MEDICAL DATA EXTRACTION

Asst.Prof. Mrs. Meghana Vidyadhar Bandiwadekar,
Ramprasad Dattatray Bhat,
Samanveet Shankarrao Kurulkar,
Roshan Rajendra Kesarkar,
Ankur Sanjaykumar Potdar,
Muhammadkhalid Alfaj Mujawar

Computer Science and Engineering, Dr D.Y. Patil College of Engineering and Technology, Kolhapur

Abstract: -

The proposed system is a user-friendly and efficient Data Extraction software for Medical Documents and Images, integrating advanced technologies such as PHP, Android, database, ML-Kit, retrofit, recycler views. The application facilitates efficient user registration, user login, insurance claims, and management of claimed users. The system aims to enhance the accessibility and accuracy of medical data extraction, thereby optimizing insurance procedures for agents, Also This paper outlines the technical architecture, functionalities, and implementation details of the application, highlighting its potential to revolutionize insurance operations within the healthcare industry.

Keywords: - Machine Learning Kit(ML-Kit)

I. INTRODUCTION

In response to the growing complexities of insurance management in the healthcare sector, our project introduces a sophisticated Data Extraction software tailored for medical documents and images. Combining the power of PHP, Android, and ML-Kit, alongside robust database infrastructure, the application offers a user-friendly interface for efficient user registration, login, insurance claims, and management of claimed users. By harnessing ML-Kit for advanced data extraction and retrofit/recycler-views for streamlined data handling, our solution aims to revolutionize insurance procedures, enhancing accessibility and accuracy while optimizing the overall user experience. Through this paper, we delve into the technical intricacies and functionalities of our application, showcasing its potential to modernize insurance operations within the healthcare industry

II. OVERVIEW

The process of development and implementation of a sophisticated Data Extraction software tailored for medical documents and images, aimed at revolutionizing insurance management within the healthcare sector. Beginning with an introduction to the project's objectives and the challenges it addresses, the paper navigates through the technical architecture, functionalities, and implementation details of the application. Key technologies such as PHP, Android, ML-Kit, and database management are explored in depth, highlighting

their roles in facilitating efficient user registration, login, insurance claims processing and management of claimed users. The paper also discusses the
integration of advanced features such as ML-Kit for data extraction and retrofit/recycler-views for data handling, emphasizing their contributions to enhancing accessibility, accuracy, and user experience. Furthermore, real-world implications and potential future developments of the application are examined, offering insights into its transformative impact on insurance operations within the healthcare industry. Through a comprehensive examination of the project's technical aspects and practical implications, this paper aims to provide valuable insights into the potential of technology-driven solutions in optimizing healthcare insurance procedure.

