

Experiment No-5

Aim: Develop an elementary Chabot for any suitable customerinteraction application.

Theory:

What is a Chabot?

A chatbot is a computer program designed to have a conversation with human beings over the internet. It's also known as conversational agents, which communicate andcollaborate with human users, through text messaging, in order to accomplish a specific task. Basically, there are two types of chatbots. The one that uses **ArtificialIntelligence**, and another one is based on multiple choice scripts.

Both types of chatbots aim to create a more personalized content experience for theusers, whether that's while watching a video, reading articles or buying new shoes.

These chatbots hold the promise of being the next generation of technology that people use to interact online with business enterprises. These Chatbots offer a lot ofadvantages, one of which is that, because Chatbots communicate using a natural language, users don't need to learn yet another new website interface, to get comfortable with the unavoidable quirks.

Chatbots are capable to interpret human speech, and decide which information is being sought. Artificial intelligence is getting smarter each day, and brands that areintegrating Chatbots with the artificial intelligence, can deliver one-to-one individualized experiences to consumers.

Why chatbot?

Chatbots can be useful in many aspects of the customer experience, including providing customer service, presenting product recommendations and engaging customers through targeted marketing campaigns. If a customer has an issue with a product, she can connect with a Chabot to explain the situation and the Chabot can input that information to provide a recommendation of how to fix the product. On the recommendation side, chatbots can be used to share popular products with customers that they might find useful and can act as a sort of personal shopper or

concierge service to find the perfect gift, meal or night out for a customer with just a few basic questions. Brands are also using chatbots to connect their customers with thought leaders and add personality to their products. In all cases, brands seem to be having great success and experiencing increased engagement and revenue.

Chatbots are easy to use and many customers prefer them over calling a representative on the phone because it tends to be faster and less invasive. They can also save money for companies and are easy to set up.

Chatbots are relatively new and most companies haven't implemented them yet, it's only natural that users are interested in them. Hence, people want to discover what chatbots can and cannot do.

The number of businesses using chatbots has grown exponentially. Chatbots have increased from 30,000 in 2016 to over 100,000 today. Every major company has announced their own Chatbot and 60% of the youth population uses them daily.

These statistics prove that chatbots are the new-gen tech. No more waiting for the right time to incorporate them into your business. The time is now. By the year 2020, nearly 80% of businesses will have their own Chatbot.

Billions of people are already using chatbots, so it's time your business did too.

Benefits of Chatbot?

Chatbots are being made to ease the pain that the industries are facing today. The purpose of chat bots is to support and scale business teams in their relations with customers.

Chatbots may sound like a futuristic notion, but according to Global Web Index statistics, it is said that 75% of internet users are adopting one or more messenger platforms. Although research shows us that each user makes use of an average of 24 apps a month, wherein 80% of the time would be in just 5 apps. This means you can hardly shoot ahead with an app, but you still have high chances to integrate your chatbot with one of these platforms.

Now let's go through some of the benefits that chatbots provide:

1. Available 24*7:

I'm sure most of you have experienced listening to the boring music playing while

you're kept on hold by a customer care agent. On an average people spend 7 minutes.

until they are assigned to an agent. Gone are the days of waiting for the next available operative. Bots are replacing live chat and other forms of contact such as emails and phone calls.

Since chat bots are basically virtual robots they never get tired and continue to obey your command. They will continue to operate every day throughout the year without requiring to take a break. This improves your customer satisfaction and helps you rank highly in your sector.

2. Handling Customers:

We humans are restricted to the number of things we can do at the same time. A study suggests that humans can only concentrate on 3–4 things at the same time. If it goes beyond that you are bound to meet errors.

Chatbots on the other hand can simultaneously have conversations with thousands of people. No matter what time of the day it is or how many people are contacting you, every single one of them will be answered instantly. Companies like Taco Bell and Dominoes are already using chatbots to arrange delivery of parcels.

3. Helps you Save Money:

If you are a business owner, you are bound to have a lot of employees who need to be paid for the work they do. And these expenses just keep adding up as business grows. Chatbots are a one-time investment which helps businesses reduce down on staff required.

You could integrate a customer support chatbot in your business to cater to simple queries of customers and pass on only the complex queries to customer support agents.

4. Provides 100% satisfaction to customers:

Humans react to others based on their mood and emotions. If an agent is having a good attitude or is in good mood, he will most probably talk to customers in a good way. In contrary to this the customer will not be satisfied.

