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Artificial Intelligence HealthCare Chatbot System

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ABSTRACT: In recent years, chatbots have become more and more common in a variety of sectors, including healthcare, education, marketing, cultural heritage, social networks, and entertainment. In order to handle the massive volume of user enquiries during pandemics, chatbots have become a necessary piece of technology. In this study, we present a sophisticated chatbot system that can converse with people and respond to inquiries about healthcare. In order to solve the well-known role of question answering, our model used the pre-trained Google BERT language model. For the question-answering task, we extend the BERT by two architectural steps. The BERT Transformer is used in the initial stage of a text classification method to divide text into groups according to word meaning.

KEYWORDS: Healthcare, Patient, Doctor, Appointment, Management

I. INTRODUCTION

A. Overview

In recent years, chatbots have become increasingly popular in a wide range of industries, including entertainment, marketing, support networks, education, cultural heritage, and many others. Chatbots have evolved into a necessary element of technology to handle the enormous volume of user queries during pandemics. In this essay, we demonstrate a clever chatbot system that can converse with users and offer them healthcare-related information.

The primary benefit of using chatbots for company is that it streamlines customer care processes and can answer consumer questions about products or services. On the other hand, creating a clever chatbot is challenging since it requires technology for contextual comprehension, text entailment, and language understanding. Therefore, a number of applications require both artificial intelligence and natural language processing.

Determining AI's involvement in offering workable remedies for the specified epidemic is still important. Unexpectedly, a global research initiative must be created to start taking precautions against this but rather prospective outbreak without assigning blame. We have noticed a recent rise in interest in conversational agents and software that converses with users in natural language. Since around ten years ago, text-based chatbots—also known as chatbots—have flourished in a variety of application scenarios, enabling human-machine interaction through written language.

B. Motivation

India's healthcare system is adjusting to an increase in demand for medical services and care, just like many other nations. The medical records must include the patient's whole medical history. Because they have various uses, doctors are expected to keep precise records. In order to address the issues with the manual technique, this study on hospital management systems attempts to convert the manual manner of looking for, classifying, storing, and retrieving hospital information (files) into an electronic medical record. After a system study, computer-based software was developed to take the role of this manual process. Real-time patient records are generated by these computer-based systems when patients arrive and exit the hospital.

Hospitals currently use a manual system to manage and store vital information. The current system requires a lot of paper forms because data repositories are scattered throughout the hospital management infrastructure. Frequently, information is incomplete or does not follow management standards. In order to ensure that no important information is lost, a thorough auditing method is required because forms regularly disappear while being moved between departments. There may be inconsistencies in the data across different data storage since the hospital has multiple copies of the same data.

II. RELATED WORK

“Grand challenges in clinical decision support” Author- Sittig D, Wright A, Osheroff J, et al. For physicians, patients, and consumers, there is an urgent need for high-quality, efficient methods of planning, creating, presenting, implementing, assessing, and sustaining all forms of clinical decision support capabilities. We created a rank-ordered list of the top 10 grand issues in clinical decision support using an iterative, consensus-building method. The purpose of this list is to inform and motivate researchers, developers, funders, and policymakers. The following issues must be resolved in the following order of priority if patients and organisations are to start reaping the fullest benefits from these systems: enhance the computer-human interface; Disseminate top CDS design, development, and implementation practises; condense patient-level data; prioritise and filter user recommendations; develop a shared architecture for CDS modules and services that are executable; Practical advice for patients with comorbid conditions; Regarding the creation and implementation of CDS content; Internet-based clinical decision support repositories should be developed, free text material should be used to drive clinical decision support, and huge clinical datasets should be mined for novel CDS. If clinical decision support is to live up to its potential and enhance the quality, safety, and effectiveness of healthcare, it is imperative that solutions to these problems are found.

“Using Electronic Health Records for Surgical Quality Improvement in the Era of Big Data” Author-Anderson J E, Chang D C: Many healthcare facilities use a corrective mechanism to ensure the security of their electronic health records (EHRs): although some staff members have essentially unrestricted access to the records in theory, there is a strict ex post facto audit process in place for accesses that are inappropriate and/or violate the facility's security and privacy policies. This method is inefficient since each suspected access must be examined by a security professional, and it is only applied retrospectively after possible damage has already been done. This drives the development of automated methods based on machine learning and historical data. SVMs and logistic regression, two supervised learning models, have been effectively used in earlier attempts at such a system. These methods, however superior than manual auditing, do not take into account the users' or patients' identities. They are unable to take advantage of the fact that patients with a history of violations are more likely to commit violations in the future. In light of this, we suggest in this study a method for anticipating unauthorised accesses that is inspired by collaborative filtering. For employees and patients, our approach includes both explicit and latent information, with the latter serving as a unique "fingerprint" based on previous access patterns. The suggested method greatly outperforms existing methods when tested against real EHR access data from two tertiary hospitals and a file-access dataset from Amazon. It also offers insights into what constitutes an inappropriate access.

