Blockchain based medicine ordering system using IVR

Submitted in partial fulfillment of the requirements of the degree

BACHELOR OF ENGINEERING IN **COMPUTER ENGINEERING**

By

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CERTIFICATE

This is to certify that the Mini Project entitled **"Blockchain based medicine ordering system using IVR"** is a bonafide work of **Lintomon Chirrakara(08),Aditya Kushwaha(35),Chinmay Phapale(46),Vedant Talwalkar(61)** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **"Bachelor of Engineering"** in **"Computer Engineering"** .

Mr. Richard Joseph
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(Prof. Dr. Nupur Giri)
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(Prof. J. M. Nair)
Principal

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INSTITUTE OF TECHNOLOGY
HASHU ADVANI MEMORIAL COMPLEX,
COLLECTOR'S COLONY, CHEMBUR,
MUMBAI-400 074, INDIA.

Mini Project Approval

This Mini Project entitled " **Blockchain based medicine ordering system using IVR"** by **Lintomon Chirakkara(08), Aditya Kushwaha(35) ,Chinmay Phapale(46),Vedant Talwalkar(61)** is approved for the degree of **Bachelor of Engineering** in **Computer Engineering.**

Examiners

1.....21/10/23.....
(Mr. Richard Joseph)

2.....Lifna. C.S.....21/10/23.....
(External Examiner name & Sign)

Date: 21/10/2023

Place: Chembur

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Abstract ii

The combination of blockchain technology and interactive voice response (IVR) technologies in healthcare has resulted in a novel method to pharmaceutical ordering and delivery. This project proposes a Blockchain-Based Medicine Ordering System that uses interactive voice response to harness the potential of artificial intelligence (AI). The technology improves the efficiency, transparency, and security of pharmaceutical procurement by combining the inherent data integrity and traceability of blockchain with the user-friendly interface of IVR. By allowing consumers to communicate with the system using natural language, the ordering process becomes more efficient and accessible, breaking down old boundaries. The initiative aims to transform the landscape of pharmaceutical procurement through this creative collaboration, creating a safe and smooth experience for patients, healthcare practitioners, and pharmacists alike.

KEYWORDS - *Artificial Intelligence, blockchain, IVR*

ACKNOWLEDGEMENTS iii

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List of abbreviations: iv

- GPU - Graphics Processing Unit
- CPU - Central Processing Unit
- RAM - Random Access Memory
- HDD - Hard Disk Drive
- SSD - Solid State Drive
- UX - User Experience
- SQL - Structured Query Language
- NoSQL - Not Only SQL
- JSON - JavaScript Object Notation
- NLP - Natural Language Processing

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Introduction

1.1 Introduction

In an era driven by technological advancement and the pursuit of enhanced convenience, the fusion of Interactive Voice Response (IVR) technology and chatbot systems emerges as a beacon of user-centric innovation. This project sets the stage for a transformative experience, where voice commands act as the channel between users and a state-of-the-art medication ordering system. This visionary approach introduces an AI-powered chatbot that not only responds to inquiries about medication but also seamlessly delivers orders with a simple agreement. This innovation is underpinned by the dynamic IVR interface, welcoming users from diverse backgrounds to engage effortlessly. The forthcoming narrative unveils the creation of an intricately woven IVR chatbot seamlessly integrated into the medication ordering system.Extensive testing ensures flawless operation, providing the best possible user experience and making the process of buying medications easier. This endeavor successfully combines modern healthcare technology and user-centered design, bringing in an era marked by accessible and efficient solutions.

1.2 Motivation

The necessary need to improve the healthcare information environment serves as the inspiration for our project. Current systems often fail to give users interactive, personalized medical advice, which leads to generalized and occasionally inaccurate recommendations. Our motivation stems from the idea of a personalized healthcare system that takes into account each user's particular health needs and preferences. By utilizing IVR and OCR technologies, we hope to provide users with a personalized and adaptable system. Our goal is to make healthcare information more accurate, individualized, and readily available in addition to organizing it. By doing this, we hope to improve patient experiences and offer helpful support to anyone looking for medical advice.

