

# FAQ (Frequently Asked Questions) ChatBot for Conversation

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**Abstract**— ChatBot is a software application used to conduct an on-line chat conversation via text or text-to-speech, in instead of providing direct contact with a live human. However, An FAQ (Frequently Asked Questions) chatBot is a type of internet bot or software application that is beneficial for answering some of the most frequently asked questions your customers may have. FAQ bots help direct customers to the right website pages and provide answers easily any time of the day. In this paper, we present the architecture and prototype of a FAQ chatBot

**Keywords**—ChatBot; Communication; Pattern Matching; Request; Response, FAQ

## I. INTRODUCTION

The computer has made everybody's life easier. The most important aspect of computer science today is having the ability of cognitive technologies and providing automation to save the time, an essential skill for life. A FAQ chatBot is a program designed to answer common questions people have in their mind. This paper is based on the text only chatBot. FAQ ChatBot recognize the user input as well as by using pattern matching with the FAQ database, access information to provide a predefined acknowledgment. For example, if the user is providing the bot a sentence like "What is the Support Email address?" The FAQ chatBot is most likely to reply by looking at the database "It is Support@domain.com." or the chatBot replies as "You can reach out to support at Support@domain.com." based on the sentence given by the user. When the input is bringing into being in the database, a response from a predefined pattern is given to the user. A FAQ ChatBot is implemented using pattern comparing, in which the order of the sentence is recognized and a saved response pattern is familiarize to the exclusive variables of the sentence. "They cannot register and respond to complex questions, and are unable to perform compound activities, what FAQ respond it is all depends on the depth and the volume of knowledge database" [1]. "ChatBot is relatively a new technology. The application of a ChatBot can be seen in various fields in the future. This paper covers the techniques used to design and implement a FAQ ChatBot. Comparisons are made, findings are discussed and conclusion is drawn at the end" [2].

## II. RELATED WORK

### Problem statement:

A FAQ ChatBot refers to a chatting 'Knowledgeable' robot. "It is a communication simulating computer

program. It is all about the conversation with the user. The conversation with a FAQ ChatBot is very simple. It answers to the questions asked by the user. During designing a FAQ ChatBot, how does the ChatBot speak to the user? And how will be the conversation with the user and the ChatBot is very important" [3]. A chatBot should always be designed with the end-user in mind. You want the user experience to be as pleasant as possible. The following facts are kept in mind during designing a FAQ ChatBot that define a great chatBot.

### A. Make it Human-friendly

Prepare and decide an avatar for your chatBot that is interesting. It can be a real human or it can be your brand logo or mascot. Make the capability more authentic by bearing in mind the way the bot asks and answers questions. Your bot attitude should always be professional, but keep in mind that this is a dialog. Ensure that natural language is used and try to add some personality into the responses.

### B. Give it a Personality

Remember that language gives personality. The style of dialogue you use will outline the character of your business and team itself. It's fine to say that "This is a chatBot". Sometimes act as to be a human can backfire and raise unexpected expectations. The chatBot will have its own manner of interacting and people are used to it by now. Adding delays between messages is not going to solve the actual problem, which is customer interaction and data gathering.

### C. Keep the Conversation simple

Take a direct approach to designing your conversations. If you introduce a lot of branching or jumping between messages, it can eventually lead to user dissatisfaction. It's more important for the chatBot to be "easy-to-use" than

being intelligent. The bot will not be able to address all the issues or questions that your potential client may have. But as long as you keep them engaged, you get the opportunity to grip their contact information and get back to them later.

#### D. Fewer typing, more clicking

If you design a chatBot that asks the user to type a lot, then that generally leads to lower completion rates. The more space you give the user to type a question, the more intelligent your chatBot should be. And yet, you may be far from getting the data that you needed. You should move away from the traditional approach of text-based questions to the more interactive questions like multi-choices, range sliders, feedback widgets etc. This gives a more vibrant effect to the chatBot and enhances the UX. Users can simply click and choose their answers. You also get the added benefit of getting a structured response. Structured answers help smoothen the integration process with other tools in your workflow.

#### E. Let it tie your Brand

Everything about the bot should match your brand image, from the personality of the bot to the colors you choose for the text. You must reflect your brand throughout each step.

#### F. Picking Bot Format

Selecting to make an FAQ bot is just the first step. Before you go any further, you need to study your FAQ needs. The volume and complexity of your FAQ database, as well as channels where you want to broadcast the FAQ, will help you define which type of chatBot will serve and benefit your customers in the most competent way possible. You can build a rule-based chatBot, NLP-based bot or bot that uses a combination of the two.

**Rule-Based FAQ Bot** - This kind of bot doesn't rely on AI but rather follows a decision-tree conversation structure. It's driven by a series of predefined rules designed to solve specific problems or achieve particular goals. With rule-based bots, conversations are mapped out like a flow chart, limiting and controlling user questions and responses.

Rule-based ChatBots can be simple or incredibly complex. However, they never allow users to leave the predefined conversational flow. In this case, the personalization happens through choice-making and information conditioning.

