AN INTELLIGENT BEHAVIOUR SHOWN BY CHATBOT SYSTEM FOR BANKING IN VERNACULAR LANGUAGES

A PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

In

COMPUTER SCIENCE AND ENGINEERING

ANAND INSTITUTE OF HIGHER TECHNOLOGY

ANNA UNIVERSITY:CHENNAI 600 025

MARCH 2019

BONAFIDE CERTIFICATE

Certified that this project report **"AN INTELLIGENT BEHAVIOUR SHOWN BY CHATBOT SYSTEM FOR BANKING IN VERNACULAR LANGUAGES"** is the bonafide work of **M.RAJBABU (310115104067) and P.PRABHURAJ (310115104059)** who carried out the project work under my supervision.

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ACKNOWLEDGEMENT

First and foremost, we thank the almighty, for showering his abundant blessings on us to successfully complete the project. Our sincere thanks to, our beloved "**Kalvivallal" Late Thiru T.Kalasalingam, B.Com., Founder** for his keen interest and affection towards us.

Our sincere thanks and gratitude to **SelvaRatna "Illayavallal" Shri Dr.K.Sridharan, M.com., Ph.D., Chairman, Dr. S.Arivazhagi, M.B.B.S., Ph.d., Secretary** for giving us the necessary support during the project work. We convey our thanks to **Dr.K.Diwakar, M.E., Ph.D., Principal** for his support towards the successful completion of this project.

We pay our grateful acknowledgement and sincere thanks to **Prof. Dr.S.Roselin Mary, Ph.D., HOD/CSE**., Internal Guide **Mr.S.Jeyabalan, M.Tech.,** for their better guidance and constant encouragement in completing this project to make it a successful one.

We also thank all the Faculty members of the Department for their commendable support and encouragement to go ahead with the project in reaching perfection.

Last but not the least our sincere thanks to all our parents and friends for their continuous support and encouragement in the successful completion of our project.

ABSTRACT

A Chabot is a software that is used to interact between a computer and a human in natural language. Chabot are extended in real life, such as help desk tools, automatic telephone answering system, business, e-commerce, service provided companies Chabot is in essence, a piece of robotic software used to imitate human conversation through text chats. In this paper proposal is carried on to explain the design of a Chabot that specifically tailored as resolving the query about banking system in two languages. Chatbots are actually a stateful services, remembering commands in order to generate solution for it. When Chabot technology is integrated with popular web services it can be utilized securely by an even larger audience. The User can ask the question any bank-related activities through the chat-bot without physically available to the bank for inquiry. The System analyses the question and then answers to the user. With the help of artificial intelligence, the system answers the query asked by the user. The system replies using an effective Graphical User Interface as if a real person is talking to the user. The user just has to register himself to the system and has to login to the system. The chat-bots consists of core and interface that is accessing the core in (MySQL).Natural language processing technologies are used for parsing, tokenizing, stemming and filtering the content of the complaint.

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LIST OF ABBREVIATIONS

SYMBOLS	ABBREVIATIONS
SQL	**S**tructured **Q**uery **L**anguage
API	**A**pplication **P**rogram **I**nterface
PHP	**P**ersonal **H**ome **P**age
AIML	**A**rtificial **I**ntelligence **M**arkup **L**anguage
NLP	**N**ode **L**anguage **P**rocessing
CSS	**C**ascading **S**tyle **S**heet
HTTP	**H**yper **T**ext **T**ransfer **P**rotocol
GUI	**G**raphical **U**ser **I**nterface
FAQ	**F**requently **A**sked **Q**uestions
CSCL	**C**omputer **S**upported **C**ollaborative **L**earning
NLD	**N**atural **L**anguage **D**ialog System

CHAPTER 1

INTRODUCTION

Chabot are extremely valuable for businesses and this value will only increase as time goes by. On obvious area of Chabot implementation is customer service. Waiting on hold may soon be a thing of the past as they become advanced enough to deal with basic level customer services queries and this had made their technical support much more responsive and immediate. This has resulted in significant cost reduction.

The ability to identify the user's intent and extract the data and relevant entities contained in the user's request is the primary condition and the most relevant step at the core of a Chabot. If Chabot are not able to correctly understanding the user request, it won't be able to provide correct answers. The Chabot must identify the user context to manage the conversation state, flow and branching. The proposed Chabot identify the user context that helps to trigger the particular intent alone for generating response to the user.

When an intent is triggered, Chabot will make a HTTP POST request to webhook with a JSON object containing information about the matched intent. This Chatbot implemented in two languages English and Hindi. These multi-lingual languages can works by sending a query and receiving response. It is easy to use for people who suffered in English language and helps to resolve the banking queries without physically available to bank. Initially user have to register themselves to the system and access the chatbot using login portal. After login the session of particular user is generated and chat box is displayed where user can chat by asking queries (either in English or Hindi) related to banking activities. The system will reply to the user in two languages(English and Hindi) with the help of effective graphical user Interface(GUI).The user can query about the banking related activities with the help of this web application. Banking

related activities such as common FAQ’s , Documents required, Queries about loans, Creating accounts, Current Interest rate. It will help the user to be updated about the banking activities.

1.1 OBJECTIVE

To create an web application which is able to build a platform that uses artificial intelligence to analyze the queries regarding bank related activities in two languages English and Hindi. The user can ask queries in either of these two languages, the chatbot response to the user by these two languages.

1.2 SCOPE

This chatbot targets wide range of people who struggled to ask queries regarding bank related activities without physically available to the bank for inquiry. It builds the effective communication between the user and bank and there is always a updation in knowledge about the banking system.

CHAPTER 2

LITERATURE SURVEY

TITLE **:** Designing a Chatbot that Simulates an Historical Figure

AUTHOR **:** Emanuela Haller, Traian Rebedea

PUBLICATION **:**19th International Conference on Control Systems and Computer Science, 2013

Concept Discussed

This project is to identifying the most important facts in texts describing the life (including the personality) of an historical figure for building a conversational agent that could be used in middle-school CSCL(computer-supported collaborative learning) scenarios.

Work Done

To develop an application that can receive as “input” a plain text or a web page about the historical figure and has as “output” a trained conversational agent which is able to answer all kind of questions about the life experience of that specific person.

Problem Identification

The purpose is to provide a generic solution to this problem, so the goal is not to simulate the life and behavior of particular person. Rather, we would like the bot to automatically acquire as much information about the life and personality of the simulated person so that it can act accordingly.

Knowledge Gained

The paper is related to how a program can automatically extract structured data from plain text in order to “import” the life events and thus the personality

of the artificial entity. The first concern is to identify open and, to some extent, reliable sources of information to extract your knowledge from some good choices are Wikipedia (http://www.wikipedia.org/) and DBpedia (http://dbpedia.org/About), as they provide correct information for a wide range of historical figures.

TITLE **:** An Approach to Enhance Chatbot Semantic Power and Maintainability Experiences within the FRASI Project

AUTHOR **:** Salvatore Gaglio

PUBLICATION **:** IEEE Sixth International Conference on Semantic Computing,2012

Concept Discussed

The paper illustrates the implementation and semantic enhancement of a domain-oriented Question-Answering system based on a pattern-matching chatbot technology. Question Answering (QA) systems can be thought as information retrieval systems which try to answer to natural language queries by returning answers rather than a simple list of document links.

Work done

In semantic Web knowledge has been used in order to improve the capabilities of a language independent conversational agent oriented to solve question answering tasks. It introduced a chain of conversational agents and subdivide questions into domains: definition, measure, list, comparison, factual and reasoning questions. In particular, the first agent has the task of converting Semantic Web knowledge to AIML format, while a second agent deals with the task to detect.

Problem Identification

The main difficulty in building a KB for a chatbot is to handwrite all possible question-answer pairs that constitute the KB. The illustrated approach should be sufficient if the conversation between the chatbot and the user are limited to a very narrow and specific topic.

Knowledge Gained

Natural Language Dialog Systems (NLDs) are an appropriate and easy way to access information. Users can type natural language questions and expect to receive short answers in natural language. Usually, in its simplest form, this approach does not require sophisticated natural language processing or logical inference.

TITLE **:** The ChatBot Feels You – A Counseling Service Using Emotional Response Generation

AUTHOR **:** Dongkeon Lee, Kyo-Joong Oh, Ho-Jin Choi

PUBLICATION **:** IEEE International Conference on Big Data and Smart Computing (BigComp), 2017

Concept Discussed

This paper suggests a introduce a novel chatbot system for psychiatric counseling service. It argue that more reasonable and continuous emotion recognition will make better mental healthcare experiment.

Work done

The service can generate appropriate response using the user input features. In the same time, the user’s emotion extraction be applied according to the user's personal information like age and gender. Also, for the proper response generation, system need to collect pair dataset of user intention and proper

response we expect, the intention previous steps and the right response can be obtained from both manually and automatically which came from the structural data of target domain knowledge pair, such as, knowledge base (KB) or Web document.

