

Pharmacy Management System using ML

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Abstract: *Pharmacy Management System using ML application helps the pharmacist to manage pharmacy in systematic ways. Pharmacy Management system using ML can make the work easier by giving the details of Medicines. It becomes very difficult in big medical stores to handle the details of the medicine manually so by using this system we can maintain the records of all the medicines. Also, nowadays doctors are very busy so, they tend to scribble unreadable prescribed medicines which leads to the problem of misinterpreting medicine names. Patients are sometimes curious to know information about their prescribed medicines before purchasing them. Therefore, this system recognizes handwritten medicine names and returns a readable digital text of the medicine.*

Keywords: Pharmacy, ML, Medicines, Management

I. INTRODUCTION

This Pharmacy Management System using ML is a complete dispensing workflow management system that is designed to improve accuracy and enhance safety and efficiency. Most Pharmacies are still doing their whole work manually; this manual system requires the pharmacist or workers to manually monitor all processes, this kind of work may lead to mistakes by workers and lead to major problems. Therefore, to solve this kind of problem the urgent need is to develop a Pharmacy management system that will prove beneficial for the Pharmacy.

Another problem that is normally faced by pharmacists is in a situation where a doctor writes a prescription to the patient, sometimes medicines are misread maybe because of either run readable handwriting or a pharmacist's incapability to identify drug names in the prescriptions. It cannot be denied that it is very threatening when medicines are wrongly given to patients as it can lead to some major health problems. Here the system is providing a solution to all the above issues and provides an ease to the worker or pharmacist by reducing manual work and helping in maintaining the stock very well, and can-do cost saving and maintaining inventory control. Also, this system can help pharmacists in recognizing handwritten medicine names and returning a readable digital text of the medicine.

II. LITERATURE SURVEY

2.1 Designing a Computerized Pharmacy Management System with Inventory Stock Alert System

This project illustrates the design and implementation of a Pharmacy Management System with a stock alert system. The primary aim is to improve accuracy and enhance safety and efficiency in the pharmaceutical store. Today management is one of the most essential features of all forms Management provides sophistication to perform any kind of task in a particular form. This is a pharmacy management system; it is used to manage most pharmacy related activities in the pharmacy.

2.2 Simulation-based decision-making for hospital pharmacy management

Managing healthcare delivery systems plays an important role for healthcare providers in order to have high-quality service performances. Inpatient pharmacy delivery systems are one of those that have a key role in hospitals' service quality. Simulation is the best tool to analyze hospital pharmacy operations due to their inherent complexity. In this article, a simulation model is developed based on data collected from a hospital in Turkey to analyze its pharmacy delivery system. In comparison to the baseline system, two different scenarios with varying factors are investigated, seeking to minimize drug delivery time to patients. The results presented here indicate the possibility of improved system performance.

2.3 Medical Prescription Recognition using Machine Learning

Admittedly, because of how busy doctors are nowadays, they tend to scribble unreadable prescribed medicines which leads to the problem of misinterpreting medicine names. Patients are sometimes curious to know information about their prescribed medicines before purchasing them. Recently, developers have been searching for a method to address this problem efficiently but, no technique leads to full recognition of medicine names due to the bad handwriting of doctors and its variety so that leads us to machine learning where the system will learn various types of handwritings for the same medicine to be able to recognize new handwritings. This paper proposed a system that presents a solution for both the pharmacist and the patient through a mobile application that recognizes handwritten medicine names and returns a readable digital text of the medicine and its dose. The System identifies the medicines' names and the doses for the collected data set with some, pre-processing techniques like image subtraction, noise reduction, and image resizing. After that, the pre-processed images will undergo some processing as they will be classified and feature extracted through Convolutional Neural Network, and finally, the Optical Character Recognition technique applied to the medicines with low accuracy in the post-processing phase to identify their names by comparing the result with the dataset containing all the medicines. This will help in diminishing the instances of distortion of medication names assisting pharmacists in limiting their doubts. The proposed system was tested on different real cases, and accuracy reached 70% using (CNN) model.

