The rise of AI-powered pharma

How AI is transforming the pharmaceutical industry

Globant
Introduction: The Big Tech challenge

As healthcare stakeholders come to recognize the importance of putting patients’ needs first, healthcare is becoming more patient-centric. Instead of focusing exclusively on patient experience during doctor’s appointments or hospital visits, a patient-centric approach considers the full patient journey, including touchpoints with other stakeholders such as pharmacies and how care regimens are followed at home. This more holistic view leads to better patient outcomes and a more positive healthcare experience overall.

However, for the pharmaceutical industry specifically, patient centricity heightens competition with Big Tech companies that have already shown their ability to build trust with customers by centering on their needs. Companies like Amazon, Apple and Google have begun translating their skill at fashioning customer-centric experiences to the healthcare space. For example, customers already trust Amazon Prime Rx with their prescriptions and their Apple Watches and Fitbits with their real-time heart rates. In the future, Big Tech companies could leverage that trust further. What if tomorrow Google invented a new way to administer medicines that was more convenient than a once-a-day pill?

Forward-thinking pharmaceutical companies can gain competitive advantage by innovating beyond creating new treatments and drugs. They can learn from Big Tech by using technology — especially artificial intelligence (AI) — to cater to patients’ needs, improving outcomes and building trust for the long term. By leveraging the power of AI, pharmaceutical companies can streamline processes, reach customers more effectively and eventually power innovation that will keep them at the cutting edge of the industry and build trust with customers. This is AI-powered pharma.
Four ways **AI can transform pharma**

AI can be deployed powerfully across all stages of the drug development life cycle, and can also be used to optimize drug production and distribution. The examples described below show how this technology can enhance or augment rather than replace human work across the industry. AI tools will help researchers, healthcare providers and even marketers and salespeople do their jobs more quickly, easily and effectively.

1. **Accelerating R&D**

Successful AI algorithms can save pharmaceutical companies millions of dollars and many hours of labor by accelerating the drug discovery process. When evaluating a candidate compound, researchers generally have two goals: first, determining whether the compound binds with the desired drug target, and second, predicting the compound’s absorption, distribution, metabolism and excretion (ADME) profile — essentially how it will behave inside the human body. AI tools can aid both steps, while also predicting adverse drug interactions and side effects. For example, one algorithm **reduced failure rates** by predicting which candidate compounds would interact negatively with a particular liver enzyme.

Pharma companies can also use AI on data on a drug’s real-world impact on patients’ health (vs. just clinical trial data) to improve the efficacy of drugs already on the market. Some are using **AI-powered natural language processing (NLP) tools for adverse event monitoring and pharmacovigilance.** It’s a small jump to use similar techniques to understand patient pain points and infer potential improvements to existing treatments.

2. **Improving diagnoses**

AI can improve diagnostics by detecting symptoms of illness that humans can’t. For instance, Globant worked with one healthcare organization to create an AI algorithm to enable the early detection of lung cancer in pediatric patients based on a CT scan, enabling faster and more effective treatment. Another AI solution — an AI-powered smart assistant tool — helps healthcare providers calculate psoriasis area and severity index (PASI) based on a single photo sample of the affected area of the patient’s skin. After an initial PASI score is calculated, providers can edit and adjust values as needed to match final observations and arrive at a precise result. In both cases, AI tools greatly accelerate diagnosis and treatment of disease.
Manufacturers across industries are already using AI to optimize factory processes. For example, predictive maintenance algorithms can be used to predict when parts will need to be replaced or repaired outside of the normal maintenance schedule. Pharmaceutical companies can borrow some of these techniques to improve their own production processes.

For example, a manufacturer could automate quality control by mounting a camera on the factory line to photograph each pill as it emerges from production, then run an image recognition algorithm to detect which ones are likely to be defective. An automated process could then separate these pills from the rest of the batch, improving the efficiency of factory operations.

The social distancing forced by COVID-19 has been a hurdle for pharmaceutical sales reps used to connecting with healthcare providers in person. AI can help restore a personal touch to sales interactions by tailoring messaging to specific providers. In particular, remote appointments generate data that — if shared with permission — could be used to better segment customers by revealing insights around population health. If people in a certain region are more prone to a certain illness due to environmental or genetic factors, that illness might show up more often in appointment records. Pharmaceutical companies would then know to target healthcare providers in that region with treatments for that illness, making their messaging more relevant.
Pharma companies need the right data to power AI

Algorithms are only as good as the data they’re trained on. To use AI effectively, pharmaceutical companies need to build robust data pipelines that ensure high data quality. Having the right data can open up new possibilities for the entire industry. For example, a pipeline connecting the biological outcome of a drug back to the discovery phase could facilitate “continuous discovery.” After identifying a drug that cures or treats a particular condition, researchers could feed that data back into the discovery process to identify related compounds that may have better ADME properties, such as easier digestion or fast metabolism.