Problem Identification

It senses emotional flow through the continuous observation of conversation. Also, we generate personalized counseling response from user input, to do this, we use additional constrains to generation model for the proper response generation which can detect conversational context, user emotion and expected reaction

Knowledge Gained

Emotional intelligence is necessary as an essential function of digital companion. To do this, we need to develop a deep interaction model that recognizes complex and long term emotions in various conversations continuously like interaction between patient and doctor.

TITLE **:** An E-business Chatbot using AIML and LSA

AUTHOR **:** Thomas N T

PUBLICATION **:** International Conference on Advances in Computing, Communications and Informatics (ICACCI), 2016

Concept Discussed

E-commerce is one of the e-business models which mostly do business over the internet. The major drawback of this field is quality of customer service they provide. In every e-business model, customers have to wait for a long time to get response from the customer service representative. As a solution to this problem this chatbot automatically gives immediate responses to the users based

on the data set of Frequently Answered Questions(FAQs), using Artificial Intelligence Markup Language (AIML) and Latent Semantic Analysis (LSA). Template based questions like greetings and general questions will be answered using AIML and other service related questions use LSA to give responses.

Work done

The main disadvantage of AIML is that the developer has to write patterns for all the questions customers could possibly ask. As a solution to this, used the method called LSA which is used to find the semantic similarity between words in vector representation form. For example, vehicle and car has semantic similarity in the vector space according to LSA. So that, the unanswered questions by AIML will be taken up by the LSA part. This technique gives more intelligence to the chatbot.

Problem Identification

This paper illustrates some integrated systems which are added AIML based chatbot to their system to make interaction with user. service provider has spend less cost to provide automated conversational agent instead of human conversational agent. Besides, user get unlimited full time chatting service which make interest user to use this particular service.

Knowledge Gained

It's a difficult task for the developer to give all questions user could possibly ask to the chatbot. This is the major drawback of AIML. The unanswered questions from AIML will be automatically routed to the LSA block.

TITLE : Implementation of ALICE chatbot as domain specific knowledge bot for BRAC U (FAQ bot)

AUTHOR : Johan Rahman

PUBLICATION : BRAC UNIVERSITY, 2013.

Concept Discussed

It implement a domain specific knowledge system to deliver answer to frequently asked questions in BRAC U environment,worked with A.L.I.C.E (Artificial Linguistic Internet Computer Entity) to develop our FAQ chatterbot system.

Work done

This project on a University environment is particularly useful for students' looking for information regarding admission in BRAC U, and its course curriculum. It has domain specific knowledge system is a set of knowledge base consisting of AIML files. AIML files consists of different patterns and templates that relates to FAQ in BRAC U environment and generates responses to them.

Problem Identification

It uses AIML files for interaction between the user and system, so the user need to specify the question in the pattern stored in AIML file.

Knowledge Gained

The primary design feature of AIML is minimal, compared with other chat robot languages, AIML is perhaps the simplest. The AIML pattern language is simple, consisting only of words, spaces, and the wildcard symbols _ and *.

CHAPTER 3

ANALYSIS

3.1 SYSTEM ANALYSIS

System analysis is a problem solving technique that decomposes a system into its component pieces. It is the purpose of the studying how well those components parts work and interact to accomplish their purpose along with of performance accuracy delivered by the system.

3.1.1 PROBLEM DEFINITION

In present scenario, the AIML files for interaction between the user and system, so the user need to specify the question in the pattern stored in AIML file. Since most of the chatbots knowledge base is in AIML format, the user need to specify the exact question in AIML file.

3.1.2 EXISTING SYSTEM

The implementation and semantic enhancement of a domain-oriented Question-Answering system based on a pattern-matching Chatbot technology. Question Answering (QA) systems can be done as retrieving information from the database which already loaded datasets by admin manually. The main difficulty in building a KB for a chatbot is to handwrite all possible question-answer pairs that constitute the KB. In semantic Web knowledge has been used in order to improve the capabilities of a language independent conversational agent oriented to solve question answering tasks.In existing system, introduced a chain of conversational agents and subdivide questions into domains: definition, measure, list, comparison, factual and reasoning questions. In particular, the first agent has the task of converting Semantic Web knowledge to AIML format, while a second agent deals with the task to detect. Natural Language Dialog Systems (NLDs) are an easiest way to access information about the datasets. Users can

type natural language questions and expect to receive short answers in natural language. NLD cant identify the context hided in user queries. It fetch the desired answer from data set which may be incorrect sometimes.

3.1.3 PROPOSED SYSTEM

In proposed system, implement a chatbot that generate dynamic response for banking system queries in two languages. This proposed chatbot identifies the user context which trigger the particular intent for response. Since it is responding dynamic response the desired answer will be generated for user. This proposed chatbot implemented a algorithm called Porter stemmer Algorithm which is used to removing suffixes from words in English. Removing suffixes automatically is an operation which is especially useful in the field of information retrieval. Since using the logon system, sessions are created for every user. If a particular question is not found in the database such questions are answered by the admin person. It enrich the high interactive graphical user interface there by it is ease of use by the user.

3.2 REQUIREMENT ANALYSIS

Requirement analysis, also called requirement engineering, is the process of determining user expectations for a new modified product. It encompasses the tasks that determine the need for analysing, documenting, validating and managing software or system requirements. The requirements should be documentable, actionable, measurable, testable and traceable related to identified business needs or opportunities and define to a level of detail, sufficient for system design.

3.2.1 FUNCTIONAL REQUIREMENTS

It is a technical specification requirement for the software products. It is the first step in the requirement analysis process which lists the requirements of particular software systems including functional, performance and security

requirements. The function of the system depends mainly on the quality hardware used to run the software with given functionality.

Usability

It specifies how easy the system must be use. It is easy to ask queries in any format which is short or long, porter stemming algorithm stimulates the desired response for user.

Robustness

It refers to a program that performs well not only under ordinary conditions but also under unusual conditions. It is the ability of the user to cope with errors for irrelevant queries during execution.

Security

The state of providing protected access to resource is security. The system provides good security and unauthorized users cannot access the system there by providing high security.

Reliability

It is the probability of how often the software fails. The measurement is often expressed in MTBF (Mean Time Between Failures). The requirement is needed in order to ensure that the processes work correctly and completely without being aborted. It can handle any load and survive and survive and even capable of working around any failure.

Compatibility

It is supported by version above all web browsers. Using any web servers like localhost makes the system real-time experience.

Flexibility

The flexibility of the project is provided in such a way that is has the ability to run on different environments being executed by different users.

Safety

Safety is a measure taken to prevent trouble. Every query is processed in a secured manner without letting others to know one's personal information.

3.2.2 NON- FUNCTIONAL REQUIREMENTS

Portability

It is the usability of the same software in different environments. The project can be run in any operating system.

Performance

These requirements determine the resources required, time interval, throughput and everything that deals with the performance of the system.

Accuracy

The result of the requesting query is very accurate and high speed of retrieving information. The degree of security provided by the system is high and effective.

Maintainability

Project is simple as further updates can be easily done without affecting its stability. Maintainability basically defines that how easy it is to maintain the system. It means that how easy it is to maintain the system, analyse, change and test the application. Maintainability of this project is simple as further updates can be easily done without affecting its stability.

3.2.3 FEASIBILITY STUDY

The feasibility of the project is analysed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, Some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- Economic Feasibility
- Technical Feasibility
- Operational Feasibility

Operational Feasibility

It is a measure of how well the solution will work in the organization. It is also a measure of how people feel about the system project. The proposed system is operationally feasible because the level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it.

Technical Feasibility

It is carried out to check the technical feasibility, that is, the technical requirement of the system. Any system developed must not have a high demand on the available technical resources. The system that has been proposed to be developed has been analyzed against several technical criteria and it will have a modest requirement.

Economic Feasibility

It is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research

and development of the system is limited. The expenditures must be justified. Thus the system to be developed will be well within the budget and this can be achieved because most of the technologies used are freely available.

3.2.4 SOFTWARE ANALYSIS

The proposed system will be primarily focusing to implement chatbot system as a web application. The system is developed using a scratch and hosted by a web server. The main advantage of this mode is that it allows the application to balance load. The front-end were developed by materialize-css framework.

Dialogflow

Dialogflow (formerly Api.ai, Speaktoit) is a Google-owned developer of human computer interaction technologies based on natural language conversations. The company is best known for creating the Assistant (by Speaktoit), a virtual buddy for Android, iOS, and Windows Phone smartphones that performs tasks and answers users' question in a natural language. Speaktoit has also created a natural language processing engine that incorporates conversation context like dialogue history, location and user preferences.

