

LITERATURE SURVEY OF VARIOUS CHATBOTS

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Abstract: A chatbot is AI computer software that can act as a conversation through textual or auditory methods. The core of chatbots analyses a customer's data using the artificial intelligence which integrates the response with them. Different tasks can be replaced with AI-powered bots as they are much more powerful—and are capable of performing multiple tasks at once. Machine Learning techniques are basically used in the process of understanding the input that we get from the user and replying to the user. Natural language processing allows a bot to have a conversation as naturally as possible. The ideal interaction between user and chatbot is a balanced mix of Innovative technology and human Intervention.

Keywords: chatbot, artificial intelligence, human conversational partner, automated.

I. INTRODUCTION

A chatbot can conduct smart conversation—either via text or voice. They are armed with machine learning which can interact with humans and become increasingly agile with each interaction. It recognizes using pattern matching, user input as well to access information to provide a predefined acknowledgment. In dialog systems they are used for numerous practical intends comprising information acquisition or customer service. Keywords are scanned with the input in simple chatbot and then respond with the most similar matching keywords or patterns from a database while some chatbots use sophisticated. Their applications make the communication between people and services, intensify the experience of customer. To have better customer engagement and operational efficiency they provide companies new opportunities by lowering the cost of customer service.

Types of chatbots used:

- **Support** – This is used to master a single domain.
- **Skills** - This does not require a lot of contextual awareness.
- **Assistant** - This is the middle ground between a skill and support chatbot. When they know a little about a variety of topics they work great.

II. LITERATURE SURVEY ON VARIOUS CHATBOTS

2.1 “Recruitment Chatbots”, International Research Journal of Engineering and Technology (IRJET), vol. 5, Issue: 08, Aug 2018[1].

Authors: Akash Balachandar, Anusha D Kulkarni

In this paper, authors have explained how the chatbot behaving as a human conversational partner are designed to comprehend a conclusive human response. In today's world, it is difficult to collect correct information easily while

hiring the right candidate. Using simply a chatbot can be a solution to this problem. Recruiters can use this in day-to-day life to automate time-consuming tasks [1].

SYSTEM DESIGN

Describing the designing process of interaction between the chatbot and the user. It uses dialogues systems, and they are of two types [1]:

- 1) Goal Oriented Dialogue Systems.
- 2) General conversation Dialogue Systems.

We use Generative and Selective approaches in recruitment chatbot which needs a general conversational dialog system. The Machine Learning principle is a core philosophy for both these approaches: Build it, Train it, and Test it. By using bot characteristics, constraints, dialogue dataset, access flow, and Sequence tokens this model is built.

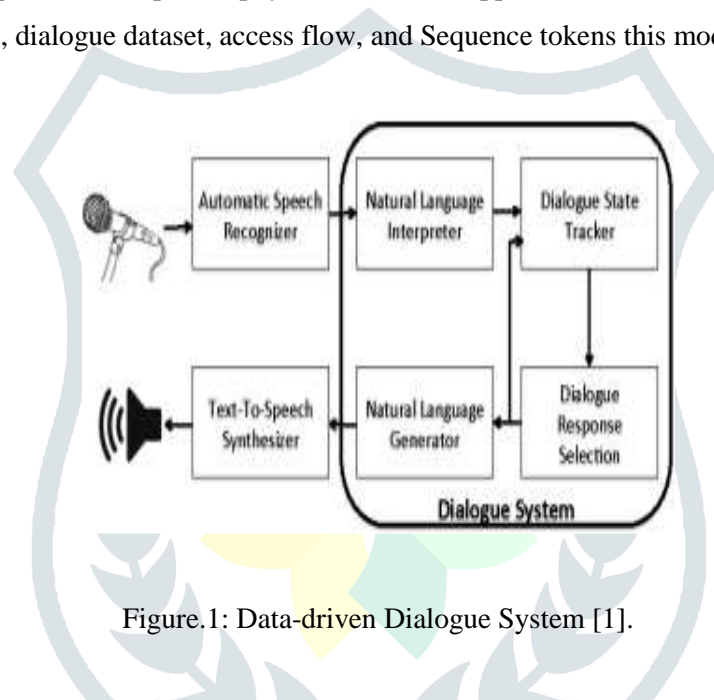


Figure.1: Data-driven Dialogue System [1].

2.2 “Classification Technique of Interviewer-Bot Result using Naïve Bayes an Phrase Reinforcement Algorithms,” International Journal of Emerging Technologies in Learning (iJET), 13(02), 33-47, 2018[2].

Authors: Sarosa, M., Junus, M., Hoesny, M. U., Sari, Z., & Fatnuriyah, M.

