

Artificial Intelligence in Pharmaceutical Sales and Marketing: Recent Study

Mr. Deepak Chirmire, Mr. Pritam Salokhe, Dr. Nilesh Chaougule
Student, Ashokrao Mane Institute of Pharmacy, Ambap
Assistant professor, Ashokrao Mane Institute of Pharmacy, Ambap
Principal, Ashokrao Mane Institute of Pharmacy, Ambap

Abstract: Artificial Intelligence (AI) is a concept that describes how intelligent people think about an intelligent machine, a computer-controlled robot, or a piece of software. The sales and marketing teams will focus on finding the right healthcare professional and segmenting them into the right channel at the right time. AI will assist marketing teams in understanding brand history, running brand diagnostics, and charting the brand's future direction. In furtherance, AI could help sales teams with Customer Relationship Management (CRM), pre-call planning, guided sales, and e-details, resulting in a competitive advantage and improved sales outcomes. Overall, this will assist organizations in achieving better business outcomes with less resources and time respectively. Furthermore, it can help improve marketing strategies and helps patients stick to therapy care plans and make better choices. The artificial intelligence help in pharmaceutical sale and marketing and effect on consumer behavior. The purpose of this article is find way to increase sale and marketing of pharmaceutical industry which can be help to new and young entrepreneurs in India.

Keywords: Artificial intelligence; Sale and marketing; Consumer; Strategy; Pharmaceutical Industry.

1. INTRODUCTION

The field of engineering science that studies the development of intelligent devices, especially intelligent computer programs, is known as artificial intelligence (AI). It is the capacity of a computer, or a robotic system with computer capability, to process input and provide results in a way that is comparable to how humans pay attention when learning, making decisions, and solving issues. The goal of artificial intelligence (AI), a subfield of computer science, is to build intelligent machines, which are becoming indispensable in the technology sector. AI has also significantly revolutionized the pharmaceutical

companies' approaches to marketing and sales. It is being heavily utilized in every aspect of the healthcare sector. It is a sophisticated form of computer-assisted methodology that involves gathering data from multiple sources, formulating rules to handle the needed data, and modeling potential outcomes to identify suitable outcomes and processes that can mimic human behavior. It is utilized in the pharmaceutical industry's production division, clinical trials, and pharmaceutical product marketing and sales.

2. WHY AI NEED IN PHARMACEUTICAL INDUSTRY AS WELL AS IN MARKETING PURPOSE ?

The amount of pharmaceutical data stored in computer databases and submitted to regulatory bodies has increased significantly in recent years. It is presently created in the form of petabytes due to developments in gadgets such as sensors, photo capture devices, mobile phones, genetic data collection, e-consultation, etc. [1] The pharmaceutical industry now includes not just medication development companies but also academicians, mathematicians, business intelligence, and research & development. The pharmaceutical industry produces a lot of unstructured data. Prescription data, medical image reports, doctor notes, patient histories, and a plethora of other data may be included. Before the patient's therapy is decided, his medical history is carefully examined and taken into consideration. Managing this vast amount of unstructured data requires a variety of analytical methods and instruments. [2] These technologies may be used for data extraction, processing, and visualization. For the purpose of handling pharmaceutical data, there are several open-source

programs accessible. Each of these platforms has advantages and disadvantages. Closing the data collection and processing gap is essential. [3] The increasing number of patients in the healthcare industry has resulted in a great deal of information overload. By using machine learning, the vast volumes of patient data may be exploited for evidence-based practice. [4]. Today's marketing and sales data is kept in an electronic database system to gather real-time information on drugs, different doctor prescriptions, and customer attitudes regarding various medications.

