IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

NATURAL LANGUAGE PROCESSING : A CHAT BOT APPLICATION

Yadnyesh Dubla, Sweety Wade, Nagnath Ipper
Computer Science, VCET Vasai, India

DOI:

ABSTRACT

This paper presents the design and development of an intelligent chat bot with natural language processing. The paper presents a technology demonstrator to verify a proposed framework required to support such a bot (Spring framework). Communication structure uses wildfly server for clients communication. By introducing an artificial brain, the web based bot generates customised user responses, aligned to desired character. Question asked to bot, and response is archived, improving the artificial brain capabilities for future generation of response.

KEYWORDS: JAVA, Spring Framework, AI.

INTRODUCTION

Web bots were created as a text based web friends, entertainer for user. Chat bot is a industry term, yet in a starting stage that may be useful for small or big organization. Such a friendly bot could, hence also function as a trainer providing realistic and up-to-date response. The convenience will be improved if system provides natural language processing. This is the problem address by paper. Today many organization or companies prefer to use different department of employees for communication. This paper meets the requirement by providing a web based interface for clients which is easily accessible through the client browser, which will help the user to track the live data with organization's system, without communicating with support team. The conversation is based on knowledge sharing and improve yourself for next data processing. The proper response is generated on the level of intelligence.

The process of an online chat system follow client server approach which acquires signal and streams to the server. The input text is processed and response is generated. This process having two stage. First stage is input text is properly spelled or not, called as natural language process and in next stage that input string goes through chat bot engine to get appropriate response. Response is made on server side. This model follows client server approach.
Server response generation can be broken into two categories : data retrieve and information output. The core focus of this paper is to improve information output by generating a response that is relevant to request, factual and personal.

MATERIALS AND METHODS

1.SYSTEM ARCHITECTURE

The system consists of the following three components : client, server and middelware. The server which is wildfly server gives three different approaches to configure and manage servers : a web interfaces, command line and set of XML configuration. We are using web interface and command line configuration to run chatbot.

Client will connect to server using spring framework for chatting. Server is capable to handle multiple request to generate appropriate response. This process place a large processing requirement on server's processor and memory resources. This limitation is even more evident when a larger number of users are to be simultaneously accommodated on system.

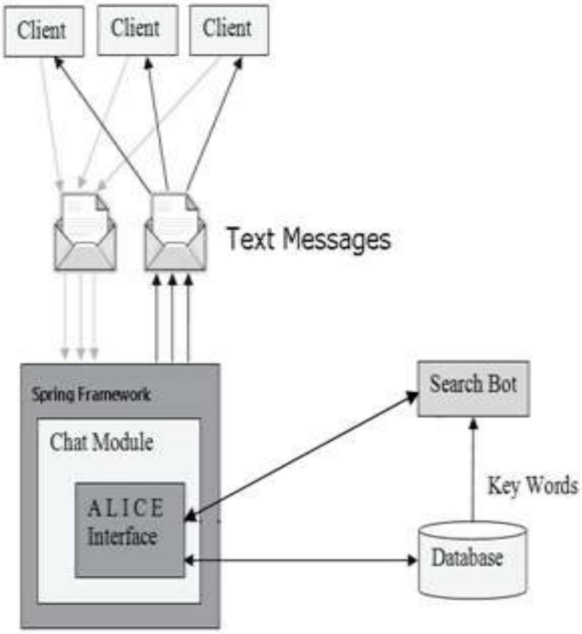

Fig.1

The server processes all received queries and provides response using response generation module which makes use of data repository with database. Data repository is updated by the content retrieve module to increase intelligence automatically. With this approach, external administrator is only required to verify the quality of updated content.

2. SYSTEM SPECIFICATION

The system presented in this paper meets the following requirements :

- The application is easily accessible through client browser.
- All the communication from to and end from the server is text.
- End user will get updated data from repository.
- Chatting process involves registration of end user based on given input as well as captcha secured integration. Admin module for system checks user data for security purpose and if any queries which are not handled by chatbot are get resolved.
- The user is allowed to register and login to the proposed system allowing for authenticated, personalized, and controlled communication with server.

3.OPEN SOURCE APPROACHE

There are number of available libraries and open source technologies to implement the specification presented in paper. This approach allows new implementation of paradigm of using existing libraries and technologies to create custom implementations using open source technologies.

RESULTS AND DISCUSSION

The main language used to develop the demonstrator of this paper is JAVA, and front end console is embedded using JSP(Java Server Pages). JSP uses HTML tags to render page. This approach of hiding JAVA component from end user creates illusion of simplicity. The database server is managed using MYSQL and backend server is managed using WildFly server. Both this server are open source which means free of cost. We are using Spring Framework to implement this paper.This is open source framework and easy to manage. Required libraries are available on internet to processed further.The code segment below illustrate the database connection for our project.

```
<beans:bean id="dataSource" class="org.apache.commons.dbcp.BasicDataSource"
        destroy-method="close">
   <beans:property name="driverClassName"
            value="com.mysql.jdbc.Driver" />
   <beans:property name="url"     value="jdbc:mysql://localhost:3306/webchatbot" />
<beans:property name="username" value="root" />
</beans:bean>
```

Communication with server is text based. The interface was generated using JAVA based architecture Spring. This process generates interface below.

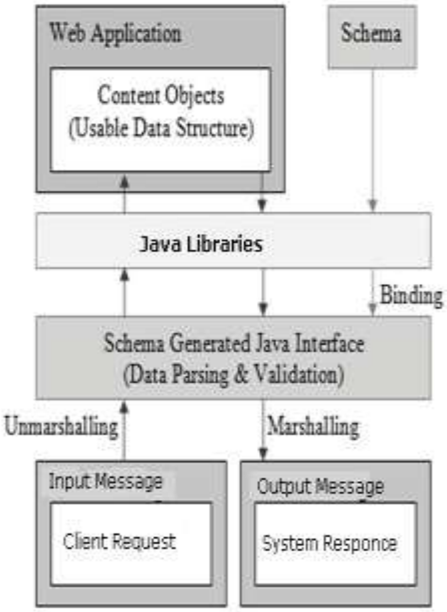

Fig.2

Spring Frameworks works on beans.

```
<beans:bean id="transactionManager" class="org.springframework.orm.hibernate4.HibernateTransactionManager">
        <beans:property name="sessionFactory" ref="hibernate4AnnotatedSessionFactory" />
</beans:bean>
```

In response generation it uses core java technology. Following snippet gives idea regarding same.

```
String[] data = info.getQuestion().split("\\|")
List<String> que = Arrays.asList(data);
for(String t : que)
{
                                        if(message.trim().contains(t.toString().trim()))
                          {
```

```
                result=info.getAnswer();
                break;
        }
}
```

CONCLUSION

The combination of natural language processing and intelligent chat bot allows for the simpler experience which allows client to run on many type of platform. Since client is not internet based, next step would be Internet based or mobile based. The use of distributed frameworks allows for an increase in throughput and the number of users it can handel. The lifetime of expert system can be limitation to age of the technology demonstrator presented in this paper.

ACKNOWLEDGEMENTS

We thank Prof. Vikrant Agaskar(Computer Science) for assistance with our Research on chat bot for college and in area of Natural Language Processing for comments that greatly improved the manuscript.

REFERENCES

[1] Steven Bird,Ekan Klein,and Edward Loper(2009).Natural Language Processing with Python

[2] David M.W. powers and Christopher C.R. Turk(1989).machine learning of natural language.springer-verlag.ISBN 978-0-387-19557-5

[3] A.L.I.C.E(artificial Linguistic Internet Computer Entity) also referred as Alicebot.