AN EFFECTIVE ANALYSIS AND INTERACTIVE HEATH CARE RECOMMENDATION SYSTEM

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Abstract

There has been a gigantic stir in the world's healthcare sector for the past couple of years with the advent of the Covid-19 pandemic. The healthcare system has suffered a huge setback, and the shortage of physicians, nurses, and healthcare facilities has highlighted the need for an intelligent healthcare system more than ever before. Smart healthcare technologies and AI/ML algorithms provide encouraging and\sfavorable solutions to the healthcare sector's challenges. An Intelligent Human-Machine Interactive system\sis the need of the hour. This paper proposes a novel architecture for an Intelligent and Interactive Healthcare System that incorporates edge/fog/cloud computing techniques and focuses on Speech Recognition and its extensive application in an interactive system. The focal reason for using speech in the healthcare . The Covid-19 pandemic has recently caused many changes in the healthcare industry. While things are getting normal with time, many health programmes built and employed during emergencies are left unexploited. To ensure that such technologies are used indefinitely, the present demand should be considered, as well as the essential concepts and frameworks to evolve the existing system.

Key words : Interactive system, human-machine interaction, smart healthcare, artificial intelligence, machine learning, hidden Markov model, C-RAN.

INTRODUCTION

alternatives in emerging nations, where technological adaptation is difficult and investing in enterprise level B2B gateway products to undertake business document exchanges is nearly impossible. In this paper, we expand our previous research and construct a speech-based B2B messaging system that allows MSME (Micro, small, and medium businesses) to interface with existing enterprise In the conventional B2B environment, companies spend a lot of money hosting and maintaining B2B gateways for business interactions with suppliers and consumers. There are several B2B frameworks that cater to the demands of these businesses. Unfortunately, there is a paucity of gateway infrastructure without making any investments.. Also, they can In today's society, health and health-related services are everywhere. The widespread availability of the internet and electronic devices has simplified how individuals receive quality health care in a short period of time. Vendors and owners are now linked in ways that were previously impossible. A system that can interact with the user while giving the required services in a parallel fashion is not uncommon in the market. However, most such proposals lose the true essence of interactivity either during the development process or when a developer becomes focused on a single service his/her product provides, leaving rather important issues untouched. This suggested solution provides consumers with a package of health services, all equally interactive powered by Artificial Intelligence via a Chabot service, owing to the aforesaid worry. A comprehensive healthcare system is not a new approach

two papers helped to grasp the scenario of the recent adaptations in the chatbot domain.recorded and analysed. This information may then be saved and utilised to help with demand forecasts.

[3] through a big data tool, scraped keywords to investigate the papers published on Covid-19. This paper visualised the scenario of research being performed over Covid-19 across the globe.

[4] Natural Language Understanding to propose a software system for eCommerce tested over different cross-platforms.

[5] Proposed a chatbot system showcasing a nice Implementation of IBM Watson as a conversational bot Engine.

[6] Demonstrates a nice practical implementation of Natural Language Understanding in its proposed chatbot system

[7] Over Artificial Intelligence techniques in medical Sciences in their paper states that the most used AI technology is data mining while ANN and K-Means take the second and Third position

[8] Present the result of Coronavirus prediction using K-Means Clustering algorithm that outperforms SVM and other ML Algorithms.

[9] propose a healthcare Chatbot system with RASA framework that provides an accurate and safe chat response along with robust disease recognition. We have taken different references from this paper in our research work.

[10] Sketch a design of a web-based E-Health platform in their paper. They were able to integrate IoT with a software system for diagnosis and other medical.

III EXISTING SYSTEM

This healthcare system is made up of three main components: a web application [11], a centralised database, and an AI chatbot. The database connects patients to hospitals while executing CRUD operations with REST APIs at the same time. The chatbot provides a variety of services, which are detailed further in the article.

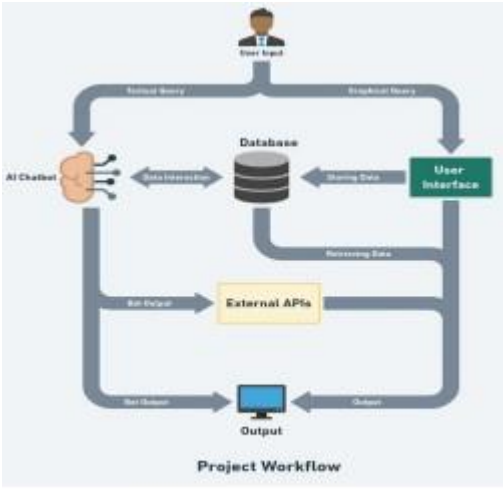


Figure 2: System Workflow

Chatbot

Overview of RASA

RASA is a well-known framework for developing Conversational bots. It is mostly regarded as an open-source alternative to Google's Dialog flow [12] and IBM's Watson. Watson. Its adaptability and simple architecture make it suitable for use in any development environment. In Artificial Intelligence, the core notion is Natural Language Understanding (NLU)

