Smart System-Health & Fitness Tracking

AET011

Sumer Sail
Dept. of Electronics Engineering
Vidyalankar Institute of Technology
Mumbai, India
sumer.sail@vit.edu.in

Abhishek Dubey
Dept. of Electronics Engineering
Vidyalankar Institute of Technology
Mumbai, India
abhishek.dubey@vit.edu.in

Heramba Narvekar
Dept. of Electronics Engineering
Vidyalankar Institute of Technology
Mumbai, India
heramba.narvekar@vit.edu.in

Prof. Arun Chavan
Dept. of Electronics Engineering
Vidyalankar Institute of Technology
Mumbai, India
arun.chavan@vit.edu.in

***Abstract*— In today's digital age, accessing healthcare services quickly, privately, and efficiently is a growing necessity. This project proposes the development of an anonymous, AI-assisted medical consultation platform that enables users to consult specialist doctors without revealing their identity. Users can upload medical reports (in the form of documents or images) and describe any symptoms they are experiencing. The system uses AI-based Natural Language Processing (NLP) and Optical Character Recognition (OCR) techniques to analyze the uploaded data and determine the appropriate medical specialty required for the case.**

The proposed solution addresses multiple challenges in modern healthcare, including the stigma associated with discussing sensitive medical issues, lack of access to specialists in remote areas, and concerns about data privacy. By leveraging AI for preliminary diagnosis and anonymized communication, the platform enhances user comfort, promotes early diagnosis, and streamlines the path to expert medical advice. This system has the potential to revolutionize telemedicine, making healthcare more inclusive, private, and accessible.

Keyword - healthcare, AI-assisted, Natural Language Processing, Optical Character Recognition, revolutionize telemedicine

I. INTRODUCTION

This project aims to build an app or website where people can talk to doctors without revealing their name or personal details. Users can upload their medical reports and describe their health problems. The platform will also allow users to download the consultation summary and continue follow-ups if needed. This idea solves many real-world problems like lack of doctors in remote areas, fear or embarrassment about health issues, and privacy concerns. It makes expert medical help easier, safer, and more comfortable for everyone.

Identify applicable funding agency here. If none, delete this text box.

II. RELATED WORK

While anonymous, AI-powered telemedicine platforms have made progress, many still struggle with offering full privacy, automated report analysis, and quick specialist matching. Research shows that anonymous consultations help reduce stigma, especially for sensitive issues like mental health, encouraging more people to seek help. AI technologies like NLP and OCR have also proven effective in analyzing medical reports and speeding up diagnoses. However, platforms like Maya and Lybrate are focused primarily on direct doctor-patient interaction, where users typically need to reveal their identity.

III. EXISTING TECHNIQUES

A. Maya

Maya is a mobile app from Bangladesh designed to provide mental health support. It helps people who may feel embarrassed to talk about their emotional or psychological problems. The app allows users to chat anonymously with mental health professionals like psychologists and counsellors, ensuring privacy. It offers counselling sessions and AI-based help to match users with the right expert. While it mainly focuses on mental health, it has expanded to include physical health as well. Available globally, especially in South Asia, it offers both free and paid services. However, it doesn't let users upload medical reports or have direct consultations with doctors about physical health. [1]

B. Lybrate

Lybrate is a telemedicine platform from India that connects people with doctors for online consultations, appointments, and lab tests. Founded in 2013, it helps improve access to healthcare, especially in areas where there are fewer doctors. Users can share their health reports and get consultations with doctors across various specialties. Lybrate also offers a feature for getting second opinions on diagnoses or treatments. However, it requires users to create an account with their personal information, which might not be ideal for those who want to stay anonymous. Lybrate doesn't use AI to analyze reports or automatically direct users to the right specialist, which can make the process slower compared to other platforms.[2]

This app enables users to ask health related questions anonymously, receiving answers from professionals within 48 hours. It has been instrumental in reducing the stigma around discussing reproductive and mental health.

IV. METHODLOGY

A. Requirment Analysis

The first step involves understanding the exact needs of the users. Since the main goal of the project is to offer anonymous healthcare access, it's essential to ensure that users can consult doctors without revealing personal details. The platform should be simple to use and capable of providing fast responses. It's also important to recognize the different types of medical reports users might upload—such as images, PDFs, or plain text—and the variety of symptoms they may describe. Additionally, the system should be able to identify and include the main medical specialties (like cardiology, dermatology, neurology, etc.) to ensure cases are routed to the correct experts.

