Web Based Intellectual Guide for Mental Health Counselling using Artificial Intelligence

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ABSTRACT: Online counselling has the potential to meet the growing demand for mental health services. Many approaches have been made to digitalized mental health counselling. It is sensible to consider the internet and Information and Communication Technologies (ICT) for mental health service delivery. The attempt has been made in the same direction, using chatbot services, assist the user to focus on their emotional well-being. The chatbot services is executed through Dialog Control Framework that manages dialog flows on multiple channels, leaving only the tasks of implementing the device-independent application logic, designing the interface of the webpage, and specifying the flow of the dialog.

KEYWORDS: Online Counselling;Chatbot; Dialogflow

I. INTRODUCTION

Counselling is a vital subject that creates and fosters, positive attitude among the people in need. It also provides a genuine understanding of the needs of others and offers an insight into personal issues. To improve the facilities related to the counselling process, many other virtual counselling schemes came into actuality, which facilitates the people in getting essential help regarding mental health and other personal issues. Mental health is often used interchangeably with terms like emotional health and it's well-being. Our mental state plays an important role in our overall well-being. It refers to how we are aware of our abilities and how well we cope with the ups and downs of life. With the increase in the stress level, there is an urgent need to focus on this area.

Our Counselling system includes different types of activities such as supporting them to register with us through a user-friendly interface, detecting whether they are suffering from depression or anxiety in any form, providing doctor support. This software includes different modules in which the knowledge base and database of the clients and counsellors will be maintained, therapy sessions will be set up.

Chatbots are automated systems which replicate user's behaviour on one side of the chatting communication. They are mimic systems which imitate the conversations between two individuals. They provide a simulating platform for effective and smart communications with the user on the other end. They copy marketers, sales person, counsellors and other mediators and work to provide services that the above-mentioned people provide. There are several chatbots catering in many domains such as: business, market, stock, customer care, healthcare, counselling, recommendation systems, support system, entertainment, brokering, journalism, online food and accessory shopping, travel chatbots, banking chatbots, recipe guides, etc.

The problem with these chatbots is that they provide monotonous answers of the questions asked by the user. They are not capable of establishing a smart communication with the human.

II. LITERATURE REVIEW

Mental health services first surfaced on the Internet in 1982 through online self-help support groups. The earliest organized service to provide mental health advice to individuals online was "Ask Uncle Ezra", a free service offered to students of Cornell University that have been in operation since 1986. In 1993, Ivan Goldberg, M.D., began answering questions online regarding the medical treatment of depression. During 1995, John Grohol, Psy.D., developed a free mental health advice website. Fee-based mental health services offered to the public began to appear on the Internet in the mid-1990s and consisted primarily of mental health advice services that offered to answer one question for a small fee. The earliest known fee-based Internet mental health service was established by Sommers in 1995. Rather than just answering a single question each time, Sommers attempted to establish longer-term online therapeutic relationships. In 1995, Needham was the first practitioner to offer e-therapy via real-time chat.

Finfgeld believed that the evolution of online counselling was possible because of several factors, including the movement of psychiatric care from inpatient to outpatient settings, the availability of personal computers, user-friendly systems, Internet technology and the resourcefulness of health care providers in the application of technology to meet

mental health care needs. The expansion of online mental health services has also been attributed to the need to provide greater access of mental health services to the mass population, the expectation of third-party payers and health care organizations for increased efficiency in the delivery of online mental health assistance and public demand for Internet-based psychological services.

Previous work for building semantic parsers (Wang et al. (2015)) and parsers for mapping natural language questions to structured queries (Zhong et al. (2017)) rely on crowd sourcing to map automatically generated structured representations to single-shot natural language utterances. However, generating multi-turn dialogues in this manner requires co-ordination among multiple participating agents. Smart chatbots made up of NLU, NLG and ML engines have the following components:
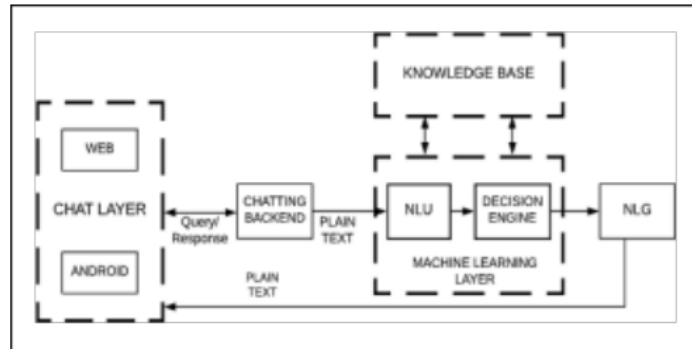

