

The Integration of Pharmacy Software and Artificial Intelligence to Enhance Customer Service in Pharmacies

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Abstract

Most of the healthcare sectors, including community pharmacy, are adapting newer technologies such as artificial intelligence and software for their advancement. The integration of these technologies into daily routines will boost productivity and function. Furthermore, it improves the quality of care, which increases customer satisfaction. However, the drawbacks of these technologies must be considered prior to implementation. These technologies must be used ethically and legally to safeguard customer rights and improve customer service.

Keywords: community pharmacy, artificial intelligence, Pharmacy management systems, software

INTRODUCTION

Artificial intelligence (AI) along with related technologies are becoming more widespread in business and society, and they are beginning to be used in healthcare. These advances in technology have the capacity to revolutionize not only the administrative procedures in healthcare organizations such as payers, providers, and pharmacies, but also a number of aspects of patient care. [1]. The value of AI-powered tools in the upcoming generation of healthcare technology is becoming increasingly apparent to the healthcare ecosystem. AI is thought to be able to enhance every step of the operation and delivery of healthcare [2].

The initial use of a computer in a pharmacy dates back to the 1980s, marking the beginning of a journey where computers have been utilized for data collection, retail pharmacy management, clinical research, drug storage, pharmacy education, clinical pharmacy, and much more. In recent years, software has become an essential tool for the pharmaceutical sector, enabling efficient data management and streamlined processes. Meanwhile, AI simplifies pharmacy workflow, reduces administrative burden, and empowers pharmacists to prioritize patient care [3].

Furthermore, Pharmacy software encompasses a variety of solutions that effectively handle pharmacy operations. Pharmacists, pharmacy technicians, and clinicians use pharmacy software systems not only to deliver prescription medication to customers safely and efficiently but also to enhance the overall pharmacy *experience for both the pharmacy and its patients* [4]. *The growing demand for convenience among patients* has driven numerous technological advances in pharmacy, such as the development of capabilities for pharmacists to communicate with patients via text directly from the software in recent years [5].

A. Applications of advanced technologies in community pharmacy

Community pharmacy are essential enterprises that provide a wide range of services to enhance public health and wellness.[6] Highly skilled community pharmacists play a vital role in assuring proper prescription usage, avoiding wasteful expenses, and making the most use of healthcare resources [7]. Pharmacies utilize a comprehensive pharmacy management software platform to improve operational

efficiency and accuracy. This sophisticated software platform not only controls pricing efficiently, but it also guarantees that prescriptions are properly matched to the appropriate drug and dosage. It automates claim processing and benefits coordination for a customer's insurance, which increases overall efficiency. One of the most significant advantages of this pharmacy software is its capacity to coordinate work processes seamlessly across several platforms, such as robotic prescription [4].

Moreover, it provides pharmacy staff with access to prescription data throughout a pharmacy or across a health system's network [4]. Pharmacists employ a variety of sophisticated computer systems, including web-based ordering systems offered by drug wholesalers, perpetual inventory systems that are mandated for controlled substances, and automatic dispensing systems, which not only count and dispense pills but also apply labels to medication bottles with precision and accuracy [5].

1. Inventory management:

Currently, the pharmacy's inventory management is primarily manual, with daily barcode scanning used to update stock information and replenish unclaimed prescriptions. Some tasks cannot be automated due to federal restrictions and technical limits, but a Pharmacy Management System (PMS) can help with routine tasks. One of the primary benefits of a PMS is its capacity to effectively organize and track inventories. The PMS decreases the risk of inaccurate counts and delays in system updates by keeping a complete log that can be sorted by parameters like storage conditions and expiration dates, thereby preventing potentially dangerous errors.

When it comes to ordering medication, a PMS streamlines the process by automatically generating orders based on specified reorder points or par levels set by the pharmacy. The system determines the quantity required to replenish stock and sends orders via electronic data exchange (EDI). Additionally, a PMS creates reports that allow pharmacists to evaluate wholesalers and vendors based on performance, assisting them in identifying critical factors influencing drug orders. This capacity also helps to prepare for times of increased demand, like as flu season, by automatically changing par levels based on anticipated needs[8].