III. SYSTEM DESIGN

To overcome the limitations of the above systems, we are proposing a Web Application for managing the pharmacy using PHP and ML.

The complete shop management software is designed to ease the workload of the medical shop manager and design a solution for the pharmacist by providing a platform that recognizes and reads doctors' handwriting in the medical prescription and returns a readable digital text of the medicine and its dose. The main feature includes invoicing inventory and stock control, accounting, client and vendor management, and medical prescription recognition. This software helps to track all the profits, losses, and products of the medical shop.

The design of the pharmacy management system is based on the computer which will simplify the maintenance of the information, accessible and efficient. The Pharmacy Management System will provide information about the end of the drugs in the medical so that the physician can order them drugs before the end. The pharmacist and nurses will get more accurate results at the time sell, about the details of the use of medicines and the dosages so that the system will become more reliable to use than the present system.

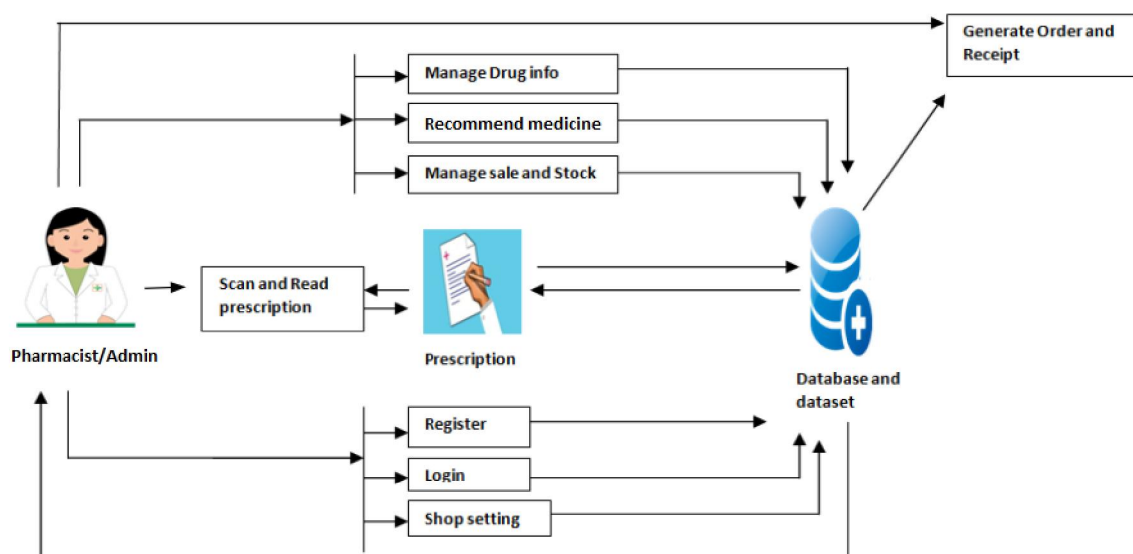


Figure 1: Block Diagram

IV. SYSTEM IMPLEMENTATION

The proposed system includes a login page (figure 2) that enables admin/pharmacist to access their account and engaged with the system features

