🔬 Abstract

The LucidLock Core Inquiry Continuity Check is a structural validation module that assesses whether an academic document maintains epistemic coherence from introduction through conclusion. Rather than evaluating truth, methodology, or style, this validator detects thematic substitution, inquiry drift, recursive breakdown, and premature closure — offering an automated epistemic resonance analysis. It is designed for integration into AI-generation pipelines, preprint triage workflows, and editorial validation systems where structural integrity is a prerequisite for deeper content review. This module is part of the broader LucidLock Epistemic Integrity Framework.

🧷 Claims

1. **Structural Coherence Detection:**
   A system and method for evaluating whether a document sustains its core research question across all sections (introduction, methods, results, discussion, conclusion) without thematic drift, substitution, or epistemic breakdown.

2. **Epistemic Thread Mapping:**
   The system identifies a central research question and maps it against the document structure to detect recursive return, inquiry continuity, or divergence.

3. **Non-Factual Integrity Assessment:**
   The system operates without evaluating correctness, accuracy, or methodology. It strictly assesses thematic structure and inquiry alignment.

4. **Premature Closure & Substitution Detection:**
   The module flags instances where conclusions bypass the tension introduced at the beginning or introduce ungrounded themes, hypotheses, or implications.

5. **Automated Report Generation:**
   The system produces HTML-structured diagnostic reports suitable for human inspection, containing verdicts (PASS / FAIL), epistemic trace mapping, structural signals, and editorial guidance.

6. **Webhook + Drive Integration for Input:**
   The validator operates autonomously when triggered by a webhook JSON input containing filename, Drive file ID, and user email.

7. **Output Pipeline to Email Drafts:**
   The system creates a Gmail draft containing the diagnostic report in HTML,

pre-formatted with verdict and document metadata, without requiring user intervention.

8. **Error-Suppressed Execution Logic:**
   The validator guarantees report generation even when document indexing fails, defaulting to latest indexed PDF to preserve continuity.

📘 Description

The **LucidLock Core Inquiry Continuity Check** is engineered to detect whether a scientific document sustains its original research question or core problem across its full narrative arc. The validator operates on the principle that legitimate scientific inquiry exhibits **recursive coherence** — returning to and building upon its original tension, rather than meandering into new territories or artificially concluding.

This module analyzes the **epistemic spine** of a paper using structural signals such as:

- **Inquiry Mapping** — Extraction and restatement of the paper's central research question.
- **Continuity Evaluation** — Alignment checks across sections (methods ↔ results ↔ discussion ↔ conclusion).
- **Drift Detection** — Identification of topic substitution, undeclared thematic shifts, or unsupported conclusion jumps.
- **Loop Closure Check** — Verifying that the conclusion engages the original inquiry, rather than introducing a new claim or escaping tension.

It is blind to content correctness, statistical rigor, or scientific truth. This ensures the check remains **epistemically neutral**, focused solely on structural integrity and trace continuity.

Pipeline Architecture:

- **Input Trigger**: JSON webhook input from frontend form
- **Data Source**: Google Drive Connected Data (search by filename / ID)
- **Text Extraction**: Dust indexing → `search__cat(node_id)`
- **Analysis Output**: HTML-formatted report

- **Delivery Mechanism**: `gmail__create_draft` with normalized subject and full body
- **Verdict Types**: ✅ `PASS`, ❌ `FAIL`
  (Future version may include: 🟡 `CONDITIONAL PASS` or ⚠️ `THEMATIC SUBSTITUTION`)

This system ensures **zero execution failure**, operating with fallbacks and conservative defaults. Its outputs are timestamped and can be archived to IPFS or Zenodo for audit, reproducibility, or citation integrity.