

Top Pharma Industry Trends

From drug discovery and development to medical imaging and patient engagement, artificial intelligence occupies a prominent position in the industry. Along with big data and analytics, more than a third of pharma startups are working on software solutions for the industry. There is still a lack of access to basic medicines in many regions of the world, prompting demand for flexible pharmaceutical manufacturing. The use of real-world data to collect accurate patient experiences, blockchain to securely transact and manage patient records, and augmented, virtual, and mixed reality (AR, VR & MR) solutions also find a place in the top pharma industry trends.

1. Artificial Intelligence

The use of artificial intelligence (AI) and machine learning is accelerating the drug discovery and development processes. Startups are exploring the use of these technologies to address the various challenges in the pharma industry, such as automation and optimization of the manufacturing processes, as well as designing effective marketing and post-launch strategies. AI simplifies the identification of eligibility criteria and the inclusion of patients and also makes the cohort identification process faster and cheaper.

2. Big Data & Analytics

The large volumes of data available throughout the drug discovery and development process require high-performance systems to properly analyze data and derive value from it. The advancement in analytical techniques is also turning historical and real-time data available with pharmaceutical companies into valuable assets for predictive, diagnostic, prescriptive, and descriptive analytics. Moreover, these analytics techniques are used on almost all types of medical data from patient records, medical imaging, and hospital data, to name a few.

3. Flexible Production

The pharma industry is exploring new ways of manufacturing due to the changing market dynamics, such as small batches for precision medicine. Single-use technology is gaining popularity as it reduces downtime and increases productivity by eliminating complex steps like cleaning and validation between separate production stages. New types of bioreactor systems and continuous manufacturing processes address the increasing focus on biopharmaceuticals. In addition to eliminating downtime, continuous manufacturing has low energy needs, achieves high productivity, and minimizes the amount of waste.

4. Precision Medicine

Precision medicine comes from the idea of treating each patient as a unique individual. Advancements in omic and data analysis are providing new insights into how the human body responds to drugs. This knowledge, along with advanced

manufacturing methods such as additive manufacturing, is making personalized medicine a reality. Drug exposure models determine the pharmacokinetic and pharmacodynamic properties of drugs for arriving at the right dosage for drugs based on age, sex, comorbidities, and other clinical parameters.

5. Additive Manufacturing

The need for precision medicine is also making pharmaceutical companies rethink the manufacturing process. A lot of research is underway for making advanced 3D printers that print tissues or cells. 3D printing of human tissues has great applications in drug development, organ engineering, and regenerative medicine. This allows the development of age or physiology-dependent medical formulations, as well as precision pills. Bioprinters also help in pushing innovation in bioinks, tissue engineering, and microfluidics.

6. Blockchain

Blockchain technology is very significant for the pharmaceutical industry in every stage of the production and distribution of drugs. The stakeholders in the pharma industry are, in general, extremely secretive about their data due to the sensitive nature of the data. Blockchain technology is also being explored to tackle the use of counterfeit medicines and substandard drugs that enter into the pharmaceutical supply chain and kill thousands of patients every year. The digitalization of transactions makes blockchain a promising solution for tracking and securing the pharma transaction ecosystem.

7. Extended Reality (XR)

Mixed reality (MR), virtual reality (VR), and augmented reality (AR) is enabling visualizations like never before. Pharma startups are exploring the possibilities of these technologies in pharmaceutical research and manufacturing spheres. Extended reality tools enable data-rich and meaningful real-time location-agonistic interaction among research teams. Startups are making human augmentation in pharma a reality through extended reality wearables and tools.

8. Real-World Data

Real-world data (RWD) and real-world evidence (RWE) are transforming innovations in the pharmaceutical industry. RWD includes patient health status, treatment data, and health reports collected routinely. The pharmaceutical industry, owing to its research-intensive nature, has to make sure that the data they use is reliable and of real value. The availability of real-world data enabled by the Internet of Things (IoT), sensors, and wearables is restructuring the way the pharma industry is functioning.