**NLP-Based FAQ Bot** - NLP (Natural Language Processing) is a small sub-section of AI that deals with linguistics. The ultimate objective of this technology is to process, analyze, decipher and make sense of the natural human language in a way that is valuable. It may but doesn't have to be enriched by machine learning that enables the bot to learn from experience, not just training.

**Rule-NLP FAQ Hybrid** - A hybrid bot combines the elements of a rule-based and NLP chatBot.

#### Objectives:

Our objective is to design and prototype a smart FAQ ChatBots who can response all Support related inquiries 24x7 based on the FAQ database effectively.

### III. METHODOLOGY

In our proposed solution we have used Rule-NLP Hybrid FAQ Bot using Java programming language. Java Applets are used because it is easy to create the dialog box required for the conversation between.

The user and the bot. internally it uses any NLP (Natural Language Processing) system to interpret the human interactions and reply back with meaningful information. The design of a FAQ ChatBot is represented using Figure 1 as follows:

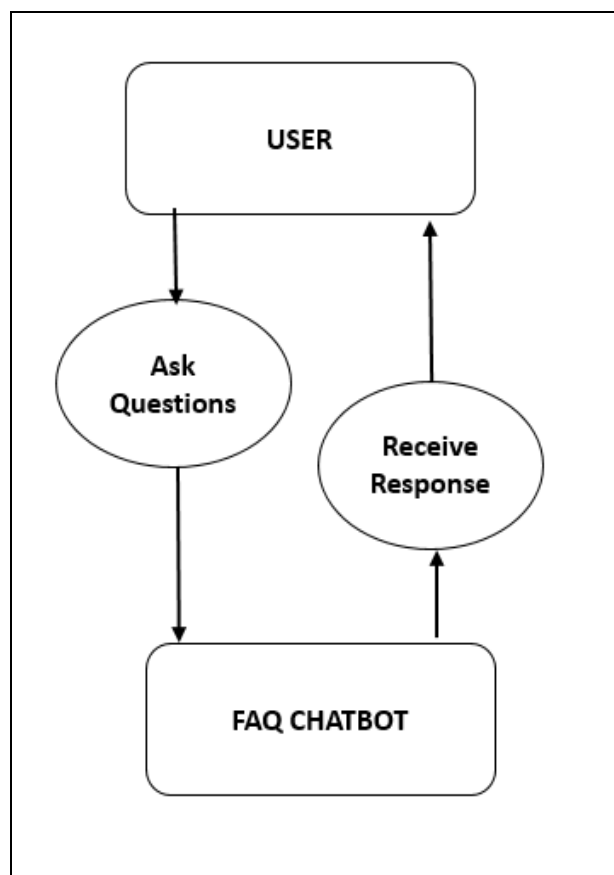


Fig.1: Use Case Diagram of ChatBot Design

Detailed implementation technique has been defined as below:

#### A. Fundamental Design Techniques and Approaches

##### • Database

Knowledge database is the key for FAQ ChatBot. Two dimensional string arrays are applied to build a database. Rows in the array are used for request and response. All the even rows contain the request or questions and all the odd rows contain the response or answers. Columns in the

array are applied to save different types of questions that could be asked by the user and responses that a FAQ ChatBot can answer. There is one row in the array which contains default responses which is used when the matching question is not found in the array.

- **Dialog box**

All the packages required for creating the dialog box are imported. The size of the dialog box and text area inside the dialog box is given. Vertical scrollbar is used so that the screen is scrolled as the conversation goes on. Horizontal scrollbar is never used because the size of the dialog box is fixed.

- **Modules Description**

- ChatBot () in this function, all the variables used for creating the dialog box are added.
- In Array () this is used as a pattern matching function.
- Add Text () All the texts or strings used in input and output are added to the text area in the dialog box.
- Random () is used to choose the response saved in the database.” The input from the user is taken using get Text () function. All the punctuation marks in the users input are removed using trim () function. The uppercase letters are converted to lowercase. A variable called response is used to hold a byte value and it is set to 0. While response is 0, the match for the input is found in the database and it is returned as a response which is displayed in the text area. If the response is 1, then the match for the input is not found in the database. In this case, a default response is returned” [4]

#### IV. RESULTS AND DISCUSSION

The designed FAQ ChatBot is very simple and user friendly. It is not very complicated like other ChatBots. The working of the ChatBot is straightforward and can be easily understood. This FAQ ChatBot uses simple pattern matching to represent the input and output whereas other ChatBots use input rules, keyword patterns and output rules to generate a response. If the input is not found in the database, a default response is generated. The input and output can be customized according to the user. Based on the developer or the user, the required requests and responses can be stored in the database. If the customer needs real human help, the ChatBot can also transfer them over to a human support agent by email as described below in Figure 2. This FAQ chatBot can be used in any kind of FAQ operations just by changing dataset.