In this paper authors have classified the outcomes of a job interview among the the interviewer-bot and user by using Naïve Bayes algorithm.

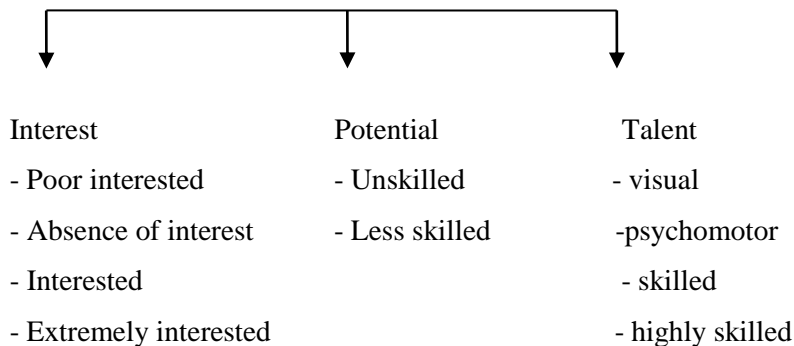


Figure 2. Classification using Naïve Bayes Algorithm.

Advantages of Naive Bayes Algorithm

- It is easy to understand and implement.
- Any kind of complex optimization is not required.
- It is easily updated if new training data is received. .
- Sometimes independence assumption may seem unreasonable, but its performance is usually good.

Advantages of Phrase Reinforcement (PR) Algorithm

- Maximizes Performance.
- For a long period of time changes can be sustained.

2.3 “Task-based Interaction Chatbot”, EEE521 final year project Report school of computing, Engineering & Intelligent System[4].

Authors: Dr. Kevin Curran, Dr. Daniel Kelly

Chatbot Architecture

It comprises of four parts first is front-end second is knowledge-base third is back-end and corpus which are training data. The communication with the user is done on front end part. NLU (natural language understanding) is used to understand the context and intent of the user input. An appropriate response is generated from user. The knowledge base determines the chatbots knowledge, which is done with the NLU and supported at the back-end. The back-end produces the knowledge base by making use of the domains corpus. Input is given to the chatbot in the form of speech or text. The input is given to the dialog management system which defines an appropriate response and asks the chatbots to perform the required action. The responses are produced in the form of text and speech both.

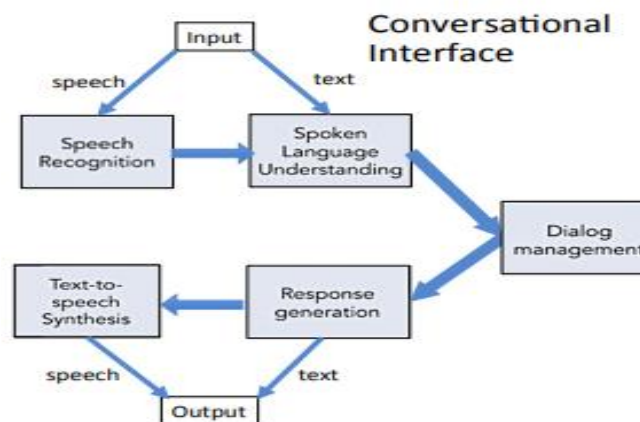


Figure 3. Standard chatbot architecture [4].

2.4“Intelligent Chatbot for Easy Web-Analytics Insights”. In 2018 International Conference on Advances in Computing, Communications and Informatics (ICACCI) (pp. 2193-2195). IEEE [5].

Author: Ravi, R.

In this paper, a comparison is done based on their ease of usage, using different analytic tools. The chatbot is built using Artificial Intelligence Markup Language contain analytics' raw data and the required data is fetched from the analytics tool’s raw data. Every website note all the details user made. AIML comprises of possible queries and their responses. It consists of 3 elements such as template, categories and pattern. Each category contains pattern and a template. Patterns are the possible queries that the bot-user may type in and the template is the response to the respective pattern [5].

There are 3 query scenarios that can be considered [5].

Scenario 1: Domain Related Query

Scenario 2: General Queries

Scenario 3: None of the above

The users can type to web analytics their query related to and will get an immediately reply. Web analytics tools are mastered to avoid the time taking task. The system is developed using raw analytics data.