1.3 Problem Statement & Objectives

A significant challenge in today's healthcare system is the need for greater security and transparency, as well as the desire for simpler ways to order medicines. The outdated systems frequently lack quick response times or user-friendly ways to interact, which can irritate customers and reduce the effectiveness of purchasing medications. Making sure the availability of medicines is accurate and ordering them in a secure and transparent manner are also difficult. By developing an innovative, voice-activated chatbot system, this project seeks to address these issues. This system employs sophisticated

language techniques and technology to obtain information quickly. Additionally, it makes use of a unique technology called blockchain to make things incredibly secure and simple to use.

The primary objective of this project is to develop an IVR (Interactive Voice Response) system that is simple to use and accessible to a wide range of users, resulting in an effortless interaction experience. While creating a voice-driven chatbot system is our main objective, data security and transparency are also very important to us. Our system is made to offer medication recommendations for both simple and serious health conditions, addressing a broad range of medical requirements. In order to achieve this, we place a high priority on making sure that the system is user-centric, user data is well-protected, and that interactions are conducted in a trustworthy and transparent manner.

1.4 Organization of the Report

Chapter 1: Introduction:

The first chapter provides an introductory glimpse into the AI-empowered Medication Ordering System project. It sets the stage by outlining the core objectives and the broader context in which the project operates. This chapter introduces the concept of an IVR-driven chatbot system for medication ordering, emphasizing the need for innovative healthcare solutions. It also highlights the primary focus areas, which include user-friendly design and streamlining the medication ordering process.

Chapter 2: Literature Survey:

In this section, a comprehensive survey of existing systems and AI-driven recommendation technologies is presented. It delves into an examination of conventional medicines ordering methods and their limitations, showcasing the gap that AI can bridge. Furthermore, it investigates the current AI and ML technologies used in similar systems, shedding light on the evolution of AI-driven medications recommendations.

Chapter 3:Proposed System

In this section, we discuss a system that we have proposed to solve the problem. This section covers the technical aspects as well as the future scope of the project. The proposed system is divided into six parts where we introduce the project, describe its architecture, outline the algorithm and process design, explain the methodology applied, discuss the implementation, and also explore the future scope of the project

Literature Survey

2.1 Survey of Existing System

ARTICLE/ BOOK NAME	AUTHORS	JOURNAL/ WEBSITE PUBLISHER	YEAR OF PUBLICATION	SUMMARY
A Novel Blockchain-Based Integrity and Reliable Veterinary Clinic Information Management System Using Predictive Analytics for Provisioning of Quality Health Services	N. Iqbal, F. Jamil, S. Ahmad and D. Kim	14th International Conference on Electronics, Communications and Computers	2021	● **Model Approach**: In this research paper, RIVIMS—a blockchain-based veterinary information management system—is proposed. It integrates performance metrics, secure clinic data, real-time and predictive data analytics, prototype development, and a report that displays system metrics. ● **Output Formats**:Research paper describing RIVIMS development, a prototype for practical demonstration, and a performance evaluation report showcasing system metrics. ● **Target Audience**:Healthcare professionals, veterinarians, data scientists, administrators, blockchain enthusiasts, government regulators, academics, tech solution providers, and the general public interested in healthcare blockchain applications.

The Advantages and Disadvantages of the Blockchain Technology	J. Golosova and A.Romanovs	2018 IEEE 6th Workshop on Advances in Information, and Electronic Electrical Engineering (AIEEE)	2018	• **Model Approach**:Examine Blockchain's pros and cons, emphasizing decentralization, transparency, security, and efficiency, while addressing challenges like energy consumption and transaction costs. Analyze its role in combating double spending and potential for industry transformation. • **Output Formats**:A research paper presenting Blockchain's advantages and challenges, complemented by visual aids like infographics or diagrams to enhance understanding. Additionally, a presentation or webinar will summarize the research for a wider audience. • **Target Audience**:Technology professionals, enthusiasts, and academics are intrigued by Blockchain's potential and challenges. Business leaders considering Blockchain integration, government policymakers and regulators assessing implications, and students studying IT and cryptocurrency. General readers seeking insight into Blockchain's impact across diverse sectors.

