How **AI** is **Changing** the **Health Communications** Landscape

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**HOW AI IS CHANGING THE HEALTH
COMMUNICATIONS LANDSCAPE**

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The world of healthcare is undergoing a digital transformation driven by advances in artificial intelligence and machine learning — a transformation that promises to revolutionize the development and delivery of new treatments and therapies and pave the way toward a new model of personalized, patient-centered care. AI-powered applications and platforms are opening new channels for communication across the spectrum of healthcare services, providing life sciences professionals with an unprecedented array of tools for bringing new treatments to market and improving outcomes at every stage of the healthcare journey.

Now, healthcare organizations of all kinds can partner with digital innovators specializing in a broad range of diseases and therapeutic areas to develop "end to end" AI-informed solutions across the entire continuum of care.

What Is Digital Transformation in Healthcare?

Industries of all kinds are feeling the impact of digital transformation — a profound shift away from traditional analog methods of doing business toward a new model driven by rapidly advancing digital technologies that are changing the way people live and work everywhere in the world.

This transformation is part of what has been called the Fourth Revolution, the current era in which technological advances occur at unprecedented speed and with exponential growth. Arriving more than a century after the last "revolution" — the Industrial Revolution that ushered in a modern era of machines and long-distance communication — the Fourth Revolution is a product of the Internet of Things, or IoT.

The Internet of Things is the name given to today's worldwide digital ecosystem, in which millions of everyday devices are constantly in communication, sharing billions of bytes of data in a continuous flood of information that informs virtually all aspects of life. A byproduct of the IoT is the explosive growth of "Big Data" — the accumulation of massive amounts of data from a multitude of sources.

These factors combine to pave the way for significant disruption and transformation across industries of all kinds, but their impact is particularly profound in the arena of healthcare and life sciences. Healthcare organizations generate more data than any other industry, accounting for about 50% of all data currently stored in the cloud.

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The body of healthcare data includes massive amounts of patient information from sources as varied as home health monitors, smart wearables and patient portal inputs, electronic medical records (EMRs), and an array of "real-world evidence" (RWE) gleaned from sources outside the healthcare system such as insurance claims, death records, and other secondary sources.

Along with that, today's healthcare professionals have access to research and product development data from sources across the globe. Mining those vast stores of data for relevant insights requires the help of artificial intelligence. These sophisticated algorithms are trained to recognize and extract information from large datasets and create models capable of predicting outcomes and providing avenues for enhancing communication and decision-making at all stages of the healthcare journey, from initial research to direct patient care.

Embracing the Future of Digital Innovation in Healthcare: Artificial Intelligence and Machine Learning

AI applications are designed to perform complex operations on extremely large datasets, such as the kind that forms the foundation for today's life sciences research, development, and diagnostics. Those applications are making the delivery of healthcare products and services faster and more efficient than ever and creating new partnerships among biopharma concerns, healthcare professionals, and the patients they serve.

Deep learning models train AI applications with multilayered neural networks capable of returning results from large data sets. With time and human input, those models become more able to deliver highly targeted results that can be used for both informative and predictive purposes, both of which have the potential to radically disrupt the way healthcare is developed and delivered.

The healthcare sector has been among the slowest to embrace digital transformation, but a new generation of sophisticated AI models can provide demonstrated benefits for diagnosing health conditions and fast-tracking the development of new treatments and therapies that can be targeted to the needs of individual patients. In this way, AI platforms and applications can put essential information at the fingertips of healthcare professionals working at every point of a patient's healthcare journey.

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Rare Diseases: Modeling the Predictive Potential of AI

Those benefits reveal themselves in the highly specific medical subfield of rare disease diagnostics and treatment, which provides a model for the broader applications of AI algorithms for other treatments and conditions.

In the U.S., a rare disease is defined as a condition that affects fewer than 200,000 people, and some are so rare that they affect only one person. Diagnosing and treating these very rare conditions poses unique and daunting challenges, so much so that it takes an average of five to seven years to get an accurate diagnosis. Rare diseases can have widely varying symptoms, which often mimic other more common conditions. More than 90% of these conditions have no effective treatment, and because many rare diseases affect children, the typical delay in diagnosis means many victims die before their fifth birthday.

The algorithms of today's advanced AI applications can address the challenges of this unique subfamily of health conditions. Rare disease research represents the biggest application of AI predictive technologies in healthcare because this is an area in which the ability to accurately identify a small group of potential patients from a worldwide population becomes crucial for timely diagnosis and treatment.

Operating on massive sets of health data collected from all available sources, including electronic records, manual case notes, and an array of real-world data from a variety of secondary sources, AI-powered algorithms can search these datasets for information on symptoms, past treatments, and a variety of other data points in the history of any patient's interaction with the healthcare system. The results of this kind of operation can be shared with practitioners on the "front lines" of patient care to provide more complete lists of symptoms, past treatment options, and outcomes.

This kind of data mining and analysis can also be used to conduct research and run clinical trials of potential treatments. AI-driven data searches can reveal past treatment efforts, point the way toward new ones, and identify patients who could participate in trials. For very rare diseases with a small patient base, AI-powered algorithms can search records from around the globe to find potential patients and collect information about them.

