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A Comparative Evaluation of Technologies Deployed for Chatbot

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ABSTRACT:

Nowadays, many of us are using ICT tools and technologies with many new applications, technology is expanding day by day. All of us are experiencing that most of the website have their own virtual machines that answer our queries and those machines provide a sufficient information that we need related to our query and that virtual machine is referred to as a CHATBOT. It is possible to make these Chatbot using various languages like ***html, css, JavaScript, Pluto, php, python, artificial intelligence and machine learning****. Each of these Chatbot have their own additional features related to their particular language. This paper describes a simple comparison between these Chatbot of various languages. In this article, we present a comparative study between the working and features of various languages used for making Chatbot.*

KEYWORDS: -Chatbot, PHP, Python, AI, Pluto and ML

INTRODUCTION:

During these days, this virtual machine (chatbot) is the basic need of each and every person. 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.
Before discussing further let's just have a short journey of chatbot like what is chatbot and how it is working.

Analysis of Chatbot:

A chatbot is a machine that are planned to imitate conversation with human and users, especially over the information superhighway. In other words, a chatbot has information stored in its database to spot the sentences and making a call itself as response to answer a given question. It is a robotic plan of action that interacts with consumers as a human and costs little to nothing to be interactive. Talkbot can deal withvarious clients all the times of the day and week and are not limited by time or by physical location. Chatbot is a mimic human conversations. The learning ability of chatbot is24/7 presence. They can boost the communication and create real interactions. The user must build an innovative and user-accessible interface for communication. Overloading your bot with attribute and formulatingto ace all undertakings that will set you up for dispiritedness. An instanceof this might be a chatbot that tells you the weather forecast for a location. A recipient might ask for the "weather forecast in London" and the chatbot would find the answer and responding the client. This type of interactive agent is only as smart as the inventor who invented it and convict about every eventuality of conversation.

Analysis of various languages:

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

PHP:PHP basically stands for hypertext pre-processor. PHP is an exceptionally approved scripting language that is used to create dynamic Web pages. It is frequently used to bring the data out of a database on the Web server and admit it on the Web page. PHP can obtain data from forms, create dynamic page content, can work with databases, create sessions, send and receive cookies, send emails, etc. PHP get under way as a small open source project that develop as more and more people found out how useful it was. Rasmus Lerdorf discharge the first version of PHP way back in 1994. It is racially mixed with popular databases, including MySQL, PostgreSQL, Oracle, Sybase, Informix, and Microsoft SQL Server. PHP iszippy at the time of implementation, when it is compiled to an Apache module on the UNIX side. The MySQL server, once begin then it executes even very difficult queries with wide result sets in record-setting time. PHP contribute to a large number of major convention such as POP3, IMAP, and LDAP. PHP4 build pillar for Java and distributed object architectures (COM and CORBA), making entire development for the first time.

PYTHON: Python is a general-purpose interpreted, object-oriented and high-level programming language. It is defined as an interpreted language that does not need to compile to run. Python is an active and interpreted (byte code-compiled) language. It was created to fulfill the need of focusing on code readability and its syntax allow programmer to express their concepts in fewer lines of code. Python is widely used in data science, machine learning, and artificial intelligence because of its simplicity and powerful libraries. Python is a general-purpose which means it is widely used in every field, the reason is it's very simple to understand, scalable because of which the speed of development is so fast and reliable. Python doesn't need any programming background so that's why it's popular amongst developers as well. Python has it's syntax similar to the English language that is easily understandable by human.Since Python is open-source that's why there are many libraries available that make developer's jobs easy ultimately results in high productivity. They easily focus on business logic and its skills in the robotic area where information is available in large data sets.

PLUTO: Object-oriented programming and logic programming are two simultaneously developed areas in Computer Science. They offer better programming technologies than traditional procedural-based approach. Logic programming started in the early seventies as an outgrowth of earlier work in automated theorem proving and artificial intelligence. In the same way, Pluto is an object-oriented logic programming language that supports nearly all key object-oriented features in a logic programming framework, such as object identity, complex objects, class definitions, typing, clause-based methods, encapsulation of data and methods, information hiding, overloading, late binding, polymorphism, class hierarchy, and non-monotonic multiple structural and behavioral inheritance with overriding, blocking and conflict handling. Pluto takes many features from ROL2 and Java. Unlike ROL2 which is seem to be mainly a database query language, Pluto is intended to be a general programming language and includes many programming related features not in ROL2.

LITERATURE SURVEY:

There are many languages that are used for making chatbot. There are many applications also that are consolidating the human appearance and are trying to reproduce human exchange, but in majority of cases the information used for conversation in bot responses are put in the database created by a human specialist. By using the Artificial Intelligence, we can develop different types of chatbots. In this paper, we are going to discuss about the various chatbots that had been developed by using various languages. In this, we are comparing chatbots developed by using three different languages that is, by using PHP, Python and Pluto. 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.

