A comparative Evaluation of Technologies Deployed for Chatbot-II

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ABSTRACT:

In today's world everybody is covered with various new technologies. Nobody can imagine their life without these ICT (Information and Communication Technology) because these tools can make everybody's life so easy and time saving. Similarly, whenever a person can visit any particular website for any purpose instead of going through the full website which is very time consuming today's generation kids look for a chatbot in every website because from that chatbot they can take the answer of their query which can satisfied them instead of searching the full website for a particular program or for any particular thing. With the help of these virtual machines we can do any particular task may be of programming or any other field. We can search anything easily and can get the answers of our queries very easily. These robotic programs are nowadays available on each and every particular website that can interact with the user and can respond to the user's queries and can satisfy them with their answers.

KEYWORDS: -Chatbot, .Net, NodeJs, ReactJS, AI and ML

INTRODUCTION:

Nowadays, this robotic machine which we called as chatbot is the most basic need of every user. These virtual machines can save time and make the work so easy and hand free. Whenever anyone come to interact with any particular website they firstly looking for the chatbot because their first requirement is to open a chatbot and ask for their queries as everyone is comfortable in communicating through chatting rather than on phone calls. In a nutshell, chatbot is a basic need of every website.

Now let's come to know about this virtual machine and their languages.

Analysis of Chatbot:

A chatbot is called a virtual machine that helps us to make our work easy. This chatbot is a machine that help the user to interact with him whenever anyone visit any particular website. A chatbot is a computer program that can understand human language and can interact with the user in their own language. A chatbot can play a very important role in everybody's life. It firstly understand user request and then analyze it and after processing the request and particular entities it respond to the particular request of the customer or any particular user. This machine can respond to the particular request of the user in various ways like in images, text, audio, video etc. Chatbot indulged human beings in a basic conversation through auditory and textual methods. These chatbots are very common nowadays. These chatbots are used in every smart phone, tablet, laptop and computer desktops and many others. These chatbots is a user friendly method to clear one's queries, retrieve information, and give simple directives or to engage oneself in a simple talk. These chatbot are responding to every user single request with the help of internet. These virtual machines are helpful in many ways.

Analysis of various languages:

Now, Let' discuss about various languages which are used for making the Chabot's likes:

.NET: - The .Net is a software development platform. This software was introduced by Microsoft in late 1990 under the NGWS while they are working on a such a platform that can support multiple languages on a single platform. It is also used to create a from-based, console-based, mobile and web-based applications or services that are available in Microsoft environment. The .Net is a pure object oriented language that is very similar to that is very similar to the java language. This language is very similar to java language the working of .net is very similar to java language but the only difference is that it is not platform independence as java. The common language runtime CLR and the .Net framework class library are the two main components of .Net framework. The .Net Framework provide a number of features that help to improve the security, reliability and performance of applications. The platform's API implementing the CLI standard libraries that is the set of libraries that provide the most common functionalities such as file system management, exception handling, network communication, threading, reflection etc. The coreFX component is called the unified base class library.

NodeJs: - NodeJs is a non-proprietary and multi-platform JavaScript runtime environment. NodeJs apps run in a single process without creating a new thread for every new request.Nodejs provide a set of serial I/O primal in its standard reading room that prevent JavaScript code from stalling. Libraries in these are written using non-blocking paradigms. NodeJs can run on many platforms that also help in error detection and error correction. We often use NodeJs for building back-end services like APIs like web app and mobile app. Originators prefer to use NodeJs because it is easily scaling the application in both horizontal and vertical directions. All APIs of NodeJs library are asynchronous and non-blocking. It essentially means a NodeJs based server never wait for an API to return data. The server moves to the next API after calling it and a notifications mechanism of events of NodeJs help the server to get a response from the previous API call. NodeJs uses a single wovened model with event iterating. Event mechanism helps the server to respond in a non-blocking way and makes the server highly scalable as opposed to traditional server which create finite thread to handle appeal. Event appliance helps the server to respond in a non-blocking way and makes the server highly scalable as opposed to traditional servers which create finite threads to handle requests.

