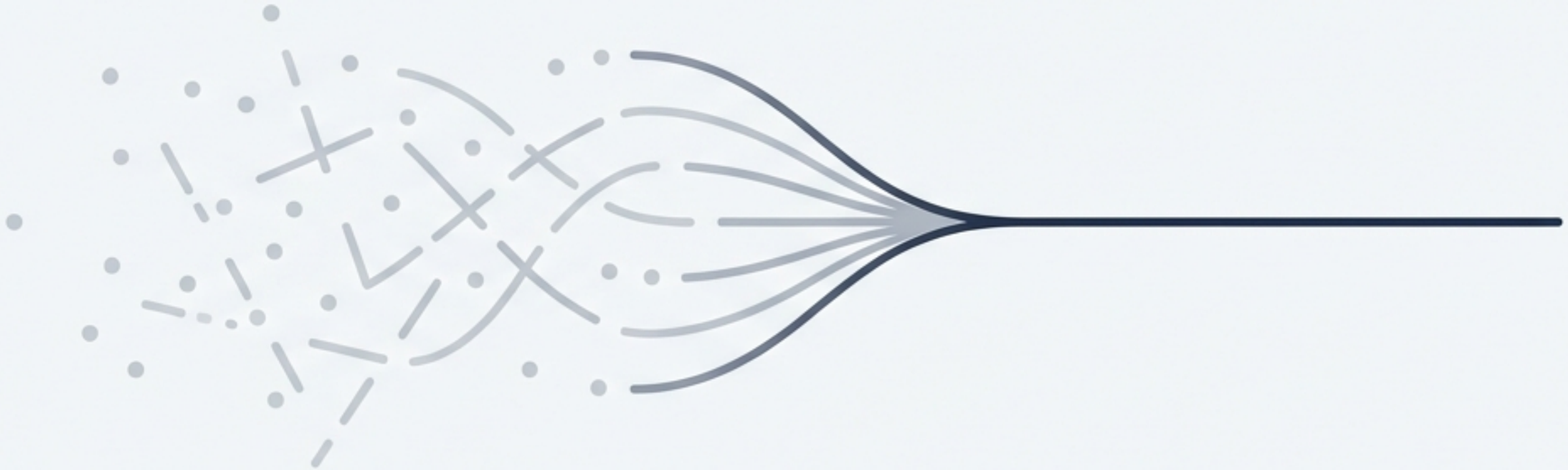
LexFabric Agents

A Multi-Agent System for Evidence & Timeline Reasoning



Capstone Project: Google AI Agents Intensive 2025

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Critical insights are lost in a maze of fragmented evidence

In high-stakes domains like legal and compliance, events rarely arrive in chronological order. Analysts must manually **reconstruct timelines from dozens or hundreds of scattered artifacts—emails, notes, filings, and logs. This process is slow, expensive, and prone to human error.**

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Monolithic LLMs excel at summary, but struggle with synthesis.

Standard LLMs can analyze single documents effectively, but they fall short when required to combine multiple, conflicting sources into a coherent structure.

The Challenge

The Goal

Key Struggles

- Ordering events across multiple files
- Merging partial evidence fragments
- Maintaining provenance and cross-document consistency
- Answering grounded questions without inventing facts or hallucinating

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Our Solution: A Multi-Agent System for Grounded Reasoning

We built an end-to-end agentic architecture that transforms raw, unstructured files into a structured, chronological, and verifiable narrative.

- Ingests structured and unstructured evidence
- Extracts dates, actors, and events
- Constructs a chronological timeline
- Answers natural-language questions grounded purely in evidence

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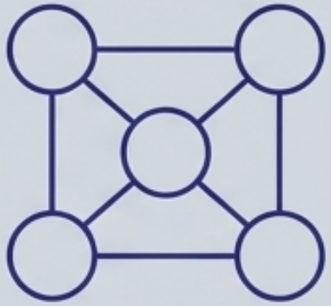
Architecture: A Deliberate, Deterministic Pipeline

Tier 1: Synthetic Evidence Server

The source of truth. Exposes cases and evidence via deterministic tools. Ensures reproducibility and safe evaluation.



Tier 2: Multi-Agent Pipeline

The reasoning core. A team of specialized agents collaborates to process and structure the data.

Tier 3: CLI Interface

The user gateway. Provides accessible, professional interaction with the system for expert workflows.

