Accelerate Healthy Outcomes with Data and AI

Learn how leading healthcare organizations are accelerating decision making, improving business processes, enhancing user engagement, reducing costs and driving remarkable growth and profitability.
The Challenge
A leading healthcare services provider wanted to reduce the incidence of drug addiction among its patients and lower healthcare costs by proactively identifying potential drug-seeking behavior. Treating addiction is very expensive — U.S. healthcare organizations spend more than $500 billion annually caring for patients suffering from opioid addiction alone. Drug addiction also interferes with positive health outcomes for patients being treated for other conditions, and diverts much-needed resources from other patients. Across a large healthcare organization, however, it’s challenging to consistently identify patients at risk of becoming addicted and alert physicians to that risk.

The Solution
People seeking opioids or other addictive drugs tend to behave in predictable ways and have common characteristics. We developed an artificial intelligence-driven machine-learning solution for the healthcare provider’s compliance function that parses doctors’ notes entered into the organization’s electronic medical records (EMR) to identify potential drug-seeking behavior.

Our AI-based solution links text analytics performed on physicians’ notes from patient visits — including their impressions of a patient’s behavior, appearance and diagnoses — with data in the organization’s confidential third-party EMR system. It then uses that text analytics and advanced machine learning to generate system alerts for doctors during patient visits when a pattern of at-risk behavior is identified. This enables caregivers to intercede with patients in real time and take corrective actions.

Our Approach
We sought to identify common characteristics of typical drug-seekers by examining three sources of information: the patient’s diseases and conditions as recorded in the EMR, the types of drugs that historically had been prescribed to the patient, and the behaviors and symptoms exhibited due to each type of drug. Our solution learns continuously from its own results to verify the accuracy of its models and improve searches.

RESULTS
$60 million identified in organizational savings.
Identified 85,000 at-risk patients.
Captures behavior and symptoms as patients interact with a physician.
Identifies at-risk patients in real time.

Read the full case study here.
Improving Patient Insights, Care through AI Data Analytics

The Challenge
In the healthcare industry, social determinants of health — including economic stability, education, healthcare system and physical environment — are considered to be important factors in addressing patients' holistic healthcare needs and outcomes.

A large healthcare provider was looking for a resource with expertise in natural language processing (NLP) that could mine physician notes to identify these important determinants. The goal was to create a cohesive, holistic patient health history — and better serve patient needs with regular, targeted and localized care — by establishing interoperability across thousands of healthcare provider electronic medical records (EMR) systems.

The provider wanted to capture all caregiver notes to analyze social determinants of health in a structured format, and then ascertain whether these factors had a significant impact on patients' health outcomes.

The Solution
We developed an AI and ML solution that identifies and analyzes which social determinants of health have a significant impact on a patient's health by mining the unstructured data found in physicians' notes.

By supporting patients with proper care in their local communities, the system helps the provider more closely monitor and control patients' overall health and illnesses. This has resulted in fewer acute medical issues requiring emergency room visits, which has lowered healthcare costs overall.

Our Approach
We built a text mining engine that efficiently analyzes physician notes to not just extract specific words and relevant information but also find meaningful insights and context. We implemented an algorithm to analyze 900,000 records from approximately 200,000 patients. The anonymized records comprise caregiver notes taken during patient encounters. This includes multiple notes from the same visit, such as operative, clinical, post-operative and discharge notes. Our solution helps identify people in need of care for a particular disease and points them to specific outreach programs in their local area.

RESULTS
Identified 11% of encounters with homelessness and food insecurity-related social determinants.
Identified 34% of additional encounters that lacked Z codes through text mining.
Analyzed 900,000 patient records for patient insights.
Improved quality of care and health outcomes.
Reduced cost of care.

Read the full case study here.

Cognizant
The Challenge
In healthcare, one of the most important measures of success is patient satisfaction. Every hospital patient in the U.S. is asked to complete a Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey. In 2017, a large health network asked us to analyze its CAHPS data using advanced artificial intelligence and computer science techniques.

The healthcare provider’s goal was to fully understand patients’ needs so it could improve its CAHPS ratings and develop better, more customized care. The challenge was to deliver specific, actionable recommendations and advice, using a combination of patient feedback and clinical background data.