ReactJS: - ReactJS work as the frontend framework for JavaScript. ReactJS is a declarative, flexible and efficient JavaScript library that are used for building various UI components. It is a non-proprietary front-end library that are responsible only for the view layer op application. We write react components to create any react app that correspond to various elements. In ReactJS a component takes in parameters called props and returns a hierarchy of views to display via the render method. The render method returns description of what you want to see on the screen. React takes the depiction and exhibit the result. React is a popular JavaScript reading room used for web development. There are multiple ways to represent ReactJS is simple component-based JavaScript UI reading room. It can be used to develop both small and big applications. ReactJS priority goal is to make user interfaces (UI) that make apps load faster. It also uses virtual DOM (JavaScript object), which also helps the ReactJS app run faster. In JavaScript, the virtual DOM is faster than the real DOM. ReactJS can be used on both the server and client-server sides, as well as with other frameworks. It uses data patterns and components to make the code easier to read and make app maintenance easier.

LITERATURE SURVEY:

If we talked about technology so there are multiple programming languages are available that are highly scalable and flexible that support various features provide various features and are used to make various different applications. Todays is the tome and is the world of competition so each and every language provide all the updated features to prove their language. Nowadays, if we talked about a Particular application so that particular application can be built by using various languages where their main work is very similar or we can say that their work is almost similar but those all provide different feature as they vary from languages. When we vary from language to language for

particular application we can experience various different features provided by each particular language. Like in this paper we are talking about chatbot so there are various different chatbot are available that are built by using different applications. We are comparing the three different language in our previous paper like php, python and Pluto are compared in our previous paper and in this paper we are going to compare the other three languages like .net, NodeJs and ReactJS that are very popular languages nowadays and everybody are very familiar with these languages. Each of these language have their own additional syntax and their own additional features so in this we are going to observe that how all these chatbots work similarly by having different features, different syntax and different coding platforms. If we talk about the working of chatbot then we can say that it is a virtual machine that respond to the queries of the human either in the form of text, images, audio video or in the form of speech. In the previous chatbot, the user can ask their queries in the form of text and can get replies in the same form but nowadays, there are various chatbots that take query verbally or in the form of speech and can respond to these queries in the same form. So let's move forward and observe that how chatbot can be developed by using various languages and how it can work.