III. PROCESS

A. FLOW CHART

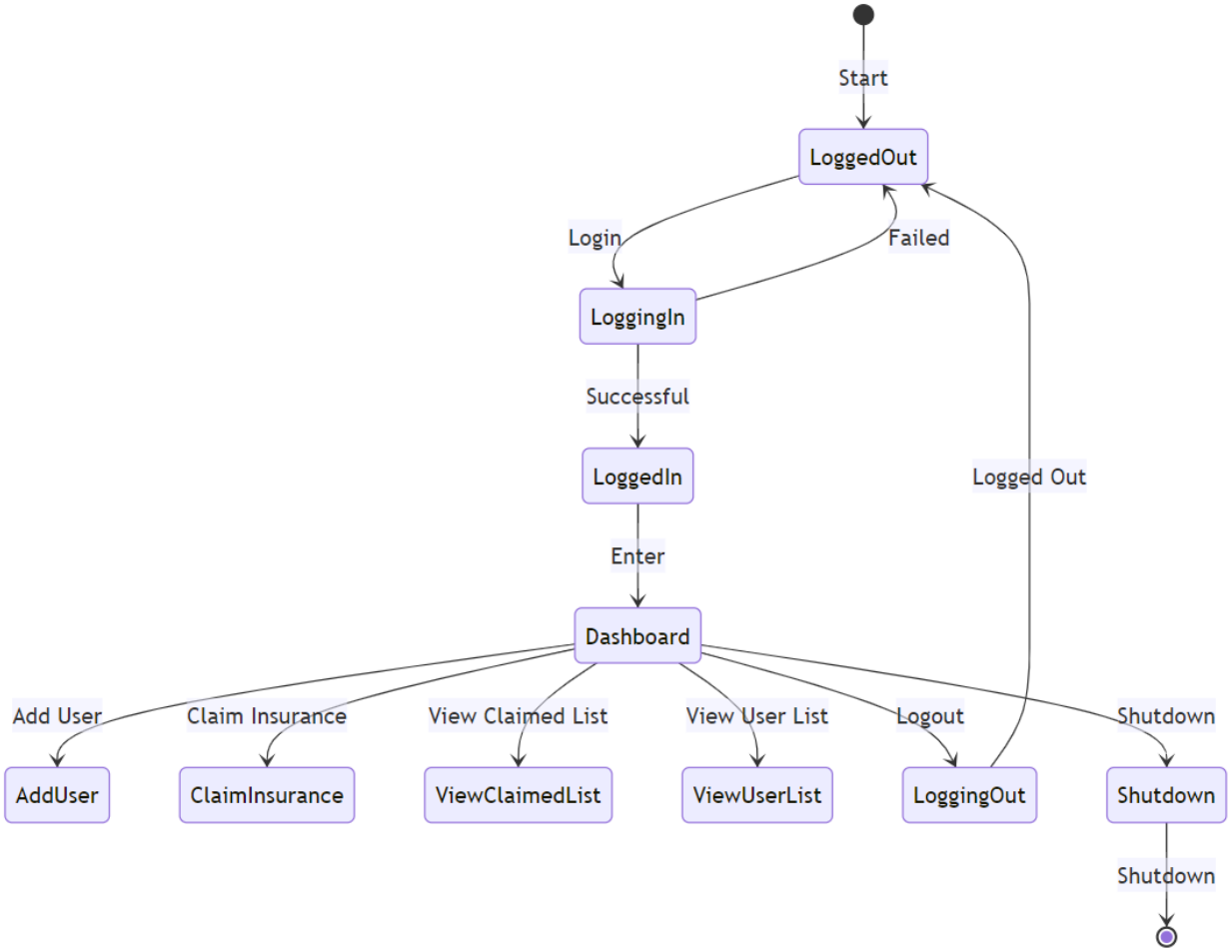

Fig 1. Flow Chart

In the realm of user registration and login processes, the initial access to the application sets the stage. Admin privileges confer access to a username and password authentication mechanism, leading to a dashboard interface upon successful login. This dashboard serves as a comprehensive control centre, facilitating navigation across various modules. Core insurance claim processing, and data visualization. The "Add User" module within the dashboard empowers administrators to register new users efficiently. Critical personal details such as full name, mobile number, address, date of birth, and insurance start date are solicited and stored in the database upon submission. Meanwhile, the "Claim Insurance" module streamlines the insurance claim process by enabling administrators to initiate claims for users. Leveraging image processing capabilities, the system

automatically extracts pertinent textual information from uploaded medical documents, enhancing efficiency and accuracy. The "View User List" and "View Claimed User List" modules serve as vital repositories of user data, facilitating effective management and analysis. Administrators can access essential user information and perform actions such as editing or deleting records as warranted. Additionally, detailed insights into claimed insurance statuses and associated details empower administrators to make informed decisions swiftly. A seamless logout mechanism ensures security and session management, allowing administrators to terminate their sessions promptly, thereby mitigating unauthorized access risks. The project's overarching objective revolves around fostering user-friendly navigation and robust data management practices. By integrating advanced technologies such as image text extraction, the system optimizes insurance procedures, reduces manual intervention, and augments the accessibility and accuracy of medical data extraction, thus fortifying patient care standards within the healthcare sector. This approach reflects a commitment to innovation and efficiency, ultimately enhancing the operational efficacy of insurance processes while prioritizing user experience and data integrity.

