SENTIMENT ANALYSIS FOR CHATBOT TO MAKE THEM EMOTIONALLY REACTIVE

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Abstract - Implementing chatbots has practically helped to upgrade the engagement of users with the chatbots. Moreover ,the implementation of chatbot programs in the industries help the companies to decrease their cost of operations in engaging their employees and consumers. Here still some problems exist to design a human-like bot program. Which understands the natural human conversation and revert back for the conversation of the interlocutors, keeping hold on the converse flowing in a naturally is a difficulty task for computers.This research goals to designing an emotionally pragmatic bot system in order to increase the believability of bots by using the Natural Language Processing(NLP) and it's information,The results showing that there is a drastically Significant improvement in the chatbot credibility with the system which has emotional expressions induced compare with the one without emotional expressions.

Key Words: *Chatbot, Emotional category, Sentiment classifcation, Emotions, Natural language processing, Deep Learning*

1.INTRODUCTION

The Business application of conversational chatbot is getting input and analyzing an intention of an user and giving appropriate response, such as seeking for a restaurant, making queries regards to the weather condition, and responding for frequently incoming queries on specific domains. Here intent transformations are crucial for the chatbot agent for carrying out specific tasks. However, the chatbot agent is not providing adequate responses in everyday chat, which lacks particular intentions in conversation.

This paper mainly focus on designing of a chatbot which responds to the user with emotions The chatbots are designed to identify the human emotional content in the converse of User by make familiar them with list of expression in combination with basic emotions (cheerfulness,sorrow,disgust,anger,anxiety,and fear) of which will be used in converse With the combination of some keywords, by using some keywords we are enabling the Chatbots to recognize the emotion.

2. LITERATURE SURVEY

Different types of sentiment analysis and its applications were presented. Algorithms and their originating references of various SA techniques are categorized and briefly explained.

The common sentiment analysis methods from the perspective of machine learning technologies, which encompass Naive Bayes technique, Maximum Entropy method, Support Vector Machine technique, and Artificial Neural Network method and performance assessment and difficulties have been introduced.

The ratio of accuracy differs according to what they applied; for example it was 82.9% by applying Support Vector Machines, while it was 78.7% by applying Naive Bayes classifier.

One of the possible techniques to get more accuracy of classification of tweets is applying SentiWordNet and Naive Bayes that give positive, negative and objective degrees of the words that exist in tweets.

During the initial step, sentiment lexicons are used to classify tweets, while the polarity of each tweet is also assigned by aggregating the scores of each token. During the next step, the SVM classifier receives all the tweets with low absolute scores to strengthen the whole accuracy.

Real-time solution using spark framework, for processing sentiment analysis Saudi dialect in twitter based on lexicon-based algorithm was suggested.

An efficient sentiment prediction technique in Big Data, using Spark was recommended. The outcomes got from the suggested work were subject to analysis to demonstrate high levels of scalability in relation to accuracy and time. It was noted that even with the growth of data volume, the processing time indicated very less variance.

3. REQUIREMENTS

Develop a chat bot which responds to the user questions depending upon the context. Develop an Emotion recognition module to analyse the user sentiment who's interacting with the chatbot. Embed the smartness to chatbot to improve the conversation with the user depending upon the user's emotion Deploy the application over cloud infrastructure so that · the solution can be integrated with other third party applications easily.

3.1 Hardware Requirements

- Processor: Intel Core i5 or AMD FX 8 core series with clock speed of 2.4 GHz or above
- RAM: 2GB or above
- Hard disk: 40 GB or above
- Input device: Keyboard or mouse or compatible pointing devices
- Display: XGA (1024*768 pixels) or higher resolution monitor with 32 bit color settings
- Miscellaneous: USB Interface, Power adapter, etc

3.2 Software Requirements

- Operating System: Linux or Cent OS
- Programming Language – Backend: Core Java, Advanced Java, J2EE, Map Reduce Framework, MVC Framework
- Programming language - Frontend: Bootstrap Framework, HTML, CSS, JavaScript, Ajax, JQuery
- Development environment: Eclipse Oxygen IDE
- Application Server: Apache Tomcat v9.0

4. THE MODEL

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could see it as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering.

If the broader topic of product development "blends the perspective of marketing, design, and manufacturing into a single approach to product development," then design is the act of taking the marketing information and creating the design of the product to be manufactured. Systems design is therefore the process of defining and developing systems to satisfy specified requirements of the user.

Until the 1990s systems design had a crucial and respected role in the data processing industry. In the

1990s standardization of hardware and software resulted in the ability to build modular systems. The increasing importance of software running on generic platforms has enhanced the discipline of software engineering.

Object-oriented analysis and design methods are becoming the most widely used methods for computer systems design.[citation needed] The UML has become the standard language in object-oriented analysis and design.[citation needed] It is widely used for modeling software systems and is increasingly used for high designing non-software systems and organizations.[citation needed]

System design is one of the most important phases of software development process. The purpose of the design is to plan the solution of a problem specified by the requirement documentation. In other words the first step in the solution to the problem is the design of the project.