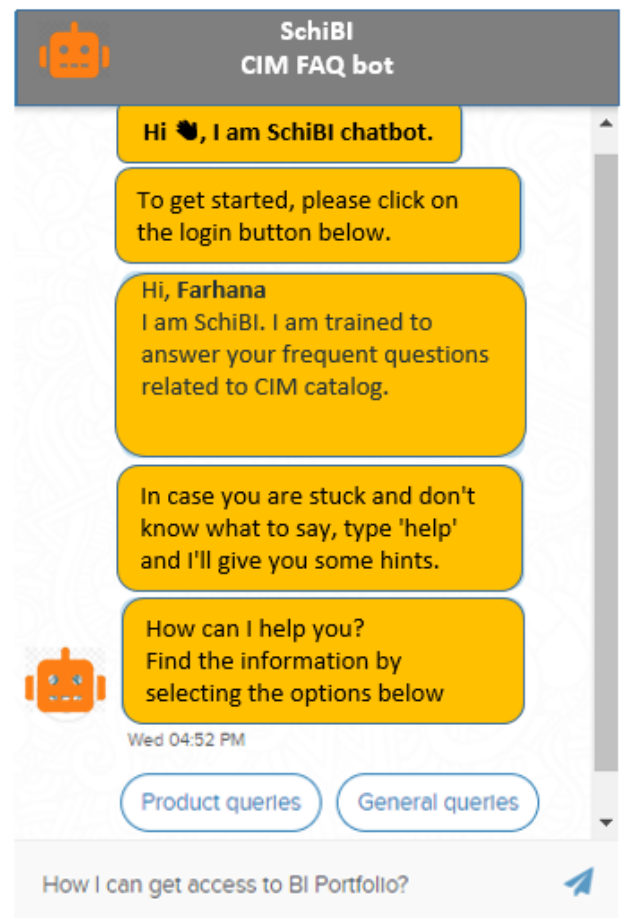


Figure 2: User Interface of FAQ ChatBot

#### V. CONCLUSION AND FUTURE SCOPE

##### Future Scope

ChatBots are artificial intelligence systems that interact with users via messaging, text, or speech. ChatBots can work in segments such as marketing, payments and processing, and service. Today, consumers are demanding round-the-clock service for assistance in areas ranging from banking and finance, to health and wellness. As a result, companies are rapidly looking to develop ChatBots and virtual assistants to answer questions customers may have at any time of day. But companies should take note that the more successful ChatBots are the ones that are able to drive a good conversational experience that mimics human agents – they should be able to effectively address customer requests. As more businesses and consumers use ChatBots, the more demand will exist for better development of ChatBots, thus making it easier for companies to implement them within their business. Training data as a major barrier to entry for enterprises seeking ChatBots. This is especially true for more advanced ChatBots that seek to understand intent and respond in human-mimicking natural language. Linguistic and conversational ability must improve. The anticipated benefits of ChatBots often fall short due to their notoriously robotic language, inflexibility and difficulty in

understanding the intent and nuance of language. User experience demands a consistent, clear and focused personality that mimics human interaction and makes them feel at ease. Machine learning systems have no consistent personality because the dialogue answers are all amalgamated text fragments from different sources. Looking ahead to the future scope of ChatBots, bots need to further develop their NLP and ability to go off-script.

## VI. CONCLUSION

ChatBot are programs that mimic human conversation. It is designed to be the ultimate virtual assistant. ChatBot and specifically FAQ ChatBot has become more popular in business groups right now as they can reduce customer service cost and handles multiple users at a time. In this paper we provide the design of a FAQ chatBot, which provides an efficient and accurate answer for any query based on the dataset of FAQs. We looked into the best approach to develop a simple ChatBot. The proposed method is one of the simple and automated solutions to transport data from a computer without having to think for proper keywords to look up in a search or browse several web pages to collect information, it allows organizations to handle many customers at once, and simultaneously. By “employing” ChatBots that complements human agents, you will not only save on employee costs but you will also avoid the problems caused by human errors. Users can easily type their query in natural language and retrieve information. In this paper, information about the design, implementation of the FAQ chatBot has been presented that is simple, friendly and conversational.

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Mrs. Farhana Sethi pursued Bachelor of Electrical and Computer Systems from N.E.D University of Engineering and Technology, Pakistan in 1997. She is currently working as Quality and Governance Manager in Schlumberger Oilfield Head Quarter, Houston Texas United States of America since 2006. She is a certified Azure Solution Architect and has completed Professional Certification in Reservoir Geomechanics from Stanford University - United States, California. Professional Certification in Internet of Things from Stanford University - United States, California. Professional certification in Data Science: Machine Learning from Harvard University - United States, Massachusetts. She has earned more than 20 certification from Microsoft, Cisco, Red hat, ITIL and PMI focuses on Operating System and Network Security, Cloud Security and Privacy, Big Data Analytics, Database, Systems, Project management and Computational Intelligence. She has 13 years of technical experience and 10 years of management experience in the related field of Information technology and Oil Field Industry