1. Intent : User messages are categorized based on intents
2. Entity: Entities serve as the structured information pieces inside intent sent as a response.
3. Stories & Rules: Stories and rules represent the conversation sequence between the user and the bot.
4. Domain: It defines all the factors RASA uses to operate the bot.
5. Action: This comes under Custom Actions used primarily for making API calls adding tweaks and buttons to the chat flow.

blood bank-related information. Diagnostics and booking are provided by hospitals linked to the system. Similarly, the other public APIs include real-time worldwide data, Covid-19 FAQs [19], news, and health-related information.

3. Database & REST APIs

Django, a Python framework, is used to store user data [20] and manage API requests. For database CRUD operations, the GET, POST, PATCH, PUT, and DELETE methods are employed. These activities are carried out as needed from the frontend and the chat bot environment. During the registration process, users are assigned a unique Patient ID [21], which will subsequently serve as the link between patient information and his/her appointment at a hospital, guaranteeing correct data flow with minimum errors.

4. . User Interface

This healthcare system is a web application built with ReactJS, an open-source front-end JavaScript library [22] that is supported by Python for AI and database. The Mantine UI Component is often used to provide dynamism in the user interface [12]. In interacting with the user, the website processes and performs API requests and calls. For the chat interface, another interactive module called React Chat Widget is utilised.

Users may arrange medical appointments immediately from the main user menu [23]. The connection to the hospitals may be accomplished by using the Hospitals' API endpoints. The website now provides real-time Covid data visualisation using updated Covid-19 APIs.

This portion, created using the D3 framework, has live active, critical, and death scenarios.

5. . Deployment

All healthcare system functions are placed [24] on a single Microsoft Azure server, ensuring that the system is completely accessible from anyplace with the internet. IP address was assigned.

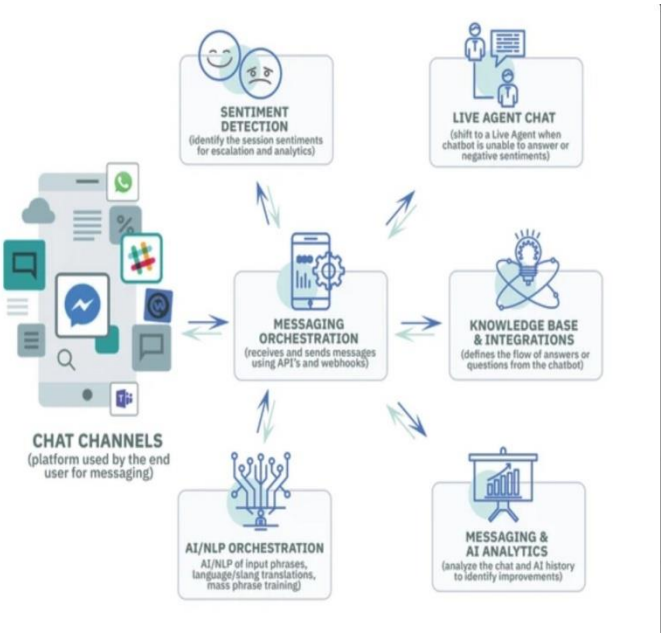
II. proposed system

An Interactive Healthcare System (I2HS) that utilizes Machine Learning (ML) can have a significant impact on the healthcare industry. With the help of ML, healthcare professionals can gather, analyze and interpret patient data more accurately and efficiently, leading to better treatment outcomes

Intelligent health care system

Here are some ways in which ML can be integrated into an I2HS:

Disease diagnosis: Machine learning models can be trained to



identify patterns in patient data that are indicative of specific diseases. For example, an ML algorithm can analyze a patient's medical history, symptoms, and lab test results to identify the likelihood of a patient having a particular disease.

Predictive modeling: An I2HS can use machine learning to analyze data from a large number of patients to identify patterns that are predictive of future health outcomes. This can help healthcare professionals predict the likelihood of a patient developing a particular disease or having a particular outcome from a treatment.

Treatment recommendation: Machine learning algorithms can be used to recommend treatments based on a patient's medical history, genetic profile, and other factors. This can help healthcare professionals develop personalized treatment plans that are more

for maximum effectiveness.