The Solution
We investigated data from 60,000 patients who visited the organization’s health centers over the course of six months. Our team evaluated key patient-care issues such as communication, responsiveness and pain management, and then compiled a holistic set of analytics correlating the patients’ clinical and social backgrounds, along with their satisfaction feedback.

We were able to identify and target very specific patient care issues, and show the healthcare provider where it ranked on these issues in relation to national averages. More importantly, we were able to recommend specific actions the organization could take to improve patient care delivery, health outcomes and business operations.

Our Approach
We delivered a detailed set of patient satisfaction analytics, along with observations and specific recommendations that would have the highest impact on patient satisfaction levels and resulting CAHPS scores. We made a number of suggestions regarding patient communications, such as older patients needing to be carefully briefed on their medications and new mothers requiring extra attention on discharge day. We advised the client on resource planning to ensure proper staffing for these special circumstances.

RESULTS
Analyzed 60,000 CAHPS records.

Identified factors leading to lower patient satisfaction.

Recommended specific improvements for increasing patient satisfaction, which is expected to significantly improve the organization’s CAHPS scores.

▶ Read the full case study here.
How Unstructured Data Analysis Can Lead to Healthier Patient Behavior

The Challenge
Taking medications as prescribed can improve not only patient health but also the success of the companies producing pharmaceuticals and other treatments.

A biotechnology company wanted to use its case notes to understand why patients did or didn’t follow their medication regimens. But the descriptions of patient interactions were often inaccurate, incomplete or inconsistently formatted, which made it difficult or impossible to derive valuable insights that the company could capture and act upon.

The Solution
We worked with the biotech company to apply AI, machine learning and natural language processing to gain insight into factors that motivate patients to start, discontinue and switch use of medications. Using these insights, the company was able to increase treatment compliance by identifying roadblocks and improving patient support.

The company created new key performance indicators for its customer service processes, workflow improvements and coaching for improved patient engagement. Next steps include more complete documentation of the insights, training in documentation techniques and exploring how this approach could improve other functions, such as sales and marketing.

Our Approach
Working with the biotech company to understand its products, patients and business needs, we identified the words and phrases of greatest interest within its case notes and built the ontologies and taxonomies required to train an artificial intelligence application to recognize this content. Our life sciences technology experts applied machine learning and NLP to years of unstructured, free-text notes. To more effectively share the findings with client stakeholders and senior leadership, we created a 40-page narrative that presented our results in an understandable and actionable format.

RESULTS

Uncovered 30 meaningful insights and nine key recommendations.

Developed KPIs to monitor and encourage actions that maximize patient wellness and drug sales.

Improved training for patient services staff by creating better documentation and increasing the focus on patient interactions.

Read the full case study here.
Fast-Tracking Cancer Drug Development Using Data Science

The Challenge
The stakes are high in oncology drug development: The process is costly, the competition is fierce, and the mission — saving lives — is critical. A major pharmaceuticals company wanted to improve its highly manual process for conducting clinical trials for its cancer drugs. The company wanted to reduce the time it takes to conduct clinical trials for cancer drugs while increasing the effectiveness and safety of the drug development process.

The organization chose us as a partner for this ongoing initiative because of our skills in data science and artificial intelligence, as well as our deep experience in life sciences and the pharmaceutical industry.

The Solution
Our overall goal was to use AI to enhance decision-making in the clinical trials phases of oncology drug development. AI improves the process of selecting candidates for specific drugs by collecting evidence of drug effectiveness based on chemical structure and how the targeted body tissue responds.

We are working closely with the company’s Pharmaceutical Development & Commercialization organization to build an automated process for data analysis in preclinical trials. The power of AI helps us predict adverse drug reactions, which results not only in a safer and faster process but also a more streamlined regulatory approval process.

Our Approach
The project is part of an ongoing research and development initiative, with each phase producing assets that can be reused as case studies for future research problems. This knowledge provides recommendations for improving the process of capturing data in other trials. Using AI and data science helps shorten preclinical trial times by three to four years and cut per-patient costs while improving safety and producing reusable assets and technical knowledge that can be utilized in future initiatives.

RESULTS
A 3 to 4 year reduction in clinical oncology trials.
8% to 10% cost savings per patient.
Created a reusable, automated data analysis pipeline for drug candidates.
AI-enabled deployment of next-generation candidate drug evaluation methods.
Saved time and money by streamlining the drug development process.