In particular, pharmaceutical companies should work on gathering two types of data: patient data and internal data.

1. Patient data

Understanding the biological outcome of drugs and treatments is vital to pharmaceutical companies’ success. Yet most have relatively little access to patient data. Even when privacy regulations like HIPAA in the U.S. and GDPR in the EU are complied with, obtaining patients’ consent can be difficult. Patients are happy to share their health records with the medical system and Big Tech, because they feel they get value back. They’re less likely to trust a pharmaceutical company with whom they don’t have a strong relationship. To improve access to patient data, pharmaceutical companies must build trust by creating experiences that add value to patients’ lives.

2. Internal data

Pharmaceutical companies collect enormous quantities of data on R&D experiments, clinical trial results, adverse outcomes and so on. However, that data is often siloed and disorganized due, in part to the high frequency of mergers and acquisitions in the industry. For example, when a startup develops an exciting new drug, it’s usually acquired by a larger enterprise company with experience running clinical trials and shepherding drugs through the approvals process. The startup and the enterprise company likely store data on different systems and format it in different ways, making it difficult to merge information together to get one view.
Building strong pipelines for both types of data is a prerequisite for AI success in pharma—but it may not be sufficient on its own to solve all the technological challenges companies face. For example, if we could develop an AI model to predict how molecules of a candidate drug would interact with each other and with various molecules in the human body, it would dramatically accelerate R&D.

However, for any given drug, there are so many relevant molecular combinations that it would take years to evaluate every option with today’s technology. It may be that we need entirely new technologies to seize these possibilities. Boehringer Ingelheim has already partnered with Google to explore pharma R&D applications of quantum computing, but the project is still in its early stages. Only time will tell how pharmaceutical companies and their partners will solve this particular technological challenge.

The transition to an AI-powered future involves more than just adopting the right technologies. Pharmaceutical companies will have to grow their relationships with patients and healthcare providers to make their operations more patient-centric, build trust and ultimately gain access to vital data. They’ll also need to build an ecosystem of partners who can help them make AI potential a reality. Here are two steps toward the future your company can begin taking.

1. **Build patient trust**

Patients trust Big Tech with their health data and other sensitive information because they see those companies deliver value in their daily lives. For example, if I share my location data with Google Maps, I see returns in the form of more relevant restaurant recommendations and maybe even a reminder of where I parked my car if I forget.

Pharmaceutical companies are a part of patients’ daily lives, too, through the medicines you make. So get inspired by digital pure players and brainstorm ways to reach patients in a similar way. Opening up new channels of communication can help you connect better with patients. For example, sponsoring an esports team might help you connect with younger audiences and raise awareness of specific diseases.

Partnerships can be a great way for pharmaceutical companies to build stronger patient relationships. For instance, Novartis recently collaborated with Disney to provide entertainment, games and emotional support for children in hospital cancer wards in Spain. The partnership leverages Disney’s personal connections with audiences and Novartis’ medical expertise—an ideal match.

As you start thinking patient-first—and people-first—you’ll find many new and creative ways to build trust with your audience. That includes physicians, who ultimately prescribe your medications and treatments—and who appreciate a personal touch too.
Pharmaceutical companies have long relied on an ecosystem of partners to handle different stages of drug development — for example, they work with, and often acquire, startups that do R&D. To accelerate AI transformation, adopt a similar attitude toward developing your technological capabilities. By relying on external partners that have specialized expertise, you can speed up time-to-market for new products and services while freeing up your time to focus on creating life-saving or life-improving drugs and treatments.

It’s important to remember that you’re striving to become a digital company, not an IT company. That means automating or outsourcing IT commodity work and reinvesting the resulting savings back into your core business. It also means becoming adept at using digital and AI tools to innovate in a way that leverages your unique expertise and enhances that core business — for instance, by using AI to accelerate drug discovery. Eventually, growing your AI capabilities may mean attracting some technical talent in-house. But especially at the beginning of your AI journey, working with the right partners will be vital to the success of your early initiatives.

Conclusion: An engine for ongoing innovation

Disruption is coming big and fast for the pharmaceutical industry, and for healthcare in general. It’s time to start preparing your company for the industry’s AI-driven future. By building trust with patients and healthcare providers, streamlining IT operations and investing in AI, you will build a platform for ongoing innovation — and insulate yourself from competitive threats.
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• We have more than 17,250 employees and we are present in 18 countries working for companies like Google, Rockwell Automation, Electronic Arts and Santander, among others.

• We were named a Worldwide Leader in CX Improvement Services by IDC MarketScape report.

• We were also featured as a business case study at Harvard, MIT, and Stanford.

• We are a member of the Cybersecurity Tech Accord.

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