

Constraints & Objectives

High-Risk Property (HRP) must be classified under evolving federal compliance frameworks:

- ITAR — International Traffic in Arms Regulations
- NRC — Nuclear Regulatory Commission
- CCL — Commerce Control List

Can modern AI systems assist in accurate, scalable classification if applied early, at the point of acquisition?

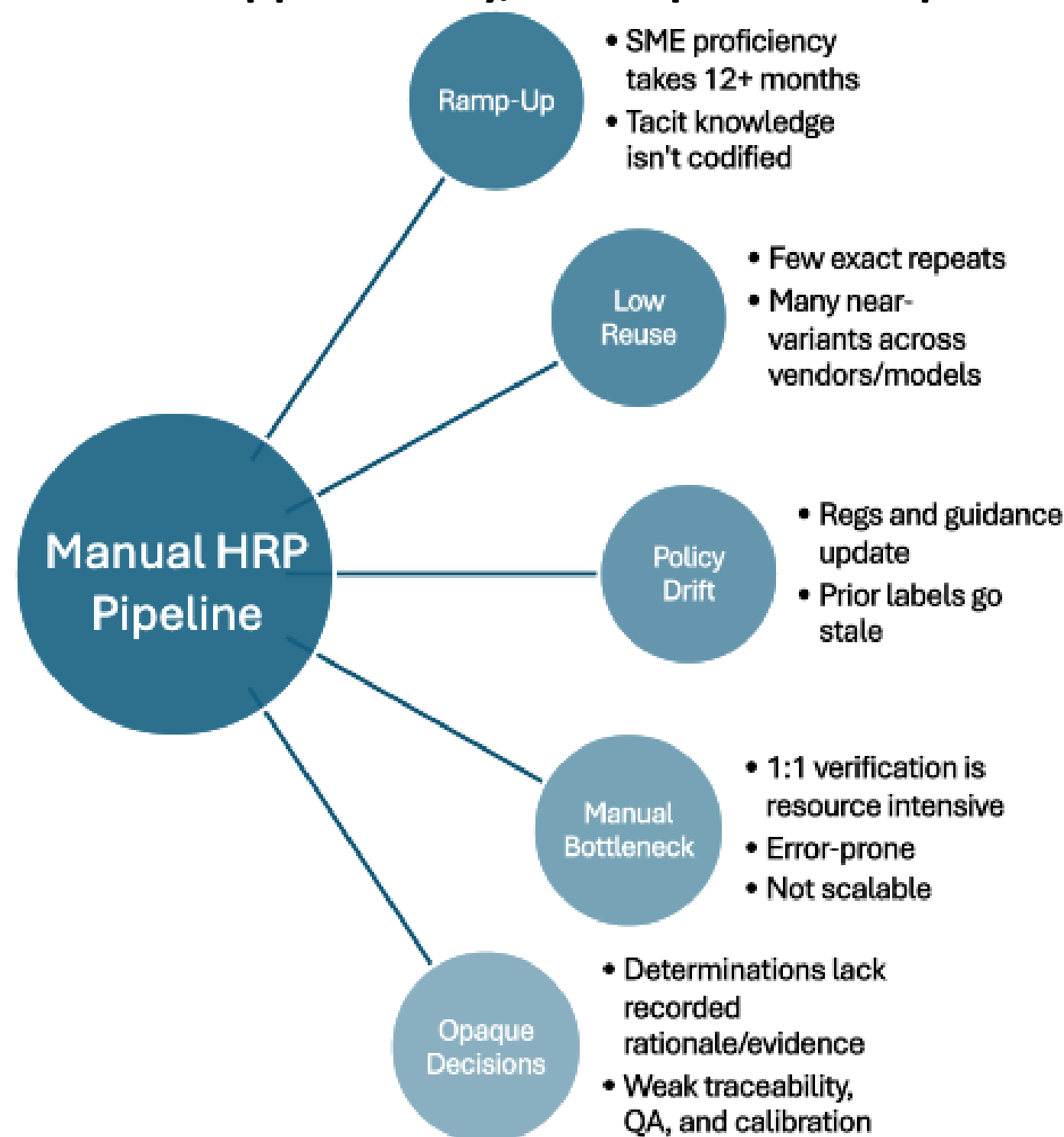


Figure: Key points that drive the framework architecture

System Architecture (Data flow and API)