Whereas chatbots are bound by some rules and obey them as long as they're programmed to. They always treat a customer in the politest and perfect way no matter how rough the person is. Also, in the travel and hospitality industry where

travelers do not speak the same language, a bot can be trained to communicate in the language of the traveler.

5. Automation of repetitive work:

Let's be honest, no one likes doing the same work again and again over brief periods of time. In the case of humans, such tasks are prone to errors. Chatbots now help automate tasks which are to be done frequently and at the right time.

Also, now there are numerous slack bots which automate repetitive tasks. This helps people save time and increase productivity. For example, there are new items bought from your ecommerce site or there is a bug reported then it sends a short summary to a slack channel.

6. Personal Assistant:

People could use Bots as a fashion advisor for clothing recommendations, or ask trading tips from a finance bot, suggest places to visit from a travel bot and so forth. This would help the users get a more personal touch from the Chatbot. Also, the Chatbot will remember all your choices and provide you with relevant choices the next time you visit it.

How Chatbot can drive revenue for you?

Below we have compiled reasons why chatbots are important for your business and how can they help in increasing revenues:

a. Higher user customer engagement

Most businesses these days have a web presence. But with being on the internet, boundaries of day and night, availability and unavailability have changed, so have user expectations. This is probably the biggest reason to use them. Bots give the user an interactive experience. It makes customers feel they are working with someone to help resolve their issue. If done right, bots can help customers find what they are looking for and make them more likely to return.

Customer Engagement

- Clearance Sale: Notify users about on-going clearance sale of products relevant to the users at their nearest outlets.
- Product Finder: Enable consultative selling without the need of a call center
- It offers Notification: Notify users about offers, product launches on

products/services they've shown interest in, and products that's back in stock

b. Mobile-ready and immediate availability

Along with a web presence, it has also become increasingly important for brands to have a mobile presence - mobile apps, mobile-optimized websites. Considering how chat has been around on the mobile for ages, most chatbot implementations don't need you to work on tweaking their UI, they are ready to implement and so available to your customers immediately.

You might argue that you have an app for that. Having an app for your brand is great, but having users discover that app, download it and use it to stay engaged is not an easy deal. Instead, implementing a Chatbot - which works on the mobile browser or a messaging-app which the user regularly uses - makes it all the more reason for a customer to be engaged with the brand

c. It can drive sales

Chatbots can be intelligent. Depending on a user's preferences or purchases, it can send products to customers which are more likely to convert into sales. Or it can send coupons to users for in-store purchases/discounts. Bots can also be used to link the user to your eCommerce site/app so they can buy the product directly from the convenience of their phones

Sell Intelligently

- Product Recommendations : Push proactive recommendations to users based on their preferences and search and order history.
- Enable order booking over chat.

d. Minimal cost - Maximum return

The best part about bots is they are cheap. Chatbots provide the necessary infrastructure and APIs for creating these bots. They require minimal maintenance and since it is automated, there is no labor-intensive work that goes in there.

e. Customer Service

- Track Order : Keep users up to date with order status. Schedule or rescheduledelivery to a provided address or request to pick it up at any other Best Buy outlet.
- Stock outs : Notify users when desired product is available and place order over a chat.
- Returns and Replacements : No waiting time to reach customer care. Customers can instantly place request to replace or return an order.
- Seek Reviews : Reach out to users to seek reviews on the products recently bought

f. Gift Recommendations

- Recommend relevant gifting options to users, accessing calendar events and understanding the likes and style of beneficiary.
- Opportunity to upsell gift cards for the users for every occasion.

Application across Industries



According to a new survey, 80% of businesses want to integrate chatbots in their business model by 2020. So which industries can reap the greatest benefits by implementing consumer-facing chatbots? According to a chatbot, these major areas of direct-to-consumer engagement are prime:

○ Chatbots in Restaurant and Retail Industries

Famous restaurant chains like Burger King and Taco bell has introduced their Chatbots to stand out of competitors of the Industry as well as treat their customers quickly. Customers of these restaurants are greeted by the resident Chatbots, and are offered the menu options- like a counter order, the Buyer

chooses their pickup location, pays, and gets told when they can head over to grab their food. Chatbots also works to accept table reservations, take special requests and go take the extra step to make the evening special for your guests.

Chatbots are not only good for the restaurant staff in reducing work and pain but canprovide a better user experience for the customers.

- **Chatbots in Hospitality and Travel**

For hoteliers, automation has been held up as a solution for all difficulties related to productivity issues, labour costs, a way to ensure consistently, streamlined production processes across the system. Accurate and immediate delivery of information to customers is a major factor in running a successful online Business, especially in the price sensitive and competitive Travel and Hospitality industry. Chatbots particularly have gotten a lot of attention from the hospitality industry in recent months.

