Leveraging machine learning for efficient clinical trials

Client
An American pharmaceutical company with offices in 18 countries

Company Size
33,000+ employees

Location
Global

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A global pharmaceutical company sought to enhance the efficiency of its clinical trial processes, particularly in optimizing trial design.

The company partnered with our intelligent automation team to develop a design hub based on machine learning to streamline trial country allocation, site selection, and overall trial management. The solution led to significant cost savings, reduced trial timelines, and operational efficiencies.

- Machine Learning Model Development
- Data Cloud Migration
- Advanced Analytics
- Data Cleansing & Quality

The Challenge: Overcoming inefficient trial design

Objective: To optimize clinical trial design processes for faster country and site selection.

Existing Issues: Inefficiencies in trial design led to increased costs and delayed trial completion.

Solution Needed: A platform driven by machine learning to streamline trial decision-making and optimize resource allocation.

Outcome: The client needed a solution to improve trial efficiency, which would drive better health outcomes for patients.

The pharmaceutical company faced significant challenges in managing the complexity of trial design, including long decision-making timelines for country and site selection. These inefficiencies not only delayed clinical trials but also increased operational costs, which made it essential to find a solution that could optimize processes and improve speed to market for critical treatments.

The Solution: Design hub powered by machine learning for trial optimization

We developed a design hub powered by machine learning, which enabled faster and more informed decision-making in trial country allocation and site selection. The platform integrated data sources into a scalable cloud environment, providing real-time insights and predictive analytics to improve trial outcomes.

Phase 1: Data Migration and Integration

The team migrated and integrated existing internal and external data sources into a unified cloud platform to ensure accessibility and scalability.

Workstreams:

- Data ingestion
- Cloud migration
- Data integration

Phase 2: Machine Learning Model Development

We developed a custom machine learning model to predict trial parameters. This optimized country and site selection to reduce trial timelines and costs.

Workstreams:

- Model training, validation, and deployment using AWS Lambda and Python

Phase 3: User Interface Development and Adoption

We built a user-friendly interface to enable easy access to predictive analytics, accompanied by comprehensive training to drive user adoption across departments.

Workstreams:

- UI/UX design
- Predictive analytics dashboard
- User training and adoption

Services and Technologies Used:

Services:

- Machine Learning
- Data Cloud Migration
- AWS Cloud Application Development
- Data Integration
- Data Cleansing and Quality
- Data Enablement
- UI/UX Design

Technologies:

- AWS Serverless Lambda
- PostgreSQL
- Python

The Results: Impact on the client organization

The project led to a more efficient trial design process, significantly reduced operational costs, and improved ability for the company to make real-time decisions. By automating trial processes and optimizing country allocation, the company achieved faster trial start-ups and enhanced resource utilization.

Accelerated Scenario Creation: We reduced the time for country allocation scenario creation from weeks to minutes.

Applied Machine Learning Success: We applied machine learning to a global oncology study, and the client has plans for five additional therapeutic areas.

Reduction in Non-Enrolling Sites: The client projects savings of $3M-$5M from minimizing the number of non-enrolling trial sites.

Decreased Reliance on Rescue Sites: This work reduced the need for rescue sites, leading to projected savings of $3M-$4M.

Avoidable Protocol Amendments: Avoidable protocol amendments led to estimated savings of $8M-$10M.