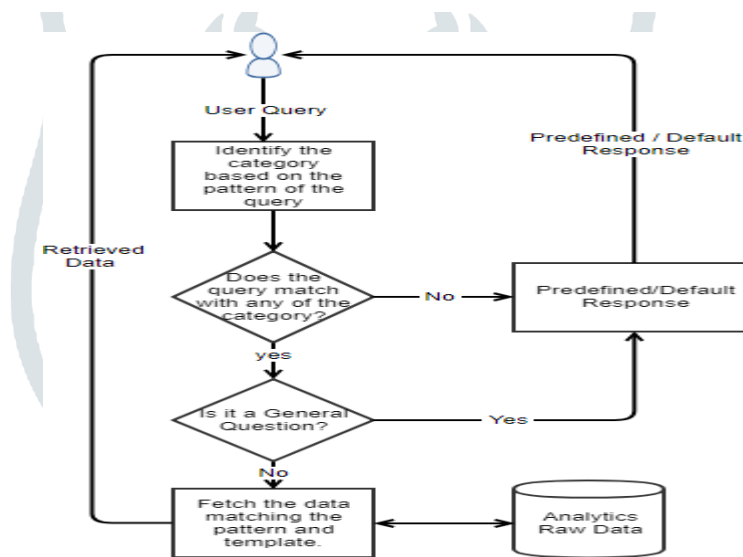


Figure 4. Proposed Model [5].

SR. No	Ease of use	Web Analytics Tools	
		Google Analytics	Adobe Analytics
1	Customer services	It does not provide exclusive client services.	It provides 24/7 exclusive client services.
2	Structured Approach	Native reporting and structured approach are	It lacks structure and predefined reports

		big advantages	
3	Data Connectors	While connecting to 3rd party it faces challenges	To integrate with different types of Adobe and 3rd party tools, wide range of connectors are available
4	Customization	Different APIs are used to bring data in the environment	By one-click data can be added in platform
5	Implementation	Easier and simpler	Complex
6	Real-time	It is a real-time tool	It is slow and usually delayed by around 2 hrs

Table 1. Comparison between different web analytics tools

III. APPLICATIONS OF CHATBOT

- **Experience and Service** - Communication in multiple languages, Handle customer service requests, Manage account settings, Offer alerts and information, preferences.
- **Recruitment** – Scheduling meetings, Candidates interaction, Answer & questions.
- **Healthcare** - Provide status on staffing, resources Deliver medicine or safety alerts, Communication with physicians.
- **Government** - Resolve parking tickets, Visa applications management.
- **Smart Home Devices** - control entertainment devices, control heating, Manage security, and control home appliances, control fitness devices, set medicine reminders.
- **Transportation** - Remotely lock vehicles; retrieve information, Call ride share service.
- **Personal Assistant** - Manage payments, Search for information, Purchase products or services, respond to questions.
- **Sales & Marketing** - Make recommendations, and Offer loyalty incentives, Deliver campaigns and offers, Deliver relevant content.
- **Employee Productivity** - Manage calendar, manage email, Plan resources, Search.

IV. ADVANTAGES AND DISADVANTAGES

4.1 ADVANTAGES:

- **Reduced Costs** – Chatbot is an advantage for companies receiving multiple queries at a time as it eliminates the requirement of any manpower during online communication.

- **24-7 availability** – Chatbot once installed can answer queries at any time. Companies can reach out to them later as they trace their activities during non working hours.
- **Updating and Learning** – Chatbot have the ability of updating and learning themselves on their own from the transactions. Due to algorithms and machine learning, they are capable of updating themselves.
- **Multiple Customer Handling** – Humans can handle a limited clients at a time. However, there is no such restriction with chatbots they can solve as many queries as required at once.

4.2 DISADVANTAGES:

- **Complex Interface** – Chatbots requires long time for understanding user requirement.
- **Inability to Understand** – Chatbots cannot respond properly, due to fixed programs if an unsaved query is introduced to them. This leads to customer dissatisfaction and may result in the loss.
- **Time-Consuming** – The idea of using chatbot is to accelerate the response and makes better customer interaction but it appears more time-taking due to less data available and time needed for self updating. It appears confused while attending more number of customers at the same time.
- **Zero decision-making** – Sometimes they are enabled to make proper decisions. Big companies like Microsoft etc. are facing the same trouble.
- **Poor Memory** – Chatbots lacks in memorizing the past conversation which require typing the same thing again. This may annoy customers.

V. CONCLUSION

Under this study, an attempt is made to understand the automated process of various chatbots by using smart algorithms. The classification of text in chatbot by using pattern matching to build, train, test it, helps in getting the desired output. It allows spoken or written phrases to be analyzed by computers to determine the intent of the user. Architecture and designing process of the chatbot is studied to understand how they interact with humans. AI chatbots helps better decision making. The advantages, disadvantages and various other applications of a chatbot are mentioned.

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