Chatbots can help hotels in a number of areas, including time management, guest services and cost reduction. They can assist guests with elementary questions and requests. Thus, freeing up hotel staff to devote more of their time and attention to time-sensitive, critical, and complicated tasks. They are often more cost effective and faster than their human counterparts. They can be programmed to speak to guests in different languages, making it easier for the guests to speak in their local languageto communicate.

- **Chatbots in Health Industry**

Chatbots are a much better fit for patient engagement than Standalone apps. Throughthese Health-Bots, users can ask health related questions and receive immediate responses. These responses are either original or based on responses to similar questions in the database. The impersonal nature of a bot could act as a benefit in certain situations, where an actual Doctor is not needed.

Chatbots ease the access to healthcare and industry has favourable chances to servetheir customers with personalised health tips. It can be a good example of the successof Chatbots and Service Industry combo.

- **Chatbots in E-Commerce**

Mobile messengers- connected with Chatbots and the E-commerce business can open a new channel for selling the products online. E-commerce Shopping destination “Spring” was the early adopter. E-commerce future is where brands

have their own Chatbots which can interact with their customers through their apps.

- **Chatbots in Fashion Industry**

Chatbots, AI and Machine Learning pave a new domain of possibilities in the Fashion industry, from Data Analytics to Personal Chatbot Stylists. Fashion is such an industry where luxury goods can only be bought in a few physical boutiques and one to one customer service is essential. The Internet changed this dramatically, by giving the customers a seamless but a very impersonal experience of shopping. This particular problem can be solved by Chatbots. Customers can be treated personally with bots, which can exchange messages, give required suggestions and information. Famous fashion brands like Burberry, Tommy Hilfiger have recently launched Chatbots for the London and New York Fashion Week respectively.

Sephora a famous cosmetics brand and H&M – a fashion clothing brand have also launched their Chatbots.

- **Chatbots in Finance**

Chatbots have already stepped in Finance Industry. Chatbots can be programmed to assist the customers as Financial Advisor, Expense Saving Bot, Banking Bots, Taxbots, etc. Banks and Fintech have ample opportunities in developing bots for reducing their costs as well as human errors. Chatbots can work for customer's convenience, managing multiple accounts, directly checking their bank balance and expenses on particular things. Further about Finance and Chatbots have been discussed in our earlier blog: Chatbots as your Personal Finance Assistant.

- **Chatbots in Fitness Industry**

Chat based health and fitness companies using Chatbot, to help their customers get personalised health and fitness tips. Tech based fitness companies can have a huge opportunity by developing their own Chatbots offering huge customer base with personalised services. Engage with your fans like never before with news, highlights, game-day info, roster and more.

Chatbots and Service Industry together have a wide range of opportunities and small to big all size of companies using chatbots to reduce their work and help their customers better.

- **Chatbots in Media**

Big publisher or small agency, our suite of tools can help your audience chatbot experience rich and frictionless. Famous News and Media companies like The WallStreet Journal, CNN, Fox news, etc have launched their bots to help you receive the latest news on the go.

- **Chatbot in Celebrity:**

With a Chabot you can now have one-on-one conversation with millions of fans.

- **Chabot in MarketingSMS Marketing:**

- Why promote just a coupon code that the customer does not know how to use?
- Improve conversions from your existing SMS campaigns.
- Talk to your customers when they want to using “Talk to an Agent” feature.

- **Email Marketing**

- So your eMail has made a solid elevator pitch about your product.
- As a next step, is making customers fill an online form the most exciting way to engage with your customers?
- It's time to rethink the landing page.
- Instantly engage in a conversation with your customers.
- Address their concerns and queries

- **Social Media Triage**

- How effectively are you addressing the negative sentiment around your brand on social media?
- Addressing queries instantly and effectively can convert even an angry customer into a loyal fan.
- Leverage a chatbot as your first response strategy and comfort that customer.

Process

Stage #1: Chatty Bot welcomes you

Teach your assistant to introduce itself in the console.

Stage #2: Print your

name Introduce

yourself to the bot.**Stage**

#3: Guess the age

Use your knowledge of strings and numbers to make the assistant guess your age.

Stage #4: Learning numbers

Your assistant is old enough to learn how to count. And you are experienced enough to apply a for loop at this stage!

Stage #5: Multiple Choice

At this point, the assistant will be able to check your knowledge and ask multiple-choice questions. Add some functions to your code and make the stage even better.

