AI CHATBOT FOR ANSWERING FAQ'S

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***Abstract*—FAQ section answers the frequently asked questions of the user. Generally, these are answered by humans but not a chat bot . Hence, this paper proposes a new chat bot which can also answer Frequently asked questions. In addition to answering textual queries, it also has the capability of answering the queries by observing images provided by the user. If user is not satisfied with the answers given by chat bot, then the control is given to agent and agent replies to the query and adds it to the database.**

Keywords—Natural Language Processing, Neural Networks, GPT3, Chatbot, FAQ, CNN, RNN, KNN, vCar, MangoDB ,RASA

I. INTRODUCTION

A chat bot, sometimes known as a chatter bot, is a computer software that uses text or text-to-speech technologies to conduct online chat cconversations. A chat bot is software that may help clients by automating discussions and communicating with them over message networks. It is designed to closely resemble human interaction with a conversational partner. Chat bots can help consumers discover the information they need by replying to their enquiries and requests—whether through text, speech, or both without requiring human participation.

"FAQ" is the abbreviation for "Frequently Asked Questions." FAQs are generated for software applications, computer hardware, websites, and online services in the IT field. They act as a one-stop shop for finding solutions to frequently asked questions.

In every application FAQ section is present to answer Frequent asked Questions and these are generally answered by people working in that organization. But this Chat bot aims to resolve this problem by answering the FAQ's **. It not only answers textual queries but it also has the capability of answering the queries by just looking at the Screenshots provided by the user and in this FAQ section, user can simply click on the query or the image and get his query solved.**

II. LITERATURE SURVEY

Ajinkya Huddar ,Chaitanya Bysani et.al[1], proposed a solution for College FAQ chatbot. For natural language understanding, dialogue management, and integration, the chatbot employs the RASAOpen Source framework. It can recognize free-form text messages in any language and convert them to structured data. It even has interactive learning, which allows the developer to manually teach it and provide feedback when it makes a mistake.

Panitan Muangkammuen, Narong Intiruk, Kanda Runapongsa Saikaew[2] proposed and constructed a Frequently Asked Questions (FAQs) Chatbot, which uses a Recurrent Neural Network (RNN) in the form of Long Short Term Memory (LSTM) for text categorization and answers to clients automatically. The chatbot could recognize 86.36 percent of the queries and respond with 93.2 percent accuracy, according to the findings of the trial.

From user interaction, the chatbot proposed by Rohit Binu Mathew et al[3] will be able to detect symptoms. Based on the collected symptoms, the chatbot guesses the disease and suggests treatment. The machine learning method utilized here is the K-nearest neighbour algorithm (KNN). This shows that utilizing simple symptom analysis and a natural method supported by language processing, a medical chatbot can diagnose patients with fair accuracy.

Unibot(University Chatbot) by Neelkumar P.et al[4] implemented a completely new algorithm. It is highly efficient, has extremely few database searches and consumes very less memory.The following is the algorithm: Please accept the user's message. Create an array named "important words" to hold all of the terms in the database. If a match is discovered, save the user's query to a separate table. If no results are returned, go through all of the keywords in the "Question" columns.

If numerous rows are generated,utilize the "title" field to present the user with alternatives.

Bhavika R. et al In [5] proposed a chat bot for university- related Frequently Asked Questions (FAQs) that is utilized in the educational sector and allows users to ask

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questions about college entrance, college information, and other academic-related topics. The developer processes the user's query in order to match the AIML format. The user's query and the knowledge base are matched using patterns.

The modules included in the proposed system by Harshala Gawade, Prachi Vishe [6] are as follows:

A. Online Enquiry - Students can inquire about facilities and ask questions concerning tests, fees, and other matters over the internet.
B. Online Chatbot - Questions are replied using the language model that was defined and the response media that was generated. The outcome can be shown as graphics, cards, or text.

The following is the fundamental algorithm that will be used to make this suggested system operate.

