

## Indian Stock Market Watch

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Summary:

This project introduces a market-watch agent built with Google ADK that provides a one-stop solution for tracking top gainers and losers in India's NSE. The problem it addresses is the inefficiency of manually searching multiple websites for stock updates and sentiment insights. The solution integrates nsetools for live market data, formats results with change points and sentiment analysis, and leverages Gemini 2.5 for handling user stock-related queries. The same functionality is extended to a Telegram bot for easy daily access. In the future, this agent can be scaled for enterprise traders to support internal decision-making while selectively exposing public information, ultimately streamlining market monitoring and enhancing productivity.

Background

Pain Point

- Fragmented information sources: Retail investors and traders often need to visit multiple websites, portals, or apps to check stock prices, top gainers/losers, and company-specific updates. This is time-consuming and inefficient.
- Lack of contextual insights: Raw numbers (price, % change, volume) are available, but there is little immediate sentiment or interpretation to help users understand what the move might mean.
- Daily monitoring burden: Traders and analysts spend significant effort compiling snapshots of market activity for reporting or decision-making. This repetitive task consumes valuable time that could be spent on analysis or strategy.
- Accessibility gap: Many existing solutions are either too complex for casual investors or locked behind premium subscriptions, leaving everyday users without a simple, consolidated view.

Derived Use Case

- One-stop agent for NSE market watch: By integrating live data from NSE (via nsetools) with AI-driven sentiment analysis, the agent provides a single interface to view top gainers, losers, and stock-specific snapshots.
- Interactive Q&A capability: Users can ask natural language questions about any stock, and the agent resolves symbols, fetches data, and generates contextual insights using Gemini 2.5.
- Automated delivery via Telegram bot: Instead of manually checking dashboards, users receive formatted daily snapshots and alerts directly in their chat group, making market monitoring effortless.
- Scalable for enterprise use: The same design can be extended to internal trading desks, where analysts need quick, reliable updates for their daily workflow. Public exposure can be limited to privacy-safe information, while internal teams benefit from richer datasets.

Solution Description

The proposed solution is a Market Watch Agent built using Google ADK, designed

to provide a consolidated view of the Indian stock market (NSE). It directly addresses the problem of fragmented and inefficient access to market data, where investors and traders often need to consult multiple websites or platforms to track top gainers, losers, and stock-specific insights.

What the Solution Is

- A one-stop agent that fetches live NSE data (via nsetools) and presents it in a structured, easy-to-read format.
- It enriches raw market numbers with sentiment tags and contextual analysis, helping users quickly interpret whether a move suggests momentum, pullback, or volatility.
- Integrated with Gemini 2.5 for natural language Q&A, allowing users to ask stock-related questions and receive contextual insights without manual searching.
- Extended to a Telegram bot, which automatically delivers daily snapshots and watchlist alerts directly to user groups, making market monitoring effortless.

How It Fits the Problem Statement

- Problem: Investors face information overload and inefficiency when tracking market movements across multiple sources.
- Fit: The agent consolidates data, interprets it, and delivers insights in real time, eliminating the need for manual searches and reducing decision-making friction.
- Accessibility: By pushing updates via Telegram, the solution meets users where they already communicate, ensuring convenience and adoption.

Potential Impact

- For Retail Investors: Simplifies daily monitoring, provides context to raw numbers, and reduces reliance on multiple portals.
- For Trading Communities: Enables group-wide access to consistent, formatted market snapshots and alerts.
- For Enterprises: Can be scaled into internal dashboards for trading desks, offering structured, repeatable insights while maintaining privacy controls.
- Future Potential: With enhancements like sector analysis, news integration, and personalization, the agent could evolve into a comprehensive decision-support tool for both individuals and institutions.

Solution Design

1. Domain Perspective

- Problem Context:

Indian retail investors and traders need quick access to top gainers/losers, stock snapshots, and sentiment insights from NSE. Traditionally, this requires visiting multiple portals, interpreting raw data manually, and then forming a view – which is inefficient and error-prone.

- Use Case Derived:

- Provide a daily market snapshot (top gainers/losers, sentiment tags, bias).
- Enable interactive queries about specific stocks (e.g., “What’s happening with TCS today?”).
- Deliver insights in natural language that are easy for retail investors to understand.
- Automate delivery via Telegram bot for accessibility.
- Scale to enterprise use cases where analysts need structured, repeatable updates for internal workflows.

