

# MomentumFlow AI

Real-time AI-Powered Trading Signals for S&P; 500 Momentum Strategies



**Confluent AI Partner Catalyst Hackathon 2025**



**New Way Capital Advisory Limited**

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# Executive Summary

**MomentumFlow AI** is a real-time momentum trading scanner that leverages **Confluent Kafka** streaming to deliver institutional-grade market analysis to retail and professional traders. Built for the S&P 500, it combines proven momentum trading strategies with live data streaming and AI-powered pattern recognition.

Metric	Value
Stocks Covered	534 S&P 500 stocks
Data Streams	2 (Prices + News)
Update Frequency	Real-time via Kafka
Pattern Detection	Bull Flag with sentiment analysis
Risk Management	Integrated position sizing

## Problem Statement

Retail traders face significant challenges in today's fast-moving markets:

- **Information Overload:** 500+ stocks to monitor with no systematic approach
- **Delayed Data:** Free tools provide 15-20 minute delayed quotes
- **News Fragmentation:** Relevant news scattered across multiple sources
- **Pattern Recognition:** Manual chart analysis is time-consuming and error-prone
- **Risk Management:** Most traders lack proper position sizing protocols

Professional trading desks have real-time streaming infrastructure that costs \$10,000+ per month. Retail traders need an affordable alternative.

## Our Solution

MomentumFlow AI democratizes institutional-grade trading tools by combining:

- ✓ **Confluent Kafka Streaming:** Real-time price and news data pipeline
- ✓ **5-Criteria Momentum Scanner:** Systematic stock filtering based on proven strategies
- ✓ **Trend Indicator:** EMA-based trend detection (Bullish/Bearish/Neutral)
- ✓ **Bull Flag Detection:** Automated pattern recognition with adjustable thresholds
- ✓ **Sentiment Analysis:** AI-powered news sentiment (Bullish/Bearish/Neutral)
- ✓ **Position Sizing Calculator:** Risk-based trade planning with scaling protocols

# Technical Architecture

## Confluent Kafka Integration

The application leverages **Confluent Cloud** as its real-time data backbone, enabling scalable, fault-tolerant streaming of market data.

Component	Technology	Purpose
Kafka Cluster	Confluent Cloud (Zurich)	Message broker
Topic: stock_prices	JSON messages	Real-time OHLCV + momentum scores
Topic: stock_news	JSON messages	Google News with sentiment
Price Producer	Python + confluent-kafka	Yahoo Finance → Kafka
News Producer	Python + feedparser	Google News RSS → Kafka
Consumer	R Shiny + httr	Kafka REST API → Dashboard

## Data Flow

- 1. Data Ingestion:** Python producers fetch data from Yahoo Finance and Google News
- 2. Kafka Streaming:** Messages published to Confluent Cloud topics
- 3. Processing:** Momentum scores and sentiment calculated in producers
- 4. Consumption:** R Shiny app reads from Kafka REST API
- 5. Visualization:** Real-time dashboard with charts, tables, and alerts

## Key Features

### Stock Scanner

Scans 534 S&P; 500 stocks against 5 momentum criteria. Displays score (0-5), trend indicator, and key metrics.

### Technical Analysis

Interactive candlestick charts with EMA, RSI, Bollinger Bands, and volume analysis. Includes live news feed.

### Bull Flag Detector

Automated pattern recognition with adjustable thresholds. Calculates entry, stop-loss, and target prices.

## **Trade Ideas**

Auto-generates High Conviction (Score 5 + Bull Flag), Strong Setups, and Watchlist categories.

## **Risk Calculator**

Position sizing based on account size, risk percentage, and stop-loss distance.

## **Strategy Guide**

Complete methodology documentation including S&P; 500 adaptations.

## 5 Momentum Criteria (Adapted for S&P; 500)

#	Criterion	Threshold	Rationale
1	Price Range	\$5 - \$500	Covers most S&P 500 stocks
2	Daily Change	$\geq 0.5\%$	Meaningful price movement
3	Relative Volume	$\geq 1.0x$ average	Confirms participation
4	Momentum	Price > Open	Intraday buying pressure
5	Volatility	Range $\geq 0.5\%$	Sufficient profit opportunity

## Bull Flag Detection Thresholds

Parameter	S&P 500 (Large Cap)	Penny Stocks
Pole Return	$\geq 1.5\%$	$\geq 3\%$
Flag Range	$< 7\%$	$< 5\%$
Volume	Decreasing	Decreasing

## Technology Stack

Layer	Technology
Streaming Platform	Confluent Cloud (Apache Kafka)
Backend Producers	Python 3.x, confluent-kafka, feedparser
Data Sources	Yahoo Finance API, Google News RSS
Frontend	R Shiny, shinydashboard
Visualization	Plotly, DT (DataTables)
Technical Analysis	quantmod, TTR, PerformanceAnalytics
Deployment	Local / shinyapps.io

## Why Confluent Kafka?

Confluent Cloud provides the ideal infrastructure for real-time financial data streaming:

- **Low Latency:** Sub-second message delivery for time-sensitive trading signals
- **Scalability:** Easily handle 500+ stock feeds with room to grow
- **Reliability:** 99.99% uptime SLA ensures data availability during market hours
- **Geographic Distribution:** Zurich cluster minimizes latency for European traders
- **REST API:** Simple integration with R Shiny without complex Kafka client setup
- **Managed Service:** No infrastructure management overhead

The dual-topic architecture (stock\_prices + stock\_news) demonstrates how Confluent can unify multiple real-time data sources into a cohesive trading platform.

## Future Roadmap

**Q1 2026:** Add options flow analysis via Kafka Streams

**Q2 2026:** Integrate Claude AI for natural language trade queries

**Q3 2026:** Multi-asset support (crypto, forex, commodities)

**Q4 2026:** Mobile app with push notifications via Kafka Connect

# About New Way Capital Advisory

**New Way Capital Advisory Limited** is a Swiss fintech company specializing in AI-powered portfolio analytics for institutional clients. Founded in Geneva, we combine 15+ years of private banking expertise with cutting-edge technology.

## Founder Profile

**Tianning Ning** — Founder & CEO

- 15+ years in Swiss private banking (BCGE, BCV)
- Managed CHF 100M+ in discretionary portfolios
- CIIA certified, Master's from HEC Lausanne
- Expertise: Quantitative finance, ML, portfolio optimization
- Trilingual: Mandarin (native), French (C2), English (C2)

## Contact

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