Chatterbot

ChatterBot is a Python library that makes it easy to generate automated responses to a user’s input. ChatterBot uses a selection of machine learning algorithms to produce different types of responses. This makes it easy for developers to create chat bots and automate conversations with users. For more details about the ideas and concepts behind ChatterBot see the process flow diagram. The language independent design of ChatterBot allows it to be trained to speak any language. Additionally, the machine-learning nature of ChatterBot allows an agent instance to improve it’s own knowledge of possible responses as it interacts with humans and other sources of informative data.

Python

Python is an interpreted, high-level, general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python has a design philosophy that emphasizes code readability, notably using significant whitespace. It provides constructs that enable clear programming on both small and large scales. Van Rossum led the language community until stepping down as leader in July 2018.Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object-oriented, imperative, functional and procedural. It also has a comprehensive standard library.

HTML

Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web applications. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document. HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded Into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links and other items.

Cascading style sheets(CSS)

Cascading Style Sheets is a style Sheet presentation of a document written in a markup language. is to set the style of web pages and user interfaces written in HTML and XHTML can be applied to any XML document, including plain XML,SVG and other media. It is technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.

CSS is designed primarily to enable the separation of presentation and content, including aspects such as the layout, colors, and fonts. This separation can improve Content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple HTML pages to share formatting by specifying the relevant CSS in a separate .css file and reduce complexity and repetition in the structural content. Changes to the graphic design of a document (or hundreds of documents) can be applied quickly and easily, by editing a few lines in the CSS file they use, rather than by changing markup in the documents.

JavaScript

JavaScript is a high-level, interpreted programming language. It is a language which is also characterized as dynamic, weakly typed, prototype-based and multi-paradigm. Alongside HTML and CSS, JavaScript is one of the three core technologies of World Wide Web content engineering, It is used to make webpages interactive and provide online programs, including video games.

Materialize-CSS

Materialize CSS is a UI component library which is created with CSS, JavaScript and HTML. It is created and designed by Google. Materialize CSS is also known as Material Design. It is a design language which combines the classic principles of successful design along with innovation and technology. Google's goal is to develop a system of design that allows for a unified user experience across all their products on any platform.It is used to construct attractive, consistent, and functional web pages and web apps while adhering to modern web design principles such as browser portability, device independence, and graceful degradation.

XAMPP

XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server possible. XAMPP's ease of deployment means a WAMP or LAMP stack can be installed quickly and simply on an operating system by a developer, with the advantage a number of common add-in applications such as Wordpress and Joomla! can also be installed with similar ease using Bitnami .

3.2.5 HARDWARE SPECIFICATION

The hardware requirement serves as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. It implies what the system must do and must not do it.

CPU type : Intel Pentium 4

Clock speed : 2.0 GHZ

Ram size : 512 MB

Hard disk capacity : 32 GB

Internet connectivity : 3G, 4G

3.2.6 SOFTWARE SPECIFICATION

The Software requirement document is the specification of system, it should include both a definition and a specification of requirement. It provides a basis for creating the software requirements specification.

Language : Python

Front End : Materialize-CSS

Back End : MySQL

Documentation : MS Office

CHAPTER 4

DESIGN

4.1 SYSTEM DESIGN

System design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. It could be seen as the application of systems theory to product development.

4.1.1 Overall Design

The following is a block diagram of the overall design of the proposed system, the user will initially register to the system and there by login to the system. After login a session is created is valid user. User can ask their queries as textual method to chatbot in either English or Hindi. The requested query will search for the user context using NLP, the query process is simple to analyze using conversational webhook file to retrieve the dynamic responses back to the user in both languages.

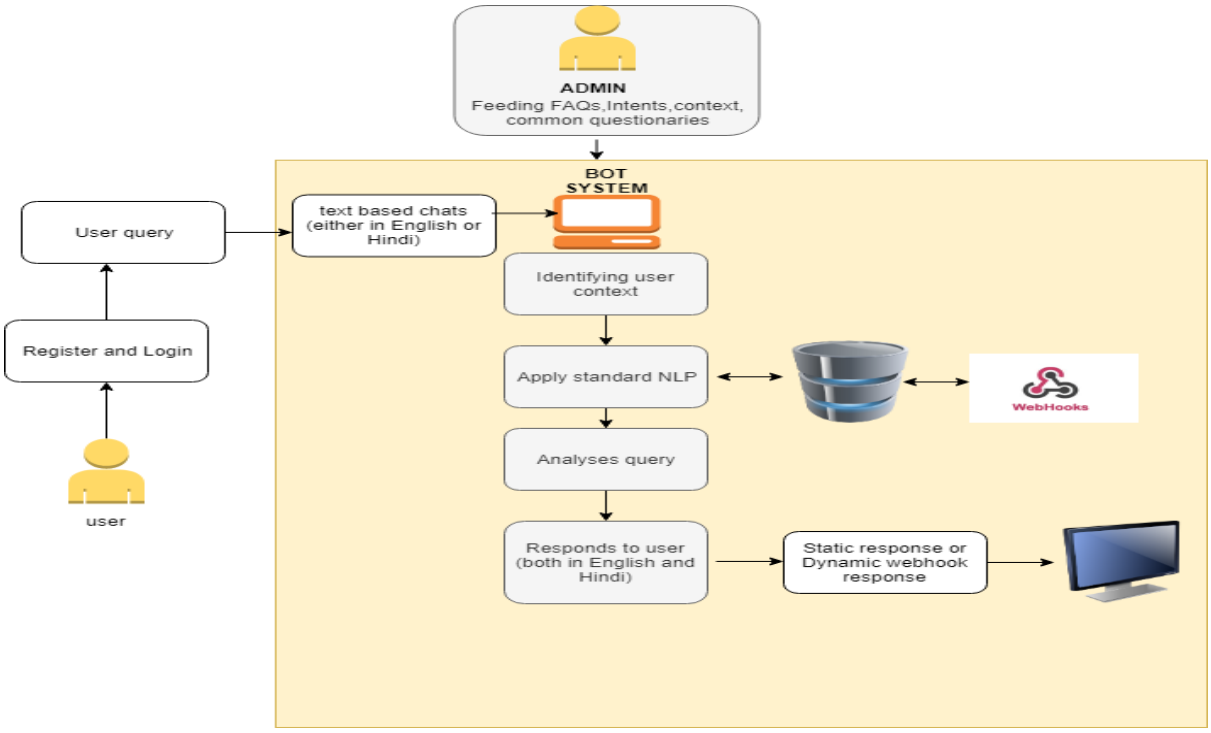


Fig 4.1 Overall Architecture Diagram

4.2 UML DIAGRAMS

4.2.1 USE CASE DIAGRAM

A Use case diagram at its simplest is a representation of user interaction with the system and the specification of the use case. A use case diagram can portray the different types of users of a system and the various ways to interact with system.