Dynamic interactive voice response (IVR) platform	R.Karademir and E. Heves		2013	● **Model Approach**:Develop a dynamic Interactive Voice Response (IVR) platform for call centers to enable non-programmers to design, change, report, inspect, and manage various IVR scenarios. Streamline IVR modifications, add new modules, and enhance flexibility to meet dynamic service demands, reducing time and cost implications. ● **Output Formats**:Research paper, technical documentation, visual aids, and presentations/webinars targeting call center professionals and decision-makers to showcase the dynamic IVR platform's development and advantages. ● **Target Audience**:Call center professionals, administrators, IT professionals, developers

MedBlock: Efficient and Secure Medical Data Sharing Via Blockchain	Fan, K., Wang, S., Ren, Y	Journal of Medical Systems	2018	● **Model Approach**: Develop a blockchain-based information management system, MedBlock, to address challenges in Electronic Medical Records (EMRs). Implement distributed ledger technology, efficient EMR access, and improved consensus mechanisms to enhance security and privacy while simplifying data sharing. ● **Output Formats:** Research paper, technical documentation, visual materials (diagrams and infographics), and presentations/webinars designed for healthcare professionals and policymakers to understand and implement MedBlock, a blockchain-based information management system for EMRs. ● **Target Audience:** Healthcare professionals, IT professionals, pharmaceutical scientists, government regulators, and academic researchers interested in MedBlock, a blockchain-based EMR solution for improved healthcare data management and precision medicine.

MedRec:Using Blockchain for Medical Data Access and Permission Management	A. Azaria, A. Ekblaw, T. Vieira and A. Lippman	*2016 2nd International Conference on Open and Big Data (OBD)*, Vienna, Austria	2016	• **Model Approach**: Create MedRec, a blockchain-based electronic medical record system, to provide safe, open, and compatible access to medical data. This approach addresses slow accessibility, data fragmentation, and patient empowerment while enhancing the quality of data for research • **Output Formats:** Research papers, technical documentation, visual materials, and presentations/webinars are developed to introduce and implement MedRec, revolutionizing medical record management in healthcare institutions. • **Target Audience**: Healthcare professionals, administrators, IT professionals, developers, pharmaceutical
				scientists, researchers, government regulators, policymakers, and academic researchers, all interested in innovative EMR solutions and the application of blockchain technology in healthcare data management. .
Personalized IVR system in contact center	R.Karademir and E. Heves		2013	• **Model Approach**:Develop a personalized Interactive Voice Response (IVR) system for contact centers, aiming to enhance customer interactions and self-service experiences by using personalized greetings, customized menus, and speech recognition. • **Output Formats**: Research paper, technical documentation, visual materials, and presentations/webinars focused on the Personalized IVR system, designed for contact center professionals, customer service representatives, and IT experts, emphasizing improved customer interactions and system implementation.

				• **Target Audience**: Business leaders looking to improve customer service and streamline contact center operations; contact center professionals and customer service representatives looking for advanced IVR solutions; IT professionals and developers interested in speech recognition technology and IVR customization; and academic researchers in telecommunications and customer service looking for creative contact center technology solutions.

While developing the IVR-based medication ordering system, we encountered numerous outdated systems that frequently failed to provide the user with accurate information when they inquired about the prescriptions they needed to take. Therefore, we were interested in learning how they operate, what they do, and above all if they are meeting user expectations. We are hoping to learn about these systems' strong points and potential areas for development as a result of our efforts.

1. **1mg:**

   1mg provides a comprehensive range of digital healthcare services in India, such as wellness products, telemedicine, online medication orders, diagnostics, and health record management. Our system is focused on medication management, whereas 1mg is more concerned with providing general healthcare services. Users can upload handwritten doctor's prescriptions, which our system interprets using OCR and IVR technology, in addition to receiving medication information. This special feature makes our system stand out by responding to a particular healthcare need and improving user accessibility and personalization of medication management.

2. **MediSearch:**

   MediSearch is an essential web resource that helps users make sensible choices about their health by providing information about medications and medical conditions. It provides comprehensive details on drugs, their applications, and any possible negative effects. Even though it offers vital medical information, our system separates itself by appropriately responding to user inquiries based on symptoms and recommending particular drugs, increasing the degree of customized assistance. To put it simply, our system enhances existing platforms such as MediSearch by providing new and improved features that help users manage their health.