Conclusion: Thus we have studied development of elementary Chatbot

Group-C

Experiment No-6

Aim: Implement any one of the following Expert System

- I. Information management
- II. Hospitals and medical facilities
- III. Help desks management
- IV. Employee performance evaluation
- V. Stock market trading
- VI. Airline scheduling and cargo schedules

Theory:

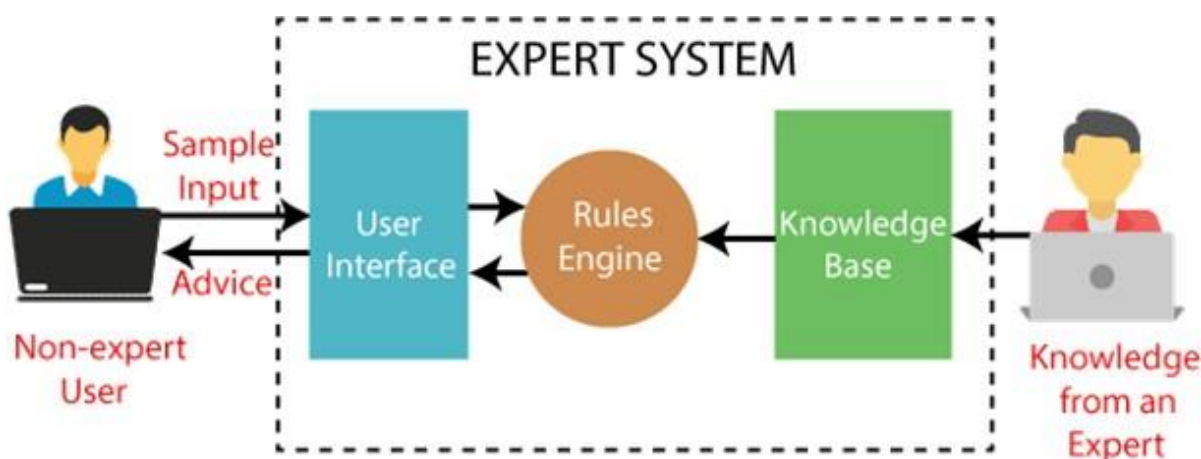
 What is an Expert System?

An expert system is a computer program that is designed to solve complex problems and to provide decision-making ability like a human expert. It performs this by extracting knowledge from its knowledge base using the reasoning and inference rules according to the user queries.

The expert system is a part of AI, and the first ES was developed in the year 1970, which was the first successful approach of artificial intelligence. It solves the most complex issue as an expert by extracting the knowledge stored in its knowledge base. The system helps in decision making for complex problems using **both facts and heuristics like a human expert**. It is called so because it contains the expert knowledge of a specific domain and can solve any complex problem of that particular domain. These systems are designed for a specific domain, such as **medicine, science**, etc.

The performance of an expert system is based on the expert's knowledge stored in its knowledge base. The more knowledge stored in the KB, the more that system improves its performance. One of the common examples of an ES is a suggestion of spelling errors while typing in the Google search box.

Below is the block diagram that represents the working of an expert system:



✚ Below are some popular examples of the Expert System:

- **DENDRAL:** It was an artificial intelligence project that was made as a chemical analysis expert system. It was used in organic chemistry to detect unknown organic molecules with the help of their mass spectra and knowledge base of chemistry.
- **MYCIN:** It was one of the earliest backward chaining expert systems that was designed to find the bacteria causing infections like bacteraemia and meningitis. It was also used for the recommendation of antibiotics and the diagnosis of blood clotting diseases.
- **PXDES:** It is an expert system that is used to determine the type and level of lung cancer. To determine the disease, it takes a picture from the upper body, which looks like the shadow. This shadow identifies the type and degree of harm.
- **CaDeT:** The CaDet expert system is a diagnostic support system that can detect cancer at early stages.

