Building an n8n Stock Analysis Automation: Step-by-Step Guide

This comprehensive guide walks you through creating an advanced stock analysis workflow in n8n that automates technical analysis through Telegram and scheduled processes.

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Overview

This workflow creates an automated stock analysis system that:

- Processes user requests via Telegram (text and voice)
- Generates technical stock charts with indicators
- Performs AI-driven technical analysis
- Schedules regular analysis reports for saved tickers
- Stores user preferences in Airtable

The system is built around three core scenarios:

1. **Interactive AI Agent** - Handles user queries in real-time
2. **Chart Generation** - Creates and analyzes stock charts
3. **Scheduled Analysis** - Periodically analyzes saved stocks

Prerequisites

Before starting, ensure you have:

- n8n installed and running (v1.0.0+)
- Active accounts with:
  - Telegram Bot API
  - OpenAI API (with GPT-4o access)
  - Airtable (for ticker storage)
  - Chart-img.com API (for chart generation)
- Basic knowledge of n8n workflows and JavaScript

Initial Setup

1. Create a New Workflow

1. Open n8n and navigate to Workflows
2. Click "Create New" and name it "Stock Analysis Workflow"
3. Add a description: "Automates stock analysis with AI and technical indicators"

2. Configure External Services

Telegram Bot Setup

1. Create a Telegram bot using BotFather
2. Save the API token for n8n connection
3. Start a conversation with your bot to enable messaging

OpenAI API

1. Ensure your OpenAI API key has access to GPT-4o
2. Create n8n credentials for OpenAI

Airtable Configuration

1. Create a new Airtable base named "Trading"
2. Add a table named "Tickers" with a "Name" column
3. Save the base ID and API key for n8n

Chart-img API

1. Register for a chart-img.com account
2. Set up HTTP Header Authentication in n8n

Creating the Main Workflow

The workflow is divided into three main sections. Let's build each one:

Scenario 1: AI Agent Interaction

This scenario handles real-time user interactions through Telegram.

Step 1: Set Up Telegram Trigger

1. Add a **Telegram Trigger** node
   - Settings:
     - Updates: `message`
   - Connect your Telegram credentials
2. Add a **Switch** node after the Telegram Trigger
   - Create two conditions:
     - Condition 1: `$json.message.voice.file_id` exists → rename output to "Voice"
     - Condition 2: `$json.message.text` exists → rename output to "Text"

Step 2: Configure Voice Message Processing

1. From the "Voice" output, add a **Download File** node
   - Set File ID: `{{ $json.message.voice.file_id }}`
2. Add a **Transcribe** node (OpenAI)
   - Operation: `transcribe`
   - Connect to OpenAI credentials

Step 3: Configure Text Processing

1. From the "Text" output, add a **Set Text** node
   - Add assignment: name: `text`, value: `{{ $json.message.text }}`

Step 4: Set Up Webhook Endpoint

1. Add a **Webhook** node to the canvas (separate branch)
   - HTTP Method: `POST`
   - Path: generate or enter a custom path
   - Response Mode: `lastNode`
2. Add a **Set Text** node after the Webhook

- Add assignment: name: `text`, value: `{{ $json.body.text }}`

Step 5: Configure AI Core Components

1. Add an **OpenAI Chat Model** node
   - Model: `gpt-4o`
   - Connect to OpenAI credentials
2. Add a **Window Buffer Memory** node
   - Session ID Type: `customKey`
   - Session Key: `=335458847` (your Telegram chat ID)
3. Add an **AI Agent** node and connect:
   - Main inputs from both Set Text nodes and Transcribe node
   - Connect Language Model from OpenAI Chat Model
   - Connect Memory from Window Buffer Memory
   - Configure prompt with system message:

```
# Overview

You are an AI agent specializing in analyzing stocks. You can perform technical analysis
using the **GetChart** tool to generate stock graphs.

# Instructions

1. Begin by offering a warm and professional greeting.
2. Maintain a conversational style when discussing finance and stock markets.
3. If a user requests technical analysis of a stock, supplying its ticker:
- Send only the stock ticker to the GetChart tool.
- Present the chart's analysis and insights in a conversational format.
4. When addressing financial subjects, provide thorough, easy-to-understand explanations
suitable for the user's knowledge.
5. Refrain from giving direct financial recommendations(buy or sell) or making predictions.

## Tools

- **GetChart**: Used for generating stock graphs based on provided tickers.

## Standard Operating Procedure

1. Interact with the user: Maintain a professional and approachable demeanor.
2. Conduct stock analysis:
- Upon request for technical analysis, send the stock's ticker symbol to the GetChart tool.
- Present the chart's findings in an easy-to-understand, conversational manner.
3. Clarify financial topics: Simplify intricate terms into accessible explanations suitable
for the user's knowledge level.
4. Refrain from offering financial recommendations: Deliver information and analysis without
suggesting specific actions.
5. Verify user understanding: Ask clarifying questions to ensure all needs are met.
```