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2.2 Limitation Existing system or Research gap

- It's evident from a survey of other systems whose functionality matches ours that every system has some flaws which our system intends to address.Understanding these limitations and gaps is essential for the development of the 'IVR based medications' personalized recommendation system:

- 1. Lack of Personalization: While current systems frequently offer broad information about drugs and illnesses, they might not provide specific advice depending on the individual user's requirements, medical background, and unique symptoms.

- 2. Inability to Prescribe Medications: One important function our system attempts to address is the inability of these platforms to prescribe or recommend particular medications to users based on their symptoms or uploaded medical documents.

- 3. Limited Interaction: Although these platforms allow users to search for information, there isn't much opportunity for two-way communication. Our system offers real-time guidance and improves user engagement by introducing an Interactive Voice Response (IVR) system.

- 4. Poor Integration: In many current platforms, the integration of features like symptom analysis, medication information, and personalized recommendations are either incomplete or separated. Our system aims to provide a thorough and unified solution.

- 5. Research Gap: To deliver an accurate and interactive healthcare experience, there is an absence in the research and development of systems that effectively combine medication information, symptom analysis, and IVR capabilities. Our system fills this research gap by providing a novel approach to these requirements.

- In conclusion, personalization, prescription capabilities, interaction, integration, and a lack of research in comprehensive healthcare solutions are the main drawbacks of current systems like 1mg and MediSearch. Our system aims to close these gaps by offering an interactive, user-centered platform for improved healthcare administration.

2.3 Mini Project Contribution

Our mini project makes a significant contribution by fixing issues with already-existing healthcare platforms such as MediSearch and 1mg. Through the use of IVR and OCR technologies, it provides prescription and medication recommendations, improves accessibility to essential healthcare information, encourages user interaction and engagement, and integrates healthcare solutions. This fills in the knowledge gaps in the field of healthcare technology and guarantees that people can easily and conveniently make decisions about their health and well-being.

Proposed System

3.1 Introduction

The suggested chatbot solution offers an IVR-based method for ordering medications. Users can talk to the IVR system as they speak to a chemist and find out the medicines based on their symptoms, or by providing prescription medicines and getting the availability of the medicines, also give alternative medicines based on the composition of the medicine. By creating customized QR codes for payments, the chatbot simplifies the ordering process and improves security. Upon successful payment, users receive order confirmations and tracking information. Data security is given a priority, and profiles can store user preferences. The chatbot intends to reinvent drug ordering with accessibility, security, and user-centered design through thorough usability testing.

Key Features:

1. **Voice-Powered Queries:** Users can simply use their voice to ask for specific medicines through the IVR system. This makes it convenient for users to interact with the chatbot without the need for typing or navigating complex menus.

2. **Real-Time Availability:** As soon as a user requests a medicine, the system instantly checks if it's currently in stock. This real-time check ensures that users receive accurate and up-to-date information about the availability of the requested medicine.

3. **Smart Suggestions:** If the requested medicine isn't available, the system doesn't leave users empty-handed. It uses its intelligence to recommend alternative medicines that have similar effects or purposes. This assists users in finding suitable alternatives without delay.

4. **Effortless Ordering:** Once users find the medicine they need, the system guides them through the order placement process smoothly. It provides step-by-step prompts to make sure the ordering process is easy to understand and complete.

5. **Instant Updates:** After users confirm their orders, the system promptly sends them order confirmations. Additionally, the system generates QR codes for secure payments. This means users don't have to wait long for payment instructions, enhancing the overall user experience.