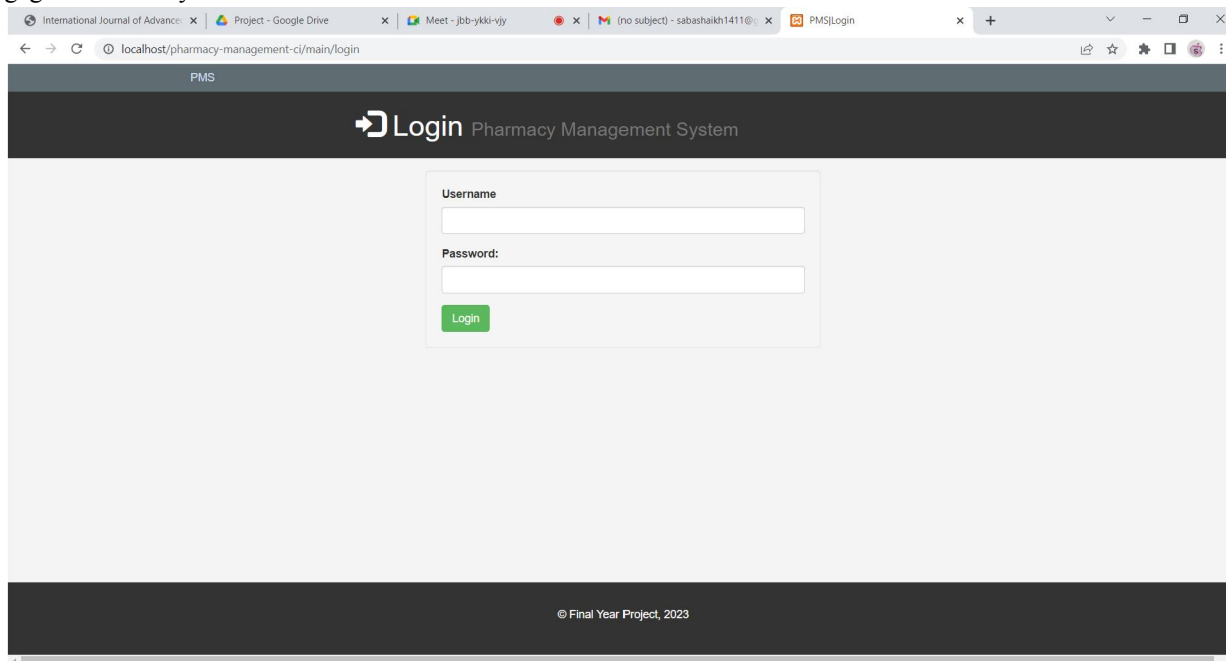


Figure 2: login page

After login, the main dashboard (figure 3) will appear with real-time updates about medicine types, purchase amount, today's sales, etc. and it also includes medicines, inventory, sales, OCR, etc.