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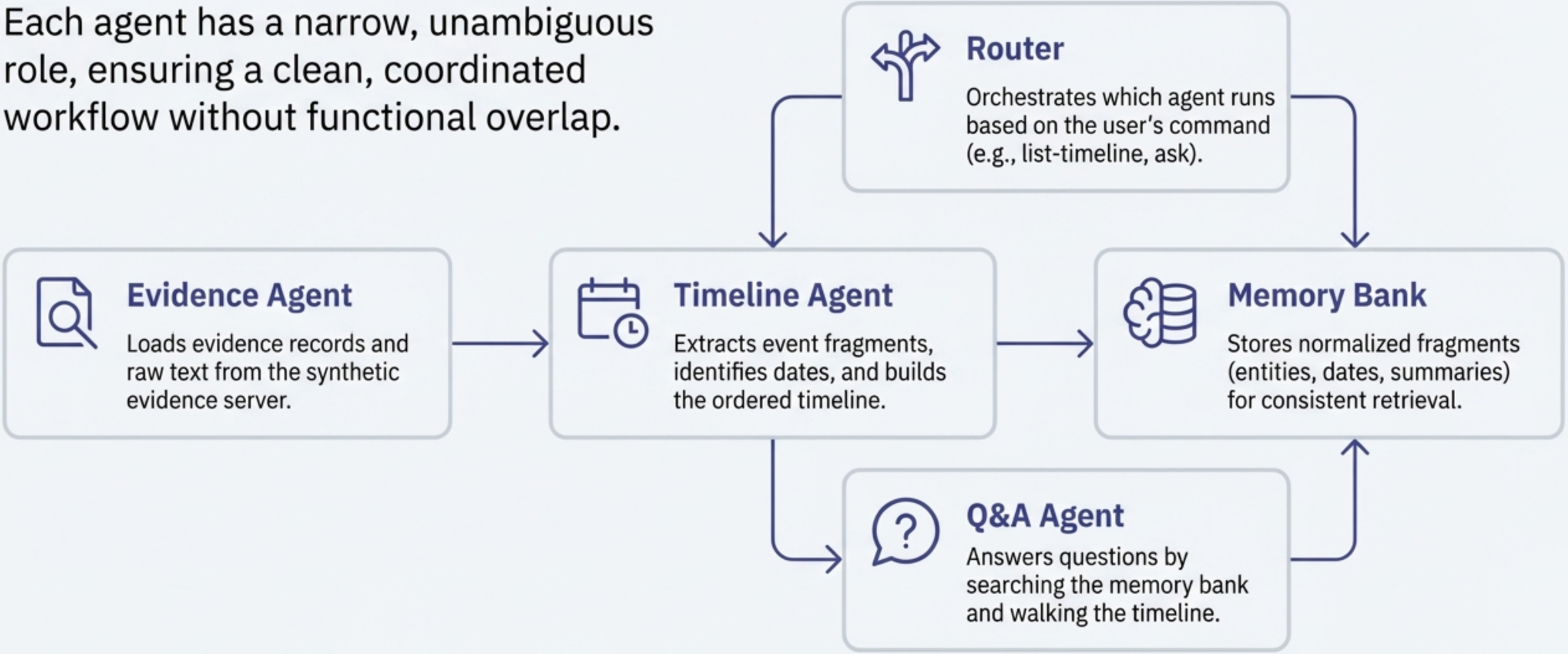
The Reasoning Core: A Team of Specialized Specialists

Each agent has a narrow, unambiguous role, ensuring a clean, coordinated workflow without functional overlap.



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Integrity by Design: A Verifiable and Reproducible Pipeline

For legal and investigative work, reproducibility is not a feature—it's a requirement. Our system is built on a foundation of trust.

Evidence-Bound Reasoning

The Q&A agent is rule-based and refuses to invent information or answer questions outside the provided evidence.

Deterministic SHA-256 Pipeline

Every ingestion pass generates a hash manifest, ensuring chain-of-custody fidelity and perfectly reproducible results.

Offline Execution

The entire system runs locally without external API calls, guaranteeing data privacy and security.

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Advanced Reasoning in Action

We validated the system against a test harness of 10 reasoning patterns that mirror real-world analytical tasks where monolithic LLMs typically fail.