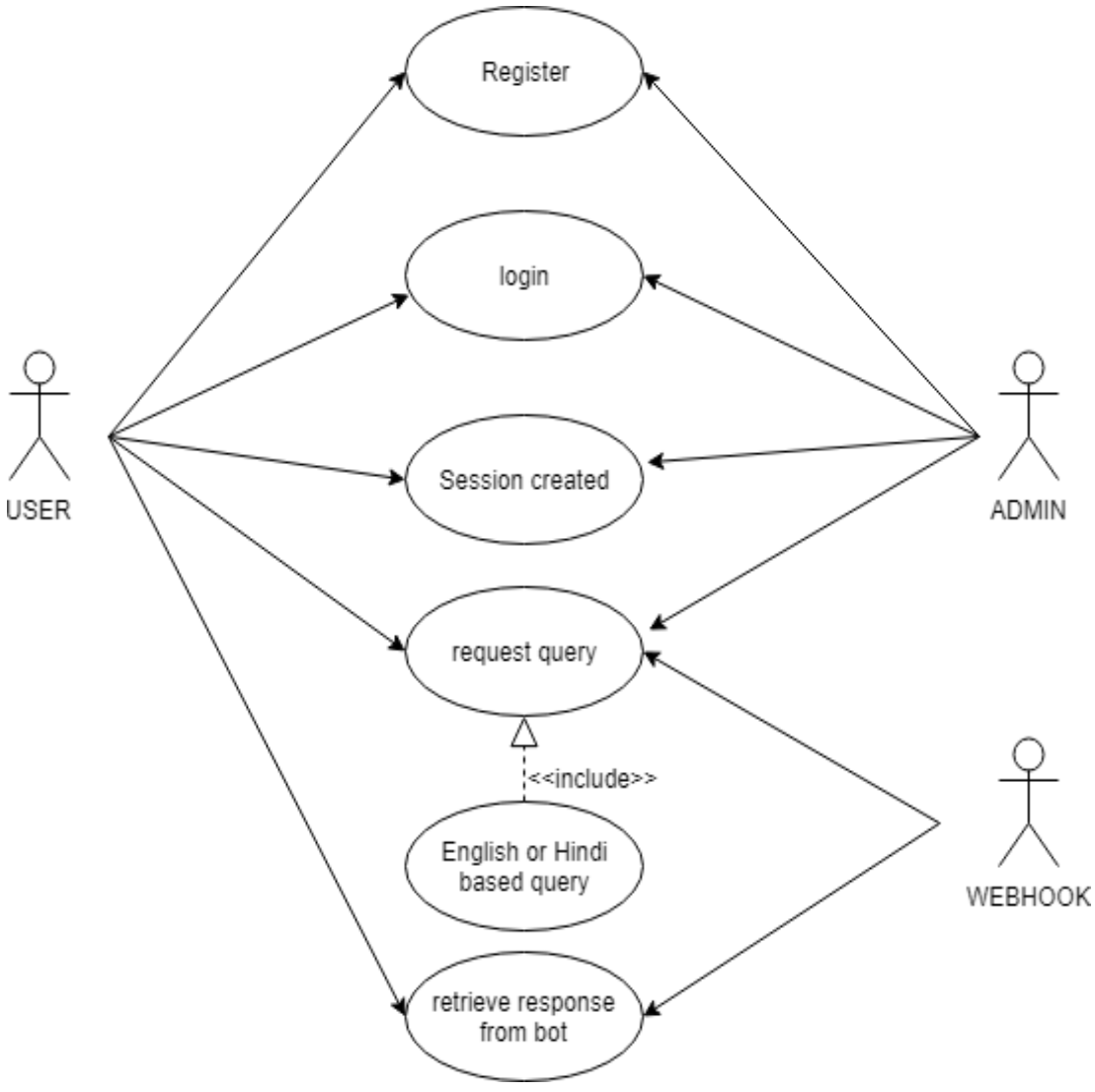


Fig 4.2 Use Case Diagram

4.2.2 CLASS DIAGRAM

Class diagram in the Unified Modeling Language is a type of static structure of system by showing the system classes, their attributes, operations, and the relationships among objects.

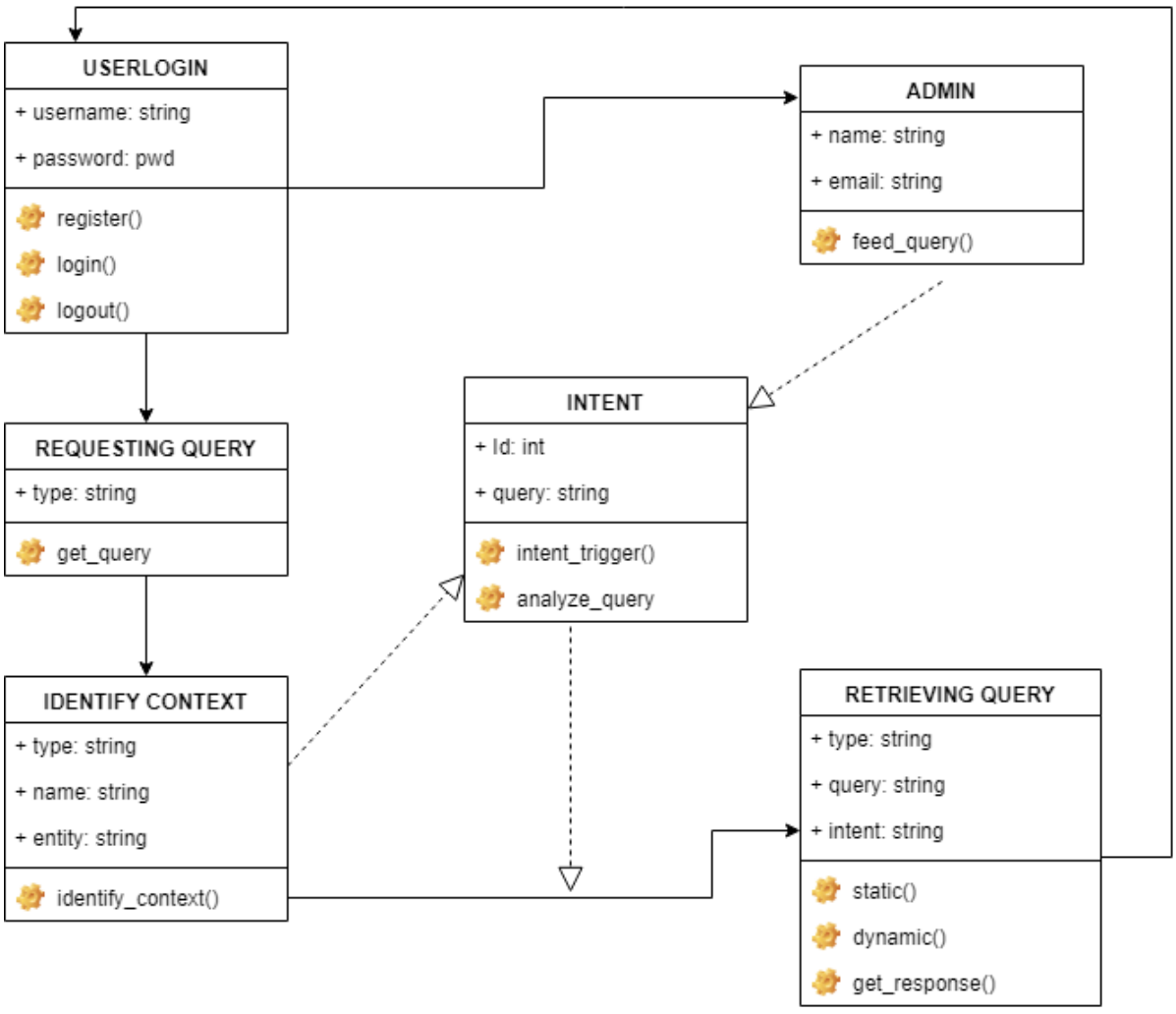


Fig 4.3 Class Diagram

4.2.3 ACTIVIY DIAGRAM

Activity diagram is essentially a flowchart, showing flow of control from activity to activity. Activity diagrams are used to model the dynamic aspects of the system. It shows the overall flow of control.

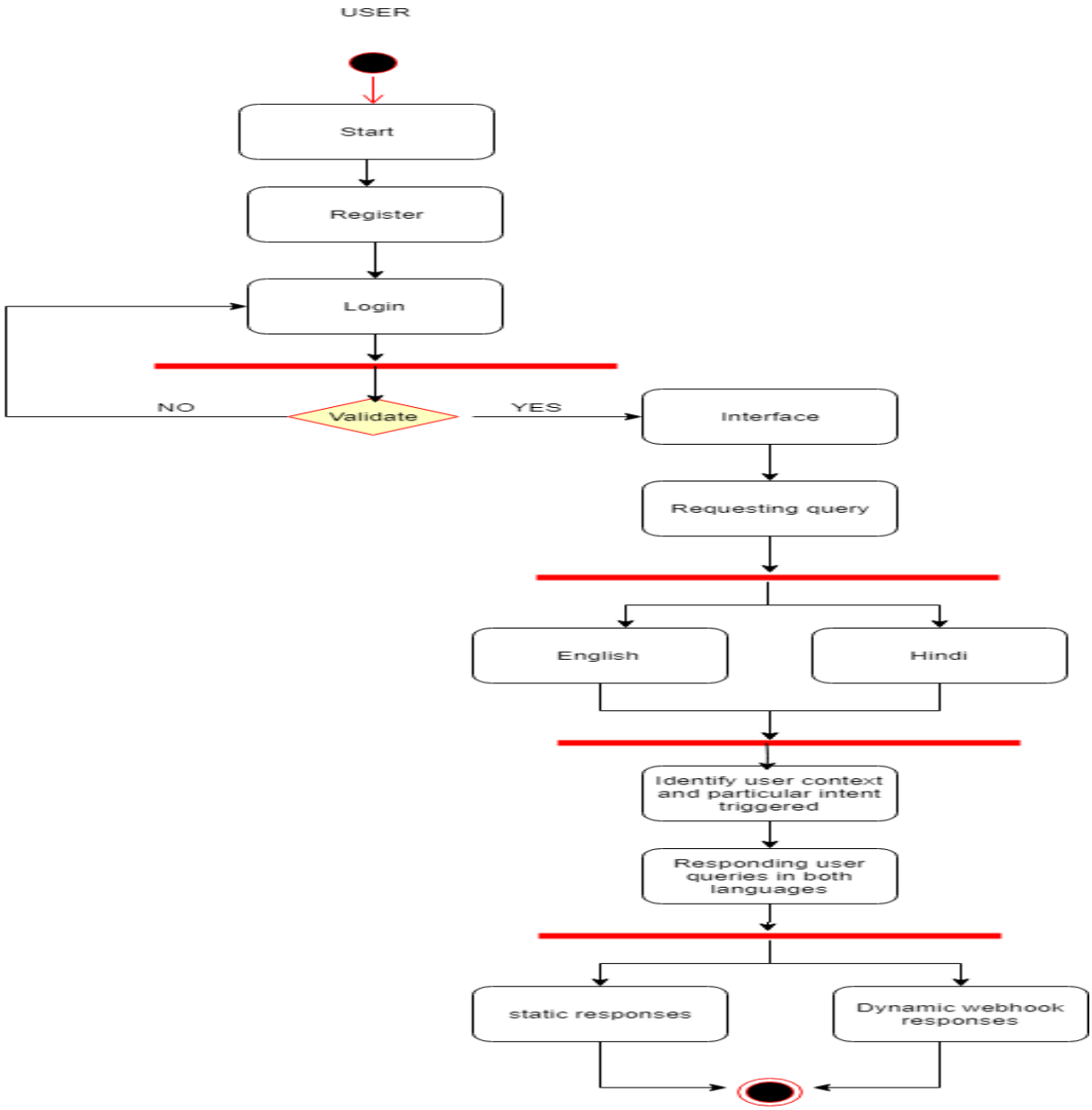


Fig 4.4 Activity Diagram

4.2.4 SEQUENCE DIAGRAM

A sequence diagram is an interaction diagram that shows how processes operate with one another and in what order. It shows object interactions arranged in time sequence.