Technical Architecture

Data Layer

- Source: NSE live data via nsetools.

- Functions:

- get\_top\_gainers / get\_top\_losers → fetch trending stocks.
- get\_quote(symbol) → detailed snapshot for individual stocks.
- Normalization: Raw NSE fields vary (e.g., pChange, perChange, netPrice). A normalization layer ensures consistent fields: symbol, price, change\_pct, volume, day\_high, day\_low.

## Processing Layer

- Sentiment Classification:
- Rules-based tags (`classify_stock`) for quick interpretation (e.g., "Strong momentum", "Sharp selloff").
- Bias computation (`compute_future_bias`) to contextualize moves within intraday ranges.
- Market Mood Summary:
- Aggregates average % change of gainers vs losers to provide a "bias" line (bullish, bearish, mixed).

## AI Reasoning Layer

- LLM Integration:
- Gemini 2.5 (via Google ADK) or Ollama LLaMA models handle free-form user queries.
- Prompt engineering ensures safe, contextual responses:
- Explains momentum, risks, short-term vs long-term views.
- Always ends with disclaimer: "This is not investment advice...".
- Symbol Resolution:
- Regex + dictionary mapping (`guess_symbols_from_question`) to resolve NSE symbols from user queries.
- Falls back to company name matching if ticker not found.

## Delivery Layer

- Telegram Bot Integration:
- Uses Telegram Bot API (`sendMessage`) to push formatted snapshots and alerts.
- Markdown formatting for readability (gainers/losers lists, sentiment tags).
- Two modes:
- Daily Snapshot → one-time run.
- Alert Mode → scheduled checks every X minutes for watchlist stocks.

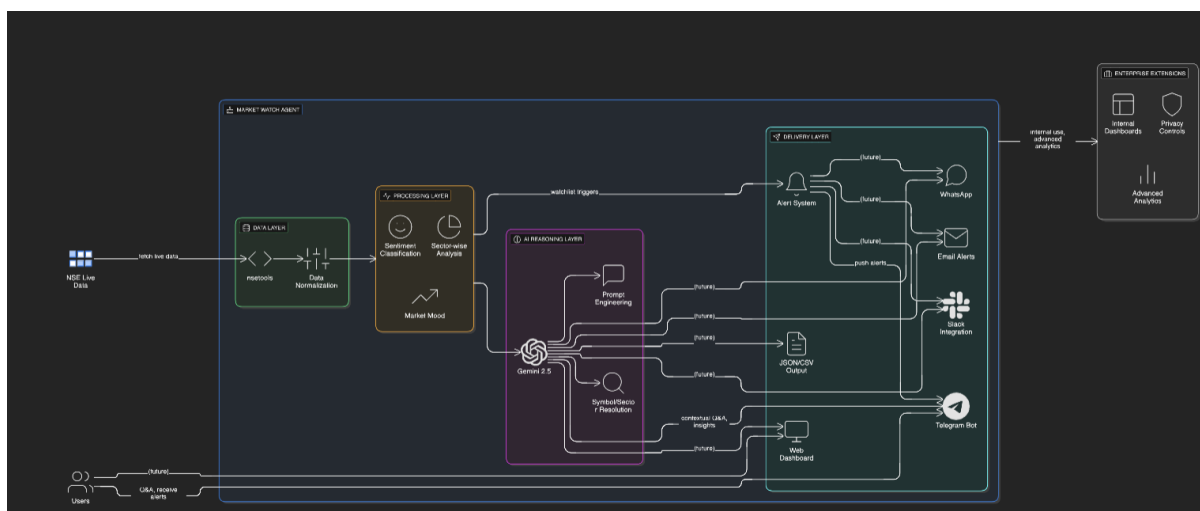
## Alert System

- Watchlist Monitoring:
- Configurable list of symbols (e.g., RELIANCE, TCS).
- Threshold-based triggers (e.g.,  $\pm 3\%$  move).
- Once-per-day guard to avoid spam.
- Option to always send snapshots even if no threshold crossed.

## Scalability & Future Enhancements

- Enterprise Integration:
- Extend to internal dashboards for trading desks.
- Provide structured JSON/CSV outputs for downstream analytics.
- Privacy Controls:
- Public version exposes only aggregated, non-sensitive data.
- Internal version can integrate proprietary datasets.
- Advanced Features:
- Sector-wise sentiment analysis.
- News integration for context.
- Predictive analytics (volatility clustering, trend detection).