3. WHY AI MATTERS IN PHARMACEUTICAL SALES AND MARKETING

Many sectors have been transformed by artificial intelligence (AI), and the pharmaceutical industry is no exception. Artificial Intelligence (AI) has great promise for enhancing pharmaceutical sales and marketing initiatives. It can help businesses collect and evaluate large volumes of data, improve decision-making, customize consumer experiences, and maximize advertising campaigns. [5]

The use of AI to drug development and discovery, emphasizing how these processes may be aided by algorithms that can be used to find possible targets, enhance lead compounds, and better design clinical trials that take into account the selling and marketing of pharmaceuticals. Artificial Intelligence (AI) in these processes has the potential to significantly affect pharmaceutical sales and marketing by helping corporations create more efficient and targeted medications, which improves market positioning and boosts sales. [6] The several uses of AI in pharmaceutical marketing are covered in this conference paper, including sales forecasting, social media analysis, individualized marketing strategies, and consumer segmentation. Pharmaceutical firms may better interact with their customers and generate income by identifying important target groups and customizing their sales and marketing tactics with the use of AI-driven customer segmentation.[7]

Examines how artificial intelligence (AI) may be used in pharmaceutical marketing strategy, with a particular emphasis on customer relationship management, competition analysis, and market research. Pharmaceutical sales and marketing teams may create plans that improve business success by using AI-powered systems that gather and analyze data from

many sources to produce insights about market trends, rival activity, and client preferences.[8] AI in the marketing and sales of pharmaceuticals. Artificial Intelligence has the ability to estimate product demand, identify key figures in the medical community, improve sales representative area allocation, and optimize marketing channels. Pharmaceutical firms may increase sales income, enhance promotional efforts, and modify marketing tactics to respond to the ever-changing market dynamics by utilizing AI technology.

4. USE OF ARTIFICIAL INTELLIGENCE IN PHARMACEUTICAL MARKETING:

Marketing is the process of advancing the sales of a business's goods and services. [9].

"Machine learning and artificial intelligence allows global life science sales, marketing, and branding team to come up with more profitable and actionable commercialization strategies from the insights uncovered from AI," said Jon Resnick, President, RealWorld & Analytics Solutions, IQVIA, in an interview. Additionally, he underlined how AI/ML helps healthcare organizations to go further into finer layers of HCP, patient, and payer data in order to uncover hitherto undiscovered insights, provide recommendations for appropriate courses of action, and facilitate quicker and better decision-making. [10]. Additional benefits of using AI systems in pharmaceutical marketing include improved value proposition, higher market share gain through resource allocation, growth maximization potential, and personalized sales and marketing channels and information. [11].

based on a single, significant research A leading US pharmaceutical business increased the implementation of its promotional plan by leveraging physician level knowledge obtained through the optimization of multichannel marketing activity data. They attempted to maximize return on investment with the use of unique targeting, segmentation, and promotional campaigning strategy.

In a different case study, a pharmaceutical business with headquarters in Europe used AI and machine learning to find out what the HCP wanted from digital interaction. The organization was able to segment physicians and create a digital engagement plan based on the information gathered from a physician thanks to

the new insights. Pharmaceutical sales and marketing can make use of this kind of AI technique.

AI is being used and accepted in a variety of settings within the healthcare network. In addition to inducing sales and marketing tactics for capital management in the pharmaceutical sector attention to cost of Pharma product, artificial intelligence may assist in studying an individual's DNA to identify the most effective treatment choice with fewer adverse effects. [12].

Around the world, corporations are embracing artificial intelligence, including the pharmaceutical and healthcare sectors. AI implementation can assist uncover methods to make more informed judgments more quickly throughout the road from molecule to market, from patient adherence to a sales call, and enhance commercialization tactics.

Artificial intelligence is being used by a number of pharmaceutical firms, including Pfizer, GSK, Novartis, Lundbeck, Takeda, AstraZeneca, and Teva, to enhance their marketing campaigns for both new and current drugs. According to a report by Eularis, sales reps who used the insights from artificial intelligence analytics to adapt their communications saw a 43% increase in prescription compared to those who did not. "AI will be able to better process stakeholder aligned information to the customer, enabling more targeted dissemination of information to the customer," according to Dr. Merton of JLABS. Additionally, he said that marketing expenses need to drop shortly. [10].

