

Chat-bot application based smart hospital system

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Abstract: This project presents an exploratory study on using conversational interfaces (CIs) to support physicians in conducting occupational health consultations. The CI was achieved through a web-based information dashboard with a Chat-bot assistant for providing real-time suggestions through text messages. Two system designs were developed: the first using a proactive Chat-bot, the second using an on-demand type of interaction. The effectiveness of the proposed CI and the two types of Chat-bot designs were investigated in a field study consisted of eight health care consultations. Quantitative results showed that the CI was positively evaluated as a reliable tool to be used during medical consultations and that occupational health physicians were eager to use this technology in their work. The qualitative data analysis suggested that our design concept might improve the work flow during the consultation, particularly with respect to the access to relevant information and structured decision-making processes using valuable references.

Keywords: Chat-bots , smart hospital , Technology , methods , Computer Science

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I. INTRODUCTION

A chat-bot is a type of software that can communicate with humans. These conversational agents are specially designed as a user interface (UI) that engages as a communication channel. Currently, chat-bots are integrated into every business, including hospitals, banks, transport, and other services. There is a great demand for them to work as information agents providing instant responses in the health care industry. Hospitals or health care organizations manage patient communications through rudimentary web operations.

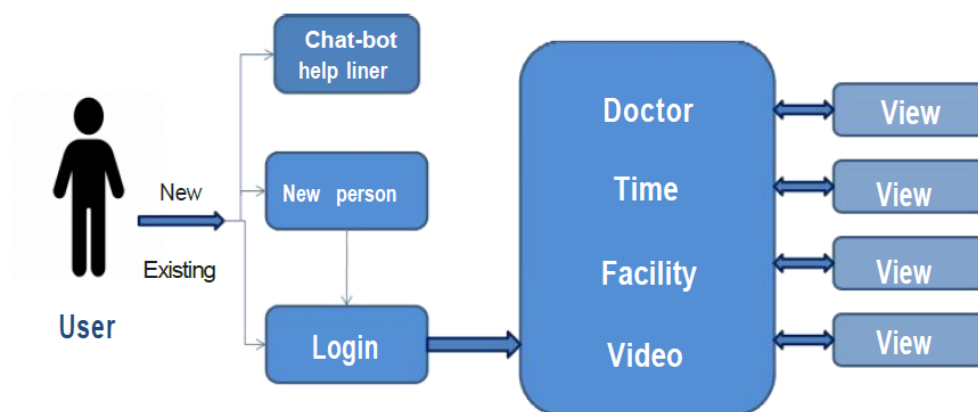
Web-based chat-bots overcome this by allowing conversations between hospital staff and patients to collect insights on facilities available in the hospital. Chat-bots have been receiving close attention in health care because these conversational agents provide easy access to information and function as an interactive platform offering personal engagement. Medical chat-bots provide the necessary information by including classification and ML algorithms. The chat-bot developed in has successfully maintained responses for disease predictions, medication recommendation, doctor availability, and others by adopting simple ML techniques. Additionally, web-based chat-bots based on NLP can assess patient sentiments and improve quality care.



Additionally ,the other two popular conversational agents , ELIZE and ALICE (Artificial Linguistic Internet Computer Entity), are known as the first human interaction chat-bots. ELIZA operates using computational linguistics with simply parsing and keyword substitution into re-framed phrases.

Therefore, it can understand user experiences and feelings. This conversational agent initiates the user chat with simple sentence structure and punctuation, and the user statement is ended with a two fold carriage response. However, A.L.I.C.E can convert readable texts (i.e. corpus) into Artificial Intelligence Markup Language (AIML) to disclose the possibility of useful prototypes without complex ML algorithms. It also incorporates NLP techniques that help engage in human conversation by applying heuristically matched rules to the user input. It was inspired by the old ELIZA program.

II. METHODOLOGY AND COMPONENTS:



A) Choosing type of Chat-bot you want to build:

Depending on the usage, knowledge scope, technology used chat-bots have been categorized in following ways.

- i. Based on the scope of knowledge bot possess, we have Open Domain and Closed Domain.

Open Domain: Open Domain Chat-bots can be asked with anything a user want to ask without any of the restriction on topic or subject of the conversation.

Closed Domain: Closed Domain Chat-bots are Domain Specific Chat-bots, whose knowledge base and scope are restricted to certain topic or subject and certain tasks as well.