## Architecture Diagram



## High-Level GTM Plan

### 1. Target Audience

- Retail Investors: Individuals seeking quick, reliable NSE updates without navigating multiple sites.
- Trading Communities: Telegram/WhatsApp groups where daily snapshots and alerts add immediate value.
- Enterprise Traders/Analysts: Internal teams in brokerage firms or financial institutions needing structured, automated market monitoring.

### Value Proposition

- One-stop agent for NSE gainers/losers, sentiment, and stock Q&A.
- Time savings by eliminating manual searches across multiple portals.
- Accessible delivery via Telegram bot and ADK agent integration.
- Scalable design for enterprise dashboards and internal workflows.

### 3. Go-To-Market Phases

- Phase 1: Pilot (Hackathon / Early Adopters)
- Launch Telegram bot in small investor groups.
- Collect feedback on usability, accuracy, and sentiment clarity.
- Phase 2: Community Expansion
- Partner with retail investor forums, Telegram/Discord trading groups.
- Offer free tier for daily snapshots, premium tier for watchlist alerts and AI Q&A.
- Phase 3: Enterprise Outreach
- Position agent as an internal productivity tool for trading desks.
- Highlight integration with Google ADK and Gemini 2.5 for scalable insights.
- Provide privacy-controlled versions for corporate use.

### 4. Channels & Distribution

- Digital Communities: Telegram, WhatsApp, Discord, Reddit finance groups.
- Content Marketing: Blog posts, LinkedIn articles, demo videos showing daily snapshots.
- Partnerships: Collaborate with fintech startups, trading education platforms.
- Enterprise Sales: Direct outreach to brokerage firms and financial institutions.

### 5. Monetization Strategy

- Freemium Model:
- Free → Daily snapshot.
- Paid → Alerts, AI Q&A, enterprise dashboards.
- Enterprise Licensing: Subscription for internal deployment with advanced features.

### 6. Success Metrics

- Adoption: Number of active Telegram bot users.
- Engagement: Frequency of queries and alerts delivered.
- Retention: Daily/weekly active users.
- Enterprise Deals: Number of corporate clients onboarded.

what's next: Elaborate the next steps to complete / enhance the solution.

### Immediate Completion Tasks

- Stabilize Data Fetching
- Ensure nsetools integration handles API changes gracefully (fallbacks for

field names, error handling).

- Add logging and monitoring to detect when NSE data is unavailable.
- Authentication & Security
- Replace hard-coded Telegram bot token and chat ID with environment variables or secure config files.
- Implement basic error recovery for failed Telegram sends.
- Deployment Readiness
- Package the agent with clear instructions (requirements.txt, Dockerfile, or ADK manifest).
- Set up automated scheduling (cron jobs or ADK orchestration) for daily snapshots.

#### Enhancement Opportunities

##### 1. User Experience

- Interactive Queries: Expand Gemini 2.5 prompts to handle sector-level or index-level questions (e.g., "How is IT sector performing today?").
- Multi-channel Delivery: Extend beyond Telegram to WhatsApp, Slack, or email alerts.
- Dashboard UI: Build a lightweight web interface for users who prefer visual charts over text snapshots.

#### Data & Insights

- Sector Analysis: Aggregate gainers/losers by sector to highlight industry trends.
- News Integration: Pull relevant headlines for watchlist stocks to add context to movements.
- Historical Trends: Store daily snapshots and allow users to query past performance.

##### 3. AI Layer

- Advanced Sentiment: Train custom prompts/models to classify moves with richer context (e.g., liquidity, valuation).
- Personalization: Allow users to set custom watchlists, thresholds, and alert preferences.
- Explainability: Add "why" tags (e.g., "Reliance up due to oil price rally") by combining market data with curated news.

#### Enterprise Readiness

- Internal Dashboards: Provide JSON/CSV outputs for integration into trading desk workflows.
- Privacy Controls: Separate public vs internal data streams to comply with confidentiality.
- Scalability: Optimize for higher frequency checks (sub-minute intervals) and larger watchlists.

#### ✓ Strategic Next Steps

- Pilot Testing: Roll out to a small Telegram group of retail investors, gather feedback on clarity and usefulness.
- Iterative Improvement: Refine prompts and sentiment tags based on user feedback.
- Partnerships: Explore collaboration with fintech communities or trading education platforms.
- Monetization: Introduce freemium tiers (daily snapshot free, advanced alerts/AI Q&A premium).