CASE STUDY • DEFI • BLOCKCHAIN ANALYTICS

Crypto Analytics Platform

A microservices platform for crypto market analysis: real-time DEX swap indexing across 4 blockchains, wallet tracking, automated copy-trading, and Telegram alerts

React · NestJS · TypeScript · Ethers.js · ClickHouse · PostgreSQL · Redis · RabbitMQ · Sentry

4	Real-time	0	100%
Blockchains indexed	Swap processing across all DEX	Critical bugs in production	Test coverage for PnL calculations

PROBLEM

Traders lose money due to blind spots

Data fragmentation

Transactions are scattered across dozens of DEXs on different blockchains. There is no single point for cross-chain analytics.

Reaction speed

The window of opportunity is seconds. Manual monitoring of explorers does not allow reacting to large wallet movements in time.

Pump & Dump schemes

There are no tools for automatic detection of suspicious liquidity and volume patterns. Money is lost.

Blind copy-trading

Existing solutions do not filter random traders from professionals, do not account for winrate and scam rate.

ABOUT THE PROJECT

Overview

Product	B2C SaaS for crypto traders
Industry	DeFi, blockchain analytics
Blockchains	Ethereum, BSC, Base, Solana
DEX	Uniswap V2/V3, PancakeSwap, Four.Meme
Architecture	Microservices (event-driven)

What we built

A microservices platform that collects, indexes, and analyzes on-chain data in real time across 4 blockchains, tracks large wallets, and provides copy-trading tools with scam protection.

SOLUTION

Key solutions

01 — Real-time DEX swap indexing

BLOCKCHAIN	DEX	INDEXING METHOD
Ethereum	Uniswap V2/V3	WebSocket on Swap events via Ethers.js
BSC (BNB Chain)	PancakeSwap, Four.Meme	WebSocket + polling fallback
Base	Uniswap V3	WebSocket to L2 node
Solana	Raydium, Jupiter (beta)	gRPC stream via Solana RPC

Storage: ClickHouse — a columnar database for millions of swap transactions. Aggregations over millions of records in milliseconds.

02 — Large wallet tracking

1 **Large buys/sells**
Alert when swap volume exceeds the threshold

2 **New token entry**
Wallet buys a token for the first time

3 **Cross-DEX movements**
Liquidity flow between platforms

4 **Anomalous activity**
Unusual trade frequency patterns

03 — Signal-based copy-trading

PARAMETER	DESCRIPTION
Trade limit	Maximum amount in ETH/BNB/SOL per single copy-trade
Slippage tolerance	Acceptable price slippage (1-3%)
Stop-loss	Automatic sell when price drops below threshold
Wallet filter	Minimum winrate, number of trades, scam rate < threshold
Token blacklist	Honeypot protection — list of banned tokens

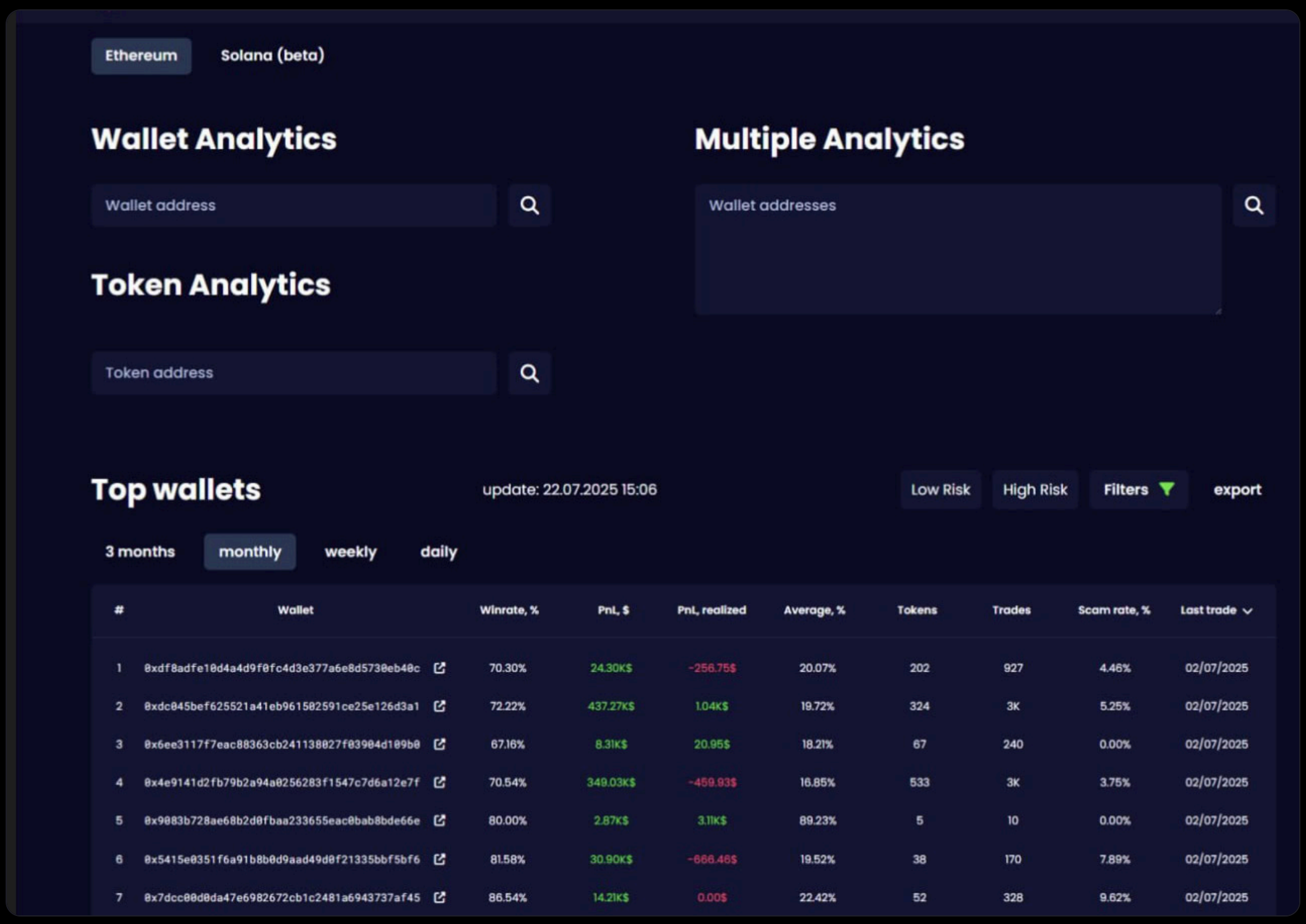
04 — Anomaly detection and scam protection