- ii. Retrieval Based and Generative Based Chat-bot classification is mainly of how the back end of the bot creates the response.

Retrieval Based Chat-bot: Retrieval Based Chat-bots uses predefined repository of responses stored by developers ,expecting and guessing the context of requests that users may ask.

Generative Based Chat-bot: Generative Based Chat-bots generates responses on their own, then and there and also not predefined. Here Bot understands the intent or context and generates answer on its own.

B) Methodology

For implementing Chat-bots as a web application, different programming languages are used by it developing . First one is front end and then the back end.

(1) Front end development :

HTML : It is Hyper Text Markup Language, which extensively used to develop simple Websites with GUI. (Graphical User Interface) providing user with different elements like Button, Text box, Text field, Check boxes, Radio Buttons.

CSS : It is Cascading Style Sheets is a style sheet language which is used to add more look and appearance a HTML page.

JavaScript : It is used to handle behavior of different elements in an HTML page. It is an Object Oriented, prototype- based language.

Bootstrap : It is essentially a style sheet. There are bootstrap components that require a JavaScript file but for the most part it is a collection of CSS styles that make building a responsive site easier.

② Back end development :

The Programming Languages used to develop Back End are, Php, MySQL Databases.

PHP : It is being used extensively as it is an open source for general purpose scripting language that is especially used for developing a web application. PHP pages has HTML with embedded code that can do “something”.

MySQL : It is a powerful open source database server built based on a relational database management system (RDBMS) and is capable of handling a large concurrent database connection. MySQL is capable of working with different programming languages like PHP, PERL, C++, JAVA, Python etc.

JSON : It is the abbreviation for JavaScript Object Notation that it is a format for representing and interchanging the data between informatics applications. It has people text format, used to represent objects and other structures of data and it is used mostly to send structured data through the network, and the process is called serialization. JSON is the simple and easier alternative of XML coding language. The elegance format of JSON comes from the fact that it is a subset of the JavaScript, being used along to this coding language.

Simulation

the simulation of overall smart hospital system for covid- 19 applications. Figure 2: represent the login page for the users.



Figure 2: Login Page View

Every time the user wants to get the information he needs to sign in or if the user already exists, he or she can interact directly. After logging in, we can see the new page which contains the list which includes the doctor, the timings, the facilities, and the map. For each content, there is a right-hand view button to display the details of each content in the list provided.



Figure 3: Chat-bot View

The view button includes the doctor's appointment, schedules, specialization, attendance, qualification. For each contents of the list, the display button displays the manual information provided. The video here plays an important role in pointing out the right path for the user.

Hardware Working



Figure 4: Block diagram of hardware working

Whenever the doctor wants to input his/her finger he has to scan using bio-metric where the image of the finger will be captured. After capturing the image, the information about the doctor stored in Arduino Uno will be sent to the node mcu, which is one of the Wi-fi module.

Next the information which is available in the wi-fi module will be displayed on to the LCD screen. Automatically the doctors attendance will be displayed. To update the doctors attendance here use the selector in which there are 3 types of selections that is enrollment, delete and match.

III. RESULT AND DISCUSSION :

The results obtained are as discussed below:

Once you have logged in the website, you can use chat-bot to know about the availability of the doctors , their details , facilities available in the hospital, etc which are shown in the below figures.



Figure 5: Dashboard



Figure 6: Details of doctor

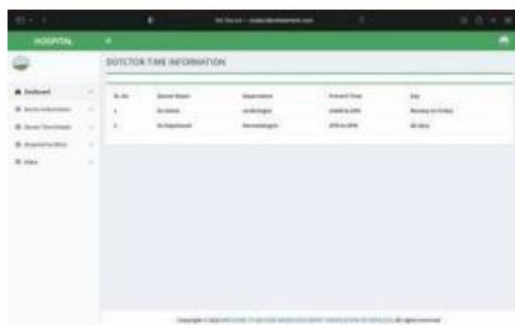


Figure 7: doctor time information



Figure 8: Hospital facility

IV. CONCLUSION

The idea behind this study is to present medical chat-bot for users, especially during unknown pandemics. Undoubtedly, Chat-bots are beneficial. People in the health care sector should deploy Chat-bots on their websites or apps to provide daily reminders to patients regarding scheduled appointments, get on-time medical advice, receive routine reminders, and even receive invoices. It is not only beneficial for the Health care center, but it is also helpful for patients.

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