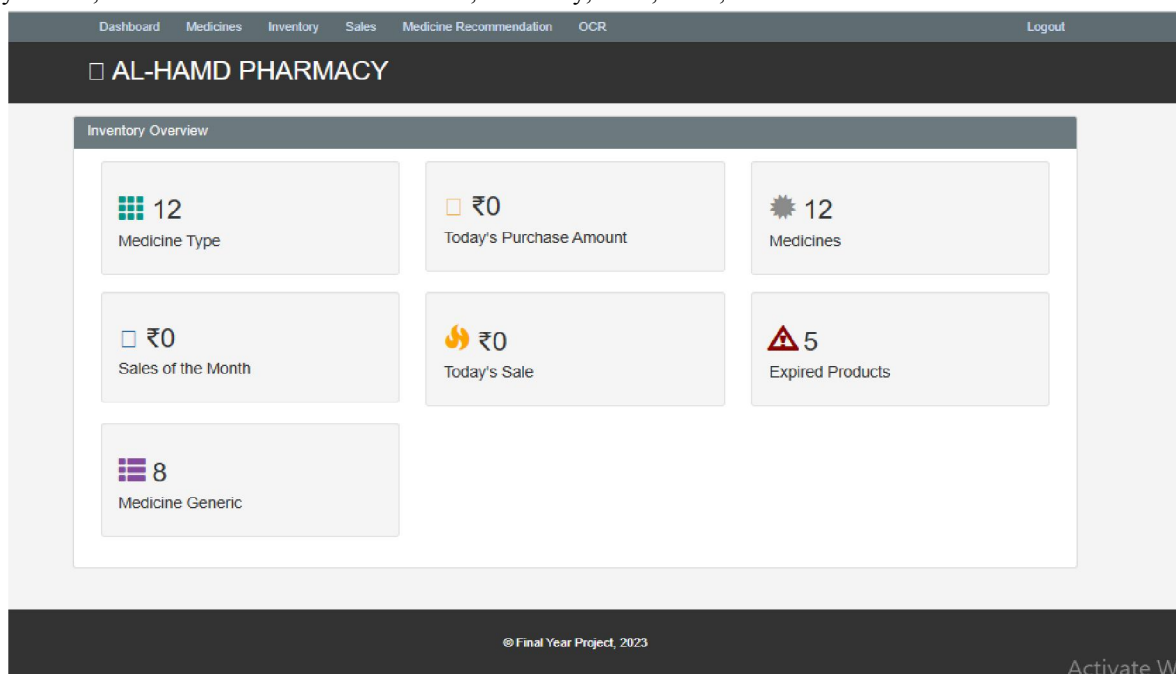
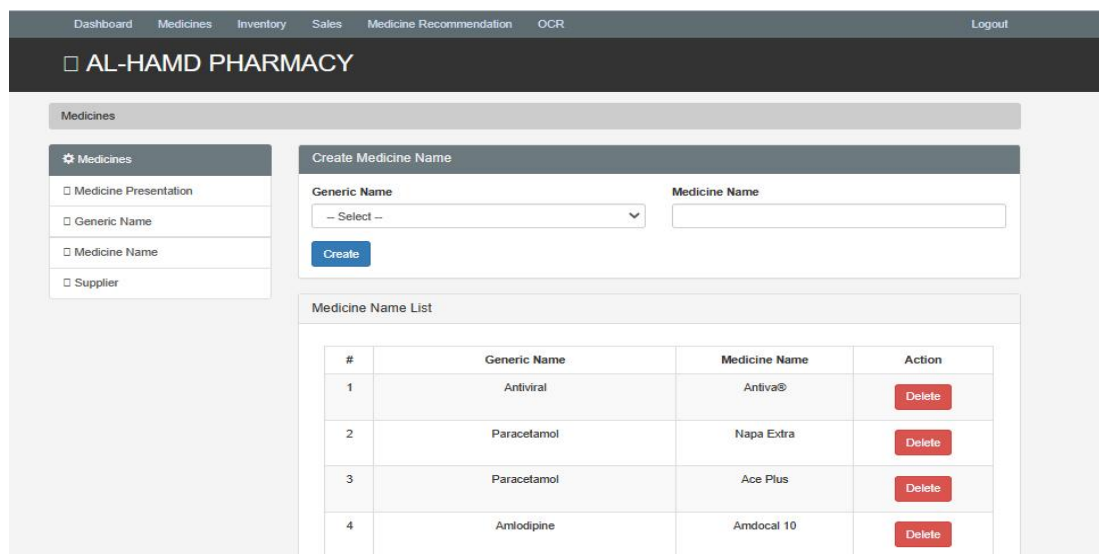


Figure 3: Dashboard

In medicine tab(figure 4), it contains details about the generic name, medicine presentation, medicine name, and supplier



AL-HAMD PHARMACY

Medicines

Medicines

- Medicine Presentation
- Generic Name
- Medicine Name
- Supplier

Create Medicine Name

Generic Name: -- Select --

Medicine Name:

