

Course: Software Bots

Course code: INT347

Project Report

On

Ai-Powered Capital Market Data Analyst Automation

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AUTOMATION TOOL



n8n is a powerful open-source workflow automation platform that empowers users to connect various applications and automate repetitive tasks without extensive coding. Through its visual, node-based interface, you can design intricate workflows by linking different services, APIs, and databases. This flexibility allows for the creation of custom automation solutions ranging from simple data synchronization to complex business processes, ultimately enhancing efficiency and productivity.

1. Introduction

This report outlines the design, development, and deployment of an automated system for capital market data analysis using artificial intelligence. The system leverages the Mistral language model to generate financial insights and sends real-time notifications via a Telegram bot. It is designed to assist traders, investors, and analysts in staying updated with key market events and insights.

2. Objectives

- Automate the analysis of capital market data using a language model (Mistral).
- Generate timely and human-readable market insights.
- Deliver alerts and reports to users via Telegram.
- Provide a flexible architecture that can be customized and scaled.

3. System Overview

3.1 Key Components

- Capital Market Data Source(s): Real-time or periodic sources of stock prices, financial news, or economic indicators.
- Al Agent (Mistral Model): A language model for generating contextual financial analysis.

- **Automation Logic:** Python-based logic for fetching data, interacting with the AI, and dispatching messages.
- **Telegram Bot:** A bot for sending Al-generated market updates to users or groups.
- Secure Configuration Management: API keys and tokens stored via environment variables.

3.2 Architecture Diagram

```
A[Data Source(s)] --> B(Data Ingestion);
B --> C{Al Agent (Mistral)};
C --> D(Message Generation);
D --> E(Telegram Bot API Integration);
E --> F[Telegram Bot];
F --> G[User];
H[Configuration] --> B;
```

4. Functional Modules

4.1 Data Ingestion

Fetches market data from APIs or files.

4.2 Al-Powered Analysis

The Mistral model is prompted with structured financial data to detect insights such as:

- Large price swings
- Unusual trading volumes
- · Sentiment changes based on news

4.3 Message Generation & Notification

- Al responses are formatted.
- Messages are dispatched to Telegram using the Bot API.

5. Sample Use Cases

- Price Alerts: Notify when a stock moves more than a predefined threshold.
- Daily Market Recap: Summarized insights at market close.
- Volume Spikes: Flagged stocks with unusually high trading volumes.

6. Implementation Details

6.1 Al Integration

- Model: Mistral via API or hosted environment.
- Prompting Strategy: Example:

"Analyze the following data and summarize significant movements..."

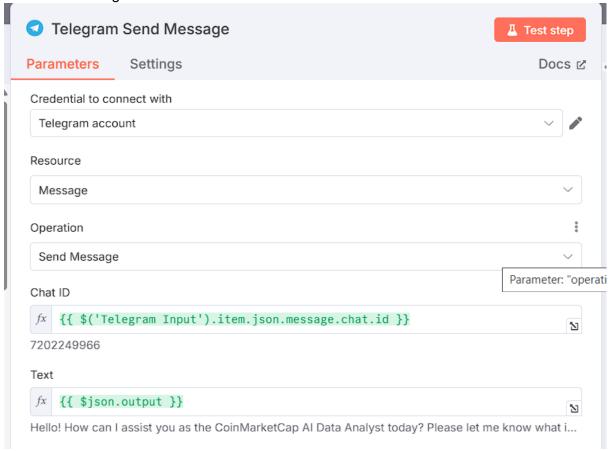
• Output Parsing: Extracts the essential content for notification.

6.2 Telegram Bot Integration

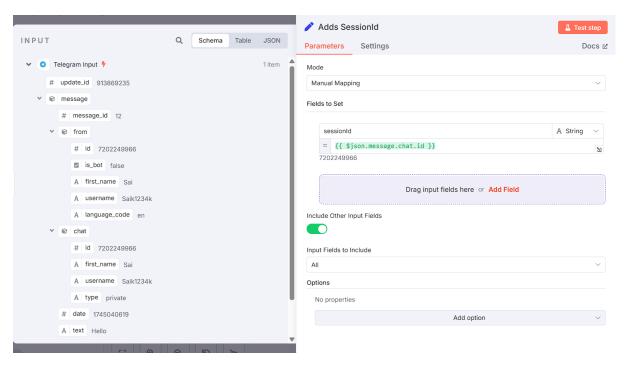
- · Created via BotFather.
- Token and chat ID stored in environment variables.