3.2 Architectural Framework / Conceptual Design

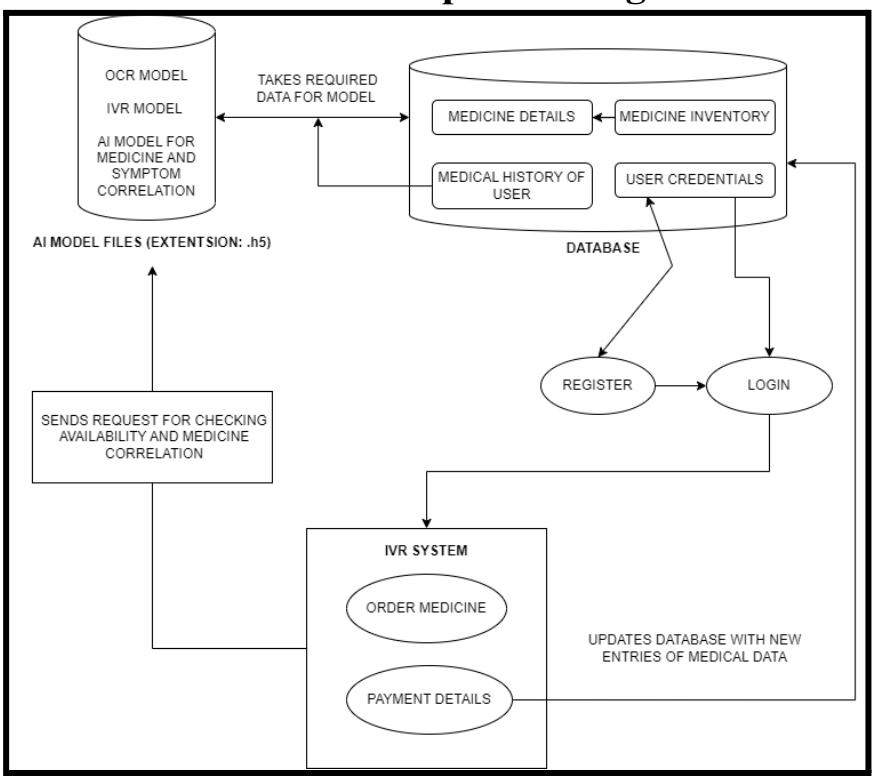

fig 3.2.1

EXPLANATION:

This architectural diagram emphasizes key system features, showcasing the central role of the database in storing essential customer information like addresses, phone numbers, and credentials for efficient medicine delivery and user verification. The database also houses valuable data regarding medicines, inventory status, and user order history. Meanwhile, the IVR system, operating on voice input, interfaces with the database to promptly locate medicines in stock or suggest suitable alternatives based on user preferences.

