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RESEARCH ARTICLE
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SURVEY ON PHARMACY MANAGEMENT SYSTEM

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ABSTRACT

A pharmacy management system is a helpful tool for pharmacies and healthcare facilities to optimize operations, patient care and maintain regular compliance.it is critical to the modern health care ecosystem because it uses technology to provide safer, more efficient and customer focused pharmaceutical services. The basic aim of Pharmacy management system is to computerize manual systems and replace them one. This system should be able to carry out tasks as directed by pharmacy manager in an economical, practical and efficient manner The software handles every aspect of a pharmacy including sales, entering new inventory, creating invoices, figuring out taxes, calculating employee compensation, providing product information, creating charts that show various statistics and overseeing staff work.

In the today's healthcare, pharmacy management systems have become crucial in enabling effective medicines distribution and inventory optimization. The rapid adoption of electronic technologies has disconnected and transfigured traditional practices across various industries, and the field of healthcare is no exception. As a result, various managerial solutions have came into view to meet the particular requirements of different sectors, including the medical industry. Traditional data management in pharmacies frequently addresses challenges like limited capacity, slower processes, restricted access to medications, complicated stock management, and the need for skilled staff to meet demands. To deal with these challenges, this paper proposes the implementation of an e-pharmacy system, precisely designed to streamline operations and services to overcome the previously mentioned impediments. Automation helps to improve the traditional method of pharmacy management. This proposed solution presents a great chance to improve effectiveness of pharmacy management in medical environments, thereby contributing to improve overall healthcare delivery. Key features of the pharmacy management system consist of the ability to properly record and handle prescription data, as well as a comprehensive database of medication information to make sure the medication issuing procedures are relevant and accurate. Additionally, the system offers flexibility in terms of customization, allowing healthcare providers to adjust settings and preferences according to their specific operational needs and protocols. Through the development and implementation of this pharmacy management system, we aim to empower medical facilities with the tools and resources needed to deliver efficient and safe medication management. By facilitating streamlined processes for prescription handling, inventory control, and patient record

maintenance, our system helps improve care quality, minimizing medication errors, and enhancing overall operational efficiency within pharmacies and healthcare settings. Our pharmacy management system seamlessly integrates with other healthcare systems, promoting easy access, collaboration among professionals, and better patient outcomes, benefiting the healthcare ecosystem as a whole.

Index Terms- Essentials of Pharmacy Management System, E-pharmacy, Stock Management, Healthcare, Automation, Database Revenue, sales, system information, Healthcare Ecosystem

1. INTRODUCTION

A pharmacy especially hospital pharmacy has always more than just a place to fill your prescription.In the Fast-moving healthcare field, the accuracy and efficiency of the medication process management to ensure patient safety and Improving patient health results has become foremost. In between prescribers and patients, the pharmacies play a fundamental role in the integration of medication distribution and administration. The implementation of traditional pharmacy operations often have to face numerous challenges, including manual errors, lack of real-time inventory tracking, limited interoperability with other healthcare systems. These compromises significantly reduces the efficiency and pose a risk of patient well-being. Thus including an automated pharmacy management system comes out to be promising approach to these long-standing issues, changing the way pharmacies operate and interact with the broader healthcare ecosystem. The systems primary objective is to propose and create a robust pharmacy management system designed to streamline pharmacy operations, enhance inventory control and integration with electronic health records (EHRs),. In this massive growing era of automation and data analytics, Our system aims to mitigate medication errors, optimize stock levels by leveraging these technologies. Our system will serve as a centralized platform, enabling pharmacists to manage medication data, efficiently manage prescriptions, track inventory levels in real-time. The pharmacy management system seamlessly integrates patients (users), pharmacists (administrators), and a centralized database to streamline the entire medication management process.Patients gain access to an authenticated user interface, enabling them to browse through the available medication inventory and place orders conveniently.it improve your accuracy, raise secureness and time saving.it gives the users to enter the manufactured and expiry date for a particular drug during stock fill up and sales transactions, entry as per arrival of and shipment of medicines in and out of Pharmacy. To compile conclusive and comprehensive software solution that gives centralized platform to manage patient information, prescription, medication inventory, enhancing patient safety ensuring compliance, checking prescriptions correctness and creating reports for data driven decision making.