B. DATA EXTRACTION MODULE

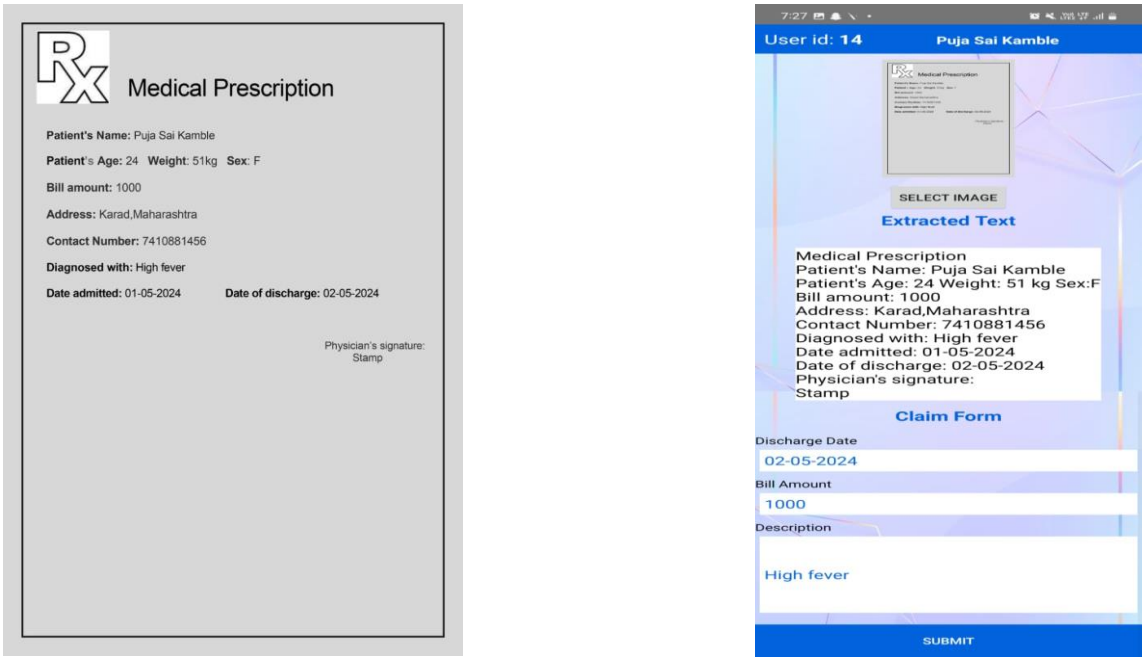

Fig 2. Data Extraction Process

Image-to-text conversion and data extraction play a crucial role in automating information retrieval from medical documents and images within the proposed software. The process begins with the submission of an image containing medical documents, such as bills or discharge summaries, by the admin user. The application utilizes advanced image processing techniques to pre-process the image, enhancing its clarity and reducing noise to optimize text recognition. Subsequently, the image undergoes text extraction utilizing cutting-edge technologies such as ML-Kit, which employs machine learning algorithms to recognize and extract text data from the document. This process involves segmenting the text regions from the rest of the image, followed by optical character recognition (OCR) to convert the text-containing regions into machine-readable format. The extracted

text is then parsed and analysed to identify relevant information based on predefined patterns and rules. This includes identifying key data points such as patient details, medical procedures, dates, and monetary amounts. Natural language processing (NLP) techniques may also be employed to further refine and categorize the extracted information. Once the relevant data has been extracted and validated, it is seamlessly integrated into the application's database or presented to the admin user for review and further processing. This automated data extraction process significantly reduces the time and effort required for manual data entry and ensures the accuracy and consistency of extracted information, thereby optimizing insurance procedures and enhancing decision-making processes within the healthcare industry. In the proposed Data Extraction software for Medical Documents and Images, the data extraction module functions as a pivotal component, enabling seamless and accurate extraction of relevant information from medical documents and images. Leveraging advanced technologies such as ML-Kit and image processing algorithms, this module automates the extraction process, significantly reducing manual effort and minimizing the risk of errors inherent in traditional methods. When an admin initiates an insurance claim through the application, they upload an image containing pertinent medical documents, such as discharge summaries or bills. The image is then processed by the ML-Kit, which employs machine learning models to recognize and extract text data from the document. Through sophisticated algorithms, the extracted text is parsed and categorized, identifying key information such as discharge dates, bill amounts, and descriptions of medical procedures. This extracted data is subsequently validated and integrated into the claim submission form, providing administrators with a comprehensive overview of the insurance claim. By seamlessly integrating data extraction capabilities into the application workflow, this module enhances efficiency, accuracy, and accessibility in managing insurance procedures, ultimately revolutionizing insurance operations within the healthcare industry.