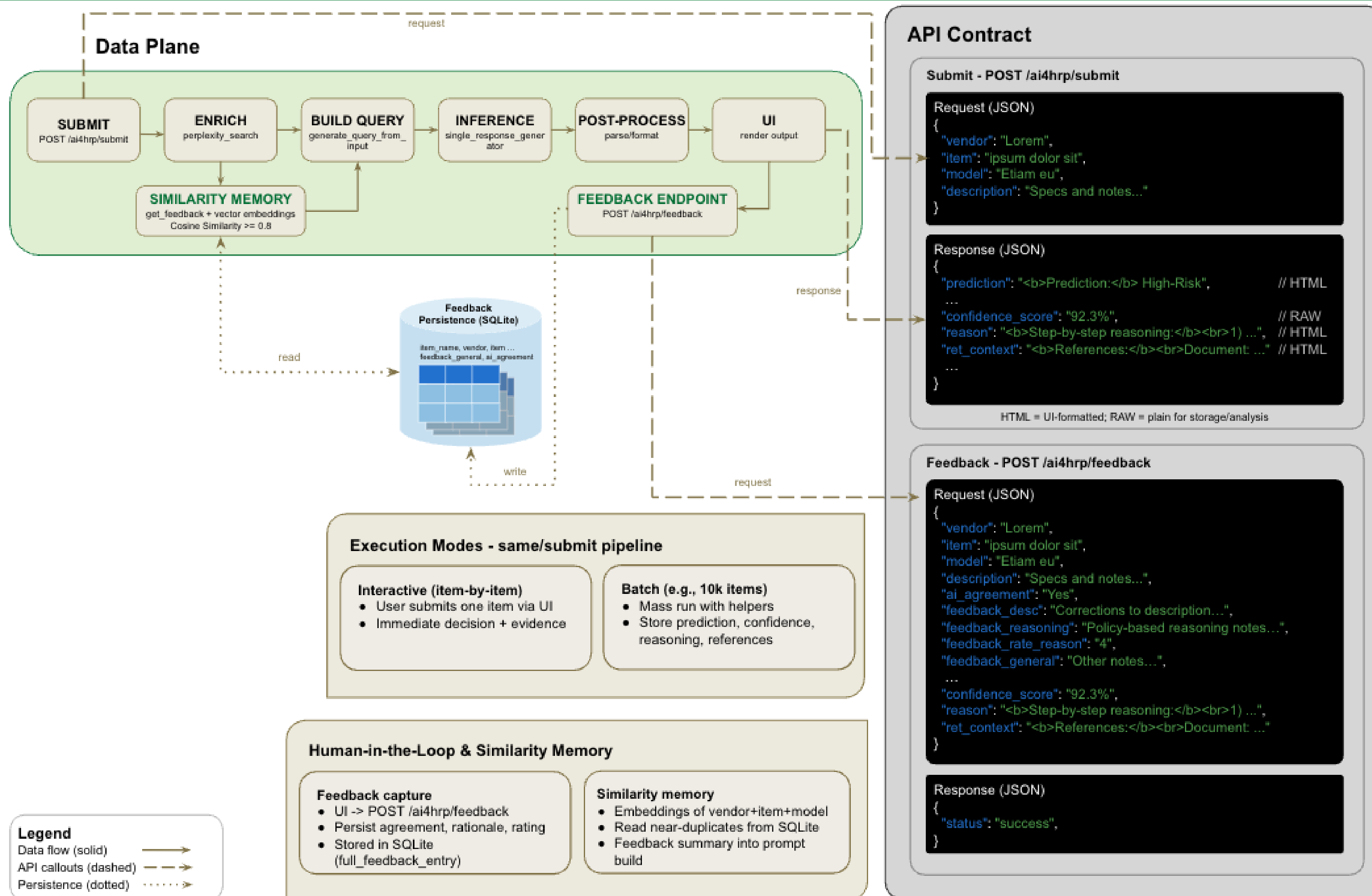


Figure: Request → decision path and endpoints. The API card shows current request/response fields implemented in code