3.3 Algorithm and Process Design

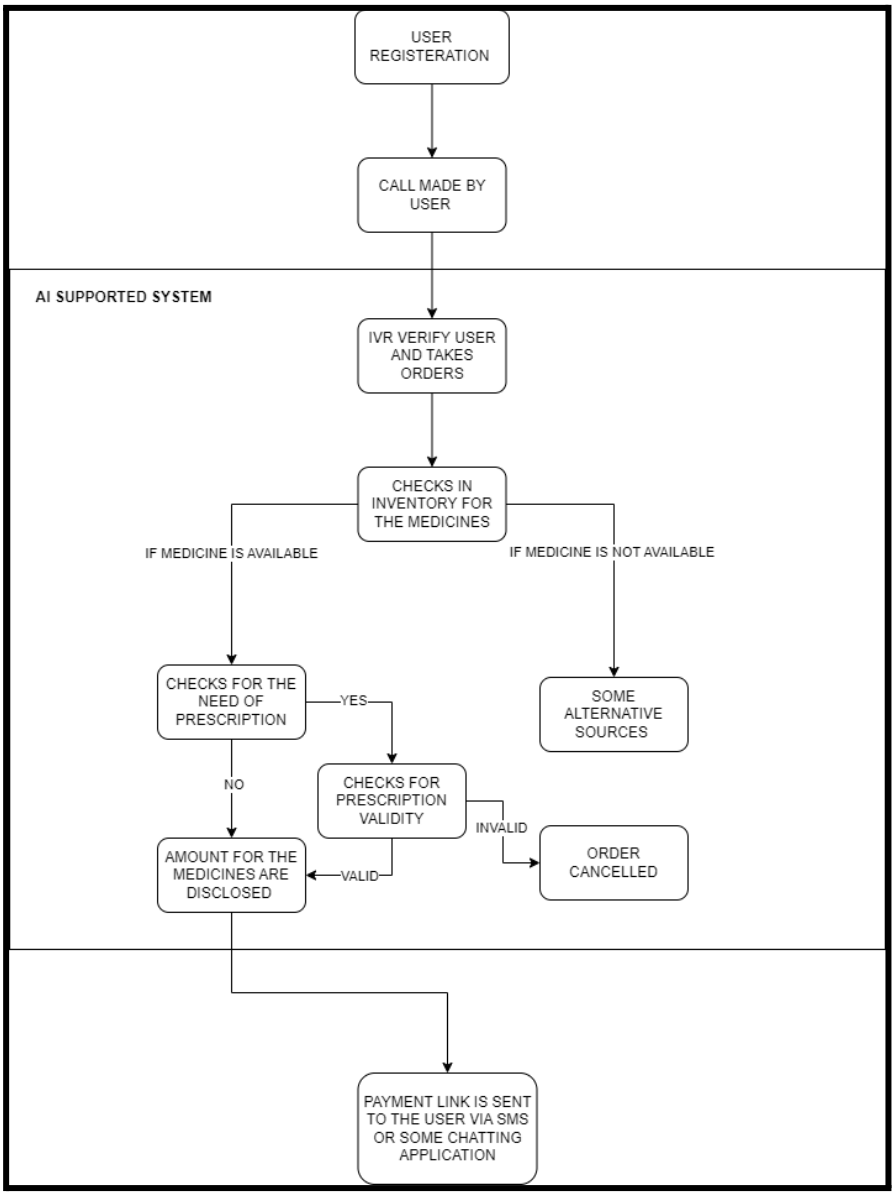

fig 3.3.1

Explanation:

The above figure shows how aur proposed idea is implemented using a use case where a user calls to our system and interacts with the IVR . The steps from user registration to ordering to the deliver of the medicines are explained below:

1. User Registration:
   This is the process where the user validates himself to the system, thus preventing any malicious calls or activities, and it also helps us to keep a user profile for assessing their health history and warn them in future orders of medicines.
2. IVR Interaction :

Interactive voice response or IVR is the receiver at the other end of the phone which authenticates the user and also listens to the order of medicines from the users.

3. Medicine Check and Prescription Reader:
   The medicines that the user needs are checked by the system for its availability and then assures the booking process. If the medicines are not available then the system checks for medicines with the same composition that can fit in the same category, keeping in mind all the side effects that the medicine can cause to the user using his past health results.
   If the ordered medicine needs a doctor prescription, then the user is asked to upload a doctor prescription where the authenticity of the prescription is checked and the list of medicines are also checked with its dosage.

4. Medicine ordering and Payment:
   The order is finalized if all the above processes are cleared and then the payment link is given to the customer through any messaging application or via chatbot integrated within the application.

3.4 Methodology Applied

The methodology for developing the IVR based Medicine Delivery system involves a systematic approach to design, implementation, and evaluation. The process encompasses data collection, model development, and performance evaluation. The following steps outline the methodology for building the AI-driven IVR based Medicine Dispensary system **Data Collection:**

- Data is collected from different sources to get the medicine data and disease data from different websites using web scraping and it is preprocessed and sorted accordingly.

User Profiling:

- Develop a user profiling mechanism to store and organize user data for personalization.

Model Selection:

- Explore various models for IVR , OCR and find existing models used for classification of medicines and disease data . Learning about various models and implementing them till the required level of accuracy is met.

Model Training:

- Split the preprocessed data into training, validation, and test sets.
- Train the selected models to minimize prediction errors.

Required Output Generation:

- Utilizing the IVR model to speak like humans and give answers to the questions asked by users from the data that was fed to it.
- Finding the accuracy of OCR model to find letters from the data that was fed into the system using .jpg ,.pdf or any format of files
- Checking if the model trained for getting personalized recommendations for the medicines and getting alternative medicines are giving output from the previous medical data of the user.

Performance Evaluation:

- Conduct rigorous evaluation of the models using the test set and appropriate evaluation metrics, such as accuracy, precision, recall, and F1-score.
- Assess the system's ability to provide relevant and accurate suggestions to users as it can cost a life.

Sources Used:

- User profiles and preferences collected during the registration process.
- Medical history of the users that was collected at the time of registration and all the medicines that the customer has booked from the system in the past.

3.5 Hardware & Software Specifications

Hardware Requirements:

- An internet-connected basic laptop or computer is sufficient for the system.
- A capable processor optimized for machine learning tasks is essential to ensure efficient performance.
- A memory capacity of 16GB is recommended, providing ample resources for various tasks.

Software Requirements:

- Programming Languages: Utilize Python or other suitable languages for seamless integration with deep learning frameworks, such as TensorFlow or PyTorch.
- Deep Learning Framework: Employ TensorFlow, PyTorch, or similar frameworks for implementing and training neural network architectures, which are fundamental for machine learning tasks.
- NLP and NLU Libraries: Leverage NLTK, spaCy, or Gensim for effective text data processing and analysis, especially for handling reviews and descriptions in the travel data.

