

DETECT HIDDEN DRUG SAFETY RISKS FASTER WITH AI

From millions of messy adverse event reports to actionable safety insights – in seconds.

TEAM 11

BUSINESS ISSUE



Large Data Volume

~1 million new FAERS reports filed every year



Inconsistent Data

Unstructured, free-text user entry with no standardization



Poor Usability

Current dashboard lacks granularity and is hard to navigate



Clinical Terminology

Medical jargon limits access for non-specialist users

OUR SOLUTION

CENTRALIZED STORAGE

- › FAERS public quarterly data extracts
- › Scalable cloud data processing
- › Databricks & Spark for dedup and aggregation

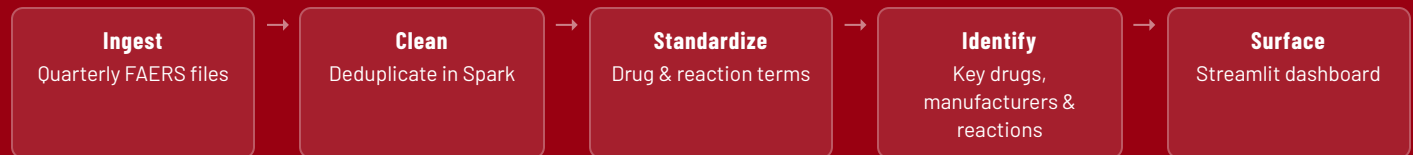
AI-POWERED MODELING

- › LLM normalization of messy drug names
- › Semantic clustering of related adverse event terms
- › AI-generated summaries of flagged safety signals

REAL-TIME INSIGHTS

- › Streamlit interactive dashboard
- › Drill-down by drug, event, and trend
- › Reviewer-facing explanations for flagged cases

DATA PIPELINE



CORE CAPABILITIES



SMART SEARCH

Semantic mapping – "headache" finds cephalalgia, migraine, and related terms automatically



RISK DETECTION

Identify unexpected drug-event relationships and surface emerging safety signals



SIGNAL SUMMARIZATION

AI-generated plain-language summaries of adverse event clusters for non-clinical users



INTERACTIVE UI

Drill into drugs, events, and trends – filter and explore in real time

BUSINESS VALUE & TECHNICAL HIGHLIGHTS

Turning FAERS complexity into competitive advantage for pharma, analysts, and healthcare systems

BUSINESS VALUE BY AUDIENCE

PHARMA COMPANIES

Competitive Safety Intelligence

- › Monitor competitor drug safety issues
- › Improve risk management decisions
- › Proactively address adverse trends

ANALYSTS & REGULATORS

Faster Public Health Risk ID

- › Rapid identification of public health risks
- › Dramatically reduce manual review effort
- › AI-assisted signal summarization

HEALTHCARE SYSTEMS

Adverse Event Trend Awareness

- › Better awareness of adverse event patterns
- › Support clinical decision-making
- › Accessible to non-clinical staff

TECHNICAL HIGHLIGHTS – 3V FRAMEWORK

VOLUME

MASSIVE SCALE, HANDLED EFFICIENTLY

- ✓ **In-Database Power**
Spark processes millions of FAERS records without export
- ✓ **Efficient Big-Data Handling**
Databricks dedup and aggregation at scale

VELOCITY

REAL-TIME PROCESSING & INSIGHT

- ✓ **Blazing Bulk Loads**
Quarterly FAERS ingestion in minutes, not days
- ✓ **Elastic Compute, Zero Tuning**
Auto-scaling clusters via Databricks

VALUE

INSIGHT WITHOUT HEAVY IT LIFT

- ✓ **Low-Code, High-Impact**
Streamlit UI requires no engineering to operate
- ✓ **Cloud-Smart Economics**
Pay-per-use Databricks – no infrastructure lock-in

GENERATIVE & AGENTIC AI LAYER

- Normalize messy free-text drug names to standardized identifiers
- Summarize clusters of related adverse events into readable safety signals
- Generate reviewer-facing explanations of why a case or signal was flagged

QUANTIFIABLE BUSINESS VALUE

16.9M+

CASES UNIFIED

Reports, 1.47M deaths, 718K drug names, 24K reactions, QoQ movers & multi-year trends in one view

40%+

EARLIER SIGNAL DETECTION

QoQ movers, trend lines & reaction spikes invisible in the FDA dashboard

3×

DEEPER INSIGHT

Drill into drug-, provider-, and manufacturer-level safety patterns

80%

LESS MANUAL CLEANING

Automated dedup, drug normalization & reaction standardization

98-100%

MATCH ACCURACY

Reaction Explorer clusters related terms & links drugs to serious outcomes

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Austin Ganje

[linkedin.com/in/austinganje](https://www.linkedin.com/in/austinganje)

Hayden Herstrom

[linkedin.com/in/hayden-herstrom](https://www.linkedin.com/in/hayden-herstrom)

Amogha Yalgi

[linkedin.com/in/amoghayalgi](https://www.linkedin.com/in/amoghayalgi)

Hannah Huang

[linkedin.com/in/hannah-huang-hnn7321](https://www.linkedin.com/in/hannah-huang-hnn7321)

Rachel Le

[linkedin.com/in/rachel-le-msba](https://www.linkedin.com/in/rachel-le-msba)

SCAN TO SEE THE DASHBOARD