<u>CHATBOT USING .NET: -</u> Developing chatbot with various languages can gives you the very new experience where you come to know about that particular language n details or in deep.[1] will represent the comparison of chatbot between the various languages and theses chatbots can work very well but very differently from each other. The importance of the research on speech emotion recognition and semantic analysis has increased. The research is primarily applied in companion robot, technology products and medical purpose. In this research, a communication system with speech emotion recognition is proposed. The system pre-process speech with sound data enhancing method in speech emotion recognition and transform the sound into spectrogram by MFCC (Mel Frequency Cepstral Coefficient).[2] Then, Google Net of CNN (Convolutional Neural Network) is applied to recognize the five emotions, which are peace, happy, sad, angry and fear, and the top accuracy of recognition is 79.81%. When applying semantic analysis, the training texts are divided into two categories, positive and negative, and the chatting conversations are conducted in the framework Seq2Seq of RNN (Recurrent Neural Network). The systematic framework of this research has two parts, the client and the server. [3] In this paper, we propose a web application using which the fans, lights and other electrical appliances can be controlled over the Internet. The important features of the web application are that firstly, we have a chatbot algorithm such that the user can text information to control the functioning of the electrical appliances at home.[4] The messages sent using the chatbot is processed using Natural Language processing techniques. Secondly, any device connected to the local area network of the house can control the devices and other appliances in the house. Thirdly, the web application used to enable home automation also has a security feature that only enables certain users to access the application. And finally, it also has a functionality of sending an email alert when intruder is detected using motion sensors.
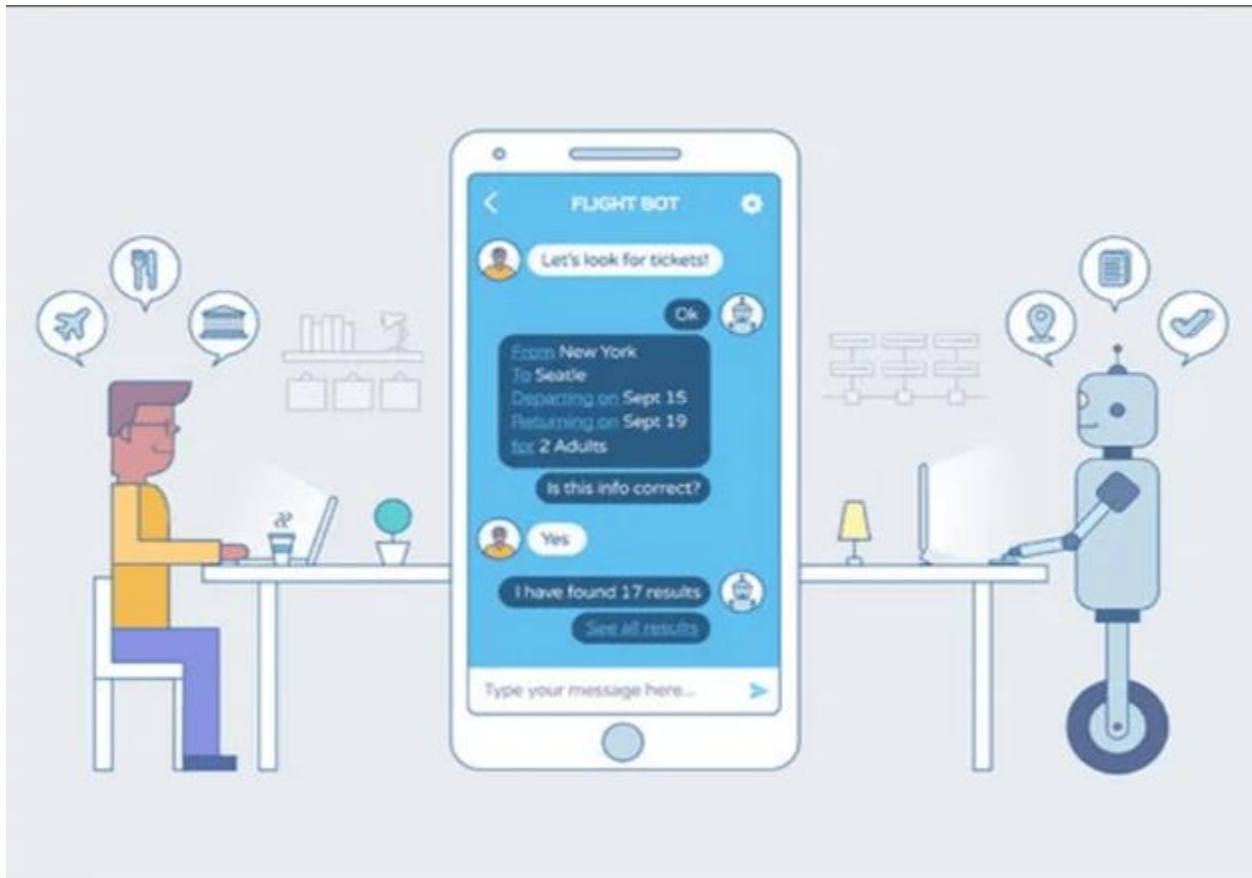