✚ Characteristics of Expert System

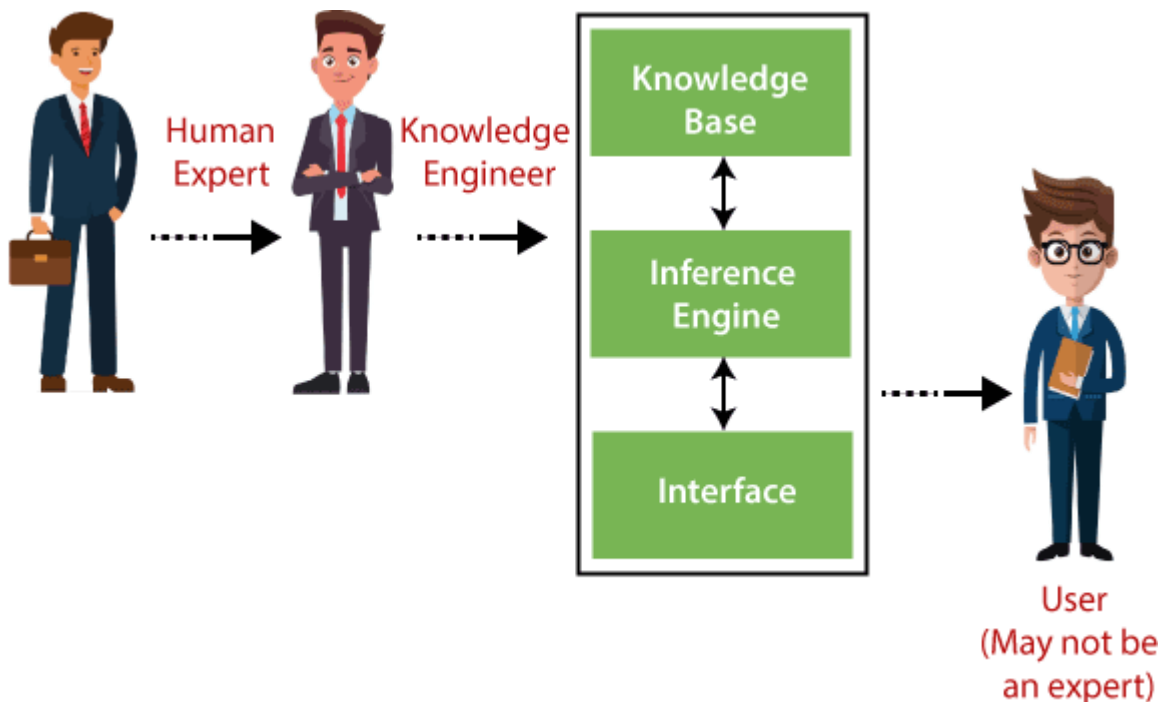
- **High Performance:** The expert system provides high performance for solving any type of complex problem of a specific domain with high efficiency and accuracy.

- **Understandable:** It responds in a way that can be easily understandable by the user. It can take input in human language and provides the output in the same way.
- **Reliable:** It is much reliable for generating an efficient and accurate output.
- **Highly responsive:** ES provides the result for any complex query within a very short period of time.

Components of Expert System

An expert system mainly consists of three components:

- **User Interface**
- **Inference Engine**
- **Knowledge Base**



Participants in the development of Expert System

There are three primary participants in the building of Expert System:

1. **Expert:** The success of an ES much depends on the knowledge provided

by human experts. These experts are those persons who are specialized in that specific domain.

2. **Knowledge Engineer:** Knowledge engineer is the person who gathers the knowledge from the domain experts and then codifies that knowledge to the system according to the formalism.
3. **End-User:** This is a particular person or a group of people who may not be experts, and working on the expert system needs the solution or advice for his queries, which are complex.

Advantages of Expert System

- These systems are highly reproducible.
- They can be used for risky places where the human presence is not safe.
- Error possibilities are less if the KB contains correct knowledge.
- The performance of these systems remains steady as it is not affected by emotions, tension, or fatigue.
- They provide a very high speed to respond to a particular query.

Limitations of Expert System

- The response of the expert system may get wrong if the knowledge base contains the wrong information.
- Like a human being, it cannot produce a creative output for different scenarios.
- Its maintenance and development costs are very high.
- Knowledge acquisition for designing is much difficult.
- For each domain, we require a specific ES, which is one of the big limitations.
- It cannot learn from itself and hence requires manual updates.

Applications of Expert System

- **In designing and manufacturing domain**

It can be broadly used for designing and manufacturing physical devices such as camera lenses and automobiles.

- **In the knowledge domain**

These systems are primarily used for publishing the relevant knowledge to the users. The two popular ES used for this domain is an advisor and a tax advisor.

- **In the finance domain**

In the finance industries, it is used to detect any type of possible fraud, suspicious activity, and advise bankers that if they should provide loans for business or not.

- **In the diagnosis and troubleshooting of devices**

In medical diagnosis, the ES system is used, and it was the first area where these systems were used.

- **Planning and Scheduling**

The expert systems can also be used for planning and scheduling some particular tasks for achieving the goal of that task.

Conclusion: Thus we have studied implementation of Expert system