment is set to reach $18.4 billion by 2026. It's clear that this trend is only likely to grow and develop in the coming years and, with continued advancements in technology, could offer incredible potential for businesses and consumers alike.

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- **Advantageous virtual assistance**

Chatbots are revolutionizing how businesses assist their customers. They offer a convenient and user-friendly way of interacting with customers and provide businesses with the potential to automate specific customer service tasks and integrate multiple applications for a more efficient workflow.

By combining different functions into one system, chatbots can give businesses a great advantage in productivity, cost-effectiveness, and speed.
With these benefits being made easily accessible, it is no wonder that many companies are now investing in adopting virtual assistant technology to take their customer service to the next level.

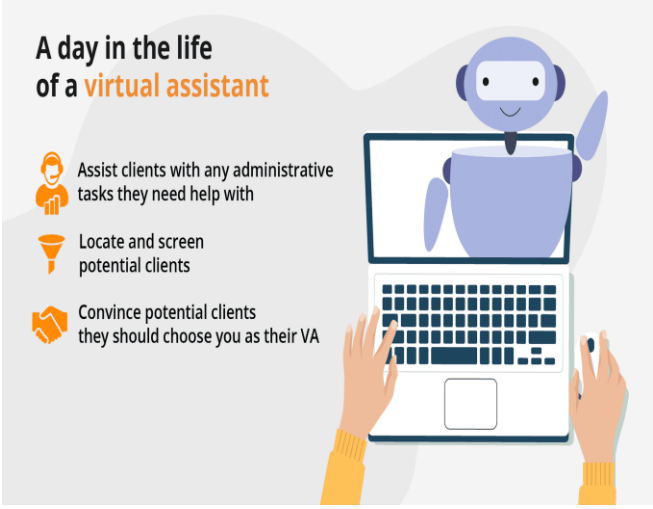

fig-7

- **AI-powered chatbots are becoming more intelligent**

AI-powered chatbots are becoming more and more intelligent these days as technology continues to advance. To bridge the gap between humans and computers, chatbots need to interact naturally with people through conversation seemingly - something made possible by artificial intelligence. Through natural language processing, AI makes it easier for machines to understand what is being said and respond accordingly.

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What was once a technology limited to simple dialogue now allows greater depth in conversations between bots and their users. While some may worry that AI-powered chatbots are erasing the need for human customer service agents, advancements in this technology should be celebrated as providing more efficient communication capabilities than ever before.

- **Chatbots are facilitating business processes**

AI chatbots are helping businesses automate processes quickly and efficiently. Modern chatbots are powered by advanced natural language processing techniques, which allow them to understand human conversations, interpret user intent and respond effectively. For example, companies often require customer support agents to process orders, answer queries, resolve issues, and so on. AI-powered bots save

businesses time and money as they can provide instant replies without needing manually Moreover, modern chatbots can even act as personal assistant bots that help with daily tasks such as booking appointments or managing orders. The demand for business-oriented AI chatbots is proliferating, and this trend will keep increasing over time.

The growth of voice-based apps

The use of digital voice assistants is steadily on the rise and set to triple by 2023, with estimates showing that smart home devices are a major driver of this surge in growth. Smart TVs will have the most significant expansion, predicted to grow by over 100% every year for the next five years. This means that more households than ever will be able to benefit from the top-quality viewing and assistant technology that was previously only available to bigger corporate players. It shows what we can achieve when we bring cutting-edge tech directly into our homes and demonstrates how far digital voice assistants have come in such a short time. With more innovations coming soon, there's no doubt that smart homes equipped with these assistants will continue to be at the forefront of the transformative capabilities of new technologies.

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- **Chatbots will automate payments**

Chatbot technology has advanced significantly in recent times, and economists and technologists predict that chatbots will become a major part of our daily lives in the coming years. One significant way chatbots are revolutionizing the world is by automating payments. Many kinds of financial transactions can be automated through chatbot technology, such as managing accounts and banking activities or making payments for goods and services.