B. AI and Report Analysis

Once the platform receives a medical report, it uses Optical Character Recognition (OCR) technology to read and extract text from any image or scanned document. After text extraction, Natural Language Processing (NLP) is applied to understand the symptoms entered by the user and analyze the content of the medical reports. This helps the system make sense of the data. Based on this analysis, either a rule-based logic system or a machine learning model can be used to match the user's condition with the right type of doctor. This automation improves speed and accuracy in diagnosis and doctor routing.

C. Anonymous Communication Setup

To maintain full anonymity, the system creates a unique ID for both the user and the doctor, like "U123" or "D456". During the consultation process, no personal information such as name, phone number, or email is ever shared. A secure chat interface is developed where both parties can communicate freely and safely. This feature is crucial, especially for users dealing with private or sensitive issues, such as mental health or reproductive health, where stigma might prevent them from seeking help otherwise.

D. Doctor Management System

The platform includes a dedicated portal for doctors, allowing only verified medical professionals to access patient cases. Doctors are notified when a new case is matched to their specialty, and they have the option to accept or reject it. Once a case is accepted, the doctor can review the anonymized details, start a secure chat with the user, and provide a diagnosis or advice. After the consultation, doctors can also submit a summary of the discussion or treatment recommendations, which the system then delivers to the user.

E. Backend and Database Development

All user data, including uploaded reports, AI analysis results, and chat histories—is securely stored in a protected backend system. Strong encryption methods are implemented to ensure that all information is kept private and cannot be accessed by unauthorized individuals. The backend also handles the logic for user-doctor matching, file processing, and communication management. Maintaining data integrity and security is vital to building trust in the platform.

F. Testing and Validation

Before going live, the system is tested using a variety of sample reports and user scenarios to verify that everything functions as intended. Testing ensures that the AI correctly reads reports, understands symptoms, and matches users with the appropriate specialist. The chat function is also tested to confirm that it maintains anonymity and works smoothly. This phase helps identify any bugs or improvements needed before public release.

G. Deployment

After successful testing, the platform is deployed on a secure cloud server for public access. The deployment includes monitoring tools to track user activity, AI accuracy, and doctor performance. Feedback is collected from both users and doctors to continuously improve the platform's features, usability, and performance. Over time, updates and improvements are made based on real-world usage and technological advancements.

V. DESIGN PROCESS

A. User Flow Design

The user flow is designed to be as simple and non-intrusive as possible to encourage usage, especially for people concerned about privacy. Users can access the app or website without the need to log in or create an account. They are prompted to upload their medical reports, which can be in formats like PDFs or images, and to describe their symptoms in a simple text form. Once the information is submitted, the system uses artificial intelligence to analyze the content and identify the medical specialty needed. The case is then automatically routed to a suitable, verified doctor without revealing the user's identity. Doctors and users communicate using anonymous system-generated IDs. After the consultation ends, the doctor provides a summary, which is securely sent to the user through the platform.

B. System Architecture Design

The system is divided into three core components: the user interface, the doctor portal, and the backend. The user interface is responsible for receiving uploaded reports and allowing users to engage in secure chat consultations. Doctors, on the other hand, access their own secure portal to view assigned cases, accept or decline them, and provide consultations. The backend plays a crucial role in storing medical reports, AI analysis data, and chat history. It is also responsible for executing AI algorithms, anonymizing data, and maintaining secure communication. The architecture ensures that all information flows are protected and that personal identities are never exposed.

C. AI Model Design

The AI in this system performs three major tasks. First, it uses Optical Character Recognition (OCR) to extract text from images or scanned documents uploaded by users. This allows the system to read handwritten or printed medical reports. Then, Natural Language Processing (NLP) is used to understand the user's typed symptoms and any extracted medical data. Finally, the AI analyzes all this information and matches it with the most appropriate doctor or specialist. This automated process makes the consultation faster, more accurate, and less dependent on manual intervention.

D. Privacy & Security Design

Privacy is the core value of this platform, and it's implemented through various security measures. Each user and doctor are assigned a unique anonymous ID, such as "User123" or "Doc456", to ensure there is no need to share real names, emails, or phone numbers. All communication between users and doctors is encrypted to prevent any data leaks or unauthorized access. Moreover, only the assigned doctor has access to a user's case, and no one else in the system can view or trace the consultation, ensuring complete confidentiality and trust.

E. UI/UX Design

The User Interface (UI) and User Experience (UX) are designed to be clean, simple, and familiar. The process is divided into clear steps, so users don't feel confused or overwhelmed. The chat interface is inspired by common apps like WhatsApp to make users feel at ease during their interaction with doctors. The interface uses easy-to-read fonts, intuitive icons, and responsive layouts that work well on both desktop and mobile devices. Overall, the focus is on making the platform accessible even to people with minimal technical skills, including elderly users or those in rural areas.