2. LITERATURE SURVEY

In this fast-growing era, the management of pharmaceutical have gained significant importance of the field of modern healthcare field, ensuring proper inventory control and Prescription management over numerous pharmacy operations. Many of the researchers have contributed to the development of these management systems. As per, Carlisle George [2012] presented algorithms and many more concepts in his book "Pharmaceutical Automation: Algorithms and Drug Dispensation" explored algorithms for efficient drug issuance, patient monitoring, and control mechanisms. Agrawal et al. [2017] and Smith and colleagues [2018] proposed a approach for hospital department services and mapping of the current state of hospital pharmacy operations considering the massive expansion of Internet of Things (IOT). Recognizing the need for interoperability, Jones [2019] introduced a framework to integrate the pharmacy management system(PMS) with the electronic medical record (EMR) systems. Thus, it helped in improvement of data security and management of medical record, not only that the framework introduced many more innovative ideas by several people in the era of Artificial Intelligence (AI) and Machine Learning (ML). Also, Chen etal.,2020 introduced robotic dispensing system, where Artificial

Intelligence (AI) with automation was combined to demonstrate a streamline medication process. Furthermore, more recently Juan Gonzalez [2023] investigated on the impact of mobile applications on the Patient Medication adherence (signifies that the patient and physician collaborate to improve the patient's health) and patient engagement within pharmacy management systems. Similarly, Emily Davis [2023] focused on the integration of blockchain technology for secure and transparent medication supply chain management. These contributions have addressed various aspects of pharmacy management, including automation, inventory control, interoperability, patient safety, and the adoption of emerging technologies. As healthcare demands continue to evolve, further research and innovation in this domain will be crucial for optimizing medication management practices and enhancing overall patient care.

3. RESEARCH METHODOLOGY

We studies the features of various pharmacy management software's. The use of the current pharmaceutical management system is essential. It involves information technology, as stated by important from demand to supply, as the importance of information about drugs itself both from the point of use and the side effect or consequences of use. This system contains an evaluation of the medicines and hospital pharmacy services so that services bases on user perceptions which can also develop through collaboration. The implementation of this pharmaceutical management system also requires an appropriate design so that it can serve quickly and accurately. But also in emergencies during the Covid-19 pandemic. Optimal control of pharmaceutical supplies is the first step in the healing phase of each patient from a treatment point , but it requires the application of information technology and computer in addition to inventory theory. The balance between supply and demand for medicines is a special consideration in each hospital based on the perspective of pharmacy management that protects two sides, namely the interests of the hospital and the interests of patients.

