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Cloud-based machine learning in health care creates patient-centered treatments

Takeda, a leading global R&D pharmaceutical company, was seeking to improve the accuracy of its prediction models for various disease states. They believed AI could be a powerful tool in this effort, but needed to create a model that could prove their hypothesis. To achieve their goals, they enlisted the help of Deloitte to create a cloud solution.

Using a small, proven real world data set on Treatment Resistant Depression and NASH, a severe form of hepatitis, Takeda and Deloitte deployed a scalable, AWS cloud-based machine learning solution called Deep Miner to rapidly test predictive models. Cloud delivered—accelerating the development of the solution and delivering insights faster. Just as Takeda hoped, the solution generated unprecedented insights their teams can now apply across a range of data to refine drug development and planning of clinical trials.

The model proved highly accurate in its predictions, outperforming previously tested traditional analyses. Accuracy jumped almost 40%, which will inform drug development, product pipeline planning, and help Takeda to appreciate unmet needs of patients and improve patient outcomes. And, Cloud made it happen. Fast.

Deloitte Cloud

Challenge

For health care organizations, evidence is a critical asset. Using traditional clinical methods, Takeda used evidence to predict, diagnose, and treat Non-Alcoholic Steatohepatitis (NASH) and Treatment Resistant Depression (TRD). Takeda determined AI in the Cloud was needed to quickly and efficiently analyze a large dataset with greater accuracy. To create a better testing model and prove their hypothesis, they needed a repeatable framework for model development to analyze huge amounts of real world evidence, which wasn't possible with traditional clinical—or computing—methods. The only way to achieve this was on the cloud.

Solution

Working closely with Deloitte, Takeda embarked on a cloud transformation journey that allowed them to combine multiple machine learning tools and datasets to create models around diagnostic problems for the two conditions. Leveraging Deloitte's cloud-enabled Deep Miner toolkit, Takeda identified the most efficient resources to create repeatable, insight-driven decisions. Running on AWS, Deep Miner offers software and services to accelerate insight generation and knowledge management. These resources, along with Deloitte's deep technology experience in digital cloud transformations, helped build, train, and deploy machine learning models that generate new and more accurate insights from real world data.

Impact

Deloitte delivered scalable tools and processes that provide value now, and can be used for future experiments. The resulting cloud-enabled system used machine learning and deep learning techniques to improve predictive accuracy from 53.4 percent to 92 percent. The new models demonstrated that traditional analysis often overestimated the drugs, procedures, and diagnoses that predicted conditions. But machine learning found fewer, very specific factors can predict disease development. Now, Takeda can better develop drugs, meet patient needs and drive better patient outcomes.

The cloud-based solution generated unprecedented insights Takeda can now apply across a range of data to refine drug development and clinical trials.

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