System Planes & Interactions: Data, Control, Observability

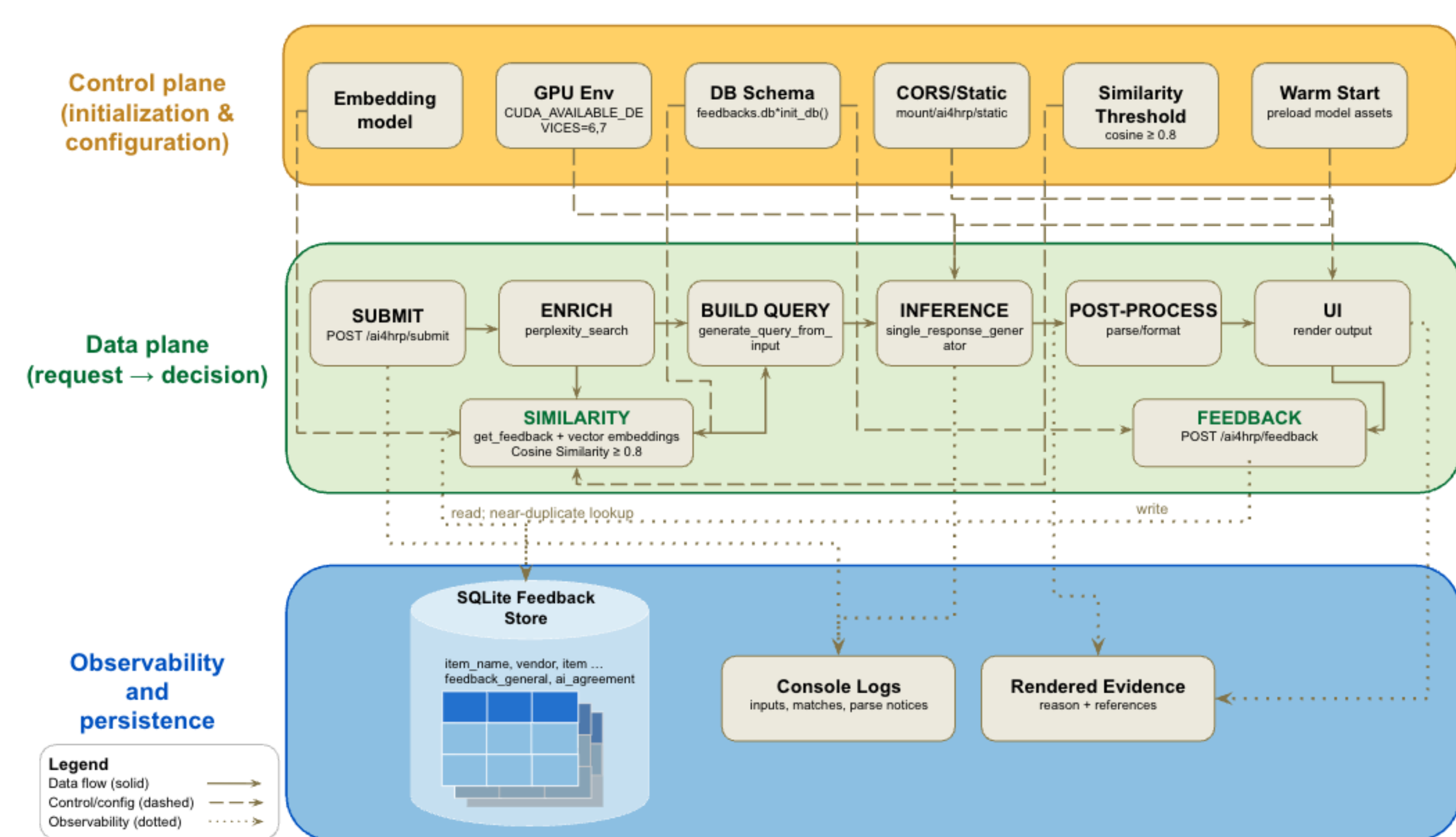


Figure: Control configures the data flow; observability records logs, evidence, and writes