- Data Preprocessing Tools: Utilize Pandas and NumPy to efficiently clean, filter, and transform raw travel data into structured formats, ensuring data integrity.
- User Interface: For an engaging and user-friendly interface, employ front-end development tools like Flutter, enabling seamless interaction with the system.
- Database: Implement a relational or NoSQL database to store and manage user medication records and other pertinent information, enhancing data organization and accessibility**.**

3.6 Result Analysis and Discussion

3.6.1 User Registration:

Security and profiling commence with user registration.

Detailed profiles are created, aiding in health history assessment and future recommendations.

Ensures system's reliability and user-centric focus.

3.6.2 IVR Interaction:

Interactive Voice Response (IVR) serves as the user interface.

Provides authentication and captures medicine orders.

Emphasizes user convenience and trust.

3.6.3 Medicine Check and Prescription Reader:

System verifies medicine availability and suitability.

Ensures authenticity of doctor prescriptions.

Cross-references medications with health records to minimize risks and side effects.

3.6.4 Medicine Ordering and Payment:

Finalizes orders only after successful checks.

Integrates seamless payment options for user convenience.

Streamlines the ordering process.

3.6.5 Data Collection and User Profiling:

Emphasis on accessing and organizing medical data from various sources.

Serves as the foundation for personalization and recommendations.

```
!pip install pytesseract
!sudo apt-get install tesseract-ocr
!pip install pdf2image
!apt-get install poppler-utils
import pytesseract
from PIL import Image
from pdf2image import convert_from_path


file_path = 'test.pdf'


if file_path.lower().endswith(('.png', '.jpg', '.jpeg', '.gif', '.bmp')):

    image = Image.open(file_path)
    text = pytesseract.image_to_string(image)
elif file_path.lower().endswith('.pdf'):
    images = convert_from_path(file_path)
    if len(images) > 0:
        text = pytesseract.image_to_string(images[0])
    else:
        text = "No pages found in the PDF."
else:
    text = "Unsupported file type."
print(text)
```