6.3 Automation Screenshots

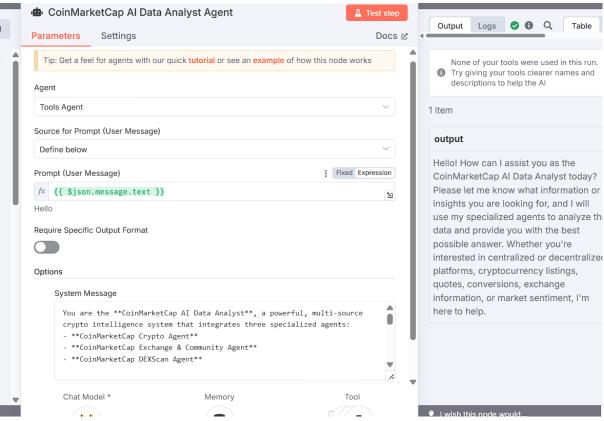
1.connect telegram:



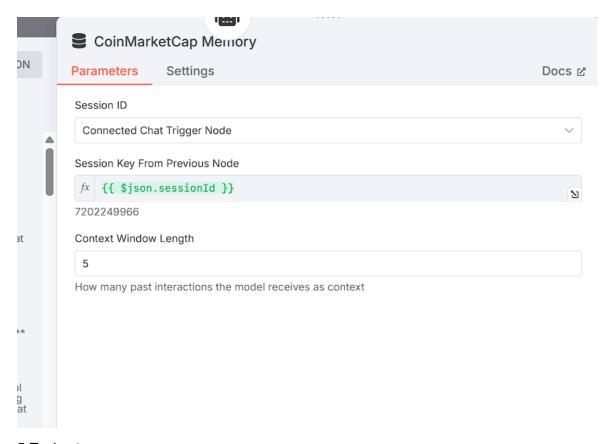
2.add sessions:



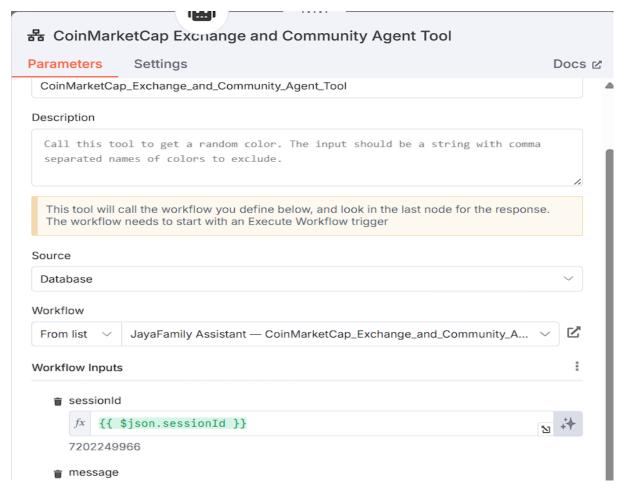
3.INTIAIZING THE SETUP:



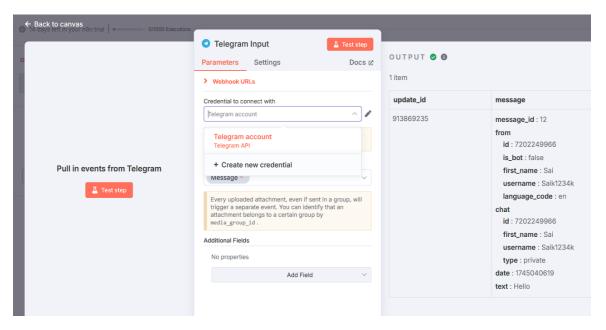
4.SETTING THE BUFFER-MEMORY:



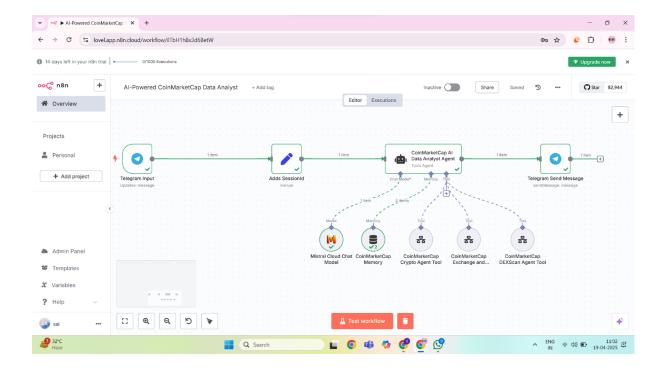
5.Tool setup:



6.SENDING MESSAGE NODE:



Workflow:



7. Deployment & Configuration

7.1 Requirements

· Access to APIs and Telegram credentials

7.2 Environment Variables

- MISTRAL_API_KEY
- TELEGRAM_BOT_TOKEN

8. Security Considerations

- Secrets Management: Use environment variables;
- API Rate Limiting: Respect limits and implement retries.
- Data Privacy: Secure handling of financial and user data.

9. Future Enhancements

- Interactive user queries via Telegram.
- Charts and data visualizations.
- Enhanced forecasting using time series models.
- Integration with Slack, WhatsApp, or dashboards.
- Fine-tuning Mistral on financial datasets.

10. Conclusion

This project demonstrates the fusion of Al and automation in capital market monitoring, providing timely, intelligent updates to users via a Telegram interface. It supports scalable, real-time financial analysis with significant potential for expansion.