Step 1: Obtain the user's input inquiry.
Step 2:Get the remaining terms from the query.
Step 3: Compare the obtained keywords to the keywords in the knowledge base and take necessary action.
Step 4: The Database module is then used to seek suitable data by calling appropriate services depending on entity information.

Wasudeo Rahane,Sayali Patil proposed a Solar bot [7] . Solar bot is an online program that runs on Messenger and uses Node.js to combine the database with the chat UI. MongoDB is used as a database to store user data, and various functions and processes are utilized to match patterns.
The bot will try to match the major keywords with the user's purpose based on the user's input. A database will be created to contain all important information regarding keywords, logs, feedback, and queries. All of the inputs in the database are given a different score, and the information with the highest score is displayed as the solution. The user will submit a question using chat interface and the Solar bot will react via chat interface.

To develop a response model, Rupesh Singh, Manmath Paste[8] proposed a method that leverages TensorFlow to create a neural network and train it with an intent file.

This model may be used to forecast a user's answer to a question. A user interface, natural language processing unit and neural network model make up the system.
When a user submits a query, the response model will respond based on the user's input.
The highest- ranking response will be presented after it has been ranked. All of the replies will be set to 0 at first, and will be adjusted when the user interacts with the bot.

On the LINE @ platform's chatbots, Jennifer and Nabila[9] suggested a strategy for identifying photographs. The system is designed to respond to client requests for product information from an online store. The data was collected by cutting a snapshot of the online store's Instagram account to a 1: 1 ratio. The expected photographs will be immediately forecasted to determine the label image. If a product is found, the buyer will receive an email with product details such as the name, price, stock availability, and estimated delivery time.

Two successful and efficient traffic sign detection and identification systems are analyzed in the work proposed by Kaoutar , Afaf et al[10].It concluded that Fast R-CNN is quicker than the C-CNN and is insensitive to variations in light. This project is a subset of the larger vCar initiative, which is an open source platform for analyzing driving data. Through a flexible plugin framework that allows outof-the-box incorporation of new algorithms, vCar is radically open to increased functionality.

III. PROBLEM STATEMENT

The major reason for choosing this theme for the project is that many users who visit websites have some or the other queries ex., if we take a e-commerce website then we have queries related to orders, shipping, delivery, products, cancellation policy etc. So, if a user have a query he should mail or call that e-commerce website's company. This is time taking process as replies may sometime takes hours and even days. This may decrease the interest in users as they are not fully satisfied and in every company "Customer Satisfaction" plays a major role. If a company fails to do so then the reputation will be damaged. This will be a greater disadvantage to the company.
Hence, in order to overcome this problem and increase the automation, we have come up with a chat bot which answers user Queries and also Frequently asked Queries both textual and images.

IV. PROPOSED SYSTEM ARCHITECTURE

The web-based chatbot will be built. This chatbot will respond to all inquiries whose responses have been pre-programmed in database. It is created on cloud so that changes can be done without any difficulties.
FAQ section is integrated into chatbot which contains both textual questions and images. These Textual Questions are trained to the AI and it is used to generate answers using Natural Language Processing(Natural Language Processing is what enables chatbots to interpret and reply to communications)and
the screenshots provided by the customers/users are observed and

classification process(CNN) is used to answer those.

At the end, The Chatbot asks for Feedback, If the user is not happy with the answers given by the chatbot then the control goes to agent and he answers the query and adds the new query to the database. Goes to agent and he answers the query and adds the new query to the database.

A. Architecture of Chatbot

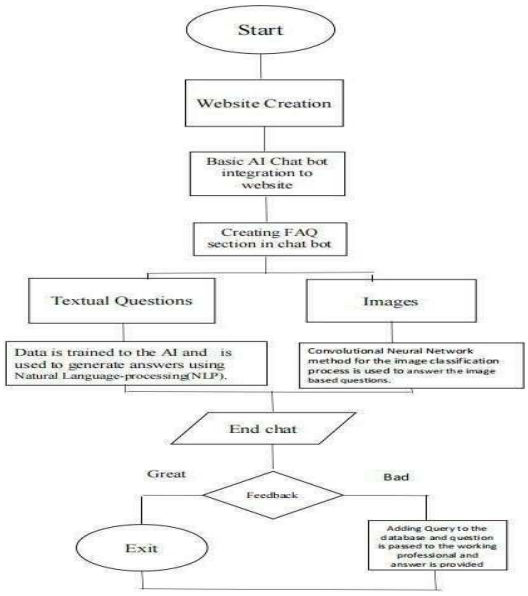

Fig.1.Proposed system Flowchart

B. Working of the Chatbot

Step-1 : Enters a Website (Basic online Shopping Website).