According to Bjarni-Kornbech, VP of Marketing & Communications at Agnitio, the company wants to use AI to bring about a new revolution in the marketing and sales of pharmaceutical goods. It is essential that the sales force receives CRM system training. But not many businesses are making the effort to train their sales force in this way. Additionally, according to Bjarni Kornbech, in order to truly provide value, it is necessary to link consumer interaction data to the CRM and, ideally, to couple the data from the marketing engine. Subsequently, all of it must be made available to the field force in one location. [13].

Pharma sales must adjust to the changing needs and desires of physicians. In the past, as well as in the present, marketing and sales teams sent out a lot of messages to physicians through a variety of channels, hoping that they would write about their product. This approach was ineffective for product marketing and resulted in an overuse of financial and human

resources. Through the use of analytics, machine learning in commercial applications helped create a more sophisticated and well-inclined brand strategy and sales approach. Health care providers are increasingly being driven toward digital ventures that support healthcare. According to a recent report, 70% of physicians are now alpha geeks. Physicians are increasingly less likely to consult with medical representatives in person and more likely to turn to internet resources for answers. [14].

5. ADVERTISING AND SOCIAL NETWORKING USED FOR SALE AND MARKETING OF PHARMA PRODUCT THROUGH AI

Numerous client product organizations have effectively used social networking platforms, such as YouTube, Twitter, and Facebook, for viral advertising and marketing campaigns. These campaigns got their moniker since it's evident that the dissemination of an advertisement over the networks is comparable to the spread of viral illnesses among this demographic. The pharmaceutical sector may not use these networks to the full extent, and it can be very challenging to determine who is responsible for the material that is sent through them.

5.1. Social Media Strategy

Social media channels work quite well for promoting and selling pharmaceuticals and medical equipment. a highly engaged audience that is amenable to targeting via both paid and organic means, which makes them ideal for the successful implementation of advertising initiatives. Businesses' websites are enhanced with features like sharing and commenting areas as part of the social media optimization process. This type of strategy might focus on the social media channel that your prospective clients use most frequently, or it could be broadened to cover all of the main channels, including Facebook, Instagram, LinkedIn, Twitter, and LinkedIn.

5.2. Mobile Applications

One of the most often used tools for pharmaceutical businesses to interact with their consumers is mobile applications. Businesses may create mobile applications to track client behavior, issue health advice, and provide information about their products.

5.3. Virtual Reality

Using virtual reality (VR) technology, businesses may provide their patrons a more immersive and interesting experience. Pharmaceutical firms, for instance, may offer interactive product presentations or teaching resources with VR technology.

5.4. Personalization

Pharmaceutical businesses may use AI and big data to evaluate vast volumes of data and target specific clients with personalized marketing messages. Businesses may personalize their messaging to be more interesting and relevant by learning about each customer's preferences. For instance, the business can tailor its marketing messaging to a customer's past searches for information on a certain medical condition in order to deliver more relevant information about that illness.

5.4. Chatbots

Personalized information and help are being offered to clients via chatbots driven by artificial intelligence. Chatbots can help consumers make better educated healthcare decisions by responding to their inquiries and offering details on goods, doses, and adverse effects.

5.5. Email Marketing And List Building

Email marketing has become one of the best tactics available for companies in the rental industry. Businesses may be able to make money by leasing their email lists to other companies. The subscribers to the email list will therefore be accessible to the latter's clients, increasing the possibility that the clients will buy the rental company's merchandise.

6. HUMAN INVOLVEMENT IN ARTIFICIAL INTELLIGENT

In order to meet the goal of marketing pharmaceutical products and devices, human intervention in the field of artificial intelligence is necessary for sales and marketing, requiring the execution of a precise and adaptable process.