CHATBOT USING PHP:

Developing a chatbot using PHP is very simple as PHP is a simple language. We can develop various panel in chatbot [1] .This chatbot can help the students and teachers in E-learning. The chatbot developed by [1] can be useful to both the teachers and students to solve their doubts and queries quite easily in hassle free manner. There are lot of researches obtainable on the subject chatbot, but they are a little bit difficult to implement as they use various AIML techniques which makes the implementation difficult for the beginners. Similarly, the chatbot would developed on the same platform using same language but the only difference is that [2] is using artificial intelligence mark-up language metadata. The chatterbox[3] provide service that is consistent and it can be enhanced as resources, services, or staff exchange, and provides an interface that engages users in communications. It restore difficult map-reading systems and looping to search the results with more targeted answers, and has the ability to refer thevarious questions to librarians to answers various queries. Some chatbots like [4] provide information like tuition fees, Term Schedule, etc. during their admission procedures or as per their daily needs.

Fig 1.(Chatbot Using PHP) [21]

CHATBOT USING PYTHON:

The days of engaging with a keyboard are over nowadays. Users can interact with systems more and more through voice assistants and chatbots. A chatbot is a virtual machine that can converse with humans using Artificial Intelligence systems in messaging platforms. The chatbot developed using python is more accurate as compared to others [6]. These days there are additionally several Natural Language Processing (NLP) [7] and intelligent systems that could comprehend human language. Artificial intelligent systems learn themselves and retrieve insight by perusing required electronic articles that have been existed on the web. WorldNet calculation [8] and grammatical forms labeling are utilized to distinguish the feeling of the words. User questions are continuously to be checked in the database. If the appropriate response is discovered, at that point that answer is sent to that user. Chatbots after receiving query from user checks confidence [9] score and gives legitimate response to the user question. The keyword match calculation is done where the user inquiry went through 3 keyword matching algorithm [10]. If this matching of keywords fails then at that point query is sent through 2 and 1 keyword matching with the database. Even then if the query doesn't get the right keyword match, at that point the chatbot application sends No Answer Found as a reply. Here each word is mapped to a vector and the vector structure is spoken to in one-hot encoded structure [11] which implies 1 represents the presence of word and 0 for everything else. Natural Language Toolkit (NLTK) is a python library which offers assistance for Natural Language Processing (NLP). The most usually utilized tokenizer is the word-punkt tokenizer [12] which parts the sentences at the blank spaces. The exactness, speed and fruitfulness of the NLTK tokenizers is exemplary. Administrator signs in to the portal and can perform activities like erase invalid answer or to include explicit answer of a specific inquiry.

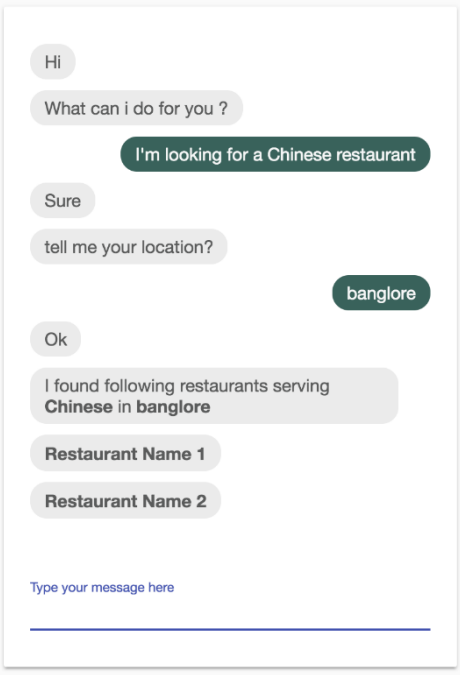

Fig 2.(Chatbot Using Python)[22]

CHATBOT USING PLUTO:

A chatbot has detailed stored in its directory to spot the judgments and making a call itself as responsive to answer a given question [14]. A Talkbot aims to create a discussion between both human and machine.The use of these bots [15] evolved quickly in various fields in recent years, including Marketing, Supporting Systems, Education, Health Care, Cultural Heritage, and Entertainment. In this paper, we first present a historical survey of the evolution of the international community's interest in these bots. Next, we talk about the [16] inspiration that drive the use of Talkbot, and we clarify these bots are very neatness in a variety of areas. Moreover, the high point is the impact of social stereotypes of these chatbots. After explainingall the important technological concepts, we move on the Chatbot's categorization based on various concepts, such as the area of understanding they refer to, the need they serve and others. Furthermore, we attend[17] these general architecture of modern interactive agent while also reference to the main manifesto for their creation. Our positioning with the particular subjects are so far, and they assures us about the expectations of various bots and cheer us to work on them in higher extent and depth. These bots [18] help the user in many ways by answering the various queries of the user.Virtual machine system [19] is able to render to the coaching projects like admission enquiry, fee's structure, academic achievement details, time- table of each department, and details of the documents required to connect etc. With this interactive agent system it'll not difficult for the bot to directly clear their queries in lesser time. Bot machines[20] may be created by using language like AI Mark-up Language (AIML), a language supported XML but they fail to manage complicated doubt as we want a machine that might accomplish plain modules and transaction should be accurate when different questions are asked. The growth of the recognition technology and transmission has made artificial intelligent systems more complicated. The AI machines are proceeding human activities like taking a call at a selected moment, performing daily based tasks. A talkbot may be a proxy that engage with users using painless language. Multiple request of chatbots like Consumer Service, call centers etc. uses AI terminology to speak with user. The prime intention of these bots is to favor a bright human and make it complex for the recipient of the conversation to grasp the important working and capabilities for his or her usage has widely fill out. The chatbots can show decent to fool the user into basic cognitive operation for which they're "talking" to an individual's being, but are very limited in improving their mental object at runtime, and normally have a less to no means of having track of all the colloquial data.