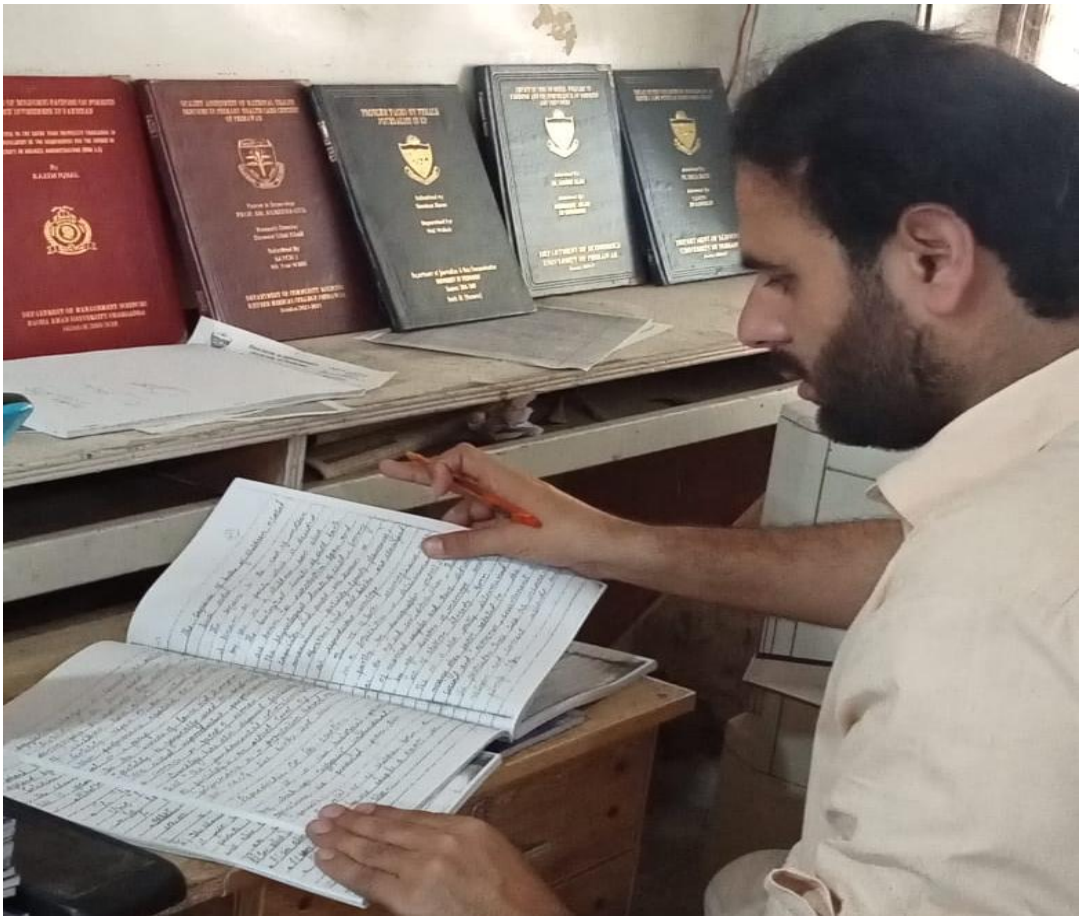


Figure 1: Research Notes

We prepared various notes read articles did interactions with Medical Owners what are there needs entities in the pharmaceutical management system shown in Figure 1 where activities or processes in the system are related to verbs. Is a brief, wordless overview to explain some conceptual relationship between data, information, and activities for managing a drugstore as part of Second, based on the data flow diagram, each process follows data entities that can have the implementation of each data**.**

