Integrated Health Report Analysis: Tips, Insights, and Scan Evaluation

Mrs. G.S. Devi Lakshmi, Ms. M. Sucharitha
[1] Assistant Professor,[2] Student
[1]Department of Information Technology,
[1]Meenakshi Sundararajan Engineering College, Chennai, India

Abstract - This study presents a Health Report analyzer to enhance patients' comprehension of medical reports. Users input data into the software, which converts it into easily understood metrics, providing insights through Cox Proportional-Hazards and linear regression analyses. Lifestyle advice is offered based on preferences. Basic radiography assessment utilizing DICOM and CNN is also incorporated for image recognition.

Index Terms - Data analytics, Regression, Image recognition, Radiography assessment.

I. INTRODUCTION

Healthcare analytics, driven by big data principles, plays a pivotal role in transforming patient care and healthcare outcomes. By leveraging advanced analytical techniques, it extracts actionable insights from diverse datasets, empowering informed decision-making and personalized treatment strategies. Despite regulatory challenges, the integration of structured and unstructured data holds immense potential for revolutionizing healthcare delivery. Big data analytics transcends traditional approaches, offering precision and foresight in navigating modern medicine. This transformative force illuminates new frontiers in research, diagnosis, and treatment. Ultimately, healthcare analytics, guided by predictive analytics, enhances patient comprehension, communication, and decision-making, fostering proactive well-being management and driving a new era of data-driven healthcare excellence.

II. LITERATURE SURVEY

Joppe W. Bos, Kristin Lauter. et al [1] This paper explores the potential of homomorphic encryption in safeguarding the privacy of medical data. We discuss applications in predictive analysis, demonstrating a functional implementation on Microsoft's Azure cloud platform. The system allows encrypted health data input, yielding encrypted predictions on cardiovascular disease risk. Through homomorphic encryption, computations are performed on encrypted data without decryption, preserving confidentiality. This approach ensures privacy while enabling valuable analysis of sensitive medical information.

R. Lakshmi Priya, G. Manimannan. et al [2] This study employs machine learning methods to analyze Blood Pressure (BP) data from 460 patients, focusing on demographic characteristics and BP Systolic and Diastolic readings. Logistic Regression, Support Vector Machine, and Random Forest Model are utilized to classify BP categories. Evaluation metrics (Area under the Curve, Classification Accuracy, F1 Score, Precision, and Recall) indicate strong performance. Three distinct categories emerge: Normal, Elevated, and Hypertension. The study suggests that machine learning tools effectively analyze large BP datasets. Classification results are visualized using a Silhouette plot.

EXISTING SYSTEM

Regular Analysis of Medical Reports [4]: Computer-aided detection using Deep Learning (DL) and Machine Learning (ML) in medical imaging is crucial for early disease diagnosis. This literature review of 40 studies from 2014 to 2022 analyzes ML and DL applications, modalities, tools, and techniques, providing insights for healthcare practitioners to choose accurate and time-efficient diagnostic methods. To examine unstructured medical records for ascertainable information that can be articulated and organized into structured data.

Big Data Analytics of Master Health Check-Up Patients' Blood Test Reports [5]: Big data analytics, particularly in healthcare, reveals that nearly half of Master Health Checkup patients at a multi-specialty corporate hospital have diabetes, and 20% exhibit symptoms of kidney disease, gout, hyperuricemia, and inflammatory conditions. The study advises tailored investigation, treatment, and improvements in medical facilities for enhanced patient outcomes. It helped in creating a better understanding of analyzing the blood reports for master check-ups.

III. PROPOSED SYSTEM

The health report analyzer project simplifies the analysis of medical reports and patient scans, enabling individuals to input their data and gain valuable insights using Cox Proportional-Hazards Regression and linear regression. Furthermore, it provides lifestyle recommendations and helpful tips for individuals to actively take charge of managing their health parameters based on their personal preferences. The initiative includes a fundamental radiographic assessment utilizing image and pattern recognition for basic medical images. This involves employing DICOM to compare measurements of the radio waves in the scans. By verifying that each user has their user credentials and has permission to use their data, the security of the patient's data is ensured. This helps to ensure patient confidentiality by guaranteeing that the data cannot be readily compromised.

1) Cox Proportional-Hazards Regression and linear regression analyze outcomes based on identified abnormalities. Cox Regression assesses event likelihood over time, while linear regression predicts continuous outcomes from predictor variables.

2) Radiographic evaluation employs DICOM and CNN for image analysis. DICOM standardizes medical image storage and CNN combined with random forest trees enhances machine learning for image recognition.

3) Lifestyle guidelines utilize ChatGPT API for personalized health management. The feedback loop improves recommendations over time.
4) Data encryption ensures medical records' confidentiality. The Blowfish algorithm encrypts data in the system and Firebase using JavaScript libraries. OpenCV encrypts scan images via NumPy arrays and XOR operations with randomized keys.

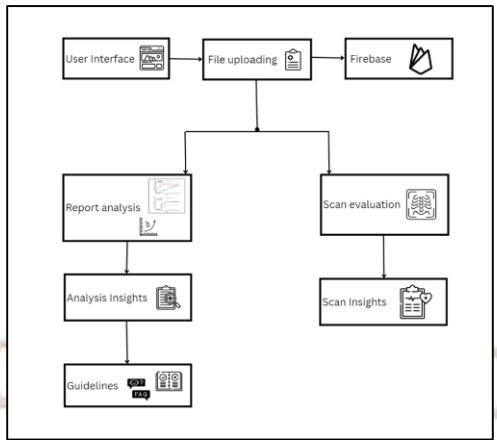

Fig.1 Architectural diagram

IV. CONCLUSIONS

This project aims to empower individuals by improving the communication between clinical reports and patients. It will also provide practical lifestyle advice, enabling informed decision-making, adherence to treatment plans, and proactive well-being management for better patient outcomes. The implementation of user-friendly interfaces and personalized content will further enhance the accessibility and usefulness of this platform.

V. REFERENCES

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