2. Medication Therapy Management:

There are various opportunities in the pharmacy setting to improve patient adherence and increase customer relationships by using Medication Therapy Management (MTM) services. These services include developing personalized prescription treatment regimens, managing drug-related concerns, and offering extensive patient education. Pharmacy Management Systems (PMSs) play an important part in MTM activities by efficiently obtaining patient information from diverse sources and generating relevant analytics via clinical decision support (CDS) systems.

Furthermore, by using medication adherence tools and working closely with physicians, pharmacists may efficiently implement and review drug therapy, ensuring that any difficulties or side effects are treated right away. Finally, excellent coordination with physicians and consistent communication channels with patients are critical to the successful implementation of these initiatives [8].

3. Point of sale and billing solution:

A modern point-of-sale (POS) system is intended to offer a comprehensive collection of functions that go much beyond the basic function of processing credit card payments. It is designed to give customers a seamless and hassle-free shopping experience while also optimizing inventory management operations. This includes the ability to accept a variety of payment methods, facilitate returns and exchanges, monitor inventory levels in real time, generate personalized financial reports, establish and manage customer loyalty programs, and customize and apply sales, coupons, and gift card benefits [8].

4. Preparing for emergency response:

Artificial intelligence (AI) is a key instrument for improving public health monitoring. AI systems can effectively spot trends in disease outbreaks, drug usage patterns, and other public health concerns that require a response from pharmacists or public health agencies by analysing large amounts of health data.

For example, AI can detect a rise in reported flu symptoms in specific regions, allowing pharmacists to stock up on antiviral drugs, flu vaccines, and over-the-counter therapies in advance of rising demand.

Furthermore, AI can help pharmacists address health equity issues by examining data such as zip codes, demographics, and medical histories. By looking at the relationship between zip codes, socioeconomic variables, and health outcomes, AI may identify locations with major health inequalities, make tailored patient recommendations, and provide insights for targeted policy measures. This level of insight can pave the way for more smart and efficient healthcare activities. For example, AI may identify locations with high rates of adult diabetes, guiding the establishment of educational programs, the provision of complementary drugs, or increased access to care for afflicted persons [8].

5. Access to pharmaceutical information:

With significant technological improvements, pharmaceutical information is now more accessible than ever. This expanded availability has resulted in major benefits for both consumers and medical professionals. Thorough research and thorough data now enable patients to receive a plethora of vital knowledge about their medications, allowing them to make more educated health decisions. The digital revolution has increased the availability of pharmacological information, with internet sites providing specific directions, dosage requirements, and complete information about potential side effects connected with various treatments.

In addition, many pharmacies now offer interactive systems that provide consumers with detailed information about the medications they are taking or considering. This individualized approach is intended to ensure that people are well-informed and confident in their healthcare decisions. Furthermore, the proliferation of smartphone apps has given users on-demand access to drug databases, allowing for quick and easy reference throughout the day. Thanks to technology, we now have access to a multitude of information regarding our medications, allowing us to make more informed healthcare decisions in today's society [9].

B. Advantages of using these integrating these technologies in customer services

The traditional pharmacy system is primarily reliant on manual processes and human expertise, resulting in inefficiencies, errors, and delays. For example, filling a prescription requires several manual procedures, including interpreting the prescription, distributing the medication, and checking the dosage and frequency. These manual processes are error-prone and time-consuming. Furthermore, the traditional pharmacy system lacks the ability to tailor pharmaceutical regimens to individual patients, limiting the efficacy of drug treatment. Using AI-powered technologies, pharmacies can greatly improve their operations and overcome these restrictions. AI can efficiently automate numerous areas of the pharmacy workflow, including prescription interpretation and medicine delivery, lowering the risk of errors and increasing efficiency significantly. Furthermore, by analyzing massive volumes of patient data, AI can enable pharmacists to create personalized drug regimens tailored to each patient's specific needs and medical history [10].

C. Key challenges in integrating Artificial intelligence and softwares in customer services

It is inconceivable to picture life without the pervasive technology that we have today. However, in the pharmaceutical industry, technology might have significant drawbacks. The adoption of digital systems and automation in pharmacies can provide various challenges for pharmacists. Automation of drug manufacturing can result in errors if not appropriately overseen by a human pharmacist. Digital technologies may replace crucial abilities such as patient-pharmacist interactions, which are essential for providing pharmaceutical treatment and conforming to regulatory standards. The development of computers software's along with other digital technologies raises security and privacy concerns, potentially jeopardizing patients'

health information. Furthermore, many automated processes now necessitate considerable quantities of data entry, which can be time-consuming for pharmacists who could rather focus on patient safety initiatives [9].