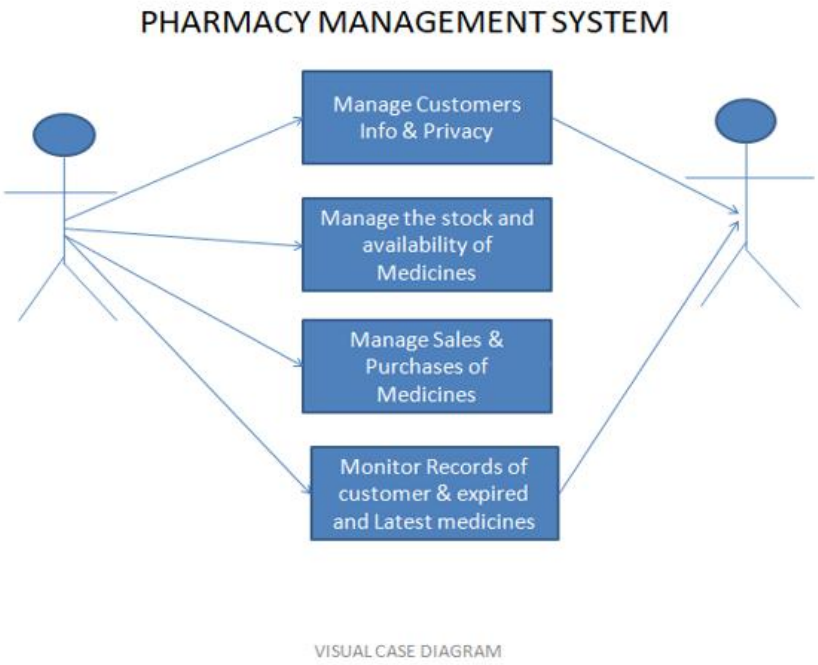


Figure 2: Visual Proposed system flow

The approach to this development and making of a pharmaceutical management system is first to build interface with other systems that provide input of user data or information. The pharmaceutical management system is a part of management. On that basis, data have integration into the system, and some other data is accessed through the system interface or extracted from information sources. In general, the pharmaceutical management system requires data related to 1. Supplier: An entity referred to as custodian or producing a product, which is in the link between a drug source or manufacturer and user. Each drug product from the factory has information about the function and use of the drug, procedure for use, expiration period, ingredients, and drug side effects. 2. Customer: As entity has the opposite activity as a supplier. A customer is an entity that refers to a buyer of products prepared in a shop and store, namely has a warehouse. Also, for each customer or patient, either by a doctor or by a customer collects information into the system. It is information about the complaints and recommendations for medicines. 3. Warehouse: An entity called a stock, which means a storage area, so that market demand properly fulfills. 4. Daily sales control is an abstract entity that contains object related to such as total annual costs, requests, and others.

4. PROPOSED WORK

Our Objective is to reduce the risk of manual errors by pointing key Features of Pharmacy Management system and ensuring proper implementation of inventory management and patient record keeping, by automating various pharmacy operations using Graphical user interface (GUI). In this paper we have prioritised interoperability, enabling seamless integration with electronic medical records (EMRs). The users can manage their profile by selecting the prescribed amount of medicine by the doctor and make a list of it, moreover to enhance patient data security by any unauthorized person the authentication system is implemented properly. The proposed system is divided into various modules, it caters the need of administrators, customers, drugs, and orders.

Introduce more efficient pharmacy workflow
•Shifting from paper to digital records
•Moving to electronic eligibility verification
•optimizing operations across various pharmacy locations

5. Key Features Of Pharmacy Management System

1. Prescription Management

Prescriptions are hard to read; they are unreadable by the patients & therefore can cause confusion. The pharmacist can store the record of the prescription & repeat the medicine as & when required. Data stored in the system reduces the chances of errors.

2. SMS & Alerts

With the help of a pharmacy management system, the pharmacists can get timely notification & alerts from the software, if any of the patients will need the medicine soon, or the medicine is going to expire. He can schedule SMS to be sent to patients intimating them in advance to buy the next dosage of medicine. The customer can also just reply to the message whether to refill the medicine & the pharmacist can simply deliver the medicine to the patients.

3. Reporting

Proper reporting & data analysis leads to better-informed decision making & huge profits. Pharmacists interact with many sales executives, patients, doctors, medical representatives in the day-to-day. Therefore here the pharmacy software comes into existence, all the data regarding each of these can easily be stored in the system which can be later analyzed for growth strategies. These reports provide valuable insights like which part of the business is performing well & which needs improvement.

4. Doctor/MR Commission Management

In the pharmacy, it is very important to keep a check on which doctor's prescription or which medical representative has sold which medicine. Every prescription & medicine sold out at the

pharmacy counts for a commission which can be easily calculated using the software. This means, "no more frauds no more mistakes".

5. Expiry Management

In any pharmacy, medicines are purchased in a bulk with different MRP & expiry dates, & therefore the pharmacists find it difficult to keep a check on every medicine. Unknowingly many medicines get expired lying on the shelves, which at last can only be thrown into the garbage. In case a software with an expiry management system is implemented then it will prompt for the near expiry medicines which the pharmacist can either sell to the customer or return back to the supplier. This saves on huge losses & also the products are not wasted.

6. Re-Order Management

The pharmacists can set the minimum & maximum stock level point, the software will indicate whenever the stock reaches the minimum level & he/she can place a re-order. The system also suggests the best buy option with nearest suppliers' schemes & offer to save more.

7. Digital Collections

In the new normal, everybody is following social distancing. Customers want to pay online and in pharmacy, the risk of getting affected with various is the most. Therefore for sake of health & safety, the pharmacies must have a digital collection option where the patient can pay without touching anything. Marg ERP is one such Pharmacy Software that is integrated with MargPay a payment platform for business-to-business payments.

