intetics
Where software concepts come alive™

Business Domain
Pharmaceuticals

Project Type
Machine Learning Services

AI-Powered Budget Forecasting Model for Clinical Trials

Client

A USA-based clinical trial sponsor that initiates, manages, and finances multi-phase clinical trials for drug development. The organization faced significant challenges in managing clinical trial budgets, with numerous variable factors complicating trend analysis, frequent budget overruns, and most trials failing to adhere to projected timelines.

Project

To develop an AI-based model for predicting budget adjustments based on changes in current trial data, using forecasts of non-financial metrics that directly affect costs. The model should combine clinical trial operational data at various levels (sponsor, CRO, sites), real-world evidence, and integrations to transactionally monitor trial financial parameters. The model aimed to enable accurate and dynamic financial predictions for trials.

Objective

The Client sought a robust, technology-driven solution to enhance the accuracy of clinical trial budget forecasts and integrate seamlessly with their existing operational and financial systems to monitor and predict financial deviations dynamically.

Team Reinforcement

The Client lacked an internal software development team capable of delivering an AI-based financial modeling. A dedicated team from Intetics was formed, including AI/ML Engineers, Data Scientists, Data Engineers, a Business Analyst, and a Project Manager. Regular progress updates ensured alignment between the Client's goals and project milestones.

intetics
Where software concepts come alive™

Challenge

The project required developing a model that seamlessly integrates data from multiple stakeholders and disparate systems, including CROs and trial sites, ensuring a unified and comprehensive financial analysis.

The model had to be designed to adapt to mid-study protocol amendments, ensuring accuracy despite trial design changes.

Limited standardization across trial sites complicates financial data integration, increasing the difficulty of creating consistent budget forecasts.

The solution is inherently complex due to a wide range of influencing variables, including site-specific operational costs impacted by regional economic conditions, fluctuating patient recruitment rates and drop-out risks, unpredictable regulatory review durations, frequent protocol changes, and the high variability between baseline assumptions and actual expenditures across different trial phases.

Quick Facts

- The model achieved 80% accuracy in predicting budget deviations.
- Projected cost overruns were flagged in 90% of cases, enabling proactive mitigation.

Technologies

Python / Pandas / NumPy / TensorFlow / AWS SageMaker / Docker

Solution

★ 01

The AI-powered predictive model for forecasting budget adjustments by predicting changes in key non-financial metrics impacting clinical trial costs, based on variations in critical clinical trial variables.

★ 02

The model utilized a combination of operational data from CROs and trial sites to ensure a comprehensive analysis of clinical trial budgets. Real-world evidence was integrated to provide context-specific insights.

★ 03

A significant number of variables affecting the trial were identified, then grouped and orthogonalized in some cases for better accuracy. ML/AI algorithms were used to forecast future values. The financial forecast was arithmetically calculated based on these predicted values.

★ 04

A key feature of this model is that it goes beyond traditional financial metrics while incorporating variables that directly influence them. The model's core principle is based on baseline, actual, and projected expense calculations.

★ 05

During the project, the Intetics team also successfully utilized previous experience in revenue cycle management solutions development (supporting eligibility checks, insurance verification, payments, claims and denials processing, and more). This expertise enabled the team to integrate the budget forecasting system seamlessly with the trial stakeholders' software ecosystems.

intetics
Where software concepts come alive™

Client Reference

“

Working with Intetics was a game-changer for us. Their team built an AI-powered model that completely revamped how we handle clinical trial budgets. The accurate predictions it provides have become essential to our financial planning and decision-making.

VP of Clinical Operations

Benefits and Results

- The system achieved 80% accuracy in predicting budget deviations, enabling stakeholders to maintain tighter control over financial management.
- Projected cost overruns were identified in 90% of trial simulations, allowing for proactive risk mitigation and improved resource allocation.
- Real-time tracking of trial changes and indicating deviations offered dynamic insights into budget impacts, empowering stakeholders to adapt strategies effectively and optimize trial performance.
- Future development is planned with the Client to provide rapid budget estimation for future trials based on the accumulated historical data.

intetics
Where software concepts come alive™

Intetics Inc.
Phone: +1-239-217-4907
www.intetics.com

Techstack:

Python, Pandas, NumPy, TensorFlow, AWS SageMaker, Docker

Team:

Project Manager, Business Analyst, AI/ML Engineers, Data Scientists