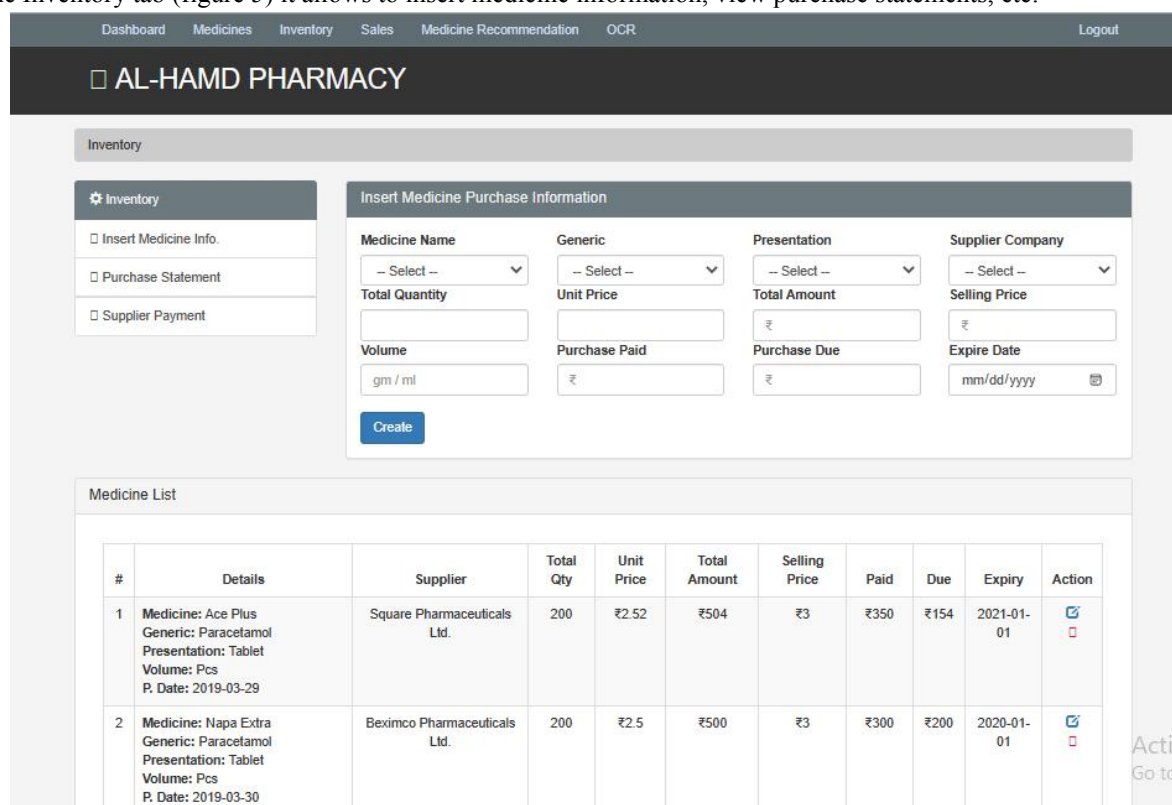
Create

Medicine Name List

#	Generic Name	Medicine Name	Action
1	Antiviral	Antiva®	Delete
2	Paracetamol	Napa Extra	Delete
3	Paracetamol	Ace Plus	Delete
4	Amlodipine	Amdocal 10	Delete

Figure 4: Medicine

In the Inventory tab (figure 5) it allows to insert medicine information, view purchase statements, etc.



AL-HAMD PHARMACY

Inventory

Inventory

- Insert Medicine Info.
- Purchase Statement
- Supplier Payment

Insert Medicine Purchase Information

Medicine Name: -- Select --

Generic: -- Select --

Presentation: -- Select --

Supplier Company: -- Select --

Total Quantity:

Unit Price:

Total Amount: ₹

Selling Price: ₹

Volume: gm / ml

Purchase Paid: ₹

Purchase Due: ₹

Expire Date: mm/dd/yyyy

Create

Medicine List

#	Details	Supplier	Total Qty	Unit Price	Total Amount	Selling Price	Paid	Due	Expiry	Action
1	Medicine: Ace Plus Generic: Paracetamol Presentation: Tablet Volume: Pcs P. Date: 2019-03-29	Square Pharmaceuticals Ltd.	200	₹2.52	₹504	₹3	₹350	₹154	2021-01-01	 
2	Medicine: Napa Extra Generic: Paracetamol Presentation: Tablet Volume: Pcs P. Date: 2019-03-30	Beximco Pharmaceuticals Ltd.	200	₹2.5	₹500	₹3	₹300	₹200	2020-01-01	 

Figure 5: Inventory

In the sales tab (figure 6) we can sell the medicines and view the sales statements.