6. Hardware Requirements:

Computer with either Intel Pentium processor or AMD processor.
- 1GB+ DDR RAM
- 40GB hard disk drive
- Keyboard
- Mouse
- Monitor
- UPS
- Internet Connection
- Printer

7. Software Requirements:

- Windows OS
- JRE and JDK.
- MySQL server (WAMP or XAMPP or any)

Hardware Requirements:
- Computer with either Intel Pentium processor or AMD processor.
- 1GB+ DDR RAM
- 40GB hard disk drive
- DirectX11 or higher Version
- Internet Connection

8. Implementation

Description on Implementation

The goal of this application is to manage the medicines and various function of the pharmacy.
List of modules:
- Login page
- Home page
- Company

• Purchase
• Drugs
• Sales
• User/Settings
• Messaging

Challenges Faced By Traditional Pharmacy Practices Absence of Process Automation
The major bottleneck of the manual system is the lack of automation techniques. The staff can spend time on serving the needs of customers by eliminating the requirement to budge in time-consuming & paper-handling tasks.

Lack of Consistency
Each pharmacy has its own set of rules, workflow, and procedures to follow. The inconsistent process tracking leads to errors, chaos, and anomalies in the system.

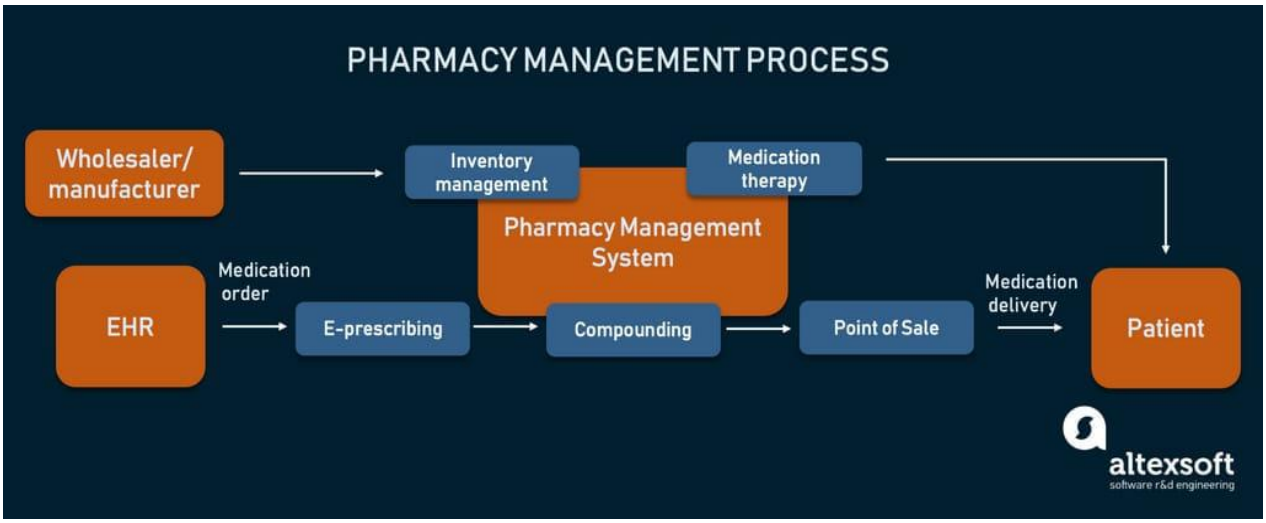
Medication Billing Errors
The inefficient billing procedure can cause errors such as incomplete entries, incorrect diagnostic code, redundant entries, and more.

Inaccurate Inventory Records
Managing the stock of medicines and supplies plays a vital role. The decision to purchase/procure and from which suppliers are essential components of inventory management. The discrepancy in gauging sales requirements for medicines can cause overstocking or understocking.

Decentralized Payment Management
Lack of streamlined processing systems and proper billing solutions can lead to inefficient payments.