RESULTS AND DISCUSSION

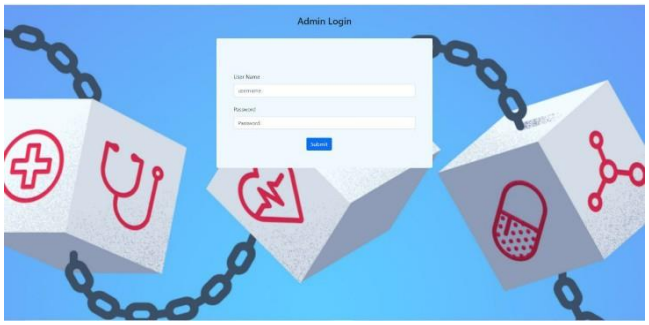


Figure 1 : Admin login

Admin Login:

The admin login provides authorized users with access to the system's features and tools for managing and securing the healthcare records. The system uses blockchain technology to ensure that the records are tamper-proof and secure, with all changes to the records being recorded in a decentralized and distributed ledger

Figure 14: pharmacy login

Pharmacy login

histories A leaf node represents a mobile user's data access transaction in the Merkle tree-based organisation of transactions in our block.

A mobile user must provide patient information (Area ID, Patient ID) to establish a transaction that is signed with the user's private key at a specific time in order to provide a data request (timestamp). The purpose of this digital signature is to build trust between the cloud server and the user.

Block header: The block header contains the following metadata to verify the data block. • Hash: The SHA256 hash of the block. With an example in Fig. 4, the hash value can be formulated as Hash12 = Hash (Hash1+Hash2) = Hash [(Tx1.Hash) +(Tx2.Hash)]. • Previous hash: The hash of the previous block that is used for block validation. • Merkle Root: A structure tostore a group of transactions in each block. • Nonce: It refers to a number that is generated by proof of work operation on miner nodes, in order to produce a hash value below a target difficulty level. • Timestamp: It refers to the time of when the block was created. It is also the timestamp of the last transaction in the block The pharmacy login provides authorized pharmacy users with access to the system's features and tools for managing and dispensing medications. The system may include features for managing medication inventory, tracking prescription orders, and communicating with healthcare providers to ensure that patients receive the correct medications. The blockchain algorithm used by the system provides several benefits for pharmacy management, including enhanced security, transparency, and trust in the medication records. The decentralized and distributed nature of the blockchain ledger ensures that medication records are tamper-proof and secure, with all changes to the records being recorded and tracked in the ledger.

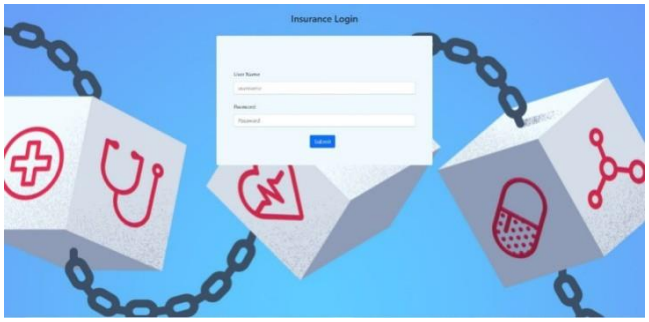


Figure 15 : insurance login

Insurance login

The insurance login provides authorized insurance company users with access to the system's features and tools for managing insurance claims and reimbursements. The system may include features for managing insurance claims, tracking payments, and communicating with healthcare providers to ensure that claims are accurate and complete. The blockchain algorithm used by the system provides several benefits for insurance management, including

Insurance login

The insurance login provides authorized insurance company users with access to the system's features and tools for managing insurance claims and reimbursements. The system may include features for managing insurance claims, tracking payments, and communicating with healthcare providers to ensure that claims are accurate and complete. The blockchain algorithm used by the system provides several benefits for insurance management, including enhanced security, transparency, and trust in the insurance records. The decentralized and distributed nature of the blockchain ledger ensures that insurance records are tamperproof and secure, with all changes to the records being recorded and tracked in the ledger.

Figure 16: doctor login

Doctor login

The doctor login provides authorized healthcare providers with access to the system's features and tools for managing patient healthcare records. The system may include features for managing patient diagnoses, tracking treatments, and communicating with other healthcare providers to ensure that patients receive appropriate care. The blockchain algorithm used by the system provides several benefits for healthcare management, including enhanced security, transparency, and trust in the healthcare records.

CONCLUSION

Based on mobile cloud computing and blockchain technology, this paper proposes a novel EHRs sharing scheme. Using a real-world prototype implementation, we identify critical challenges in current EHR sharing systems and propose efficient solutions. In order to ensure effective and secure EHR sharing, our focus in this work is on creating a dependable access control mechanism based on a single smart contract to manage user access. We deploy an Ethereum blockchain on the Amazon cloud to investigate the performance of the proposed approach, where medical entities can interact with the EHRs sharing system via a developed web application

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