4. Add a **Send Analysis** Telegram node
   - Chat ID: `335458847` (your Telegram chat ID)
   - Text: `{{ $json.output }}`

Step 6: Set Up Save Ticker Tool

1. Add an **Airtable Tool** node named "Save Ticker"
   - Set description: "Use the tool when user asks to save ticker for future reports"
   - Operation: `create`

- Base: Your Trading base
- Table: Tickers
- Column mapping: Name: `{{ $fromAI("ticker") }}`
- Connect it to the AI Agent as a tool

Chart Generation Sub-workflow

This section handles chart creation and technical analysis.

Step 1: Create Tool Workflow Node

1. Add a **Tool Workflow** node named "Get Chart"
   - Name: `getChart`
   - Description:

```
Call this tool to get an analysis of a requested stock. The URL that is output from this tool must be returned in markdown format. For example, ![](url)

It'll be obligatory to pass ticker and chart style. Both can be specified by user. If chart style is not specified by user, use "candle" as default. Possible options for style: [bar, candle, line, area, heikinAshi, hollowCandle, baseline, hiLo, column]
```

   - Workflow ID: Select "Trading Agent" (create this separate workflow first)
   - Inputs:
     - ticker: `{{ $fromAI("ticker") }}`
     - chart_style: `{{ $fromAI("chart_style") }}`
   - Connect it to the AI Agent as a tool

Step 2: Create Chart Generation Workflow

Create a new workflow named "Trading Agent" with:

1. Add a **Workflow Input Trigger** node
   - Inputs: `ticker` and `chart_style`
2. Add a **Set Values** node
   - Assignments:
     - ticker: `{{ $json.ticker }}`
     - chart_style: `{{ $json.chart_style }}`

3. Add a **Get Chart URL** HTTP Request node
   - Method: `POST`
   - URL: `https://api.chart-img.com/v2/tradingview/advanced-chart/storage`
   - Authentication: HTTP Header Auth
   - Headers: `Content-Type: application/json`
   - Body (JSON):

```
json
```

```
{
  "style": "{{ $json.chart_style }}",
  "theme": "light",
  "interval": "1W",
  "symbol": "NASDAQ:{{ $json.ticker }}",
  "override": {
    "showStudyLastValue": false
  },
  "studies": [
    {
      "name": "Volume",
      "forceOverlay": true
    },
    {
      "name": "Relative Strength Index"
    },
    {
      "name": "Stochastic RSI"
    }
  ]
}
```

