Life Sciences Case Study

PROJECT OVERVIEW

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Modeling New Patient Start Likelihood in Pharma

As part of a long-standing relationship between Clarkston and a biopharmaceutical company that treats rare diseases, Clarkston redeveloped a custom model that predicts when a doctor will be starting a new patient on the manufacturer's flagship drug.

The existing patient predictive model had been considered successful in its ability to guide sales representatives toward doctors whom they should contact. Upon evaluating the model, the team identified an opportunity to base the predictions on changes in behavior instead of raw engagement metrics as well as corrected structural flaws.

Clarkston's data scientists delivered a revamped patient predictive model more than twice as accurate as the original model, as well as provided thorough documentation and an ongoing accuracy evaluation framework. The team worked with the client's business analytics executive leadership to productionize the new model and increase prediction frequency.

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INDUSTRY:

Biopharmaceutical

PRODUCTS AND SERVICES :

Medical Drugs for Rare Diseases

PRIMARY OBJECTIVES:

- Provide comprehensive analysis of existing new patient start predictive model to executive leadership and outline opportunities for improvement
- Implement changes to existing model or develop new model with any changes geared toward maximizing predictive accuracy
- Work with business analytics executive leadership and data engineers to productionize new model for field use

RESOLUTION:

- Evaluated existing model and targeted areas for improvement
- Removed invalid and unnecessary data inputs
- Engineered numerous features to reflect behavioral change rather than raw engagement data
- Thoroughly back-tested new model to evaluate long-term performance
- Streamlined multi-script model pipeline
- Provided thorough documentation of model evaluation, engineering, changes, testing, and results
- Presented new processes to all stakeholders
- Segmented predictions based on doctor experience with prescribing the drug to prioritize key targets
- Implemented a weekly version aggregating data in rolling windows instead of at the monthly level

KEY BENEFITS:

- Delivered revamped model that maximizes accuracy, especially among highest-priority doctors
- Productionized new model to work seamlessly with client's existing sales representative software and processes
- Created organizational understanding of model improvements, process changes, and business rule changes

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KPIs

+101%

+101% increase in prediction accuracy

+30%

+30% increase in proportion of prediction set representing correct predictions despite increase in prediction set size

+85%

+85% increase in proportion of highest priority doctors contained in prediction set

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