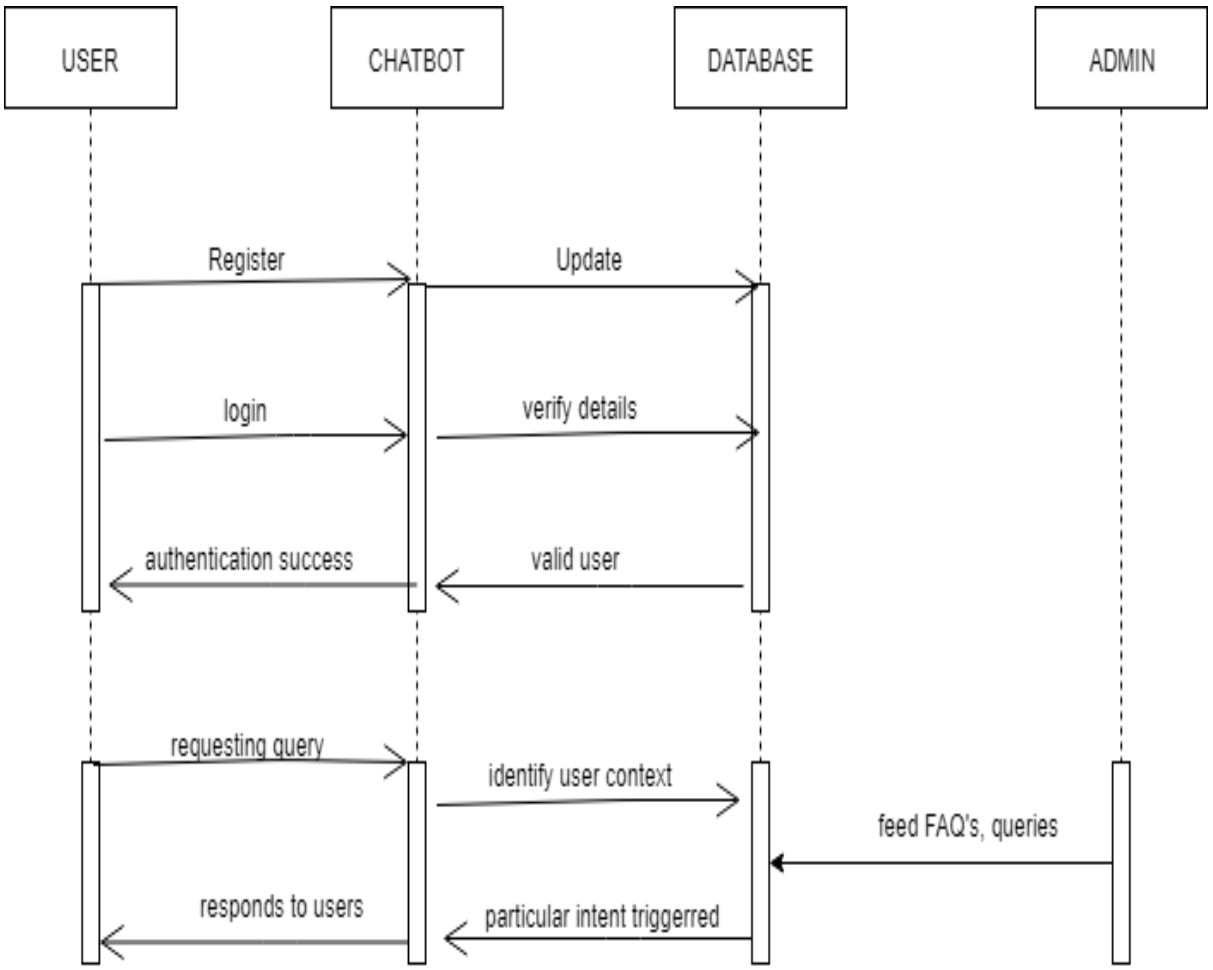


Fig 4.5 Sequence Diagram

4.2.5 COLLABORATION DIAGRAM

Collaboration diagram is a visual representation that shows various software objects interacts with each other and it often comes in the form of a visual chart that resembles a flow chart.

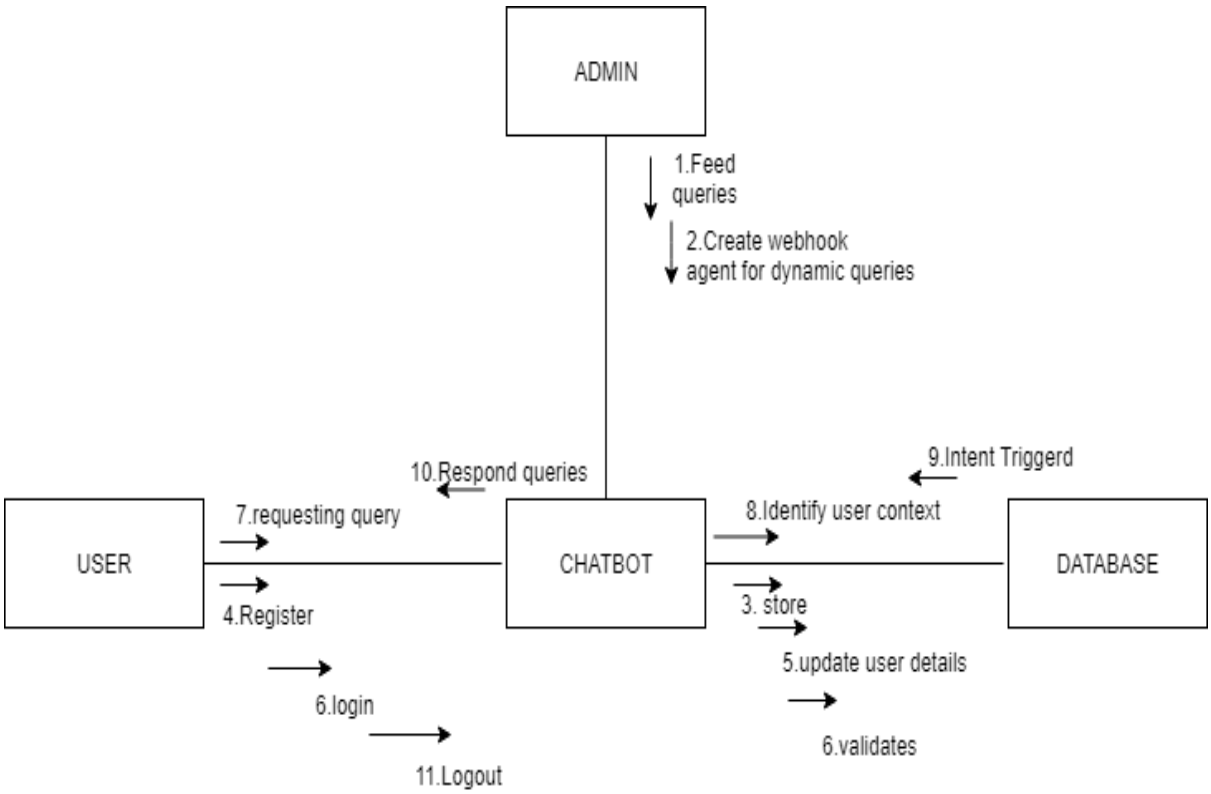


Fig 4.6 Collaboration Diagram

4.3 DATABASE DESIGN

Table 4.1 Database Design for User Login

S.No	Field Name	Field Type
1	Username	Varchar
2	Password	Varchar

CHAPTER 5

IMPLEMENTATION

5.1 MODULES

An Intelligent Behaviour Shown by Chatbot System for Banking in Vernacular Languages contains 5 modules:

- Admin Phase
- Login and Registration
- Requesting user Query
- Identifying User Context
- Retrieving Query Response

5.2 MODULE EXPLANATION

5.2.1 Admin Phase

The admin only makes the entire system performance efficient. The main intension of admin is to feed the queries of bank related activities into system. Unlike, the existing AIML chatbots, the admin have to train the conversational agent in webhook with number of multiple user expressions depends on user thoughts to the system. The webhook loads with many sets of data which helpful to get dynamic responses for user. The following below contents are describe the function of agent training.