<u>CHATBOT USING NODEJS: -</u> Chatbots [6] are a type of technology that has been used in a variety of areas in recent years, especially as the use of online media has become massively. The development of a chatbot application cannot be separated from the usage of server architecture. Because chatbots, in general, require quite complex processing, so the chosen server architecture and components also determining factors in whether or not the chatbot is capable of performing its tasks. This study tries to discuss designing a chatbot using the web hook concept, where the web hook server will only work when there is a message from the user that needs to be replied to. This concept can reduce the server workload, so the server can focus on the chatbot algorithm to be implemented. Artificial intelligence (AI) has gained tremendous popularity in recent years, and there are a lot of applications that employ this technology to replace humans' roles for tasks. Computers, mobile phones, robots [7], and everyday objects that have embedded computers inside known as the internet of things [8] are all kinds of AI implementation. For example, a voice and text-based automatic answering system based on natural language processing, include Apple's Siri (voice-based) and chatbots (text-based) which are frequently seen in customer-facing web or mobile applications. Artificial intelligence technology can provide benefits such as resource savings (both human and financial) and time savings, as a result, many companies have begun to shift from traditional to digital technology, aided by artificial intelligence [9]. Chatbots are becoming increasingly popular and are being implemented by a wide range domain of businesses because the instant messaging (chat) application is currently the most commonly used way of communication by the entire world's population [10]. Especially since the existence of smartphones, the gap between mobile and PC applications is getting smaller [11], so people can access all kinds of applications through smartphones.
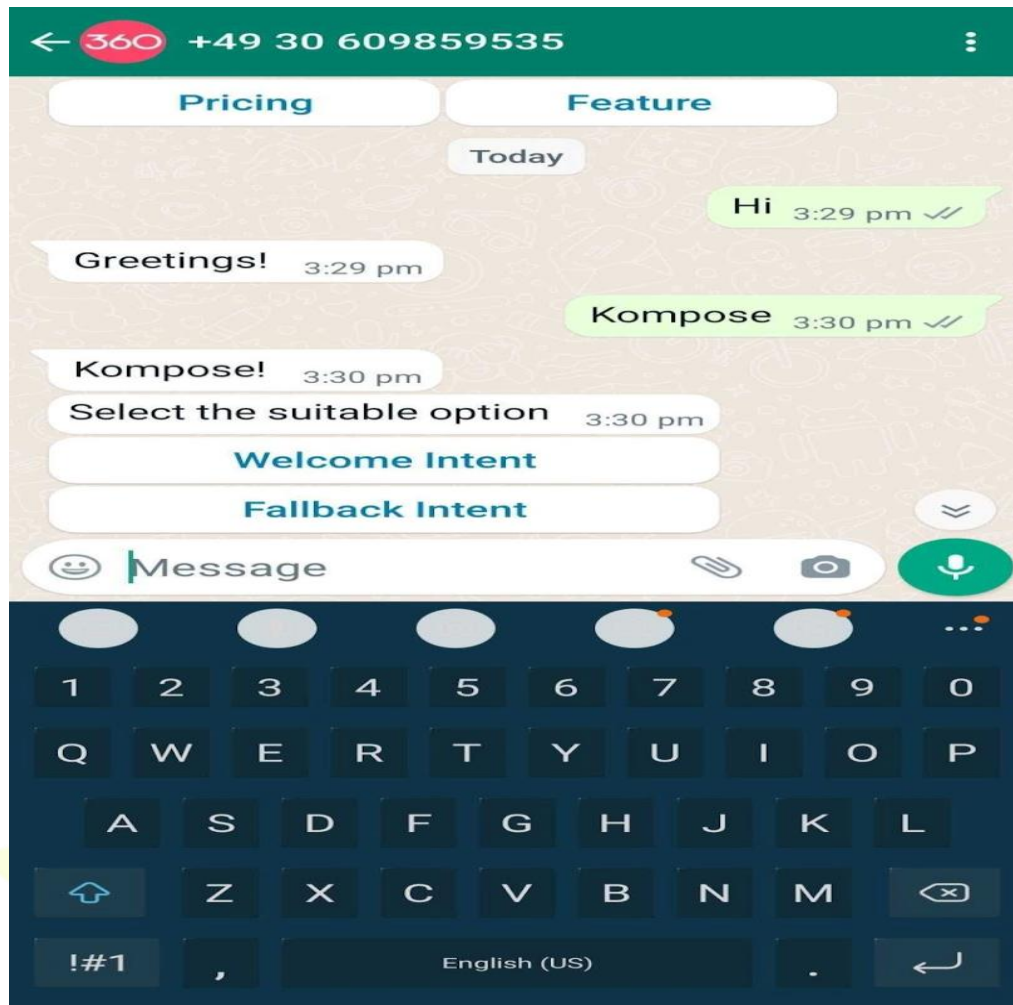