PATTERN	HOW IT IS DETECTED	ALERT
Pump & Dump	Sharp volume spike + small buys + large sell by a single wallet	HIGH
Rug Pull	Liquidity removal from pool by token developer	HIGH
Wash Trading	Mass swaps between linked wallets	MEDIUM
Volume Spike	Trading volume > 5x the 24h average	INFO

INTERFACE

Analytics dashboard

Wallet Analytics, Token Analytics, and Top Wallets ranking with filters by period (daily/weekly/monthly/3 months) and risk level (Low Risk / High Risk):



Top Wallets metrics

METRIC	DESCRIPTION
Winrate, %	% of profitable trades (top: 67-86%)
PnL, $	Absolute profit in dollars
PnL, realized	Realized profit (closed positions)

METRIC	DESCRIPTION
Tokens / Trades	Unique tokens and number of trades
Average, %	Average % profit per trade
Scam Rate, %	% of trades with scam tokens — filter

ARCHITECTURE

6 microservices

SERVICE	RESPONSIBILITY
Indexer (x4)	One per blockchain: subscribing to swap events, decoding logs, normalization, sending to RabbitMQ
Aggregator	Aggregation from queue, PnL/winrate calculation, writing to ClickHouse, updating rankings in Redis
Tracker	Monitoring subscribed wallets, anomaly detection, alert generation
Copy-Trade Engine	Signals from Tracker → limit/filter checks → transaction formation
API Gateway	REST API: wallet analytics, token analytics, rankings, settings
Telegram Bot	Push alerts, wallet subscription management

DATA FLOW

Data flow

1 **Blockchain Nodes**

WebSocket to RPC nodes ETH, BSC, Base, Solana → subscribing to swap events

2 **Indexer**

Raw logs → structured swap records (token_in, token_out, amount, wallet) → RabbitMQ

3 **Aggregator**

Queue → ClickHouse + metric recalculation (PnL, winrate, scam rate) → Redis rankings

4 **Tracker**

Each swap → check against subscribed wallets + anomalies → alert

5 **Alert → Telegram / Copy-Trade**

Push to Telegram + if copy-trading subscription active → transaction formation

STACK

Technology stack

LAYER	TECHNOLOGIES
Frontend	React, TypeScript, TanStack Query, Recharts, dark theme
Backend	NestJS, TypeScript, Ethers.js (EVM), @solana/web3.js
Analytical DB	ClickHouse — millions of swap transactions
Transactional DB	PostgreSQL — users, subscriptions, settings
Queues / Cache	RabbitMQ + Redis (price cache, rate limiting)
Monitoring	Sentry, Prometheus + Grafana, structured logging

Technical challenges

High load

ClickHouse: millions of records/sec. RabbitMQ buffers peaks. Horizontal scaling of indexers.

Multi-chain

Unified SwapEvent interface + adapters. Solana (non-EVM) — gRPC module.

PnL accuracy

FIFO method + gas fees. Prices from ClickHouse. 100% test coverage.

Fault tolerance

Auto-reconnect + block backfill. Dead letter queue. Sentry monitoring.

RESULTS

Results

4
Blockchains indexed

Real-time
Swap processing across all DEX

0
Critical bugs in production

100%
Test coverage for PnL calculations