“Evaluation of radiological features for breast tumour classification in clinical screening with machine learning methods” Author-Tim W. Nattkempera,, Bert Arnrich: Self-organizing maps (SOM) and k-means clustering are used to analyse the signal structure visually. We use a computer-aided diagnostic (CAD) technique to categorise features using k-nearest neighbour classifiers (k-nn), support vector machines (SVM), and decision trees (DT).

AI-assisted Prediction on Potential Health Risks with Regular Physical Examination Records The prevalent perception of the health environment is that it is "informative" yet "knowledgeless." There is a multitude of data available in the healthcare systems. However, there is a dearth of efficient tools for assessing obscure connections and data patterns. Data mining and knowledge discovery have many uses in both the economic and scientific worlds. Data mining tools can help the health system learn important information. In this article, we brilliantly examine the possible application of rule-based, decision-making trees, naïve bays, and artificial neural networks in large-scale medical data clustering. Unfortunately, the vast amounts of health data that are gathered by the industry are not "mined" to find hidden data. For data pre-processing and efficient decision-making, the One Dependency Augmented Naive Bayes classification (ODANB) and the Naif Credal Classifier 2 (NCC2) are utilised. This is an extension to Bayes' imprecise probability that aims to produce robust classifications even when dealing with limited or insufficient data sets. Untapped relationships and hidden patterns frequently occur. Using medical characteristics such age, sex, blood pressure, and blood sugar, it can predict the likelihood of heart illness in patients. It enables the creation of important knowledge, such as patterns and connections between heart disease-related medical parameters.

Applications of Data Mining Techniques in Healthcare and Prediction of Heart Attacks For physicians, patients, and consumers, it is imperative to create, create, implement, assess, and maintain high-quality, effective methods of supporting all types of clinical decision support. The top 10 significant problems for supporting clinical decisions have been ranked using an iterative consensus building process. The list was created to inform or inspire scholars, developers, funders, and policymakers. The difficulties to be overcome include enhancing the interfaces between people and computer systems as patients and organisations start to fully benefit from these solutions; providing best practises for CDS design, development, and implementation; summarising patient data; filtering and prioritising user-specific

recommendations; developing an architecture; and maintaining system security. If support for clinical decision making is to be fully utilised and contribute to advancements in healthcare quality, security, and effectiveness, it is imperative to find answers to these issues.

The user will be able to access and review all of his reports using the application from any online location. It's possible that the official that was interviewed had some prejudice in there. The information disclosed may have changed as a result of this. It was tough to meet with the top officials in an effort to get information from the best possible source within the organisation due to their hectic schedules. Secondary data form the foundation of the majority of analyses and conclusions in this study. There may be some inherent faults and weaknesses in this data. Finally, even if every precaution has been taken, the report itself may still have typing or compilation issues.