CHATBOT USING REACTJS: - A chatbot is an automated AI software program that allows for human-bot interaction. These conversations can be implemented through text interfaces and voice interfaces. Chatbots have several synonyms such as Chatterbox, Chat Robot, talk bot, bot, IM bot, and virtual assistants. They can be ontology or pattern-based [12]. Businesses are increasingly using artificial intelligence in conjunction with chatbots to interact with customers to provide a more personalized service experience for customers. Examples of such organizations include Lift, Fandango, Spotify, Sephora, MasterCard, Staples, and The Wall Street Journal [13]. In this work, a chatbot will be implemented to solve an e-commerce problem within an academic environment, specifically Covenant University, Ota. Therefore, the goal of this literature review is to study the application of chatbots in various contexts. In the section that follows, studies related to the application of chatbots in e-commerce and non-e-commerce contexts are examined to identify a gap concerning the concept of chatbots within the literature. A chatbot is a computer program that simulates text-based human conversations by generating responses based on input. These programs are made to imitate interpersonal interactions. [15] Government, non-profit, and private entities all utilize chatbots, but primarily business and corporate ones. Their duties may include customer assistance, product recommendations, product inquiries, and personal assistant duties. [16]. A chatbot is an automated AI program that enables communication between humans and bots. Text and speech interfaces can also be used to implement these dialogues. Additionally, chatbots are integrated AI components that run alongside websites and messaging services and, in some cases, act as independent bots. There are many names for chatbots, including Chatterbox, Chat Robot, talk bots, IM bots, and virtual assistants. They may be pattern-based or ontology-based. [18] (SaaS) solutions are frequently used to create chatbots, giving users the option to interact with them via desktop or mobile computers, smartphones, and tablets. [20].
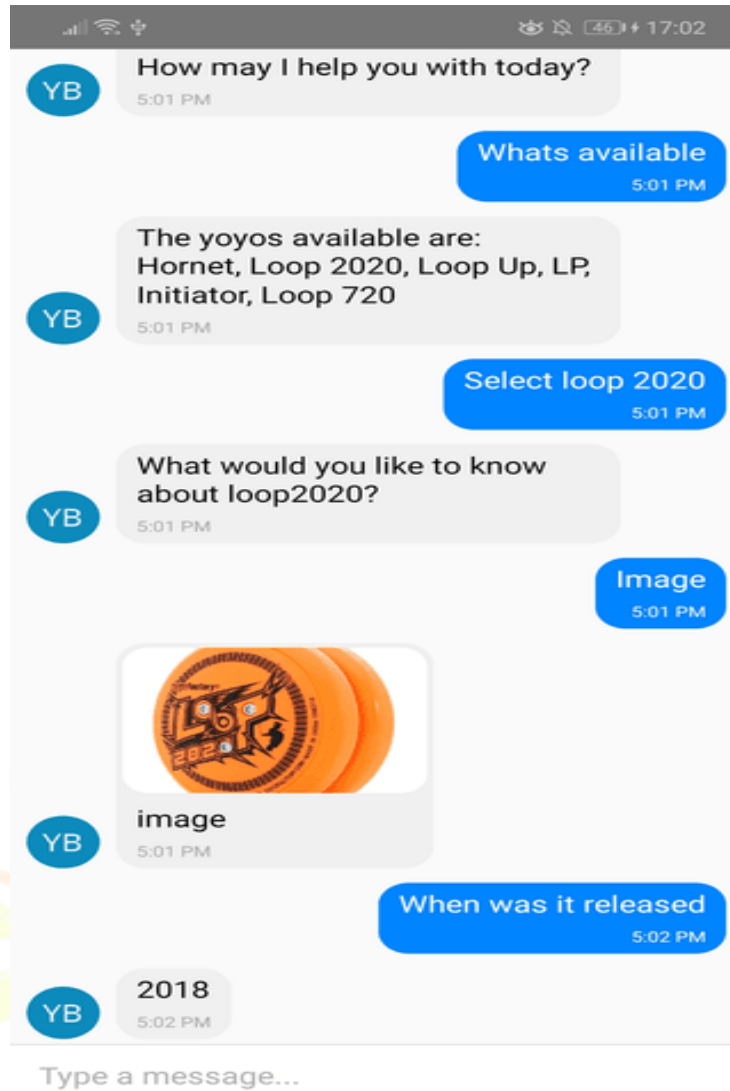
RESULT & COMPARISON DESCRIPTION:

From the whole study and research, we come to a conclusion that all these machines called chatbot or chatterbox are very good in working and all the languages are suitable for making these chatbots but they may vary in their working, features and looks. But they all provide us a good source of information that we need for any particular topic. As these chatbots are vary from language to language in similar way they may vary from their working, looks and features but they all are able to satisfy the user with their provided piece of information. From the above study and research, we come to a conclusion that all these languages are able to build a attractive chatbots that work well in their particular field. There are many advantages and disadvantages of chatbot which are developed in various languages based on their functionalities and features. In this section, we compare all the bots developed in different environments and their results.

S NO.	PARAMETER	CHATBOT USING .NET	CHATBOT USING NODEJS	CHATBOT USING REACTJS
1.	Type	Open source web application	Server side javascript runtime	Front-end javascript library
2.	Language	Javascript	Javascript	Javascript
3.	Architecture	Thread management, garbage collection	Event driven, Single threaded	Component based
4.	Concurrency	Support concurrent blocking and scalable programs	Supports concurrency through non-blocking I/O	Single-threaded, but can be used with tools like Redox for state management and handling asynchronous operations
5.	Execution Environment	Execute in a multi language and execute on a run time environment.	Executes on the server-side	Executes in the browser or on the client-side
6.	Data Handling	.Net can handle data in the csv file that are saved in the database.	Node.js can handle data from multiple sources, including databases and APIs	React.js is focused on handling UI and rendering data, but can be used with other libraries and frameworks for data handling
7.	Modules and Packages	.Net has a large set of modules and packages available through NPM.	Node.js has a large ecosystem of modules and packages available through NPM (Node Package Manager)	React.js has a large ecosystem of libraries and extensions available through NPM, YARN and other sources
8.	Scalability	Perfect for scalability due to allowing simultaneous execution of numerous thread.	Node.js can be easily scaled to handle large amounts of traffic and data	React.js can be used to build scalable UI components, but may require additional tools and libraries for scalability
9.	Learning Curve	.Net can hve considerable learning curve.	Node.js can have a steep learning curve, particularly for developers new to server-side programming	React.js can also have a learning curve, particularly for developers new to component-based UI development
10.	Community	The community of .net is actively fast and it keeps growing every year.	Node.js has a large and active community of developers, with a wealth of resources and support available	React.js also has a large and active community, with many resources and support available

CONCLUSION:

In this paper, we researched about a web-based AI chatbot which is based on Google Assistant API, JavaScript, Python, CSS and HTML. We created text-based input and output web interface and code pattern uses Google API Dialog Flow to control the conversation flow between user and chatbot. This study is a step further to improve the sustainability of car sharing as an environmentally friendly transportation service, thus contributing to sustainability within our society. Moreover, our study provides a valuable method for practitioners. They can generate more data to "stress test" their system via simulation. This could be helpful to prepare for events (e.g., trade fairs), where a higher vehicle demand is anticipated related to chatbot.

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