6.1. Data Scientists and Analysts

For AI models to be created and improved, data scientists are essential. They are responsible for collecting, preparing, and processing the data for analysis. Additionally, they create and train machine

learning algorithms to extract valuable insights from pharmaceutical data. [17][18]

6.2. Pharmaceutical Marketers and Sales Teams

Human experts in pharmaceutical marketing and sales give domain-specific data and strategic insights. They work with AI systems to understand data-driven recommendations and successfully implement them in marketing campaigns and sales strategies.[19]

6.3. Regulatory Experts

Adherence to regulations is crucial for the pharmaceutical industry. Regulatory experts work closely with AI teams to ensure that AI-driven marketing strategies and materials comply with industry regulations and standards. [20]

6.4. Ethics and Bias Experts

Ethics and fairness experts are involved in ensuring that AI applications in pharmaceutical marketing do not discriminate and adhere to ethical standards since AI systems may inadvertently introduce biases.[21]

6.5. Medical and Scientific Advisors

Scientists and medical experts offer insightful information about the scientific features of pharmaceutical items. They work together with AI teams to guarantee that marketing material is precise and in line with what is currently known about medicine. [22]

6.6. Managers and Decision-Makers

Executives and managers of pharmaceutical companies rely on AI-generated insights to inform their strategic decisions. They rely on AI to provide data-driven recommendations for product development, marketing budget allocation, and market expansion.[23]

6.7. Customer Relationship Managers

These workers establish and preserve connections with patients and healthcare providers by utilizing AI-generated consumer insights. They make certain that consumer wants and preferences are met via marketing and sales initiatives.[24]

6.8. Quality Assurance and Monitoring Teams

These groups are in charge of regularly assessing and monitoring the effectiveness of AI systems in

pharmaceutical sales and marketing to make sure they are meeting legal requirements and producing the intended outcomes. [25].

7. IMPORTANCE OF DIGITAL TRANSFORMATION THROUGH ARTIFICIAL INTELLIGENT

AI is essential for pharmaceutical sales and marketing as digital transformation changes how pharmaceutical companies engage with patients, healthcare providers, and stakeholders. Artificial intelligence (AI) may now be incorporated into many aspects of the pharmaceutical industry, leading to increased efficiency, better customer experiences, and improved decision-making. Here, we look at the benefits of digital transformation for AI in marketing and sales for pharmaceuticals.

7.1. Enhanced Data Utilization

Thanks to digital transformation, pharmaceutical companies may now utilize the vast amount of data that the digital world has to offer. AI systems may be able to evaluate this data to extract valuable information about competitor activity, industry trends, and customer preferences. Pharmaceutical sales and marketing teams utilize this data to identify growth opportunities, tailor marketing strategies, and make data-driven decisions..[26]

7.2. Personalized Marketing

In the pharmaceutical industry, personalized medicine and marketing are becoming more common. Digital transformation makes it possible to collect and analyze patient data, allowing AI to create highly tailored marketing campaigns. For example, AI can identify a patient's optimal medication based on their medical history, leading to more efficient marketing and improved patient outcomes..[27]

7.3. Real-time Engagement

Digital transformation enables real-time communication between medical personnel and patients. Artificial intelligence (AI)-powered chatbots and virtual assistants can provide prompt answers to queries, provide pharmacological information, and support medical professionals in making decisions. This level of focus promotes the growth of more solid relationships and trust. [28]

7.4. Predictive Analytics

Thanks to digital transformation and artificial intelligence, pharmaceutical companies may employ predictive analytics for a range of purposes. AI, for example, can forecast changes in the market, the demand for certain therapies, and disease outbreaks. Using these predictive skills, supply chains, manufacturing schedules, and marketing strategies may all be improved.[29]

7.5. Clinical Trial Optimization

Digital transformation streamlines clinical trial administration by simplifying the collection and analysis of trial data. AI can predict trial outcomes, identify the ideal patient demographics, and enhance recruitment strategies. Consequently, approvals for medications occur faster and at a reduced cost..[30]