Step-2 : Gets a Query.

Step-3 : Opens Chat bot to get his/her Query answered.

Step-4 : Asks Query or uploads an image that implifies his/her query.

Step-5 : Chat bot replies with suitable answer.

Or

Step- 4 : User clicks on FAQ section.

Step-4.1 : Clicks on related question or an image.

Step-5 : Chatbot replies with suitable answer

Step-6 : If user is happy with the answer given by chatbot .

Step-6.1 : Quit.

Step-7 : If user is not happy with the answer given by chatbot

Step-7.1 : Agent will answer the query.

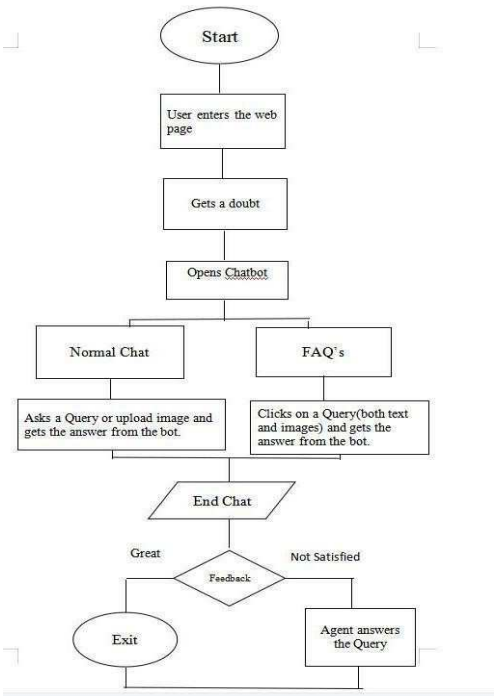

Fig. 2. User's Navigation

Intents are tasks that Assistant expects your Action to do, such processing user input or responding to a system event. Invocation and conversation models are created using intents. When these events occur, the Assistant runtime matches them to the correct purpose and passes them on to your Action to process.

Some of the intents for the e-commerce website for example a shopping website are provided:

```
ts.json > [ ] intents > {} 3 > [ ] responses > 1
{
  "intents": [
    {
      "tag": "greeting",
      "patterns": [
        "Hi",
        "Hey",
        "How are you",
        "Is anyone there?",
        "Hello",
        "Good day"
      ],
      "responses": [
        "Hey :-)",
        "Hello, thanks for visiting",
        "Hi there, what can I do for you?",
        "Hi there, how can I help?"
      ]
    },
    {
      "tag": "goodbye",
      "patterns": ["Bye", "See you later", "Goodbye"],
      "responses": [
        "See you later, thanks for visiting",
        "Have a nice day",
        "Bye! Come back again soon."
      ]
    },
    {
      "tag": "thanks",
      "patterns": ["Thanks", "Thank you", "That's helpful", "Thank's a lot!"],
      "responses": ["Happy to help!", "Any time!", "My pleasure"]
    },
    {
      "tag": "items",
      "patterns": [
```