In addition, customers have access to 24/7 customer support and can pay faster with increased convenience. This technology is cost-effective for global businesses that need efficient payment systems but also offers an improved user experience for

customers worldwide. With the rise of this trend, it's safe to say that automated payments are set to become a game-changer in the 21st-century economy.

- **Some of popular chatbot development platforms -**There are many popular chatbot development platforms, including chat fuel, bot kit and Motion.ai. Each platform has its own strengths and weaknesses, so it's important to choose one that's right for your needs.

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Bibliography

- Alepis, E., & Virvou, M. (2011). Automatic generation of emotions in tutoring agents for affective e-learning in medical education. Expert Systems with Applications, 38(8): 9840–9847.
- Ashok, G., Brian, C., Mithun, K., Shanu, S., Abhinaya, S., & Bryan, W. (2015). Using Watson for Enhancing Human-Computer Co-Creativity. AAAI Symposium: 22–29.

- Avalverde, D. (2019). A Brief History of Chatbots. Perception, Control, Cognition. Retrieved March 9, 2019 from: https://pcc.cs.byu.edu/2018/03/26/a-brief-history-of-chatbots/
- Ayedoun, E., Hayashi, Y., & Seta, K. (2015). A Conversational Agent to Encourage Willingness to Communicate in the Context of English as a Foreign Language. Procedia Computer Science, 60(1): 1433–1442.
- Ben Mimoun, Mohammed Slim, & Poncin, I. (2015). A valued agent: How ECAs affect website customers' satisfaction and behaviours. Journal of Retailing and Consumer Services, 26: 70– 82.
- Chatbot Magazine (2019). A Visual History of Chatbots. Retrieved March 9, 2019 from: https://chatbotsmagazine.com/a-visual-history-of-chatbots-8bf3b31dbfb2

- colace, F., De Santo, M., Lombardi, M., Pascale, L., Pietrosanto, A. (2018). Chatbot for E-Learning: A Cases Study. International Journal of Mechanical Engineering and Robotics Research Vol. 7, No. 5, September.
- Egencia (2018). What is a Chatbot and How does it work? Retrieved March 9, 2019 from: https://www.youtube.com/watch?v=38sL6pADCog
- Hattie, J. (2012). Visible learning for teachers: Maximizing impact on learning: Routledge. https://chatbotsmagazine.com/a-visual-history-of-chatbots-8bf3b31dbfb2
- Lip ko, H. (2018). Meet Jill Watson: Georgia Tech's first AI teaching assistant. Retrieved on March 9, 2019 from: https://pe.gatech.edu/blog/meet-jill-watson-georgia-techs-first-ai-teaching-assistant.

- Maruti Techlabs. (2018). Why can chatbots replace Mobile Apps immediately? Retrieved March 9, 2019 from: https://www.marutitech.com/why-can-chatbots-replace-mobile-apps-immediately/
- Nguyen, M. (2017). How artificial intelligence & machine learning produced robots we can talk to. Business Insider. Retrieved March 9, 2019 from: https://www.businessinsider.com/what-is-chatbot-talking-ai-robot-chat-simulators-2017-10
- Simpli learn (2018). Machine Learning Basics. Retrieved March 9, 2019 from: https://www.youtube.com/watch?v=ukzFI9rgwfU
- Sproutsocial.com (2018). A complete Guide to Chatbots in 2018. Retrieved March 9, 2019 from: https://sproutsocial.com/insights/topics/chatbots/
- V Soft Consulting. (2019). 7 of the best Language-learning Chatbot Apps. Retrieved March 9, 2019 from: https://blog.vsoftconsulting.com/blog/7-of-the-best-language-learning-chatbot-apps

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- Wikipedia (2019). Chatbot. Retrieved March 9, 2019 from: https://en.wikipedia.org/wiki/Chatbot
- Wikipedia (2019). Siri. Retrieved March 9, 2019 from: https://en.wikipedia.org/wiki/Siri#Features_and_options
- Winkler, R., Sollner, M. (2018): Unleashing the Potential of Chatbots in Education: A State-Of-The-Art Analysis. In: Academy of Management Annual Meeting (AOM). Chicago, USA.

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