Fig. 1. Architecture of Chatbot System

This unit is the front end of the system. It is responsible for collecting the user queries from the user which are the input to the system. It isalso responsible for displaying the system generated results to the user. Therefore, it can be said that the chat interface is the face of the system through which the entire communication takes place. It is the mediator of conversation between the system and the user. The query that user fires on the chat interface is passed on to the chatting backend which acts as a message delivering system between the Chat interface and the Machine Learning Layer. This interface can be accessed either as a website or as a smart phone app. The type of interface depends on the requirements of the user that are to be satisfied by the system. If the system is accessed from a smartphone, the interface will be in the form of an app and if the system is accessed from a website, then the interface will be in the form of a website.
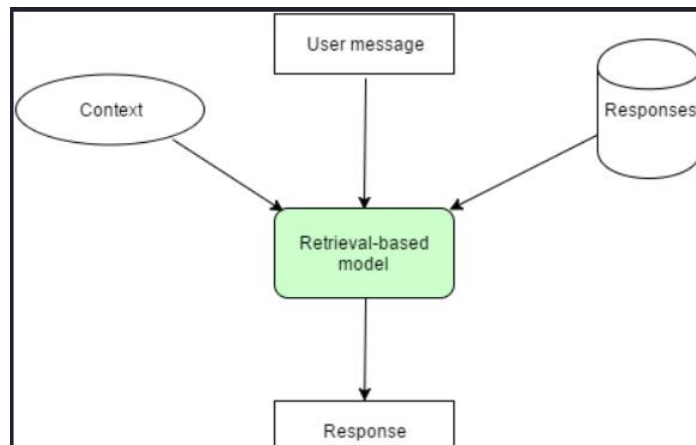

Fig. 2. Architecture of Chatbot

DIALOGFLOW: - Dialog flow is a tool to develop conversational interfaces for websites and mobile applications. It provides a natural language processing services, to build engaging chatbots. The Dialogflow has five parts to create an appealing chatbot.

INTENT: - To define the response of the user, one has to create intents. It maps user input to responses of the bot. In each intent, you define examples of user utterances that can trigger the intent, what to extract from the utterance, and how to respond.
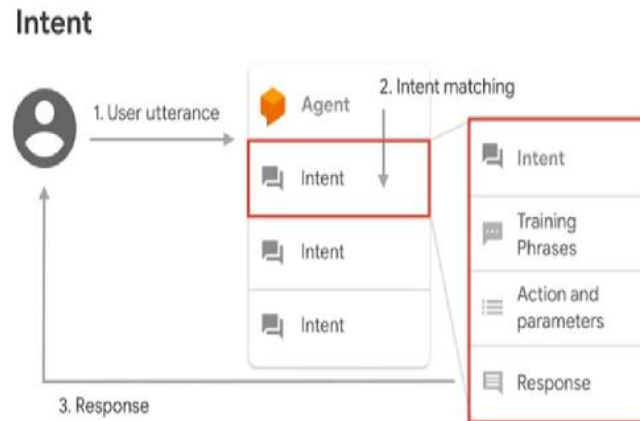
Fig. 3. Intent

Intent contain the following: -
- Training phases: - These are example phrases for what end-users might say.
- Actions: - You can define an action for each intent using action. When an intent is matched with user response, Dialogflow provides the action to your system. Actions can be used to trigger certain activities defined in your system.
- Parameters: - When an intent is matched at runtime, Dialogflow provides the extracted values from the end-user expression as parameters.
- Responses: - You define text, speech, or visual responses to respond to the end-user. These may provide the end-user with answers, ask the end-user for more information, or terminate the conversation.
- Events: With events, you can invoke an intent-based on something that has happened, instead of what an end-user communicates.