C. LITERATURE SURVEY

The development of a user-friendly and efficient Data Extraction Application for Medical Documents and Images represents a significant advancement in the healthcare and insurance sector, aiming to address the growing complexities of data management and processing. This literature review examines existing research and technologies relevant to this project, highlighting key methodologies, technologies, and their potential impact on healthcare workflows and insurance operations.

Prof. Vaibhav. V. Mainkar and colleagues' exploration of pre-processing techniques for character recognition provides valuable insights into the foundational steps essential for accurate data extraction from medical documents and images. Their discussion on skew detection, contrast enhancement, binarization, and segmentation lays the groundwork for understanding the preprocessing requirements crucial for our application's success.

Venkata Prasanth Yanambaka et al.'s focus on offline handwritten digit recognition underscores the importance of segmentation techniques in isolating individual characters, a critical aspect for accurately extracting information from medical documents. Their research informs our project's approach to handling diverse data sources and improving recognition accuracy.

Yasir Babiker Hamdam and team's emphasis on recognizing various stylistic characters with high accuracy aligns with our objective of enhancing data accessibility and analysis in medical data extraction. Their proposed framework incorporating stylish character recognition procedures serves as inspiration for optimizing recognition models within our application.

Hongshuai Zhao et al.'s utilization of deep learning methodologies for character recognition, particularly in historical documents, offers valuable insights into overcoming challenges related to data annotation and model instability. Their work informs our project's exploration of advanced neural network architectures and their potential application in medical data extraction from diverse sources.

Furthermore, José Carlos Aradillas et al.'s analysis of transfer learning techniques and data augmentation strategies in offline handwritten text recognition provides valuable guidance on optimizing recognition performance under constrained conditions. Their research informs our approach to handling limited labeled samples and errors in training data within the context of medical document extraction.

In summary, the literature survey underscores the significance of advanced technologies such as Google MLkit, Android, SQL Live Database, and pre-processing techniques in developing a robust Data Extraction Application for Medical Documents and Images. By leveraging insights from existing research, our project aims to streamline healthcare workflows, improve data accuracy, and revolutionize insurance operations within the healthcare industry.

D. CONCLUSION

The development of the Data Extraction Application for Medical Documents and Images represents a significant advancement in healthcare and insurance management. By leveraging advanced technologies such as Google MLkit, Android, SQL Live Database, and pre-processing techniques, the application offers a user-friendly solution for automating information extraction from diverse medical data sources. Through streamlined workflows and improved data accuracy, this project has the potential to revolutionize insurance operations, enhance decision-making processes, and ultimately contribute to better patient care within the healthcare industry.

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AUTHORS

First Author – Ramprasad Dattatray Bhat, Bachelor of Technology and ramrajebhat214@gmail.com.
Second Author – Samanveet Shankarrao Kurulkar, Bachelor of Technology and samanveet22@gmail.com.
Third Author – Roshan Rajendra Kesarkar, Bachelor of Technology and roshankesarkar83116@gmail.com.
Fourth Author – Ankur Sanjaykumar Potdar, Bachelor of Technology and ankurpotdar2264@gmail.com.
Fifth Author – Muhammadkhalid Alfaj Mujawar, Bachelor of Technology and khalidmujawar3313@gmail.com.

Guide: – Asst.Prof : Mrs. Meghana Vidyadhar Bandiwadekar, mvbandiwadekar@gmail.com

Correspondence Author: – Ramprasad Dattatray Bhat, ramrajebhat214@gmail.com.