System Architecture

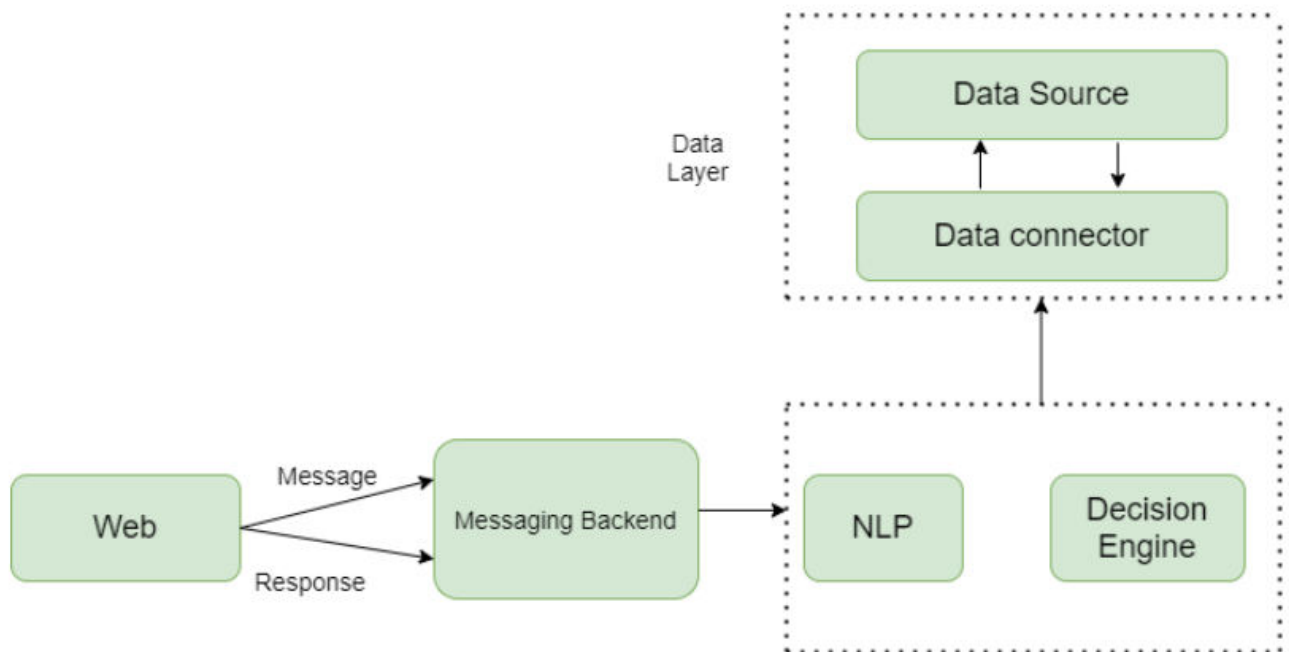


Figure 1. System Architecture

Natural Language Processing

In reality, we are encircled by people who can take in everything from their encounters with their learning ability, and we have PCs or machines which work on our directions. In any case, can a machine likewise gain from encounters or past information like a human does? So here comes the job of Machine Learning. Machine Learning is said as a subset of man-made reasoning that is essentially worried about the advancement of calculations which permit a PC to gain from the information and past encounters all alone. With the assistance of test authentic information, which is known as preparing information, AI calculations construct a numerical model that helps in settling on forecasts or choices without being expressly customized. AI brings software engineering and measurements together for making prescient models. AI builds or uses the calculations that gain from recorded information. The more we will give the data, the higher will be the exhibition. “A machine can learn in the event that it can improve its exhibition by acquiring information.”

III. RESULT AND DISCUSSION

Experiments are done by a personal computer with a configuration: Intel (R) Core (TM) i3-2120 CPU @ 3.30GHz, 4GB memory, Windows 7, MySQL 5.1 backend database and python.

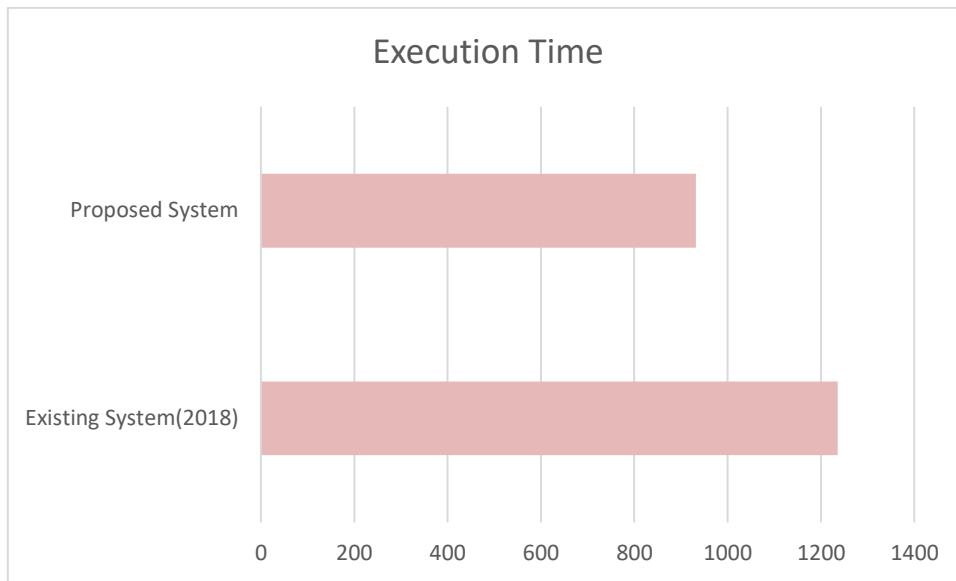


Figure 2: overall system execution graph

Existing System (2018)	Proposed System
1236	932

Table 1: overall system execution table

IV. CONCLUSION

Major shortcomings in existing chatbots, such as their inability to comprehend the link between entities and their properties, can be addressed and fixed with the suggested methodology. The suggested system successfully retrieves and maps data from numerous sources. We can continue to create intelligent chat bots that can help consumers find the right information by utilising the study's findings. Additionally, it helps consumers find solutions without having to wait for admin staff to respond. After obtaining enough training from ontological bots, we can now communicate effectively with them.

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