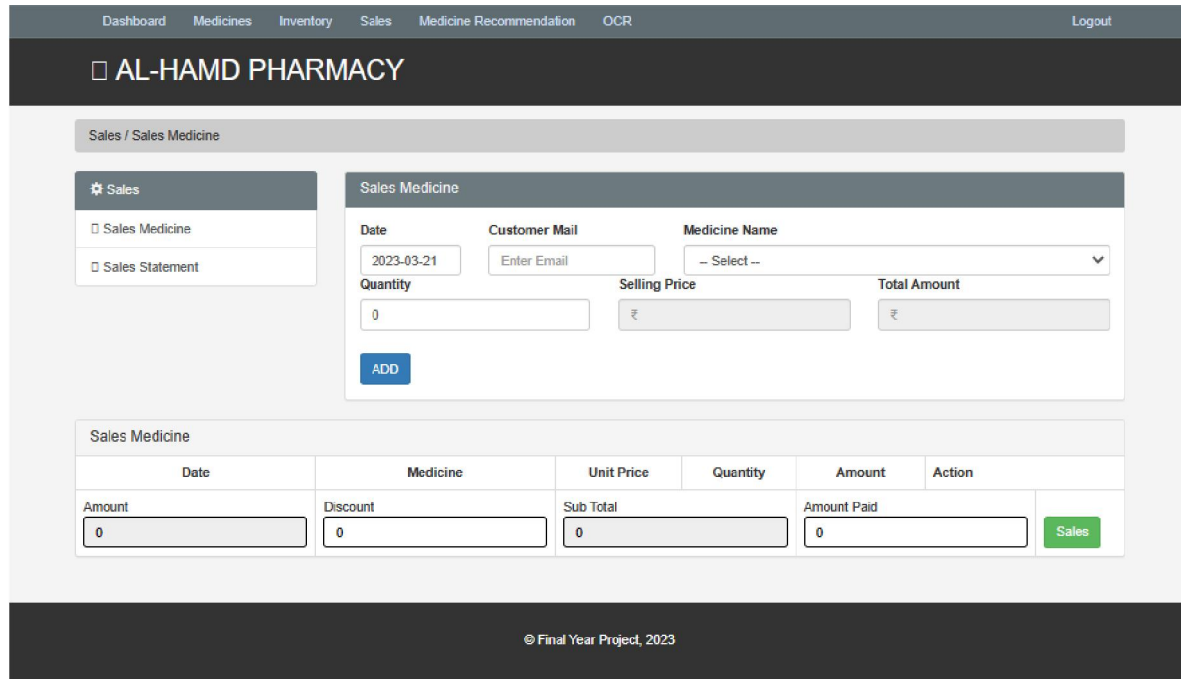


Figure 6: Sales

In this tab (figure 7) we can recommend the similar medicine based on the searched medicine