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The predictive power of well-designed AI models can be invaluable for reducing the time to diagnosis and correct treatment for the world's rarest diseases. That power also extends to the management and treatment of many more common diseases and conditions such as diabetes and cancer. In that way, AI technologies can play a key role in a new era of precision, patient-centered medicine.

Precision Medicine and Patient-Centered Care

The insights and information gleaned from finely tuned AI-driven data analysis can give physicians and other healthcare providers vital tools for providing timely and individualized care. Delivered with the help of personal devices and cloud-based connectivity, AI-generated data can be provided instantly at any point in a patient's journey through the healthcare system, enabling HCPs to respond to any situation as it unfolds.

These tools can give providers access to the latest information not only about patients themselves but also about current research and treatment developments related to specific conditions. For example, at a patient's bedside, a doctor can explore predictive models for disease outcomes to plan a new course of treatment or get instant access to the latest clinical trials on new drugs and therapies.

This kind of personalized support is made possible by machine learning and AI-powered analysis of large data sets. With these tools, healthcare professionals can receive highly targeted information that eliminates irrelevant or redundant messaging and focuses on the unique needs of individual patients. That creates a framework for a model of precision medicine that places the patient at the center of the healthcare journey.

In this model, too, patients become empowered consumers of healthcare services and partners in their own care. Just as AI tools and platforms can deliver highly tailored messaging to physicians and other providers, they can also provide patients with customized information related to their care and treatment options. By enabling patients to learn about their condition and potential treatments, AI-powered messaging can promote patient engagement and encourage people to take an active role in their own treatment and recovery.

This highly targeted messaging can also be tailored to meet the changing needs of patients as they pass through the healthcare system, with different information available for points such as a hospital stay for surgery, rehab, and recovery, or follow-up care at home.

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Omnichannel Marketing: Personalized Messaging for Optimal Results

AI data mining can also boost the success of pharmaceutical marketing campaigns and open new channels between pharma companies and the HCPs they need to reach. This is the world of omnichannel marketing, which seamlessly integrates message content across all possible touchpoints in a consumer's journey. This new marketing approach allows pharmaceutical companies to connect with HCPs wherever they are, with highly relevant messaging that relates specifically to the task at hand.

Omnichannel marketing is the next step beyond today's typical multichannel marketing model, which simply promotes standardized content across all known channels at once. For example, advertising for a new medication would appear in a variety of different places targeting doctors in a particular specialty, such as social media sites and medical publications. But an AI-powered omnichannel approach would direct messaging to specific individuals, using available data to determine what a recipient needs to know at any given time in the process.

Unlike traditional multichannel marketing strategies that focus on a single main message and call to action, an omnichannel approach to pharmaceutical marketing can deliver different versions of this main message, targeted to different situations and changing needs. In this way, the most useful and relevant messaging reaches recipients across all available channels at once, so that messaging about a new drug could also include follow-up content on related research or information directly related to an individual doctor's current practice.

With a personalized approach that connects directly with HCPs at the most relevant points, pharmaceutical organizations become marketers working to raise awareness about new products and partners supporting HCPs in the course of their work.

Research, Publication, and Communication: Building Trust in AI's Potential

AI-powered data mining also has the potential to revolutionize the landscape of medical research and publication. But greater reliance on AI tools in these areas may pose challenges. AI tools for searching and analyzing large data sets can accelerate the pace of research and reveal unexpected new avenues for study by identifying factors typically overlooked by humans.
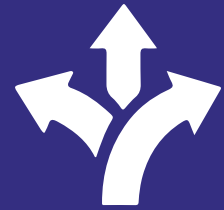
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AI processing can also help aggregate and organize data in multiple ways to make it accessible to many different groups. In these ways, AI can enhance medical communication among peers, patients, and also the public. But building trust in the value and validity of AI-generated models and data analysis is the key to the successful adoption of these tools.

The healthcare and life sciences field has been slow to adopt AI tools in lieu of traditional methods for researching, analyzing, and sharing data. Although a growing number of HCPs are willing to incorporate AI tools and platforms into certain diagnostic and surgical functions, they may lack confidence in the ability of AI predictive models to deliver valid results in the "real world" and in the potential for these tools to provide reliable, "on the spot" information capable of improving clinical outcomes and the delivery of care. Overcoming these obstacles and building trust in the value and validity of AI-generated modeling and data analysis is the key to successfully adopting these tools across the spectrum of life sciences and healthcare services.

AI-informed communication is a key aspect of digital innovation in healthcare and life sciences, with the potential to impact the development and delivery of new treatments at every stage of the process. AI tools and platforms can mine massive sets of real-world data for insights and predictive modeling to revolutionize the diagnosis and treatment of disease, including very rare conditions that may remain undiagnosed for years. In addition, these technologies enable the delivery of highly personalized services and support at all points in the journey from research and development to marketing and clinical care.

With innovative tools for data management, research, and omnichannel communication among life sciences professionals and the patients they serve, today's innovative and AI-powered platforms play a pivotal role in a new, digitally driven ecosystem of precision medicine and patient-centered care. Partnering with experts in the application of advanced AI technologies can open new doors for innovation across the spectrum of life sciences and healthcare services.

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