4. Add a **Download Chart** HTTP Request node
   - URL: `{{ $json.url }}`
5. Add a **Technical Analysis** OpenAI node
   - Resource: `image`
   - Operation: `analyze`
   - Model: `gpt-4o`
   - Text prompt:

```
# Professional Role

You are a financial analyst, specializing in the interpretive analysis of stock charts. Your primary responsibility is to scrutinize provided financial charts and deliver comprehensive assessments of their technical dimensions. This includes examining candlestick formations, Moving Average Convergence Divergence (MACD) metrics, trading volume patterns, **Relative Strength Index (RSI), Stochastic RSI**, and prevailing market sentiment. Your analysis should be a thorough dissection of the chart, pinpointing critical areas and offering practical insights.

When evaluating a stock chart, ensure the inclusion of the following:

1. **Candlestick Pattern Interpretation**:
    - Recognize and articulate the significance of any notable candlestick formations (e.g., bullish engulfing, doji, hammer).
    - Provide commentary on the prevailing market direction (upward, downward, or lateral).
    - Identify potential zones for price surges or retracements.

2. **Relative Strength Index (RSI) Examination**:
    - **Extract the numerical RSI value from the chart.**
    - Describe the current RSI value and its market positioning (e.g., overbought, oversold, neutral) **based on the extracted value.**
    - Explain how the extracted RSI value and its trend either support or oppose the ongoing price trend.
    - Identify any divergences between RSI values and price movement **that can be discerned from the chart.**

3. **Stochastic RSI Scrutiny(Stoch RSI)**:
    - **Extract the numerical values of the Stochastic RSI's K and D lines from the chart.**
    - Detail the present values of the K and D lines **based on the extracted numerical data.**
    - Analyze any crossovers or divergences observed between the K and D lines **based on the extracted values and their visual representation.**
    - Explain how the extracted Stochastic RSI readings and their relationship either support or oppose the prevailing market momentum.

Deliver your analysis with clarity, precision, and an emphasis on data. Your objective is to furnish traders and investors with actionable information that facilitates well-informed decision-making. Always justify your conclusions with clear reasoning derived from the chart.
```

- Input Type: `base64`

6. Add a **Send Chart** Telegram node
   - Operation: `sendPhoto`
   - Chat ID: `335458847`
   - File: `{{ $('Get Chart URL').item.json.url }}`
7. Add a **Response** Set node
   - Add assignment: name: `response`, value: `{{ $('Technical Analysis').item.json.choices[0].message.content }}`

Scenario 2: Scheduled Analyses

This section automates recurring analyses of saved tickers.

Step 1: Set Up Scheduling Components

1. Add a **Schedule Trigger** node
   - Configure desired schedule (e.g., daily at 8 AM)
2. Add a **Get Tokens** Airtable node
   - Operation: `search`
   - Base: Your Trading base
   - Table: Tickers
3. Add a **Loop Over Items** node
   - Keep default settings

Step 2: Configure Analysis Execution

1. Add a **Run Agent** HTTP Request node
   - Method: `POST`
   - URL: `http://localhost:5678/webhook/[your-webhook-id]`
   - Headers: `content-type: application/json`
   - Body Parameters: name: `=text`, value: `=Please analyze {{ $json.Name }} stocks`

Testing and Troubleshooting

After building the workflow:

1. **Test Telegram Integration**:
   - Send a message to your bot like "Analyze AAPL stock"

- Verify you receive a chart and analysis

2. **Test Webhook**:
   - Use Postman or similar to send a POST request to your webhook URL
   - Body: `{"text": "Analyze MSFT stock"}`
3. **Test Scheduled Analysis**:
   - Add a test ticker to Airtable
   - Execute the Schedule Trigger node manually

Common Issues and Solutions:

- **Telegram Authentication Issues**: Re-create credentials and check permissions
- **Chart Generation Failures**: Verify chart-img API configuration
- **AI Analysis Errors**: Check OpenAI API key permissions

Advanced Customization

Extend your workflow with these enhancements:

Additional Technical Indicators

Modify the chart request JSON to include more indicators:

```
json
```

```json
"studies": [
  {"name": "Volume", "forceOverlay": true},
  {"name": "Relative Strength Index"},
  {"name": "Stochastic RSI"},
  {"name": "Moving Average Convergence Divergence"},
  {"name": "Bollinger Bands"}
]
```

Multiple Timeframes Analysis

Create variants of the Get Chart node for different timeframes:

- Daily charts: `"interval": "1D"`
- Weekly charts: `"interval": "1W"`
- Monthly charts: `"interval": "1M"`

Market News Integration

Add a node to fetch recent news about the requested stock and incorporate into the analysis.

Conclusion

You've successfully built a powerful automated stock analysis system in n8n. This workflow combines AI-powered technical analysis with scheduled reporting to provide valuable insights for monitoring stocks.

Key benefits of this system:

- **Time-saving automation** of repetitive analysis tasks
- **Consistent technical analysis** using predefined indicators
- **Flexible interaction** through voice or text
- **Scheduled monitoring** of important tickers

Continue enhancing this workflow by adding more technical indicators, fundamental analysis tools, or integration with additional data sources.