7.6. Cost Efficiency

When combined, digital transformation and artificial intelligence might significantly reduce operating costs. Businesses in the pharmaceutical industry might better allocate their resources by automating repetitive tasks like data entry and analysis. AI can also optimize the use of marketing budgets by precisely identifying the right target group and reducing resource waste..[31]

7.7. Compliance and Regulatory Adherence

The pharmaceutical industry is subject to strict legal regulations. Digital transformation has made AI-driven marketing materials compliant with these guidelines. Automated technology can assist in the assessment and approval of marketing material, reducing the likelihood of non-compliance..[32]

7.8. Competitive Advantage

Adopting AI and digital transformation gives pharmaceutical companies a competitive edge. They are able to monitor their competitors' actions, react quickly to changes in the market, and innovate in areas like drug research and consumer interaction. In a market that is shifting, this adaptability is crucial.[33] Digital transformation is the cornerstone for effectively using AI into pharmaceutical sales and marketing. Pharmaceutical companies may become more efficient and competitive in a constantly evolving industry by leveraging AI's capabilities in data analysis, targeted marketing, predictive analytics, and compliance. Incorporating AI and digital

transformation is not only a prudent strategic choice, but it is also necessary for the pharmaceutical sector to be productive and competitive.

8. Impact of AI in pharma Industry consideration sale and marketing

The pharmaceutical industry has been greatly impacted by artificial intelligence (AI), which has had a disruptive effect on many aspects of medication discovery, manufacture, and delivery of healthcare. Artificial intelligence (AI) technologies are transforming the pharmaceutical industry with increased productivity, lower costs, and the ability to provide new medicines faster. This article goes into great detail on how AI is affecting the pharmaceutical industry and includes relevant sources..

8.1. Drug Discovery and Development

Early-Stage Drug Discovery: AI systems may scan through enormous datasets, including genetic data, chemical structures, and published research articles, to discover novel therapeutic possibilities. Machine learning algorithms can predict a chemical's likelihood of being a successful drug at the early stages of drug discovery, saving time and money. [34]

8.2. Drug Repurposing

AI is able to identify pharmaceuticals that are currently on the market and may have additional therapeutic uses. By analyzing data on medication interactions and disease pathways, artificial intelligence (AI) can propose novel applications for existing drugs, possibly accelerating the development of treatments. [35]

8.3. Clinical Trial Optimization

AI-powered algorithms may be used to identify appropriate patient groupings, predict patient enrollment rates, and enhance trial designs. This leads to reduced trial costs and expedited drug development. [36]

8.4. Drug Manufacturing and Quality Control

Process Optimization: AI-driven process optimization guarantees the efficient and reliable production of pharmaceuticals. AI is able to identify anomalies, modify parameters to maintain quality, and monitor manufacturing processes in real-time. [37]

8.5. Quality Control

Artificial intelligence (AI)-based computer vision systems may be used to inspect pharmaceutical products for defects, ensuring that they adhere to quality standards. These technologies decrease the likelihood of recalls while enhancing product security. [38]

8.6. Drug Safety and Pharmacovigilance

8.7. Adverse Event Detection

Artificial intelligence is capable of analyzing vast amounts of clinical and post-market data to identify potential drug adverse effects. Prompt regulatory action and improved patient safety are made possible by early detection. [39]

8.8. Personalized Medicine

Patient stratification: A person's response to different pharmaceuticals may be used to segment them into subpopulations based on AI, genetics, biomarkers, and clinical data. This allows for more tailored treatment plans and better outcomes. [40]

8.9. medicine Dosage Optimization

Artificial intelligence (AI) algorithms are able to calculate the optimal dosages of medications for individual patients, therefore reducing the likelihood of adverse effects and maximizing therapeutic efficacy. [41]

8.10. Drug Marketing and Sales

AI has made it possible for pharmaceutical companies to create customized marketing campaigns based on the traits of patients and medical professionals, which boosts engagement and returns on marketing investments. [42]