Retrieval Infrastructure

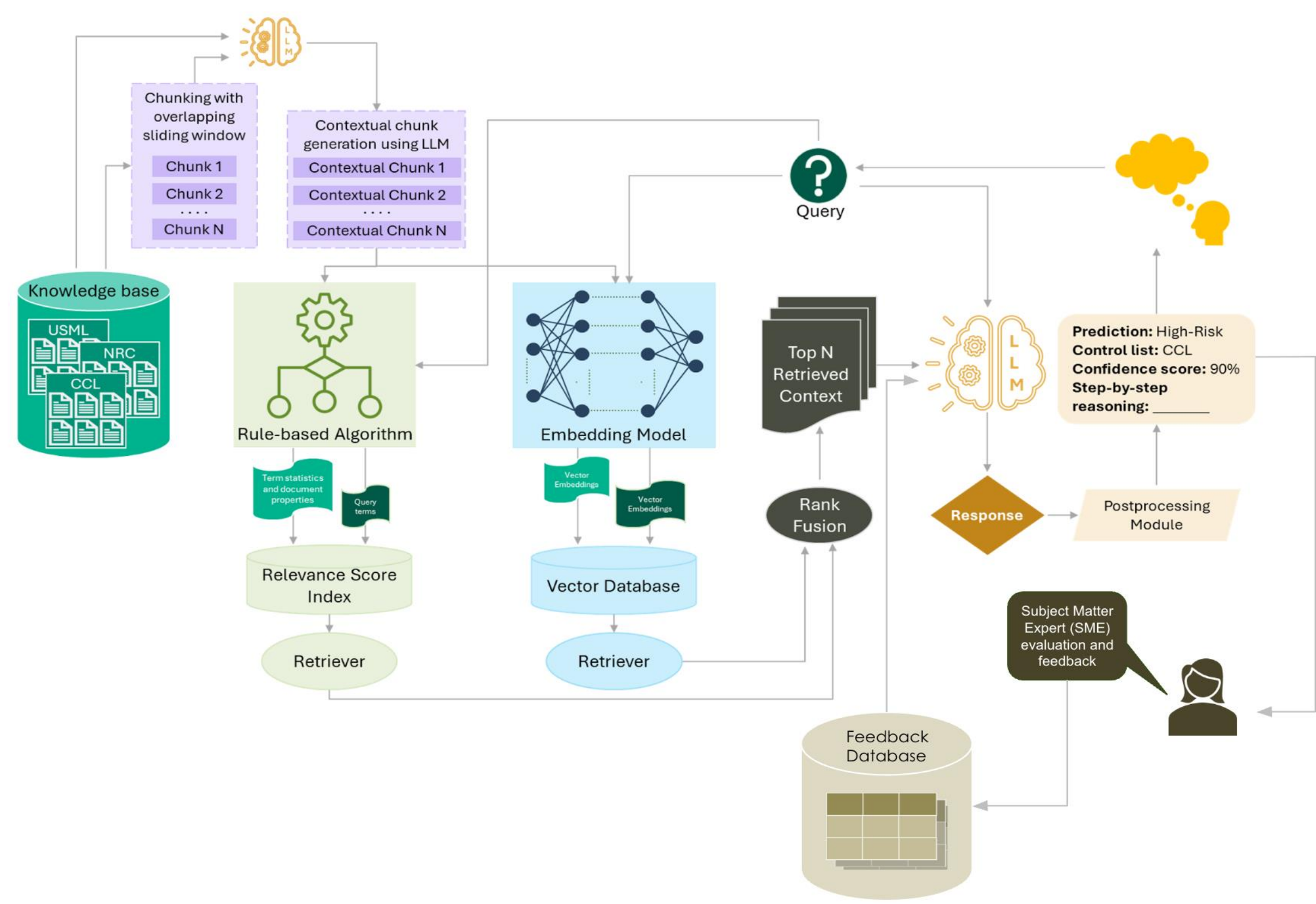
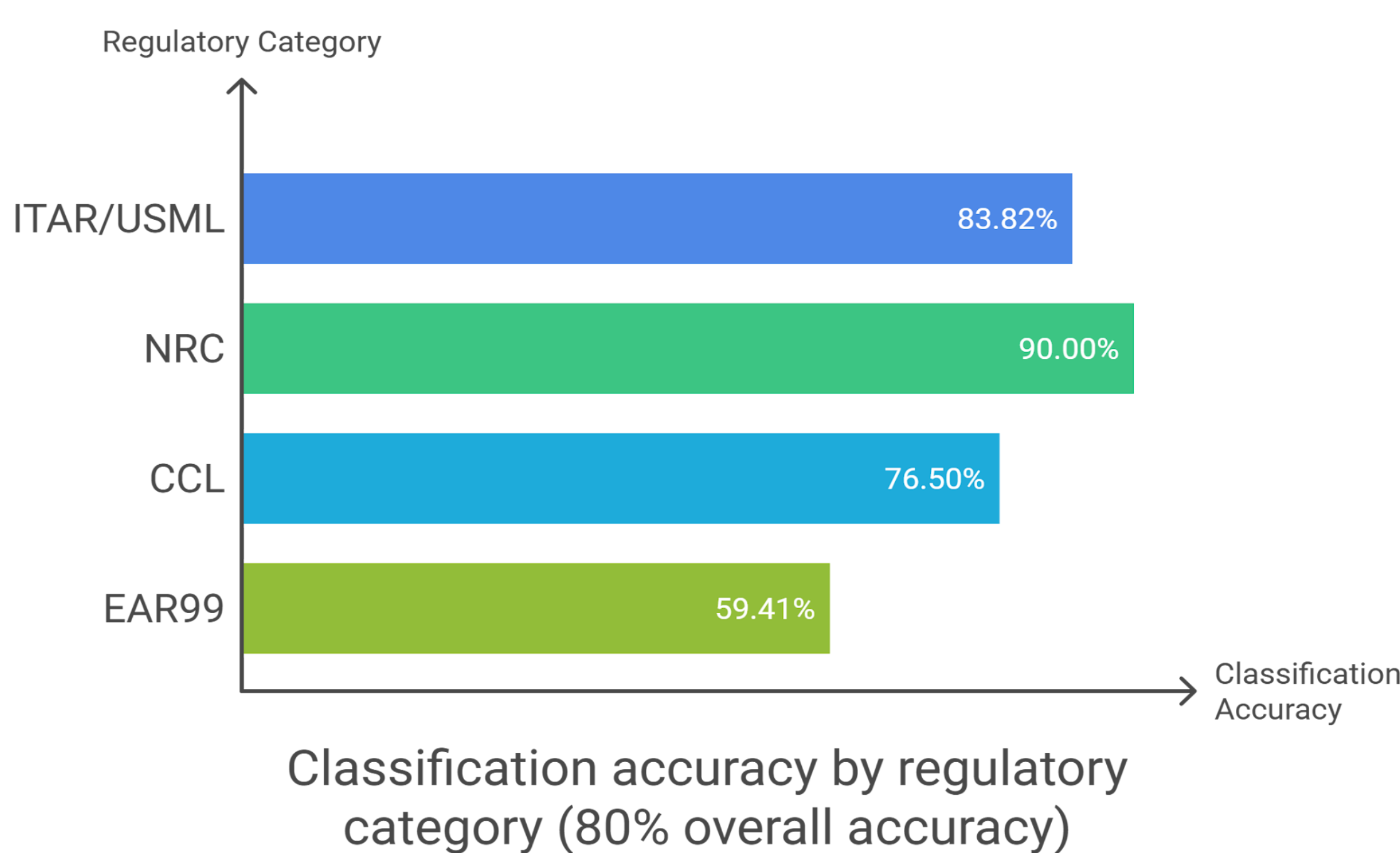


Figure: Retrieval Augmented Generation (RAG) architecture — visual overview of the retrieval, reasoning, and postprocessing flow.

Systems Evaluation



Summary and Future Work

- Results: ~78% accuracy on two-class HRP vs. non-HRP classification across held-out items.
- Errors: Minimal high → low false-negatives; remaining dual-use/ambiguous → SME.
- System: Built a traceability-first, API-driven retrieval and reasoning pipeline with human-in-the-loop feedback and similarity memory for near-duplicates.



- Integration into SAP workflow by ORNL's Information Technology Services Division (ITSD)
- Extend the system to new regulatory domains, including biomedical, legal, and export control contexts
- Improve long-term memory and feedback integration for institutional learning

Acknowledgements

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Please, reach out to the AI-Team for any questions or comments.