fig 3.6.1

```
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: VESIT B25/BE/BA/2023-2024/1124
: TE CMPN
: OPEN

Adm. No.:73
Section :
Fee Type : OPEN

Date : 28/09/2023
Student Id.: 3637018
Academic Year : 2023-2024

Roll No : D7A57

: Mr. TALWALKAR VEDANT RAJANISH

Received the following (%)Amount

' TUITION FEES 109,305.00
DEVELOPMENT FEES 11,695.00
| EXAM FEES ( ODD / EVEN ) 2,308.00
GYMKHANA FEES 400.00
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fig 3.6.2

Additionally, our system provided for the IVR-based Medicine Delivery system plays a pivotal role in the methodology. Our system is responsible for processing and extracting information from medical data sources, including images and PDFs. It employs optical character recognition (OCR) techniques to recognize and convert text from these sources into machine-readable data. Our system demonstrates a practical application of technology in the healthcare domain, enabling the system to handle diverse data formats effectively. Moreover, it offers a means of responding to user queries, ensuring that the system can provide clear and precise answers. The combination of our system with the rest of the methodology, such as user profiling and model training, creates a holistic and powerful AI-driven healthcare solution that can enhance the user experience and potentially save lives by offering accurate and timely medical information and recommendations.

In conclusion, this structured methodology underscores the system's commitment to delivering reliable, personalized, and safe healthcare solutions, emphasizing user trust and satisfaction and the potential life-altering impact of accurate medical recommendations.

3.7 Conclusion and Future Work

In the future, our vision is to develop a sophisticated and comprehensive Interactive Voice Response (IVR) system that transcends its current capabilities. Our goal is to create an IVR system that can not only read prescriptions accurately but also provide valuable medical advice and seamlessly place medication orders for users. We aim to leverage advanced artificial intelligence and natural language processing technologies to ensure the highest level of accuracy, user-friendliness, and reliability in the healthcare domain. This expanded IVR system will serve as a trusted healthcare companion, offering expert guidance, personalized recommendations, and a convenient platform for secure and efficient medication procurement, ultimately enhancing the well-being and health management of our users.

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References

[1] N. Iqbal, F. Jamil, S. Ahmad and D. Kim, "A Novel Blockchain-Based Integrity and Reliable Veterinary Clinic Information Management System Using Predictive Analytics for Provisioning of Quality Health Services," in *IEEE Access*, vol. 9, pp. 8069-8098, 2021, doi: 10.1109/ACCESS.2021.3049325.

[2] J. Golosova and A. Romanovs, "The Advantages and Disadvantages of the Blockchain Technology," 2018 IEEE 6th Workshop on Advances in Information, Electronic and Electrical Engineering (AIEEE), Vilnius, Lithuania, 2018, pp. 1-6, doi: 10.1109/AIEEE.2018.8592253.

[3] Fan, K., Wang, S., Ren, Y. *et al.* MedBlock: Efficient and Secure Medical Data Sharing Via Blockchain. J Med Syst 42, 136(2018) https://doi.org/10.1007/s10916-018-0993-7

[4] A. Azaria, A. Ekblaw, T. Vieira and A. Lippman, "MedRec: Using Blockchain for Medical Data Access and Permission Management," 2016 2nd International Conference on Open and Big Data (OBD), Vienna, Austria, 2016, pp. 25-30, doi: 10.1109/OBD.2016.11.

[5] R. Karademir and E. Heves, "Dynamic interactive voice response (IVR) platform," *Eurocon 2013*, Zagreb, Croatia, 2013, pp. 98-104, doi: 10.1109/EUROCON.2013.6624972

[6] P. K. Kushwaha and M. Kumaresan, "Machine learning algorithm in healthcare system: A Review," *2021 International Conference on Technological Advancements and Innovations (ICTAI)*, Tashkent, Uzbekistan, 2021, pp. 478-481, https://ieeexplore.ieee.org/document/9673220

[7]Mudili Soujanya and Sarun Kumar, "Personalized IVR system in contact center" *2010 International Conference on Electronics and Information Engineering*, Kyoto, Japan,2010, vol.1 ,no. 457, https://ieeexplore.ieee.org/document/5559673/authors#authors

[8]"European Medicines Agency", European Medicines Agency,

https://www.ema.europa.eu/en/medicines/field_ema_web_categories%253Aname_field/Human , Accessed: 14 August 2023

[9]"MediSearch",MediSearch,

https://medisearch.io/, Accessed: 24 August 2023

[10]"National Library of Medicine ",NLM Products and Services, https://eresources.nlm.nih.gov/,

Accessed:14 August 2023

[11]"Data Requisite ",Data Requisite ,

Indian Medicine Database, Accessed:14 August 2023

Research / Innovation: **Project Evaluation Sheet 2023-24** Class: D12 A

Title of Project (Group no): Blockchain based medicine ordering system using IVR (Group no. 47)

Group Members: Vedant Talwalkar (61), Aditya Kushwaha (35), Linton Chirakkara (03), Chinmay Phapale (46)

	Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit, Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (3)	Applied Engg & Mgmt principles (3)	Life-long learning (3)	Professional Skills (5)	Innovative Approach (5)	Total Marks (50)
Review of Project Stage I	3	4	2	1	3	2	2	2	2	3	3	3	4	4	38

Comments:

(*) Literature Survey [Review existing Systems & APIs, Circuits, methodology]

(*) Refine Block diagram / Modular

(*) Dataset exhaustive

(*) OCR using Pytesseract pkg

(*) Blockchain Type - [Public / Private]

Life CS 13/1/23

Name & Signature Reviewer

Industry / Innovation / Research / Innovation:

Project Evaluation Sheet 2023-24

Class: D12

	Engineering Concepts & Knowledge (5)	Interpretation of Problem & Analysis (5)	Design / Prototype (5)	Interpretation of Data & Dataset (3)	Modern Tool Usage (5)	Societal Benefit Safety Consideration (2)	Environment Friendly (2)	Ethics (2)	Team work (2)	Presentation Skills (3)	Applied Engg & Mgmt principles (3)	Life - long learning (3)	Professional Skills (5)	Innovative Approach (5)
Review of Project Stage 1	3	4	2	1	3	2	2	2	2	3	3	3	4	4

Comments:

Date: 13th September, 2023

Name & Signature Rev