1. Lacks Personal touch:

Artificial intelligence (AI) is a machine-based technology that lacks the empathy and personal touch that a human pharmacist possesses, which is critical in providing emotional support to patients in sensitive situations. The accuracy of AI recommendations and advice is entirely dependent on the quality of the input data it receives. If the data is erroneous, incomplete, or biased, the suggestions may be invalid.

Furthermore, AI's language proficiency is restricted to the training data it has been given, and it may struggle to understand regional dialects, slang, or other linguistic nuances. Ethical considerations like data protection, informed consent, and system biases are unavoidable with any AI-powered technology. Furthermore, many pharmacies struggle to maintain and update this complicated system, which demands significant computational resources and technical skills [10].

2. Lacks High-end data protection mechanism:

The discipline of pharmacy has tremendously profited from technology improvements in recent decades, but these benefits have also brought new risks and concerns, notably in terms of data security. As our digital world gets more interconnected, unscrupulous actors will have an easier time accessing private information. It is critical for pharmacies to take proactive steps to protect patient details, as a breach could result in severe financial losses or legal penalties.

One of the most serious risks posed by data theft is identity theft, in which hackers get access to sensitive information such as Social Security numbers, bank account information, or prescription histories. Furthermore, medical records are highly valued on the black market due to their possible use in insurance fraud and illegal drug sales. Therefore, pharmacies must remain vigilant to protect this sensitive data from cyber-criminals with malicious intent [9].

3. Lacks Technical knowledge:

It is critical to address pharmacists' lack of technical skills, as errors can have major consequences for patient safety. Incorrect use of technology can lead to erroneous calculations or dosing errors, increasing the danger of under or overdosing a patient. Such blunders could have a negative impact on the patient's health and possibly risk their lives. Furthermore, a lack of knowledge and experience with technological solutions in pharmacies may result in undiscovered errors until serious adverse reactions occur [9].

4. Limited Access to All Community Members:

The lack of technology in rural and underprivileged areas has a substantial impact on the provision of pharmacy services. Pharmacists encounter several obstacles due to a lack of innovative technology tools such as digital health records, telemedicine platforms, and automated dispensing systems. This technological gap has resulted in lower pharmaceutical safety, reduced patient access to critical medications, and manual processing of a significant number of prescriptions. Furthermore, pharmacists are unable to use evidence-based decision support tools, lack access to the internet, and struggle to stay up with the most recent breakthroughs in medication therapy [9].

5. Technology Failures:

Improperly executed computer-aided technology assisted automation can lead to data entry errors, medicine ordering blunders, and other costly consequences. Furthermore, if a system malfunctions or unexpectedly shuts down owing to unforeseen technical issues or power outages, it could have serious consequences for patient safety. Pharmacists must be aware of these hazards and take steps such as frequently storing up data and maintaining dependable internet connections to reduce the possibility of system failure [9].

6. Maintenance expenditure:

Incorporating computerization into pharmaceutical procedures offers pharmacies a great opportunity to increase productivity and improve patient care. However, some businesses may find the upfront cost prohibitively expensive. To address this, pharmacists might devise innovative strategies to balance the cost of high-tech expenditures with the maintenance of existing services. By properly managing updates and repairs, pharmacies can use technology to increase profits while providing excellent value to clients [9].

CONCLUSION:

Artificial intelligence and software designed for computers have an immense opportunity to transform community pharmacy. These technologies have the ability to streamline administrative processes, enhance decision-making, and personalize patient care. AI can help predict drug demand, improve dispensing accuracy, automate inventory management, and boost operational efficiency. Furthermore, these technologies can boost patient participation, improve health outcomes, and guide preventive care activities. This will increase pharmacist job satisfaction and lead to more profitable, efficient pharmaceutical businesses. Nonetheless, it is imperative to ensure that technologies are employed morally and sensibly and that their impact on the labor force and community is carefully evaluated.

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