Research & Development Plan: Paper Trading API Selection

To: Person B (Trading Systems Researcher)

From: Gemini AI

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Subject: A Step-by-Step Plan for Selecting a Reliable Paper Trading API

1.0 Objective

The primary objective of this plan is to identify, validate, and select a reliable, free-to-use paper trading service with a robust Python API. This service must support trading of UK equities (FTSE 100) and will serve as the execution platform for our sentiment-based trading bot. The final selection must be based on proven functionality and ease of integration.

2.0 Research Phases & Actionable Steps

This project is divided into four distinct phases. The successful completion of each phase is required to proceed to the next.

Phase 1: Triage & Candidate Identification (Duration: 2-3 Days)

Goal: To debug the existing integration and, if necessary, identify a shortlist of viable alternative trading APIs.

- **Task 1.1: Define Core Requirements**
  - **Action:** Formalise a checklist of non-negotiable features for the trading API.
  - **Requirements Checklist:**
    - [ ] **No-Cost Paper Trading:** The service must offer a free paper trading environment with no time limit.
    - [ ] **Stable Python API:** A well-documented and maintained Python library must be available (either official or a reputable community version).
    - [ ] **UK Market Data Access:** The API must provide data and support order execution for stocks listed on the London Stock Exchange (LSE), e.g., VOD.L.
    - [ ] **Straightforward Authentication:** The process for obtaining and using paper trading API keys must be clear and functional.
- **Task 1.2: Debug Existing Alpaca Integration**
  - **Action:** Dedicate a focused effort to diagnose why the current Alpaca integration in alpaca_ai_trader is failing.

    - **Debugging Steps:**
        1. Verify API keys in config.py are correct for the paper trading environment.
        2. Check for breaking changes in the alpaca-trade-api library; consider reinstalling or updating it.
        3. Isolate the failing part of trade.py by adding print statements and running functions individually. Can you fetch account info? Can you get the status of a position?
    - **Note:** Successfully debugging this is the fastest path to a solution.
- **Task 1.3: Identify Alternative Candidates (Conditional)**
    - **Action:** If Task 1.2 proves unsuccessful after a reasonable time box (e.g., one full day), begin searching for alternatives.
    - **Search Queries:** Use terms like "Alpaca API alternative UK", "free stock trading API python LSE", "best paper trading API for UK stocks".
    - **Potential Candidates:** Your research will likely lead you to platforms such as Interactive Brokers (IBKR), Tradier, or others.
- **Phase 1 Deliverable:**
    - A concise research brief. This document must contain:
        1. A summary of the debugging efforts for the Alpaca integration, including the root cause of the failure if identified.
        2. A shortlist of the top 2-3 candidate APIs (which may still include Alpaca) that appear to meet the core requirements.

Phase 2: Proof-of-Concept & Feasibility Testing (Duration: 2-3 Days)

Goal: To write a minimal, working script that proves end-to-end functionality for the top candidate(s).

- **Task 2.1: Documentation Deep Dive**
    - **Action:** For each of the top 2 candidates, thoroughly read the API documentation.
    - **Focus On:** The authentication process, order submission endpoints, account information retrieval, and error handling.
- **Task 2.2: "Hello, Trader" Proof-of-Concept Script**
    - **Action:** For each candidate, create an account and obtain paper trading API keys.
    - **Action:** Write a simple, standalone Python script (test_api.py) that performs the following critical functions:
        1. **Authentication:** Successfully authenticates with the API using your keys.
        2. **Account Check:** Fetches and prints your current paper trading account balance.
        3. **Order Submission:** Submits a simple market order (e.g., "buy 1 share of a

liquid FTSE 100 stock like VOD.L or BARC.L").
    4. **Order Verification:** Confirms that the order was received and is visible in the platform's web-based paper trading dashboard.
- **Phase 2 Deliverable:**
    1. A separate, fully-documented "Hello, Trader" script for each API tested.
    2. A summary of the testing experience for each API, noting any difficulties encountered.

Phase 3: Synthesis & Final Recommendation (Duration: 1 Day)

Goal: To make a final, evidence-based decision on the trading platform.

- **Task 3.1: Comparative Analysis**
    - **Action:** Compare the successfully tested candidate(s) against each other and the core requirements.
    - **Evaluation Criteria:** Ease of use, quality of documentation, reliability of the proof-of-concept script, and availability of community support/examples.
- **Task 3.2: Formulate Recommendation**
    - **Action:** Based on your analysis, select the single best platform for the project.
    - **Action:** Prepare a concise presentation or report to deliver to Person A.
- **Phase 3 Deliverable:**
    - A final recommendation presentation. It must include:
        1. The chosen trading API and a clear, evidence-based justification for the choice.
        2. A summary of the platform's strengths and any potential weaknesses.
        3. The working proof-of-concept script as a demonstration of its viability.
        4. A clear statement on readiness for integration into the main trading bot application.