VI. Interface Analysis

A. User Flow and Features

The platform's user flow begins with a standard authentication process that includes login using a username and password, a "forgot password" recovery option, and new user registration for first-time visitors. After successful login, users are directed to choose from gender-specific health pathways — "for him" or "for her." These tailored paths help users access relevant healthcare features more effectively. Male users can explore modules like testicular health, men's general health tracking, mental health, and fitness routines, while female users are directed to modules such as PCOS tracking, pregnancy health, and breast care. Once inside the main dashboard, users can manage their medical reports, read health blogs, use AI-based symptom checkers, and navigate multiple health-related modules. This flow ensures that users receive personalized healthcare resources based on their needs while preserving ease of access and usability.

B. Personalized Health Features

The platform includes a dedicated interface for accessing a wide range of gender-specific health features. These are categorized into three tabs: "All Features," "Male Health," and "Female Health." Under Male Health, users can explore modules such as prostate health monitoring and customized workout plans. Female Health offers specialized modules like hormonal health management, pregnancy care guidance, and breast health monitoring. Each feature comes with a short and simple description, explaining its purpose and how it can help the user. The design aims to provide not only useful health tools but also to create a sense of comfort and clarity, especially for sensitive issues where users might seek anonymous support.

C. Fitness Tracking

The fitness tracking module is designed to motivate users to maintain an active lifestyle by integrating with platforms like Google Fit. The landing page encourages users to begin their fitness journey and allows for seamless sync with wearable devices. The fitness dashboard presents daily activity metrics such as the number of steps taken, minutes of activity, and calories burned. Users can access visual analytics like line graphs or bar charts to view their activity patterns over days, weeks, or months. This visual insight helps them understand trends and make improvements in their daily routines. The fitness visualizer is a key component, offering real-time tracking and comparisons that promote accountability and goal setting.

D. Medical Report Analysis

This feature focuses on simplifying complex medical information for the user through AI-powered tools. Users can upload their medical reports using an intuitive drag-and-drop interface. Once uploaded, the AI scans and processes the document using Optical Character Recognition (OCR) and Natural Language Processing (NLP) to identify and interpret medical terms. The platform then generates simplified explanations and highlights critical findings, making the information easier to understand. Additionally, it provides users with actionable insights or recommendations based on the report's content. Throughout this process, strict privacy measures are enforced to ensure that sensitive health data remain secure and confidential.[3][6]

VII. Discussion

One of the core goals of this platform is to provide users with a secure and private way to consult doctors without revealing their identity. This is especially important for individuals dealing with sensitive health issues, such as mental health, sexual health, or socially stigmatized conditions. Anonymity reduces the fear of judgment and encourages more people to seek help early. By assigning random IDs to users and eliminating the need for personal details like name or contact information, the platform builds trust and comfort for those who might otherwise avoid getting medical advice.

The platform uses advanced technologies like Optical Character Recognition (OCR) and Natural Language Processing (NLP) to analyze medical documents and symptoms entered by users. OCR reads and extracts text from uploaded reports (images or PDFs), while NLP interprets this information to understand health issues. The system then identifies the most appropriate medical specialty for the case. This automation speeds up the triage process, ensures accurate routing to the right doctors, and reduces the burden of manual data entry and analysis.

After analyzing the user's input and medical report, the system intelligently matches the case with a verified medical specialist. This smart routing mechanism ensures that users relate to the most relevant doctor without needing to browse through lists or search manually. Doctors are verified and categorized by their specialties, allowing for quick and

effective consultations. This feature saves time and ensures better diagnosis and treatment since users are directly guided to professionals with expertise in their specific health issues.

To maintain trust and protect sensitive information, the platform follows strict data security protocols. This includes end-to-end encryption of all communications and storage, anonymous user identifiers, and compliance with international health data protection regulations like GDPR (General Data Protection Regulation) and HIPAA (Health Insurance Portability and Accountability Act). Only authorized doctors can view a specific case, and users' identities remain confidential throughout their interactions, safeguarding both privacy and legal compliance.

The platform bridges the gap for users living in rural or remote regions where healthcare infrastructure may be limited. It offers a convenient and effective way for users to access high-quality medical advice and services from the comfort of their homes. This is particularly helpful for people with mobility issues or limited financial means to travel long distances for specialist consultations. The ability to connect with top doctors remotely ensures more inclusive and equitable healthcare delivery.

By enabling users to share their health concerns anonymously and promptly, the system supports early detection of diseases and faster medical intervention. Many health conditions can be managed better or even prevented entirely if diagnosed in their early stages. With the help of AI, the platform can flag potential health risks based on reports and symptoms, encouraging users to take action before complications arise. This promotes a culture of proactive, preventive healthcare rather than reactive treatment.

