Transforming Pharmaceutical Supply Chain Intelligence Through AI

A Case Study by Gritsa Technologies

Gritsa
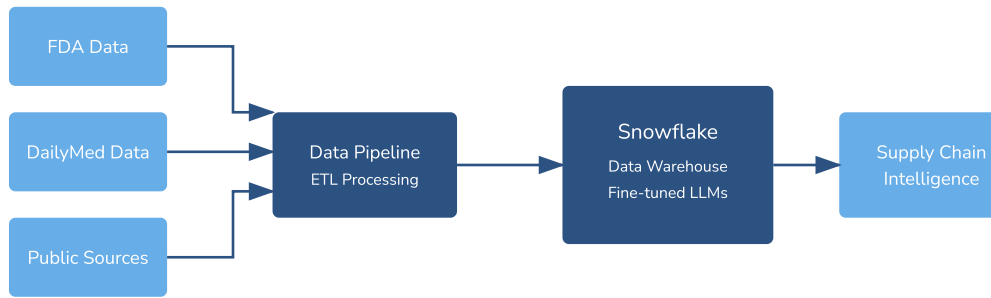Hire. Build. Launch.

Executive Summary

This case study examines how Gritsa Technologies helped Brilliant Pharma leverage artificial intelligence to transform their supply chain intelligence capabilities, resulting in £2 million in avoided supply chain disruptions and enhanced operational efficiency.

> **Key Achievement:** Successfully implemented an AI-driven solution that converted unstructured pharmaceutical data into actionable supply chain intelligence, preventing £2M in potential disruptions.

Solution Architecture

Data Flow Architecture

Data Flow Architecture

```
FDA Data ─────────┐
                  │
DailyMed Data ────┼──→ Data Pipeline ──→ Snowflake ──→ Supply Chain
                  │     ETL Processing    Data Warehouse   Intelligence
Public Sources ───┘                       Fine-tuned LLMs
```

LLM Processing Pipeline

```
Unstructured Data ──→ Fine-tuned LLM ──→ Data Extraction ──→ Structured Data
                       Text Processing     Entity Recognition
```

The architecture diagram above illustrates the end-to-end flow of data through our solution, from initial data collection to final business intelligence output. The system leverages multiple data sources and processes them through our sophisticated ETL pipeline before utilizing Snowflake's LLM capabilities for advanced analysis.

The Challenge

Brilliant Pharma faced a significant challenge in tracking and managing the country of origin for pharmaceutical drugs in their supply chain. This critical information was scattered across various public sources like FDA and DailyMed, but existed primarily in unstructured formats that were difficult to process and analyze effectively.

Key Challenges:

- Dispersed data across multiple public sources
- Unstructured information requiring manual processing
- Lack of systematic approach to data collection and analysis

- Risk of supply chain disruptions due to incomplete information

Technical Landscape Assessment

Gritsa Technologies conducted a comprehensive assessment of Brilliant Pharma's technical infrastructure, identifying key components that could be leveraged for the solution:

- Snowflake Data Warehouse as the central data repository

- dbt (data build tool) as the primary ELT platform

- Existing data pipelines collecting raw data from public sources

Solution Implementation

Gritsa Technologies developed a sophisticated solution that combined multiple cutting-edge technologies:

Solution Components:

- Custom-built data pipelines for FDA and DailyMed data extraction

- Fine-tuned Large Language Models (LLMs) within Snowflake

- Automated data processing workflows using dbt

- Structured data output feeding into supply chain decision systems

> "By leveraging Snowflake's native LLM capabilities, we were able to transform unstructured pharmaceutical data into actionable intelligence, enabling Brilliant Pharma to make data-driven supply chain decisions."

Innovation in Data Processing

The solution went beyond simple data collection, implementing innovative approaches to data processing:

- Advanced text analytics for unstructured data processing

- Custom-trained models for pharmaceutical domain understanding

- Automated validation and quality control mechanisms

- Real-time data processing and analysis capabilities

Business Impact

- £2 million in avoided supply chain disruptions

- Enhanced visibility into pharmaceutical supply chain origins

- Improved decision-making capabilities for procurement teams

- Automated processing of previously manual data analysis tasks

- Expanded insights beyond country of origin to other critical supply chain metrics

Future Outlook

The success of this implementation has opened new opportunities for applying AI in pharmaceutical supply chain management. Brilliant Pharma is now exploring additional applications of the technology for:

- Predictive analytics for supply chain disruptions

- Automated supplier risk assessment

- Real-time supply chain optimization

- Enhanced regulatory compliance monitoring

Conclusion

This project demonstrates the transformative power of combining advanced AI capabilities with existing data infrastructure. By leveraging fine-tuned LLMs within Snowflake, Gritsa Technologies delivered a solution that not only

solved Brilliant Pharma's immediate challenges but also created new opportunities for supply chain optimization and risk management.