8.11. Healthcare Delivery

Clinical Decision assistance: AI technologies help healthcare professionals make clinical decisions in real time by providing recommendations for diagnosis and treatment. [43]

8.12. Drug Adherence

Artificial intelligence-powered tools and applications may be able to assist patients in taking their drugs on a regular basis by providing educational materials and sending reminders. [44]

In summary, AI will have a big impact on the pharmaceutical industry, with implications for drug

discovery, manufacturing, safety, individualized care, and the delivery of healthcare. As AI technologies advance, they might change the way pharmaceutical companies operate, leading to more efficient processes, reduced expenses, and ultimately improved patient outcomes.

9. AI APPLICATIONS IN PHARMACEUTICAL MARKETING

9.1. Real-time Pricing Optimization

To improve pharmaceutical product prices, AI systems may dynamically examine market conditions, rival pricing, and demand trends. This keeps you competitive while maximizing earnings.[45]

9.2. Targeted Advertising

Large-scale patient data and behavioral patterns may be analyzed by AI-powered algorithms to determine target markets for certain pharmaceutical goods. This makes it possible to run targeted and customized advertising campaigns that raise consumer involvement.[46]

9.3. Drug Discovery

Large datasets may be analyzed by AI systems to find trends and possible treatment targets. As a result, finding promising molecules takes less time and money, which speeds up the drug discovery process. [47]

9.4. Adverse Event Detection

AI is able to monitor and identify unfavorable occurrences connected to pharmaceutical items by analyzing data from social media, internet forums, and other sources.

9.5. Medication Adherence

AI-powered solutions are able to track patients' compliance with recommended drug schedules and offer tailored assistance and reminders. Both patient outcomes and drug adherence rates are enhanced by this.[48]

These illustrations highlight how artificial intelligence (AI) is transforming pharmaceutical marketing through the improvement of pricing tactics, targeting of advertising, speeding up drug development, tracking of adverse events, and raising prescription adherence.

10. LIMITATIONS OF ARTIFICIAL INTELLIGENCE

Even though artificial intelligence (AI) has a lot of potential for pharmaceutical sales and marketing, there are several things to keep in mind. Here are a few of this field's AI restrictions.

10.1. Data Privacy and Security Concerns

AI depends on a lot of data, including private medical records. Because any breach might have catastrophic consequences, it is imperative to ensure the privacy and security of sensitive data. To secure consumer data, businesses must abide by stringent laws like the General Data Protection Regulation (GDPR) in the EU. [49]

10.2. Lack of Human Touch

Although AI may automate some sales and marketing tasks, some clients may find that AI lacks the human element they require. It may be necessary to have more individualized, human interactions with clients in order to develop trust and relationships—something that AI cannot accomplish on its own. After [50]

10.3. Limited Understanding of Complex Healthcare Systems

The complexities of the healthcare sector, such as clinical workflows, complicated medical conditions, and regulatory constraints, may be too much for AI algorithms to completely understand. This might make it difficult to provide clients with accurate and pertinent information in their context.[51]

10.4. Ethical and Legal Considerations

Artificial intelligence (AI) poses moral conundrums for pharmaceutical sales and marketing because of potential biases in algorithms, patient data misinterpretation, and automated decision-making. Businesses must handle these moral dilemmas and make sure AI applications abide by the law and other regulations..[52]

10.5. Overreliance on Data Quality

High-quality data is essential for AI systems to perform reliable analysis and make predictions. On the other hand, biased or inadequate data might influence decision-making and provide inaccurate results. For trustworthy AI applications, ensuring the

completeness, correctness, and representativeness of data is essential.[53]

11. CONCLUSION

The integration of artificial intelligence in pharmaceutical sales and marketing holds tremendous potential. AI enables personalized targeting, data-driven decision-making, and improved customer engagement. As the industry continues to evolve, embracing AI can enhance efficiency, optimize resources, and ultimately contribute to more effective strategies for pharmaceutical sales and marketing in a rapidly changing landscape.

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