5.2.1.1 Agents

Agents are best described as Natural Language Understanding (NLU) modules. These modules can be included in your app, website, product, or service and translate text or spoken user requests into actionable data. This translation occurs when a user's utterance matches an intent within agent.

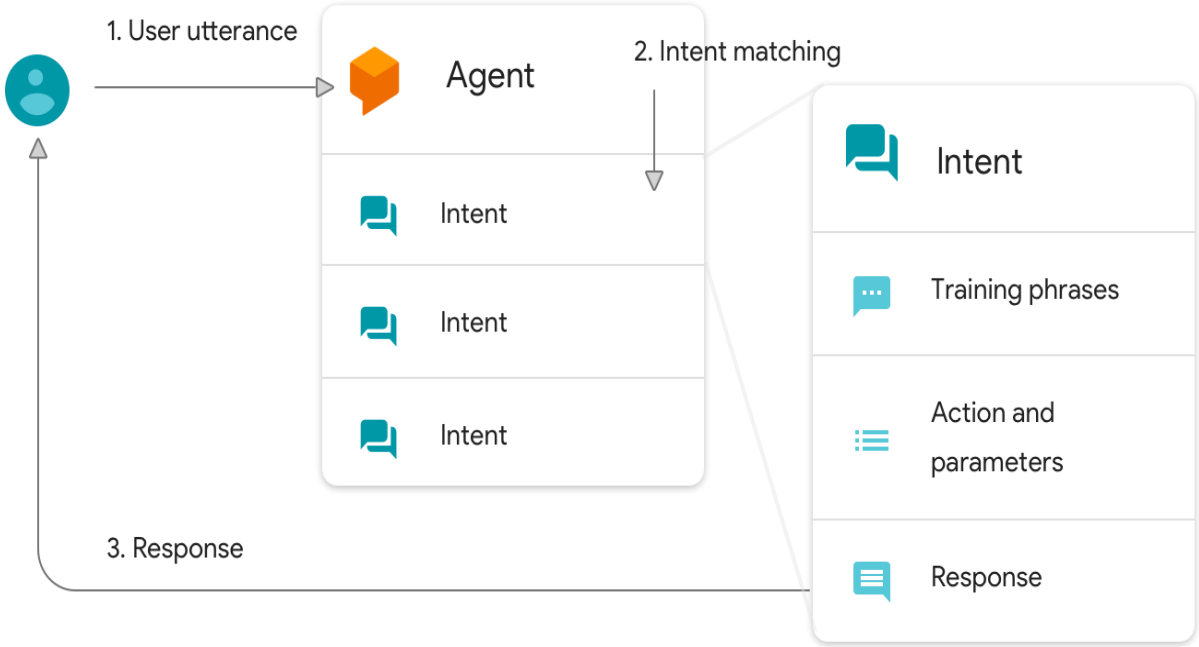


Fig 5.1 Agent functional Diagram

5.2.1.2 Intents

The intents in agent that map user input to responses. In each intent, admin have to define examples of user utterances that can trigger the intent, what to extract from the utterance, and how to respond. Generally, an intent represents one dialog turn within the conversation. For example, admin could create an agent that recognizes and responds to users' input about their favorite color. If a user said something like *"My favorite color is purple"*, agent would match that input to its corresponding intent and return the response you defined within that intent. Agent's response usually prompts users for another utterance, which agent will attempt to match to another intent, and the conversation continues.

Intent	Training Phrases
Dog	"dog", "pooch", "puppy"
Cat	"cat", "kitty", "kitten"
Mouse	"mouse"

Fig 5.2 Intent functional Diagram

5.2.1.3 Entities

Entities are mechanism for identifying and extracting useful data from natural language inputs. While intents allow the agent to understand the motivation behind a particular user input, entities are used to pick out specific pieces of information that users mention anything from street addresses to product names or amounts with units. Any important data user want to get from a user's request will have a corresponding entity.

5.2.1.4 Context

Context provide a simple way to shape a conversation without having to create and manage contexts manually. These special intents are nested under their parent intent and are designed to handle preset replies from the user, like "yes", "no", "cancel", or "next. When create a intent, an output context is added to the parent intent and an input context of the same name is added to the child intent. This means that the follow-up intent is matched only when the parent intent is matched in the previous conversational turn.

5.2.2 Login and Registration

User have to register themselves with username and password. The user information are updated to the database which is used to valid the user data when login to the system. Then user have to login into system, the validation process is started in backend, if authentication is valid the user allow to enter into the chatbot interface. Once user is logged successfully, the session for the particular user is created which lasts until user will logout of the system.

5.2.3 Requesting user query

The bot start their interaction between user and system by sending greeting messages to user. User have to ask their queries by textual method in either English or Hindi language. It parse the query to the conversational training agent to identify the various context present in user query.

5.2.4 Identifying User Context

Chatbot has done a very basic NLP, if a user enter some queries that specified intent will be triggered. When an intent is matched, it will make an HTTP POST request to the webhook with an json object containing information about the matched intent. After receiving request, the webhook can perform required tasks. For eg, the webhook might use information from the request to look up a context in database based on user queries. As the queries description can change from person to person. The same question may be asked differently from multiple user. One user may ask the query so simply and clearly, while another user may ask the same question negatively.so it is necessary to find the exact context asked by the user. Finally, the webhook should respond back with instruction for what the chatbot should do next.

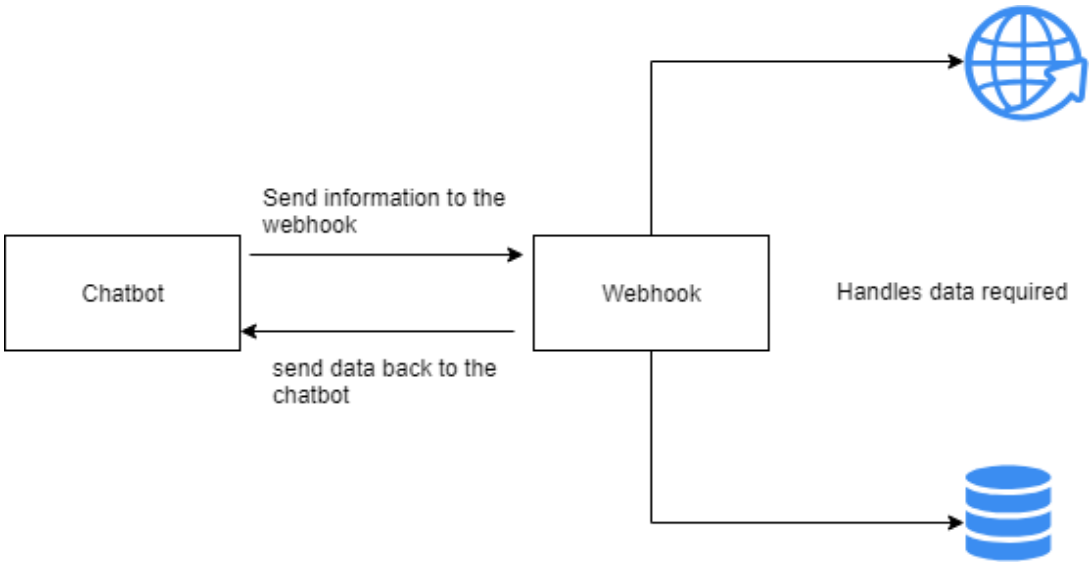


Fig 5.3 Webhook functional Diagram

5.2.5 Retrieving User Query

Every intent must define a response that's returned to the user. There are two primary ways you can return a response to the user either with a pre-defined, static response or with a response generated from a webhook.

- Static response:

  It can define one or more static text responses that will be returned when a user's input matches that particular intent. eg-Greetings messages.

- Dynamic response:

  It basically used to generate dynamic responses based on user queries. It follow ups multiple context to describe the exact intent of the user queries.

CHAPTER 6

TESTING

Testing is finding out how well something works and tells what level of knowledge or skill has been acquired. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation.

Unit Testing

Unit testing, also known as component testing, verifies the functionality of a specific section of code, usually at the function level. In an object-oriented environment, this is usually at the class level, and the minimal unit tests include the constructors and destructors.

Integration Testing

Integration testing is any type of software testing that seeks to verify the interface between components against a software design. Software components may be integrated in an iterative way or altogether.

System Testing

System testing tests a completely integrated system to verify that it meet its requirements. In addition, the software testing should ensure that the program, or partially corrupt its operating environment or cause other processes within that environment to become inoperative.

