

**Business Domain**  
Finance, Payments and POS

**Project Type**  
Platform

# Web Application for Algorithmic Trading: How a Fintech Company Automated Their Financial Data Analysis and Recommendations

## Client

The Client is a Texas-based fintech company that offers software for financial advisors to build and test investing models. Its dynamic software solutions, powered by cutting-edge technology and data, help hundreds of financial advisors with testing, risk management, and portfolio optimization.

## Project

To enhance an application that generates trade recommendations based on performance analysis, market conditions, and simulated trades results over multiple years.

## Objective

To refine application prototype: improve performance and accuracy, optimize costs, and enhance automation. The project involved navigating complex and dynamic data and processes to prepare the application for production release.

## Team Reinforcement

Utilizing a Time and Material (TM) model, developers with the required skills were immediately provided for the Client's project, while recruiting additional engineers with expertise in Ruby programming language, fintech, and algorithmic trading took only one month. Processes were tailored to the Client's standards, methods, and tools, focusing on delivering high-quality results to ensure Client and end-user satisfaction.

# Challenge

The Client needed to transform a prototype application into a production-ready, more efficient, cost-effective, and reliable solution, delivering consistent and actionable results.

Original application drawbacks:

- Simulated trades took a long time to run. Simulations spanning over ten years were failing to finish.
- Simulation results often lacked coherence.
- The cost of running the application was growing every day.

The quality of the code and the complexity of analysis algorithms set the bar very high for anybody trying to make changes in the application. It required familiarity with the technological stack, an understanding of underlying algorithms, and knowledge of a subject domain to tackle the challenge.

## Quick Facts

- ✓ Up to 20-80% reduction in operating costs of app maintenance
- ✓ Runtime error count reduced to 0
- ✓ Focus on customers and quality service, with freedom from delving into technical details

### Technologies

Ruby / Rails / React / Redis / Sentry / Sidekiq / Web API / FastTrack / AWS (ECS, RDS, EC2, ElastiCache)

# Solution

## ★ 01

Identifying and resolving issues causing server overload made operating costs stable and predictable.

## ★ 02

Optimized application logic, making it run faster and utilizing a fraction of previously used resources.

## ★ 03

A capability to assess various trading strategies through the parameterization of the simulation algorithm, facilitating easier experimentation.

## ★ 04

A comprehensive resolution of underlying issues in the application, ensuring the prevention and correction of potential problems before they occur.

## ★ 05

Automated operations, minimizing manual work and reliance on third-party resources for increased efficiency.

## ★ 06

Simplified, documented, and clarified complex aspects of the application algorithm, enhancing overall understanding and maintainability.



*A screenshot from the application web interface shows the performance of a 6-fund portfolio against the S&P index from December 31, 2007, to September 15, 2023. The portfolio consists of mutual funds and outperforms the index. The algorithm can save the portfolio value when markets go down and facilitate growth in highly volatile market conditions.*

## Benefits and Results

- ★ Up to 20-80% reduction in operating costs of app maintenance.
- ★ Automated operations, minimizing manual work and reliance on third-party resources for increased efficiency.
- ★ Focus on customers and quality service, with freedom from delving into technical details.

### Techstack:

Ruby, Rails, React, Redis, Sidekiq, Web API, Fast Track, AWS (ECS, RDS, EC2, ElastiCache)

### Team: 5

Business Analyst, 2 Developers, 1 Quality Assurance Engineer, Project Manager, additional on-demand engineers