Case Study: Healthcare

Preventive Care, With a Dose of Artificial Intelligence

A leading healthcare company adopts an AI-driven solution to identify drug-seeking behavior.

Opioid dependency is devastating for patients and their families. Drug overdoses now take more lives in the U.S. than do accidents on our nation's roads. Pain medications are often over-prescribed, which can lead to chronic abuse and addiction.

Cognizant Digital Business has developed an AI-driven machine learning solution for the compliance function at a leading healthcare services provider that parses doctors' notes entered into the organization's electronic medical records (EMR) to identify potential drug-seeking behavior.

At a glance

We're helping one of the nation's largest integrated healthcare services companies implement an intuitive AI-based solution to identify potential drug-seeking behavior by patients, alert caregivers about patients at risk, improve health outcomes and lower treatment costs.

Outcomes

Our solution — developed in a three-month timeframe — uses text analytics and an advanced machine-learning algorithm to mine physicians' notes and electronic medical records. The system alerts doctors during patients' visits when a pattern of at-risk behavior is identified:

- Targets organizational savings of $60 million.
- Identifies 85,000 at risk patients.
- Captures behavior and symptoms as patients interact with a physician.
- Uses phase-based extraction, rule-filtering and text clustering based on using SAS
- Enterprise Miner to identify patients potentially at risk.

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Addressing addiction through data

Drug addiction interferes with positive health outcomes for patients being treated for other conditions. Additionally, caregivers providing drug addiction treatment must divert much-needed resources from other patients.

Treating addiction is tremendously expensive. U.S. healthcare organizations spend more than $500 billion annually to care for patients suffering from opioid addiction. Across a large healthcare organization, it is challenging to consistently identify patients at risk of becoming addicted and alert physicians to that risk. Our client asked us to explore ways to identify potential drug-seeking behavior to lessen the incidence of addiction and lower healthcare costs.

Patterns lead to prevention

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 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.

After reviewing the medical literature and after a series of discussions with the client, we determined that certain drug-seeking behaviors — not only symptoms but also a pattern of actions, descriptive phrases or questions used by patients, and related facts and circumstances — are a meaningful indicator of current addiction or the risk of future abuse.

People looking to secure opioids or other addictive drugs tend to behave in predictable ways and have common characteristics. Individuals with a history of depression and anxiety, for example, are more likely to become drug-seekers or abuse pain medications. Some complain about running out of a particular

medicine and others claim a lower dose does not work for them. Still others describe allergies to certain drugs or influence physicians to prescribe the same medicine at every visit.

Learning from language

We proposed an AI-based solution that would link text analytics performed on physicians' notes taken during patient visits — including their impressions of a patient's behavior and appearance, their intuition and diagnoses — with data in the client's confidential third-party electronic medical records (EMR) system.

Our solution is based on an advanced machine learning algorithm that mines not only patient behaviors and symptoms but examines the physician's free flowing notes from patient interactions. It combines phase-based extraction, rule-filtering and advanced text clustering to mine highly variable data to identify patients who could become drug-seekers before they turned into addicts.

Pop-up alerts in the EMR system then prompt physicians to take corrective actions at the point of care, interceding with patients in real time. And our solution learns continuously from its own results to verify the accuracy of its models and improve searches.

Improving care, lowering cost

So far, we have developed a range of solutions for this organization, including data warehousing, application support, CRM and business process services. That background, along with our expertise in artificial intelligence and a combination of data analytics, data science and machine learning made Cognizant the ideal partner to lead this project.

The tangible health and financial benefits include saving our client as much as $60 million by identifying 85,000 at risk patients.

For more information, visit www.cognizant.com/ai.

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-speci c services and solutions support leading payers, providers and pharmacy bene t managers worldwide. For more information, visit www.cognizant.com/healthcare.

About Cognizant 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 www.cognizant.com/ai.

About Cognizant

Cognizant (Nasdaq-100: CTSH) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient business-es. Headquartered in the U.S., Cognizant is ranked 195 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at www.cognizant.com or follow us @Cognizant.

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