Case Study: MIRA - AI-Powered Clinical Trial Intelligence Platform

Executive Summary

Client: Global Pharmaceutical & Biotech Companies (Indegene) **Industry:** Life Sciences / Clinical Development **Solution:** AI-Driven Conference & Clinical Trial Intelligence **Results:** 75% faster competitive intelligence, $3M saved in analyst time, 95% conference ROI improvement

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The Challenge

Life sciences companies struggled with clinical trial and conference intelligence: - **Conference overload:** 200+ medical conferences annually - **Manual data extraction:** Teams spent weeks compiling presentation data - **Missed insights:** Critical competitive intelligence lost in information deluge - **Poor ROI tracking:** No systematic way to measure conference value - **Clinical trial complexity:** 400,000+ trials in ClinicalTrials.gov database - **Disconnected data:** Conference insights disconnected from trial data - **Team coordination:** Scattered notes and insights across individuals

Traditional approaches relied on manual data collection, spreadsheets, and institutional knowledge—creating blind spots and inefficiencies.

The Solution

Devkraft developed MIRA, an AI-powered intelligence platform:

Core AI Technologies

- **AI Model "o3":** Custom clinical trial processing and analysis
- **Web Scraping AI:** Automated conference website data extraction
- **NLP Classification:** Presentation categorization and tagging
- **Semantic Search:** Find relevant trials and presentations instantly
- **Predictive Analytics:** Forecast trial outcomes and conference value
- **Chat Interface:** Natural language queries for complex analysis

Technical Architecture

- React + TypeScript frontend for rich UX

- Redux Toolkit for state management
- Backend REST API with AI processing
- Server-Sent Events (SSE) for real-time streaming
- TailwindCSS + Radix UI for modern interface
- File processing pipeline for Excel/CSV uploads

Key Features

1. **Conference Agent:** Scrape, classify, and analyze conference data
2. **Clinical Trial Search:** NCT ID lookup with AI-powered insights
3. **Batch Processing:** Analyze 1000s of trials simultaneously
4. **AI Chat Assistant:** Ask questions about trials in natural language
5. **Team Building:** Assign conference coverage by expertise
6. **Company Booth Intelligence:** Track competitor booth activities
7. **Presentation Scheduling:** Optimize team attendance plans
8. **Export & Reporting:** Excel reports with actionable insights

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Implementation Approach

Phase 1 (Weeks 1-4): Data integration - Integrated ClinicalTrials.gov API (400K+ trials) - Built conference website scraping pipeline - Created presentation classification taxonomy

Phase 2 (Weeks 5-8): AI model development - Trained custom model “o3” for trial analysis - Developed prompt-based processing for trial data - Built semantic search for presentations and trials

Phase 3 (Weeks 9-12): User experience - Designed intuitive conference planning interface - Built AI chat for trial queries with streaming responses - Created team coordination features

Phase 4 (Weeks 13-16): Deployment & adoption - Trained 100+ medical affairs and clinical teams - Integrated with existing BI tools - Established feedback loops for continuous improvement

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Business Impact

Quantifiable Results

Metric	Before AI	After AI	Improvement
Conference Data Compilation	40 hours	2 hours	95% faster
Clinical Trial Analysis Time	15 min/trial	30 sec/trial	97% faster
Competitive Intelligence	35% missed	5% missed	86% reduction

Metric	Before AI	After AI	Improvement
Gaps			
Conference ROI	45%	85%	89% improvement
Team Coordination Efficiency	Baseline	+60%	60% gain
Analyst Productivity	Baseline	5x	400% increase

Strategic Benefits

- **Competitive Advantage:** Real-time intelligence on competitor pipelines
- **Strategic Planning:** Data-driven conference attendance decisions
- **Resource Optimization:** Send right people to right sessions
- **Institutional Knowledge:** Conference insights preserved and searchable
- **Collaboration:** Cross-functional teams aligned on priorities

Annual Value: $3M+ (analyst time savings + better conference ROI)

Technology Stack

Frontend: - React, TypeScript, Vite - Redux Toolkit, React Router - TailwindCSS, Radix UI - React Hook Form, React Table (TanStack) - Axios, React Markdown, SSE.js - Zod (validation)

Backend & AI: - Custom AI model “o3” for trial processing - REST API architecture - Server-Sent Events for streaming - File processing (Excel, CSV) - Clinical trials database integration - Web scraping engine

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Key Innovation: AI Conference Agent

MIRA’s Conference Agent automates the entire intelligence workflow:

1. Discovery - Crawls conference websites - Extracts presentation titles, authors, times - Identifies company affiliations

2. Classification - Categorizes by therapeutic area - Tags by presentation type (oral, poster, etc.) - Identifies competitive vs. partnership opportunities

3. Prioritization - Scores relevance to company interests - Flags must-attend presentations - Recommends team assignments

4. Coordination - Builds optimized attendance schedules - Avoids conflicts and gaps - Generates team assignments

Result: Conference prep time reduced from 2 weeks to 2 hours

Client Testimonial

> "MIRA has transformed how we approach medical conferences. We're now making data-driven decisions about where to invest our time and resources. The AI chat feature is like having a clinical trial expert on call 24/7."
>
> **— Head of Medical Affairs, Top 10 Pharma**

Use Cases Delivered

1. **Competitive Intelligence:** Track competitor trial progress and data presentations
2. **Partnership Scouting:** Identify potential collaboration opportunities
3. **KOL Mapping:** Find key opinion leaders presenting at conferences
4. **Trial Benchmarking:** Compare trial designs and outcomes
5. **Evidence Gaps:** Identify unmet medical needs in trial landscape
6. **Conference ROI:** Measure value of attendance and booth presence
7. **Team Planning:** Optimize coverage across global conferences

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Clinical Trial AI Chat

Users can ask complex questions in natural language:

Example Queries: - "Show me all Phase 3 oncology trials starting in 2025" - "Which competitors are testing similar mechanisms to our pipeline?" - "What's the success rate of trials in this indication?" - "Find trials with patient populations similar to our target" - "Summarize adverse events reported in competitor trials"

AI Response Features: - Streaming responses for complex queries - Citations to specific trial NCT IDs - Comparative analysis tables - Actionable insights and recommendations

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Company Booth Intelligence

Track competitor activities at conferences: - Photo/video uploads from booth visits - Notes on messaging and materials - Product demo observations - Lead capture strategies - Competitive positioning analysis

All intelligence is tagged, searchable, and linked to relevant trials and products.

Future Enhancements

1. **Predictive Analytics:** Forecast trial enrollment and completion
2. **Adverse Event AI:** Automatic safety signal detection

3. **Real-time Alerts:** Notify teams of breaking conference news
4. **Publication Integration:** Link trials to journal publications
5. **Voice Notes:** Audio capture of conference observations
6. **Mobile App:** On-site intelligence capture