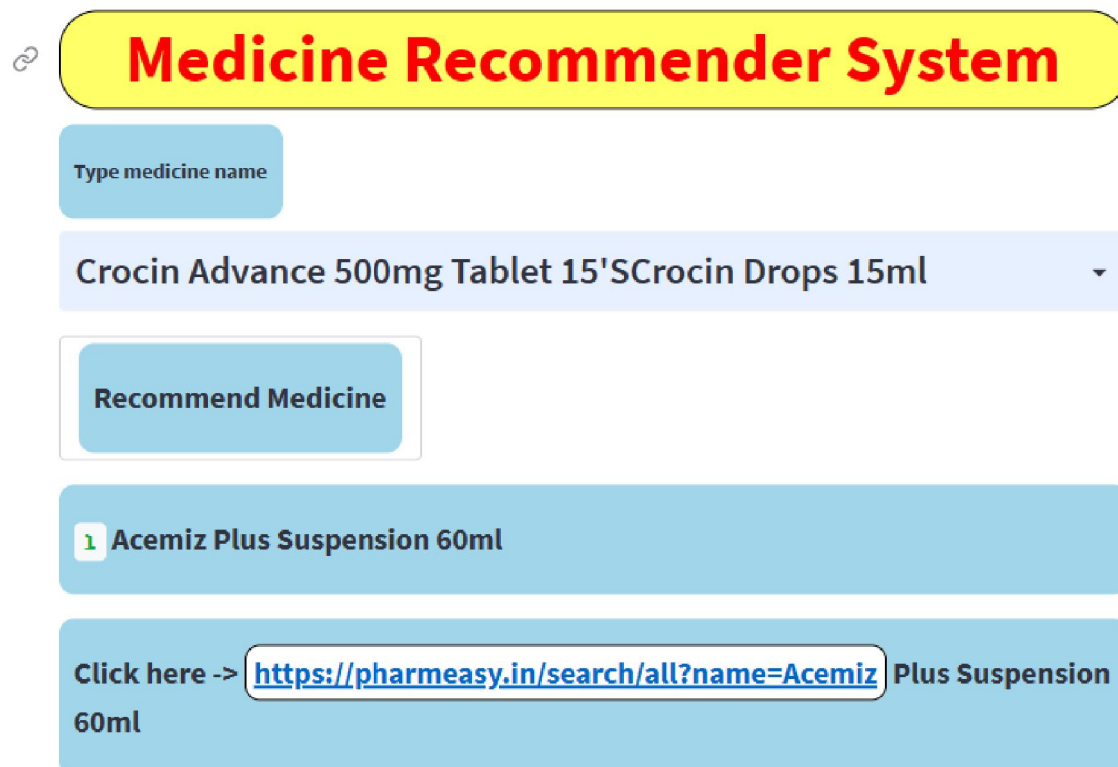
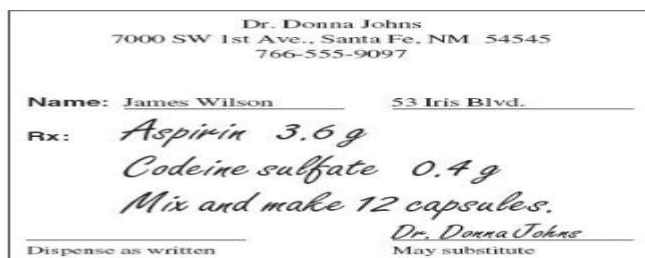


Figure 7: Medicine Recommendation

In this tab (figure 8) it will recognize medicine names using OCR (Accuracy is optimal)

Image Upload Success



OCR after reading

Dr. Donna Johns
7000 SW 1st Ave., Santa Fe, NM 54545
766-555-9097
Name: James Wilson 53 Iris Blvd.
mx Appin 3.6.9
Codeine sulfate 04g
Mic and make 12 ogpsules,
De. Donna Jokes
Dispense as written May substitute

Figure 8: OCR

V. FUTURE SCOPE

A Medical store management system is a management system that has been developed to improve the accuracy and increase the safety and efficiency of the pharmacy store.

In our solution still, some jobs left which we will do in the future like:

- We can build a mobile application for the same.
- We can create a dashboard for the users/customers also so that they can also interact with the system.
- Pharmacy safety system.
- Improve the accuracy of OCR

VI. CONCLUSION

This understanding that this pharmacy management system is very easy to work with and saves a lot of time because this system is indispensable for managing details such as regular customer records, medicines stock, etc. pharmacy system can significantly improve operational management and thus streamline the process. This allows for automating the process of Pharmacists collecting and retrieving information, improving the responsetime of the sales. Bookkeeping and older managing terms are sometimes terribly pathetic and complicated. This system removes the complexity of all things. This system also allows the pharmacist to see similar medicines and recognize the prescription given by the doctor.

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