5. SYSTEM ARCHITECTURE

Our system follows modular and layered architecture to ensure scalability and efficient database management. It is designed as a web-app to be accessible from various devices and locations. At the core of the system, we have the database component, which is used to store and manage all the data related to medication, inventory, patients and orders and all other E pharmacy requirements.



6. RESULTS & IMPLEMENTATION

The Pharmacy Management System provides capabilities to manage pharmaceutical related operation efficiently. It mainly focuses on high-quality delivery of pharmacies.

After Successful login user will enter in the application. Here various medicines are displayed which can be ordered. Along with medicines, there is description about when to use it. User can select the medicines with its quantity and place the order by clicking on buy now. Afterward user can review the order data and also download the .csv file consisting ordered medicine details.

The results obtained from research and system deployment are as follows:

1. **Inventory Management**

- Keeps track of medicines, medical supplies and other products stocked by pharmacy.
- The system helps in managing pharmacy in the terms of stock levels, reordering of medicines and expiration of medicines.

2. **Patient Safety**

- The system helps in reducing errors by providing description about when to use it for potential drug interactions, and dosage discrepancies.
- It provides utility to pharmacists for verifying prescriptions accurately and minimize risks of patients.

3. **Analytics-Driven Decision Making**

- The application for pharmacy management generates reports from which it is easy to analysis and take decisions based on real-time data for pharmacy managers.
- From understanding sales data, it would be clear that how much stock we have, the amount of should be ordered and how many prescriptions are being filled, etc.

4. **User Satisfaction**

- The application substantially improved accuracy, serves faster and optimizes communication.
- The remarkable improvements are that the patient have to wait for shorter time, can access medications easily which leads to higher satisfaction levels of patients.
- Pharmacy management systems streamline workflows, reducing time spent on manual tasks like filling prescriptions and managing inventory which is beneficial for pharmacists.

7. CONCLUSION

In conclusion, it is clear that the implementation of Pharmacy Management System achieved advancement in pharma related operations and services. It also provides computerized and automated version of Pharmacy Management System. The application is built in such a way that the future changes can be made easily. The entire process of pharmacy management is made online which is user friendly and has improved productivity due to automation. It maintains system and data security by giving access to the authorized users depending upon the user type. It effectively overcomes the paper work which is done manually. The development of the Pharmacy Management System has brought the changes which are beneficial for users and pharmacies in managing details of customer records, medicines stock, We look forward to continuing to utilize the application to provide efficient, safe, and high-quality pharmacy services to improve operational management, stream line the processes and remove complexity of all Pharmacy management system is a significant departure from archaic methods offering a cohesive, technologically advanced that streamline operations, optimize resources utilization and brings precision to pharmaceutical services.

To improve the safety and efficiency of the pharmacy, retail store, to foster the improvement of the pharmacy management system. In this case, we have a project that is on a computer, based on the type of the system. This will help you to improve the administration of a medicine's cost, insurance, security, etc.). Pharmacy management system has been created in order to ensure the reliability of the customers. They are to be able to make the sale of the right to medicines, together with access to them, which will reduce the amount of these criminal activities.

Pharmacy management system is basically an internet based software and processes the required data and shops, as well as information regarding the pharmacy database management.

The software helps you to manage your shop online or instore efficiency. Statistics drugs, medicines, or medicines to control the data that may be updated and edited as well. It works the

needs of the user, and the corresponding options. It is up to the user to perform the production, and a review of some management requirements for the supply of medicines to the hospital is important from both the hospital and the patient's point of view. The challenges that come with the provision of drugs resolve by automating the activities of providing the drugs themselves. The preparation of drugs through inventory control is very important as well as making predictions of changes in the patient's needs. Of course, this study has not completely completed the need for a complete pharmaceutical management system. It still needs a study that involves comprehensive comparisons of all the interests of various parties, such as the government. The purpose of using the database was to present different benefits, such as reducing data redundancy, reducing updating errors, increasing consistency, great data integrity, and improving data access to users through the use of a host and query languages and improved data security. At the other hand, the designed GUI frames facilitated the working on the system by allowing the user to interact with the system through graphical icons. In other meaning, the system can be managed with unskilled users.

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