The design of the system is perhaps the most critical factor affecting the quality of the software. The objective of the design phase is to produce overall design of the software. It aims to figure out the modules that should be in the system to fulfill all the system requirements in an efficient manner.

The design will contain the specification of all these modules, their interaction with other modules and the desired output from each module. The output of the design process is a description of the software architecture.
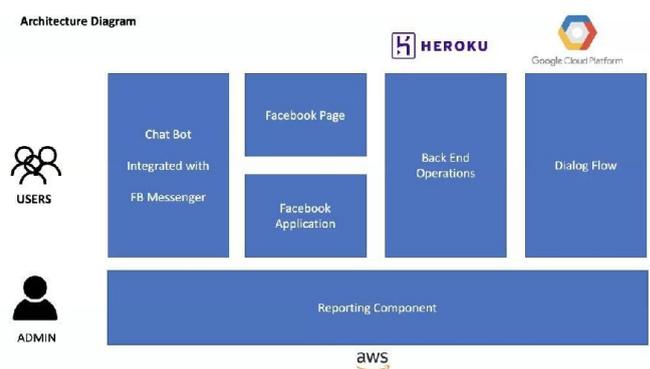

Figure 4.1 : Architecture Diagram

4.1 Implementation of Chat Bot

A chatbot is an AI-based software designed to interact with humans in their natural languages. These chatbots are usually converse via auditory or textual methods, and they can effortlessly mimic human languages to communicate with human beings in a

human-like manner. A chatbot is arguably one of the best applications of natural language processing.

We integrate the chatbot with the Facebook messenger application so that the user can experience the real time working of a chatbot. For this purpose, we need to enable the developer access on our Facebook account and create a dedicated page for this purpose. And then make necessary settings to ensure the page's messenger access has been given to the Facebook application, which will read the user messages and processes it for finding the emotion and then reply to them accordingly.

For interacting with the users messages, we make use of Google Cloud Platform's DialogFlow engine.

4.2 Sentiment Analysis of the User's messages

In this module, we implement the Sentiment Analysis component for analysing the emotions of the user's messages. For this purpose, we make use of the Sentiment analysis APIs available in the Google Cloud Platform.

The Dialog flow engine while processing the user message, will run the sentiment analysis algorithm on this input and provides the details of the analysis for our Heroku application where we decide what to respond to the user.

We determine the sentiment score for each of the users' messages and if the sentiment score is extremely low, we understand that the user is unhappy with the chatbot and we arrange for call back to the user from the support team.

4.3 Admin Portal Access

In this module, we provide a web interface for the admin of the application where he/she can prove his authorization to get access to the reporting portal. Since this module is used only by the admin, we do not expose the registration module to public. Instead, the admin password will be predefined in the application source code.

4.4 Reporting Component

In this component, we provide access to the complete report of the Chatbot operations with the end users to the admin. This reporting component will help the admin to understand how chatbot is behaving with users, number of users interacting with chatbot, sentiment analysis of the users, and much more. This kind of insights are very helpful for the admin in making some of the important business decisions.

4.5 User Interface design for the model

Here, the front end interface will be designed so that the end users can interact with the model with ease. User interface design (UI) or user interface engineering is the design of user interfaces for machines and software, such as computers, home appliances, mobile devices, and other electronic devices, with the focus on maximizing usability and the user experience. The goal of user interface design is to make the user's interaction as simple and efficient as possible, in terms of accomplishing user goals (user-centered design).

Good user interface design facilitates finishing the task at hand without drawing unnecessary attention to itself. Graphic design and typography are utilized to support its usability, influencing how the user performs certain interactions and improving the aesthetic appeal of the design; design aesthetics may enhance or detract from the ability of users to use the functions of the interface. The design process must balance technical functionality and visual elements (e.g., mental model) to create a system that is not only operational but also usable and adaptable to changing user needs.

Interface design is involved in a wide range of projects from computer systems, to cars, to commercial planes; all of these projects involve much of the same basic human interactions yet also require some unique skills and knowledge. As a result, designers tend to specialize in certain types of projects and have skills centered on their expertise, whether it is a software design, user research, web design, or industrial design.

4.5 Cloud based deployment process of the model

Here, the model will be deployed on a cloud server to make the solution accessible across the geographical areas.

For the cloud deployment process, we use either of Heroku Cloud Service provider for our need.

5. CONCLUSIONS & FUTURE WORK

By referring to a few of the papers we have come to the conclusion that understanding of the human emotions in the converse is guaranteed and this our basic concern. In this ,we proposed a chatbot which will give responses to the users with some emotions. This mechanism is aimed to model the emotional factor which is present in a text. The main aim of this emotional chatbot is to show the emotion that chatbot is able to generate the responses proper not only in context but also with an emotion.In

Future, we work to extend this work to other messenger applications like WhatsApp, Telegram, etc.

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