Table 6.1 Test Case Design

Test Case ID	Test Description	Test Procedure	Test Input	Expected Result	Actual Result
S101	Check whether the user details are updated in database.	Enter the Email id and Password.	Enter the Email id and Password. Email id=”abcd@gmail.com” Password=” 12345”.	The user details should be updated to user login table.	The user details are updated to user login table.
S102	To check whether user can login.	The user should enter Email id and password in the user application.	Enter the Email id and Password. Email id=”abcd@gmail.com” Password=” *****”.	The login details should be verified and user should be successfully logged in.	The user is successfully logged in.
S103	To check whether the session is created for logged user.	The session should be created for currently logged user	Enter the username = “john”	The chatbot should displayed as “welcome john” and session will be created.	The session is successfully created for “john”

S104	To check whether the chatbot accepting the query in English as well as Hindi.	The user should enter the query in English or Hindi	The query in English as =" what are the documents required for house loan? ". The query in Hindi as =" गृह ऋण के लिए कौन से दस्तावेज आवश्यक हैं? "	The chatbot should accept the query and processing the request	The chatbot successfully processing the query.
S105	To check whether chatbot responds to user with two languages.	Chatbot should generate the desired output in English and Hindi	Enter the query ="what is bank"	The desired output will be responded in both languages	Chatbot successfully responded with both languages.
S106	To check whether the user can logout.	If user is logout, then the user session should be destroyed.	User have to click the logout button which appear at top right side.	User should be logged out and redirects to login page	User is successfully logged out and redirects to login page.

Table 6.2 Test Case Log

S.NO	TEST CASE ID	TEST DESCRIPTION	TEST STATUS
1	S101	Check whether the user details are updated in database.	PASS
2	S102	To check whether user can login.	PASS
3	S103	To check whether the session is created for logged user.	PASS
4	S104	To check whether the chatbot accepting the query in English as well as Hindi.	PASS
5	S105	To check whether chatbot responds to user with two languages.	PASS
6	S106	To check whether the user can logout.	PASS

CHAPTER 7

RESULTS AND DISCUSSION

The result analysis was carried out by comparing the service provided by the server in existing and proposed systems. Decreased employee work, decreased waiting time, improve satisfaction, Cost, flexibility, Safety, and Integrity are the major reasons encouraging providers from switching to web based system.

The proposed Banking Chatbot supports multi languages while responding queries which helpful to all people and also reduce the necessity to physically available to the bank for inquiry. The system is fully featured to support quick, accurate, efficient and easy maintenance.

Key Benefits of the Proposed System

- Unlike the existing AIML chatbots, the proposed system have ability to identify the user context by porter and stemming, so user can expect the desired output.
- Scalable and accessible from anywhere
- Ensures smooth workflow and saves times
- Easier to interact with system by all types of peoples

CHAPTER 8

USER MANUAL

8.1 INSTALLING APACHE TOMCAT

Step 1: Create a Directory to keep all your works.

Step 2: Download Tomcat (apache-tomcat-9.0.7. from apache website)

Step 3: Mention user name and password for *manager-gui role* and install Tomcat.

Step 4: Configure the Tomcat server.

Step 5: Start the Tomcat Server.

Step 6: Go to http://{host}:{port}/manager/html in web browser.

8.2 INSTALLING MYSQL

Step 1: Download the latest MySQL Products from the official website.

Step 2: You will be greeted by the eclipse MySQL setup wizard. It will guide through the rest of the setup.

Step 3: This above application will install all components of MySQL.

Step 4: Now the environment is up and ready to be used.

8.2 INSTALLING XAMPP

Step 1: Download the Xampp latest version from the official website.

Step 2: You will be greeted by Xampp setup wizard. It will guide through the rest of the setup.

Step 3: This above application will install all components of Xampp.

Step 4: Click the Allow access button to allow the app through the firewall (if applicable)

Step 5: The XAMPP Control Panel includes three main sections. In Modules, you will find all the services available. You can run each service by clicking the Start button.

8.4 EXECUTION STEPS

Step 1: User should register as new user with username and password.

Step 2: Proceed to login to access the system.

Step 3: Session is created for currently logged user.

Step 4: The chat interface is appear bottom right side of the page.

Step 5: User can ask the queries to chatbot in two languages(English or Hindi).

Step 6: The System will understand the user queries by context and particular intent is triggered.

Step 7: The chatbot will responds back with desired answered in both languages.

Step 8: User can signoff the system by click the logout button in top right side of the page.

Step 9: Once successfully logged out, user redirects to the login page.

CHAPTER 9

CONCLUSION

In the present scenario, there is no centralized system that can inquire about the banking system. So there is a lack between the knowledge about the banking among the people. The existing chatbots can’t assured in generating the desired output as because of using the AIML type based bot interaction. So the chatbot must understand the user queries in any format which may be short or long.

An Intelligent Behaviour Shown by Chatbot System for Banking in Vernacular Languages is a centralized system which is used to analyze the inquires asked by the user about the banking system. This were implemented in two languages so its easier for people to interact with chatbot. The user queries are easily understandable by bot as because of porter stemming rule, so it is easy to recognize the short or long format queries. There by user can expect the desired answered from the chatbot without fail.

CHAPTER 10

FUTURE ENHANCEMENT

The future enhancement is focused on improving the system in a better way by integrating entire system into mobile application and the chat interface is supported with media facilities, so it reaches all over the peoples easily. The bot will supported by voice based queries using Text-to-Speech API. This API uses Speech Synthesis Markup Language (SSML) which provide synthesizable content a standard way to control aspects of speech such as pronunciation, volume, pitch etc,..