Example 1: Cross-Document Contradiction Detection

Query: *"Do any emails contradict the initial filing?"*

System Capability: Identifies conflicting facts between sources and provides provenance-backed answers.

Example 2: Causal & Procedural Reasoning

Query: *"What events led to the operational failure?"*

System Capability: Identifies causal chains (e.g., 'escalation caused by...') without inventing facts.

Example 3: Gap Detection & Recommendations

System Output: *"Analysis reveals follow-up logs and insufficient emails between Jan 15-30."*

System Capability: Audits the timeline for missing information and recommends next steps for evidence collection.

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An Interface Built for Expert Workflows

A user-friendly CLI provides direct access to the agent pipeline, mirroring real-world usage in legal, compliance, and investigative tooling. Judges can run everything locally in seconds.

```
> python -m capstone.cli --case CC02 --list-timeline
[Timeline Generated]
2024-10-05: Initial client meeting (evidence_01.txt)
2024-11-12: Key email exchange (evidence_04.eml)
...

> python -m capstone.cli --case CC02 --ask "What is
the earliest event in this case?"
[Answer] The earliest event is the 'Initial client
meeting' on 2024-10-05, found in evidence_01.txt.
```

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Why This Multi-Agent Architecture Excels

- **Clear Real-World Value**: Directly addresses a critical workflow in legal, compliance, and operational investigations.
- **Strong Multi-Agent Design**: Specialized agents with clear responsibilities ensure a robust and unambiguous pipeline.
- **Deterministic, Reproducible Evaluation**: Synthetic evidence and a SHA-256 hash manifest allow for perfect, test-stable reproducibility.
- **No Hallucination by Design**: A rule-based Q&A agent explicitly refuses to invent information, providing only evidence-grounded answers.
- **Validated with Advanced Queries**: A test harness with 10 reasoning patterns proves system maturity beyond simple summarization.
- **Professional & Extendable**: The architecture is deployable and serves as the foundation for the commercial-grade LexFabric MDLS.

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The Vision: From Capstone to Commercial-Ready System

This project's architecture was designed for extension. The next steps for the private LexFabric MDLS (Multi-Docket Litigation System) will build directly on this foundation.

Semantic Embedding Indexing

Foundation

Automated Causality Graph Construction

Future Work

Role-Based Timeline Segmentation

Future Work

Cross-Case Knowledge Transfer

Future Work

Secure Multi-Docket Reasoning

Future Work

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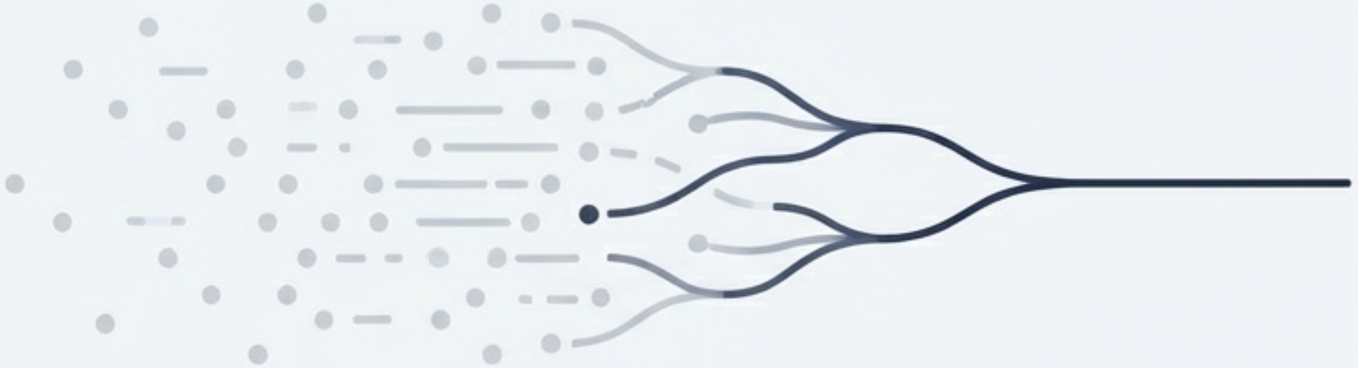
Transforming Fragmented Evidence into Explainable Knowledge

LexFabric Agents demonstrates how a multi-agent system can reliably solve complex, multi-document reasoning tasks where **monolithic models struggle**.



Grounded Reasoning | **Reproducibility & Integrity** | **Safety by Design**

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