Fig. 3. Intents

V. RESULTS

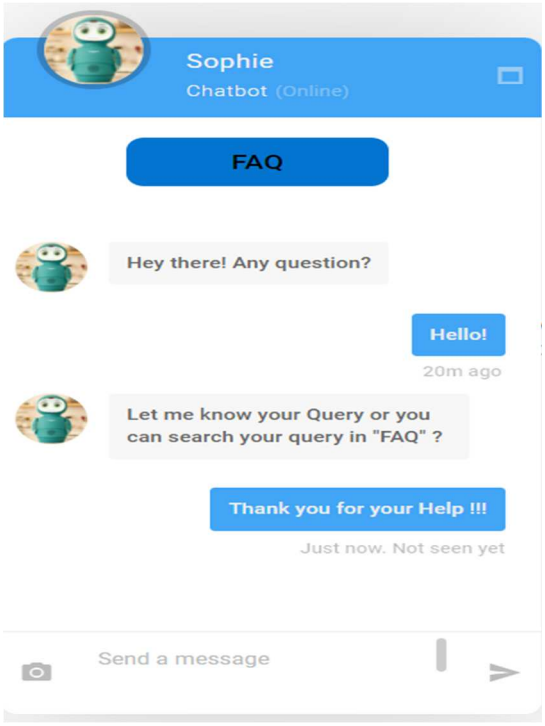

Fig.4. FAQ section integrated to chatbot

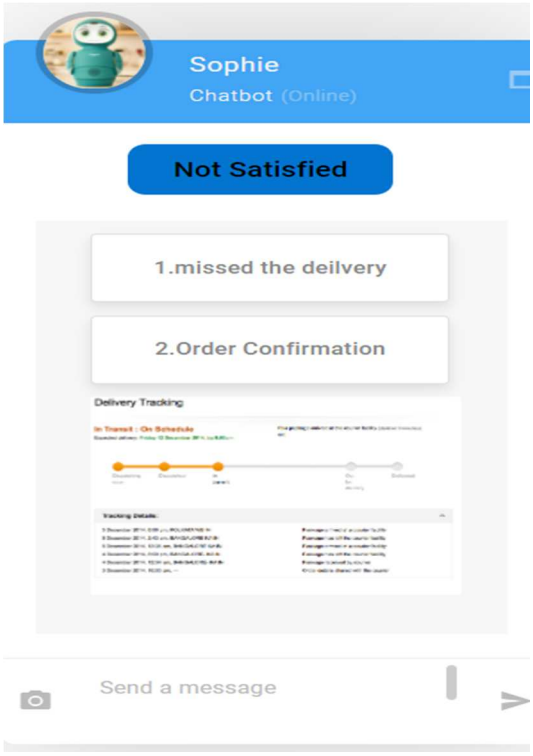

Fig.6. FAQ's

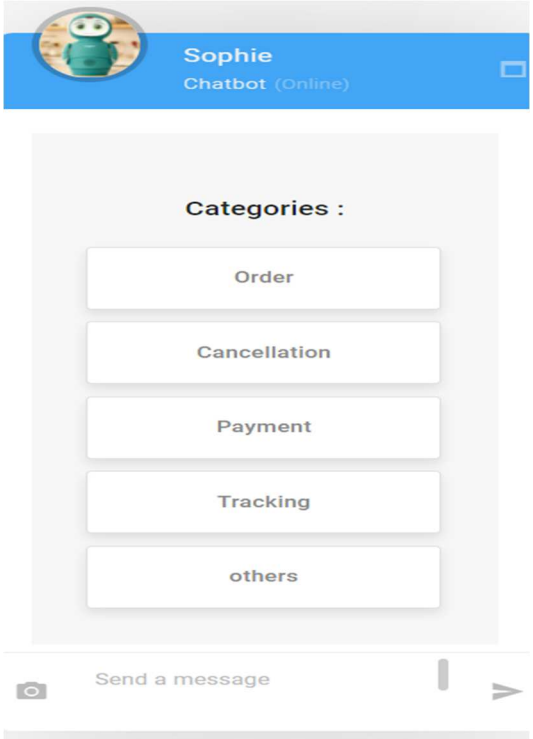

Fig.5. Categories in FAQ section

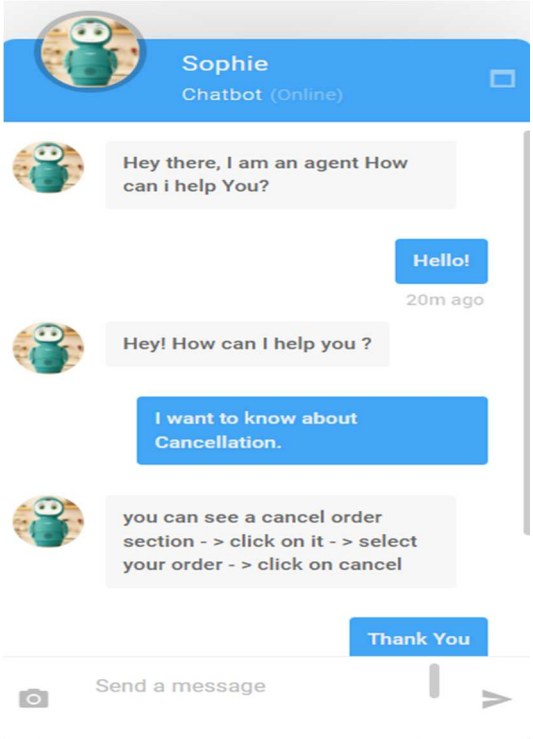

Fig.7. Agent Control

VI CONCLUSION

This chat bot not only answers textual queries but it also has the capability of answering the queries by just looking at the Screenshots provided by the user and In FAQ section, user can simply click on the query or the image and get his query solved.

Chatbot also has a capability of asking user if it's given answer is relevant to what they are expecting and if not, it will give the control to a working professional so that he/she can add the new query to the database using Machine learning and Natural language processing concepts. This chat bot uses AI and NLP capabilities to answer textual Queries and Convolutional Neural Network (CNN) for image classification process for answering queries when images are provided by the user.

This chat bot improves performance of the website and it is less time taking for a user to get his/her answer solved because everything are at one place.

User will be satisfied as he finds his query solved in a much easier way compared to other methods.

REFERENCES

[1] Huddar, Ajinkya, et al. "Dexter the College FAQ Chatbot" In International Conference on Convergence to Digital World-Quo Vadis (ICCDW), IEEE (2020).

[2] Muangkammuen, Panitan, Narong Intiruk, and Kanda Runapongsa Saikaew, "Automated thai-faq chatbot using rnn-lstm." In 22nd International Computer Science and Engineering Conference (ICSEC), IEEE(2018).