The platform is designed to support a wide variety of users by offering compatibility with multiple devices (smartphones, tablets, computers), language preferences, and even accessibility features for people with disabilities. It aims to break down barriers that prevent people from getting medical help—whether those barriers are technological, linguistic, physical, or social. This inclusiveness ensures that everyone, regardless of their background or ability, has access to reliable and comfortable healthcare services.

Remote consultation through this platform significantly reduces the financial and time burden associated with traditional hospital visits. Users avoid travel costs, long waiting times, and unnecessary appointments, which is especially beneficial for those with busy schedules or physical limitations. By streamlining the consultation process and connecting users directly to the right doctor, the platform ensures efficient use of both users' and doctors' time and resources.

The platform not only facilitates one-time consultations but also allows for follow-ups and continued communication between users and doctors—without ever compromising anonymity. Users can receive prescriptions, track their progress, and consult again if needed using the same anonymous ID. This continuity of care improves health outcomes and helps users feel supported throughout their health journey, all while keeping their identity safe and secure.

VII. Conclusion

From a technological standpoint, this project leverages cutting-edge AI to bridge the gap between users and medical professionals. By integrating AI for automated analysis of medical reports and symptoms, the platform offers a more efficient and accurate way of connecting patients with the right doctors. The use of Optical Character Recognition (OCR) and Natural Language Processing (NLP) not only streamlines the consultation process but also ensures that users can receive the right treatment faster, without manual intervention.

From a societal perspective, the project tackles key healthcare issues like privacy, accessibility, and inclusivity. Many people avoid seeking medical help due to privacy concerns or social stigma, especially when it comes to sensitive health issues. By allowing users to remain anonymous, this platform encourages more people to reach out for help without fear of judgment. Additionally, it makes healthcare more accessible to individuals in remote areas, overcoming geographical barriers that limit access to specialized care. Overall, this project offers a comprehensive solution to modern healthcare challenges, combining technological innovation with a deep understanding of user needs to create a more inclusive, secure, and accessible healthcare system.

IX. Future Scope

In the future, this platform can expand by supporting more languages, adding voice-based consultations, and improving AI to give even more accurate suggestions. It can also connect with health devices (like smartwatches) for real-time tracking, offer mental health support, and be used in hospitals or clinics to speed up diagnosis. Overall, it has the potential to become a complete, accessible, and private digital healthcare solution for people worldwide.

As technology improves, this system can also include features like doctor availability, emergency support, and integration with pharmacies for direct medicine delivery. It could help in managing long-term health conditions by tracking progress and sending regular health tips. With government or NGO support, it can reach more remote areas and help people who don't usually get good healthcare. This makes it a powerful tool for building a healthier and more connected society.

X. Acknowledgment

The authors extend their sincere gratitude to Prof. Arun Chavan for his valuable guidance and support throughout the development of this project. We would also like to express our appreciation to the Department of Electronics Engineering, Vidyalankar Institute of Technology, for providing the necessary infrastructure and resources that enabled the successful completion of this research work.

XII. REFERENCE

[1] Mayalogy Ivy Huq Russell, a former investment banker, is the founder and CEO of Maya.[2] Maya Apa, meaning '*Sister Maya*', was named after Russell's mother, who fought breast cancer in 2009

https://en.wikipedia.org/wiki/Mayalogy

[2] Lybrate is a mobile healthcare technology company that developed an online platform to connect doctors and patients.The company was founded in 2013 and is headquartered in Delhi, India. The service was. The service was founded in July 2013 by Saurabh Arora and formerly worked at Facebook in the United States and Rahul Narang

https://en.wikipedia.org/wiki/Lybrate

[3] A Survey on Deep Learning and Explainability for Automatic Report Generation from Medical Images Pablo Messina, Pablo Pino, Denis Parra, Alvaro Soto, Cecilia Besa, Sergio Uribe, Marcelo andía, Cristian Tejos, Claudia Prieto, Daniel Capurro

https://arxiv.org/abs/2010.10563

[4] Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again by Eric Topol
https://www.academia.edu/42042991/Deep_Medicine_How_Artificial_Intelligence_Can_Make_Healthcare_Human_Againpdf_by_Eric_Topol

[5] Carepre system :An intelligent clinical decision assistance system that predicts upcoming medical events based on patient history

Zhuochen Jin, Jingshun Yang, Shuyuan Cui, David Gotz, Jimeng Sun, Nan Cao

https://dl.acm.org/doi/abs/10.1145/3344258

[6] Dataiku's Medical Report Analyzer

Dataiku is a French-American artificial intelligence (AI) and machine learning company which was founded in 2013 in Paris, France
https://www.dataiku.com/solutions/catalog/medical-report-analyzer/