ENTITIES: - Entities are Dialog flow's mechanism which defines how useful data from an end-user expression is extracted.

CONTEXTS: - One can control the flow of a conversation using contexts. Contexts represent the current state of a user's request and allow your agent to carry information from one intent to another, according to the response of the user.

EVENTS: - Events allow you to invoke intents based on something that has happened instead of what a user has to say or write.

FULFILLMEMT: - Chatbot can provide more dynamic responses using fulfillment. During a conversation, fulfillment allows you to use the information extracted by Dialog flow's natural language processing to generate dynamic responses or trigger actions on your back-end.
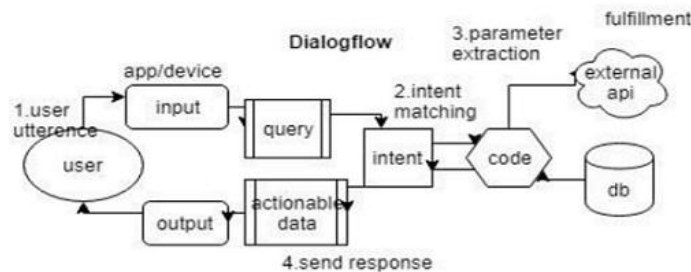

Fig 4. Architecture diagram of Dialogflow

III. METHODOLOGY

(A) PLANNING: - Requirement analysis is the most vital and fundamental stage of this process. Planned the quality assurance qualities and identified the risks associated with it. Question for the knowledge base was gathered.

(B) DESIGNING: - In this phase, the requirement gathered is used as an input and software architecture that is used for implementing system development is derived. Intellectual Guide chatbot has been created using 25 intents.

(C) IMPLEMENTATION: - Implementation/Coding started once the developer got the Design document. The Software design was translated into source code. All the components i.e. front end, backend and artificial intelligence of the software were implemented in this phase. The knowledge base and database were created and connected in this step. For the implementation of our chatbot, we have used the services of Dialogflow provided by google.

(D) TESTING: - Testing was done once all the components of the software were completed. In this phase, the developed software was tested thoroughly, the knowledge base was challenged to be sure that it performs the correct detection of the mental health issues faced by the user and any defects found are assigned to developers to get them fixed

IV. CONCLUSION AND RESULT

In here, the main focus is on the chatbot and its abilities to detect the stage of depression the user is facing, whether it is severe or mild. With the detection of depression, it provides the detail of the specialist. Dialogflow interfaces were used to design chatbot without any code and then integrated with the help of node.js.This paper provides a critical review of the task involved to make the system smart to detect the issues. This also indicates that a lot more research can be done in this area in future. The out-turn of the appropriate result depends upon the functionalities to be provided by the chatbot and also the domain in which the services is to be provided. Also, the data format plays a vital role in the appropriate result.

REFERENCES

1. Head First java,2nd edition -O'Reilly Media textbook by Bert Bates and Kathy Sierra.
2. A Literature Review On Chatbots In Healthcare Domain: Nivedita Bhirud, Subhash Tataale, Sayali Randive, Shubham Nahar.
3. JavaScript and JQuery: Interactive Front-End Web Development, by Jon Duckett.
4. Fundamentals Of Database Systems By Elmasri And Navathe.
5. Types, Causes, Symptoms, and Treatments of depression Article by: Christina Gregory, PhD.
6. Everything You Want to Know About Depression: Medically reviewed by Timothy J. Legg, PhD, PsyD, CRNP, ACRN, CPH on December 3, 2019 — Written by Valencia Higuera and Kimberly Holland.
7. A classical approach to Artificial Intelligence, Munesh Chandra Trivedi, Khanna Publications.
8. Artificial Intelligence and Machine Learning, Chandra S.S. & H.S. Anand, PHI Publications.
9. Vibhor Sharma, Monika Goyal, Drishti Malik,"An intelligent behaviour by alice Chatbot," International journal of newtechnology and research, ISSN: 2454-4116, Volume-3, Issue-4, and April 2017.