[3] Mathew, Rohit Binu, et al. "Chatbot for disease prediction and treatment recommendation using machine learning." In 3rd International Conference on Trends in Electronics and Informatics (ICOEI), IEEE (2019).

[4] Patel, Neelkumar P., et al. "AI and web-based human-like interactive university chatbot (UNIBOT)." In 3rd international conference on electronics, communication and aerospace technology (ICECA), IEEE(2019).

[5] Ranoliya, Bhavika R., Nidhi Raghuwanshi, and Sanjay Singh. "Chatbot for university related FAQs." In International Conference on Advances in Computing, Communications and Informatics (ICACCI), IEEE(2017).

[6] Gawade, Harshala, et al. "College Enquiry Chat-Bot System." In International Journal of Engineering Research & Technology, pp.741-742, (2020).

[7] Rahane, Wasudeo, et al. "Artificial intelligence based solarbot." In Second International Conference on Inventive Communication and Computational Technologies (ICICCT), IEEE (2018).

[8] Singh, Rupesh, et al. "Chatbot using TensorFlow for small Businesses." In Second International Conference on Inventive Communication and Computational Technologies (ICICCT), IEEE(2018).

[9] Nangoy, Jennifer Gabrielle, and Nabila Husna Shabrina. "Analysis of Chatbot-Based Image Classification on Social Commerce LINE@ Platform." In 7th NAFOSTED Conference on Information and Computer Science (NICS).,IEEE(2020).

[10] Boujemaa, Kaoutar Sefrioui, et al. "Traffic sign recognition using convolutional neural networks." In International Conference on Wireless Networks and Mobile Communications (WINCOM), IEEE(2017).