► Read the full case study here.
The Challenge
Over its 100 years, a global life sciences company has acquired multiple complementary businesses, including major pharmaceutical research companies. The company has accumulated a vast repository of global human health data that it uses to address questions and concerns, respond to legal inquiries and incorporate in ongoing research.

While the organization had critical information on its substantial range of drugs and compounds, the data wasn’t readily accessible. Faced with an expensive, legacy mainframe environment that inhibited free and fast access to its own data, the company chose to migrate more than 150 terabytes of data to a new, globally accessible cloud platform, increasing information flexibility and lowering costs.

The Solution
Our AI Data Modernization Method has substantially improved the company’s data access times and sharply lowered its costs — $10 million over three years. It has reduced the IT department’s reliance on an internal team and an exhaustive process to design and deliver custom reports. It also preserves the company’s existing data access and data security protocols, and it uses the same portal as the previously outsourced mainframe hosting provider.

Having ownership of its database allows the company to manage data across the business lifecycle, using a unified security model that ensures active data governance. The new platform helps ensure compliance with global regulations for storing and using health data under the industry-standard rubric of “good practice” quality guidelines and regulations (GxP).

Our Approach
We examined the current state of the company’s IT architecture, developed use cases to support the blueprint for its desired future state, and then designed and managed the successful migration of all its historical data. Our solution, based on Amazon Web Services (AWS), offered the company a global repository.

This cloud-enabled architecture is a modernized, highly responsive data ecosystem that helps the company source, transform and consume data through the cloud, leveraging artificial intelligence and advanced analytical techniques. The model provides the flexible data structure, tools and accelerators needed to generate maximum business value.

Healthy Data? That Means Reliable, Defensible and Accessible

RESULTS
95% reduction in external mainframe data-hosting costs.
$3.6 million annual savings through cloud migration.
50% improvement in data access and retrieval speeds

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Data Modernization Cuts Costs, Speeds Data to Pharma Sales Reps

The Challenge
A specialty pharmaceuticals company faced rising costs and delays in gathering, analyzing and transmitting the information its sales representatives needed to plan their physician calls and meet their sales targets. Sales reps struggled with incomplete, conflicting and hard-to-use information, and the company lacked a single, integrated source of marketing and financial data to improve its decision making.

The Solution
Using our AI Data Modernization Platform, we helped the company reduce the time and cost of collecting and normalizing data from 20 internal and external systems. Now, sales reps receive customized advice on a daily basis on their laptop or mobile devices, based on their location and the current state of their accounts. This includes recommendations on which accounts are the most worthwhile to visit, which physicians and administrators to see at each account and which products or promotions they should spend the most time discussing.

These reports also warn of any danger signs, such as stagnating sales of a specific product at an otherwise well-performing customer. For the first time, the company now has a “single source of truth” for all its financial and marketing data, helping sales reps maximize revenue and profits.

Pre-built analytics and our industry-aligned data model reduced the time required to deploy the platform by one-third, and our change management capabilities ensured rapid adoption, user satisfaction and timely retirement of older platforms.

RESULTS

- **$450,000 in annual savings** for gathering and distributing account data to sales reps.
- **35% reduction** in the time required to produce reports for the sales force.
- **30% reduction** in implementation time through the use of our pre-built analytics and industry-aligned data model.

Maximized revenue and profits with improved, real-time data.

▶ Read the full case study here.
About Cognizant Healthcare

Cognizant’s Healthcare Business Unit works with healthcare organizations to provide collaborative, innovative solutions that address the industry’s most pressing IT and business challenges—from rethinking new business models, to optimizing operations and enabling technology innovation. A global leader in healthcare, our industry-specific services and solutions support leading payers, providers and pharmacy benefit managers worldwide. For more information, visit www.cognizant.com/healthcare.

About Cognizant’s Artificial Intelligence Practice

As part of Cognizant Digital Business, Cognizant’s Artificial Intelligence Practice provides advanced data collection and management expertise, as well as artificial intelligence and analytics capabilities that help clients create highly-personalized digital experiences, products and services at every touchpoint of the customer journey. Our AI solutions glean insights from data to inform decision-making, improve operations efficiencies and reduce costs. We apply Evolutionary AI, Conversational AI and decision support solutions built on machine learning, deep learning and advanced analytics techniques to help our clients optimize their business/IT strategy, identify new growth areas and outperform the competition. To learn more, visit us at cognizant.com/ai.

About Cognizant

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