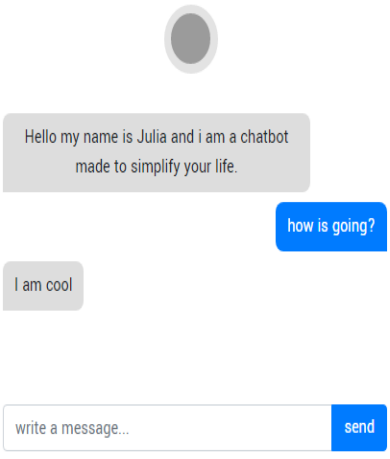

Fig 3.(Chatbot Using Pluto)[23]

RESULT & COMPARISON DESCRIPTION:

As discussed above and from the study of various chatbots we come to a result that all of these languages are good for developing the chatbots but the chatbots may vary in their working looks and features. 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. Table 1 describes the description of the chatbots using multiple languages. There are many platforms, but here we discuss most commonly used platforms, these includes PHP, Python, and Pluto. Similarly, Table 2 describes the comparison of chatbot between these three languages. We show the racially balanced surrounding as well as investigating the table which are used to develop the chatbot based on user requirement.

CHATBOT USING PHP	CHATBOT USING PYTHON	CHATBOT USING PLUTO
• PHP was developed by Rasmus Lerdorf. • The queries and replies can be stored in the backend name as phpmyadmin. • It has user defined queries and replies. • There is no any advancement in the chatbot.	• Python was developed by Guido van Rossum. • The queries and replies can be stored in the Python backend itself. • It has dynamic queries and dynamic replies. • The chatbot can be updated itself timely.	• Pluto was developed by MIT. • The queries and replies can be stored in the backend of Julia programming language. • It has user defined queries and replies. • There is no any advacement in the chatbot.

Table 1.
(Description table of Chatbot Using Various language)

Sr. No	Parameter	CHATBOT USING PHP	CHATBOT USING PYTHON	CHATBOT USING PLUTO
1.	Advancement	Manual	Automatic	Manual
2.	Frameworks	PHP include more number of frameworks as compare to Python such as Laravel, cakePHP, Slim, Symphony.	Python include frameworks such as Django, Flask and Scrapy, but they are less in number as compare to PHP.	It includes frameworks like Gtk.jl, Makie.jl, Blink.jl, Dash etc. but they are less in number as compare to PHP and Python.
3.	Syntax	PHP's syntax is little bit uncommon as compared to python. It has wide range of naming conventions.	Python's syntax is easy to remember as it is more similar to human language.	It provides simple and easy syntax for numerical computations than Python.
4.	Response Type	It supports static responses.	It support static and dynamic responses.	It supports static responses.
5.	Language Type	Scripting language for web development.	General-purpose programming language.	Object oriented programming language.
6.	Library Support	PHP lags in providing wider library support.	Python includes vast library support and packages for various applications.	It also provide wide library support as compare to PHP but not as vast like Python.
7.	Lines of Code	PHP does not provide wide range of library support due to which lines of code increases.	Python support a large variety of libraries that we just need to import in our code and use them instead of writing a lot of lines of code.	Here, Lines of code are less as compared to PHP but more as compare to Python due to its vast library support.

8.	Complexity	PHP includes more lines of code that results in more complexity.	As Python includes few lines of code so it is less complex.	As Pluto include more lines of code than python so it is more complex.
9.	Security	It is less secure because vulnerability can be created due to malicious code.	Python is more secure as its Django function provides high security, which helps in protecting the system from cyber threats.	Not secure because of non-availability of security functions.
10.	Performance	The latest versions of PHP -- **Zend** and **PHP 8.1** are almost 3 times faster than python programs that leads to its better performance rate.	As Python is dynamically typed interpreted language, it is slow as compared to other compiled languages like PHP and Pluto.	Pluto have high performance rate because it uses Just-in-time compiler i.e. we don't need to compile the program before running it.

Table 2
(Comparison table)

CONCLUSION:

In this paper, we have provided a survey of relevant chatbots based on different languages. We access the worth of chatbots based on their achievement and we found that their knowledge base and conversational properties are comparable to various languages. To be more effective in future, chatbots need many improvements such as ability to hold longer conversation and ability to learn from past experiences. In this survey, we observe the various chatbot and their working. So at the end, we conclude that all the chatbots have their own additional features and all these are important based on the user's requirement. All the chatbots provide different results as the need of the user is also different. In short we can say that, Chatbot acts as a best tool which provide one of the quick ways to interact with users. It is very helpful for the users as it accepts the user input in natural language and desired information is obtained by the users requesting for queries. It is the most important function of every business.

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