APPENDICES

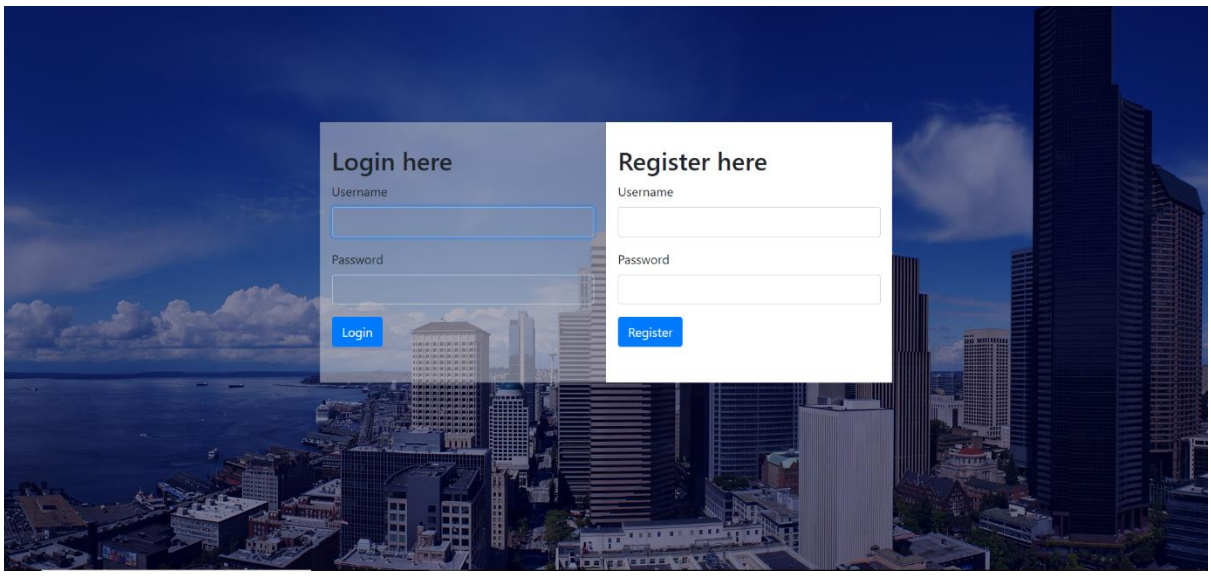
APPENDIX 1

BASE PAPER

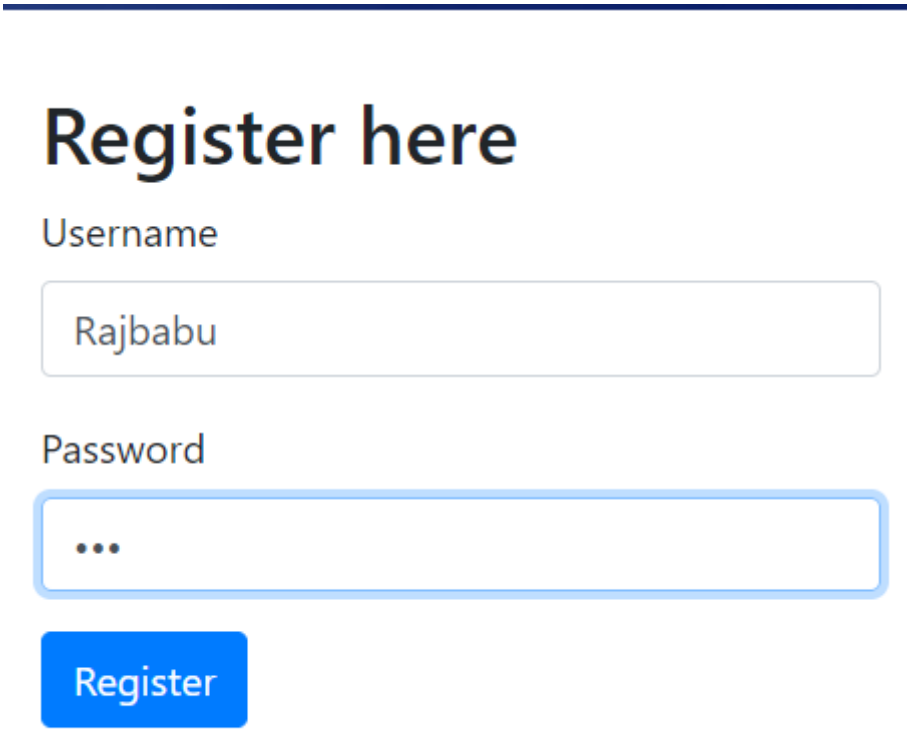
APPENDIX 2

SCREEN SHOTS

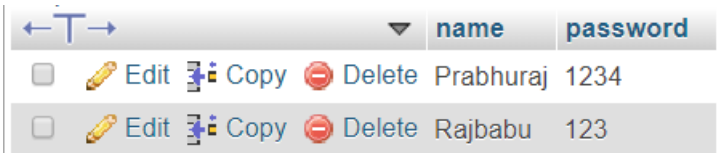
LOGIN AND REGISTRATION PAGE



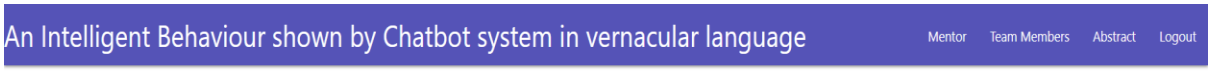
REGISTRATION PAGE



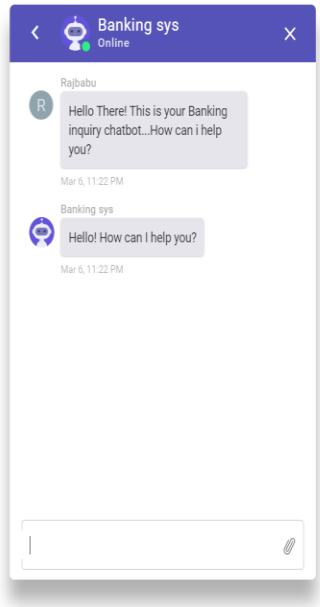
VALIDATION TABLE



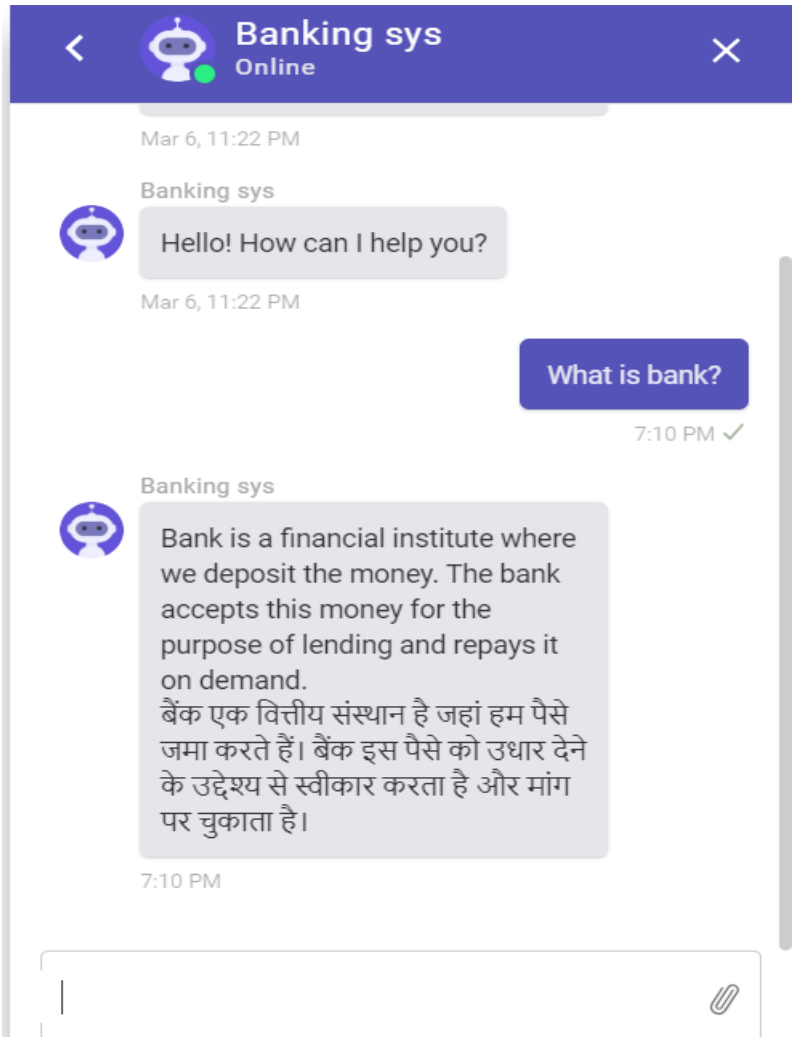
OVERALL CHATBOT PAGE



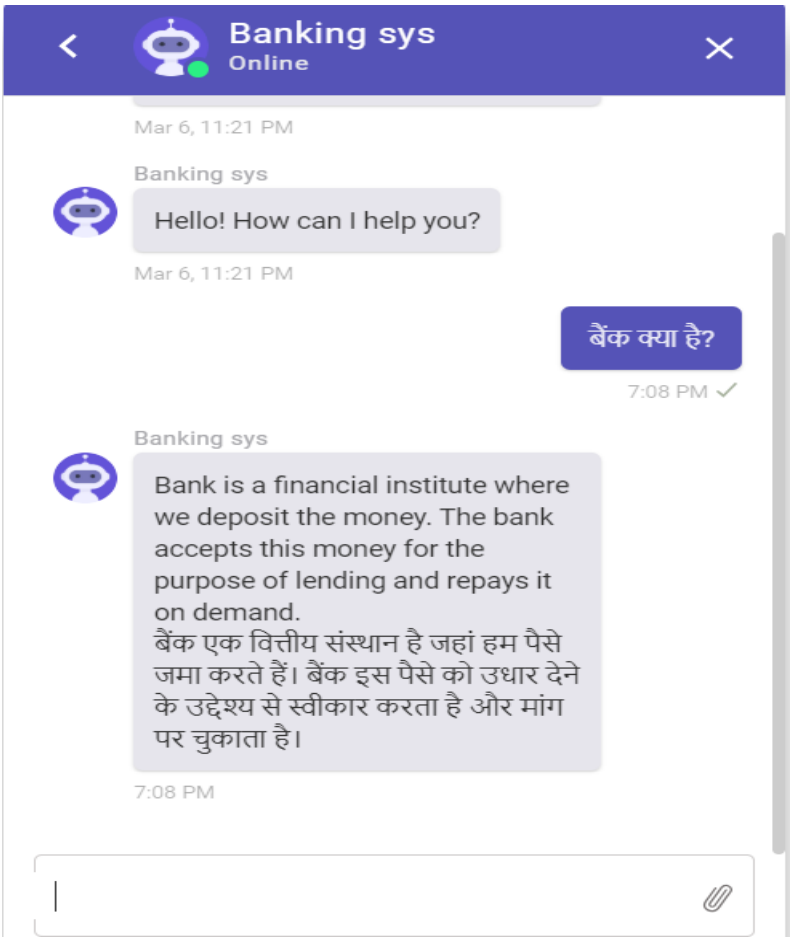
welcome Rajbabu



QUERY IN ENGLISH



QUERY IN HINDI



APPENDIX 3

PUBLICATION

REFERENCES

1. Agnese Augello, Giovanni Pilato, Alberto Machi and Salvatore Gaglio, “An Approach to Enhance Chatbot Semantic Power and Maintainability: Experiences within the FRASI Project” 2012.
2. N T Thomas, “An e-business chatbot using AIML and LSA” 2016.
3. Bhavika R. Ranoliya,Nidhi Raghuwanshi, Sanjay Singh, “Chatbot for university related FAQs” 2017.
4. Emanuela Haller, Traian Rebedea,“ Designing a Chat-bot that Simulates an Historical Figure” 2013.
5. Ayah Atiyah, Shaidah Jusoh, Sufyan Almajali, “An Efficient Search for Context-Based Chatbots” 2018