CDA Al Immutable Audit Ledger Technology I Sentinel Protocol v3.0 – Patent Pending Confirmation

System and Method for Mandatory Human-Supervised Al-Human Synergy™ Audit Logging Using Multi-Layer Blockchain Anchoring, Cryptographic Chain Validation, and Real-Time Ethics Enforcement

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IP Rights:

US Provisional: #63/826,381 AU Provisional: #2025902482 AU Trade Mark: #2535745

Bitcoin Ordinal TXID: https://mempool.space/tx/

b233578055bb5412b0a478c99811fc692839be4f418b26bbbb1b37c2a02b243a

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Title: System and Method for Mandatory Human-Supervised Al-Human Synergy™ Audit Logging Using Multi-Layer Blockchain Anchoring, Cryptographic Chain Validation, and Real-

Time Ethics Enforcement Inventor: Dr. Fernando Telles

Assignee: Telles Investments Pty Ltd

Jurisdictions: Australia ■ + United States ■ Filing Type: Provisional Patent (Dual-Jurisdiction)

Filing Dates:

- Australia: 17 June 2025 (AU2025902482)
 - United States: 19 June 2025 (US63/826,381)
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This invention discloses a technically specific system and method for generating immutable, cryptographically-secured audit logs that enforce mandatory human oversight in artificial intelligence (AI) decision-making processes through a proprietary AI-Human Synergy™ architecture. The system solves the critical technical problem of unverifiable AI reasoning chains and absent human accountability mechanisms that prevent safe AI deployment in high-stakes environments including clinical research, regulatory compliance, and legal documentation.

Technical Innovation: The invention implements a multi-layer validation architecture comprising: (1) a mandatory human approval gate that programmatically prevents publication of AI output without explicit human-signed approval, (2) a dual-hash cryptographic verification system (SHA256 + RIPEMD160) that creates tamper-evident audit trails, (3) real-time blockchain anchoring via Bitcoin OP_RETURN transactions with ordinal inscription capabilities, and (4) an embedded ethics firewall that automatically terminates processing upon detection of fabricated sources, statistical anomalies exceeding predefined thresholds, or unauthorized AI overrides.

Practical Application: The system transforms abstract AI-human collaboration concepts into concrete technical improvements by implementing programmatic constraints that enforce human decision authority, prevent AI hallucination propagation, and create legally-admissible audit trails. Unlike generic AI oversight systems, this invention mandates specific technical protocols including cryptographic checksums for all data transformations, Bitcoin ordinal timestamping for immutable proof of human intervention, and API-accessible verification endpoints that enable third-party audit validation without exposing underlying content.

Al-Human Synergy™ Protocol Implementation: The proprietary Al-Human Synergy™ framework operates as a systematic constraint mechanism rather than descriptive terminology, implementing specific technical requirements including: mandatory human approval IDs embedded in cryptographic signatures, live ethics enforcement hooks and escalation triggers, with partial automation implemented in LLM memory systems and full protocol governance handled via human-verified audit logs. Termination of execution is enforced in select conditions, including human attempts to fabricate audit trails or override final outputs without timestamp compliance. Real-time drift detection and anomaly flags are in development for next-generation firewall expansion.

Technical Claims

- Multi-Agent Memory Governance System implementing role-based write permissions across distributed AI nodes with mandatory human oversight checkpoints and automatic divergence detection protocols.
- 2. **Cryptographic Audit Chain Architecture** utilizing dual-hash verification (SHA256 + RIPEMD160) combined with OpenTimestamps (OTS) protocol integration and Bitcoin OP_RETURN anchoring for tamper-evident audit trail generation.
- 3. Real-Time Ethics Enforcement Engine enforcing execution governance via ethics firewall rules that prevent override without cryptographic or timestamped validation. Fabricated input is blocked during LLM execution by native firewall constraints and human audit enforcement. Statistical anomaly monitoring is currently under expansion for future automation.
- 4. **Blockchain-Anchored Human Validation Protocol** requiring cryptographicallysigned human approval credentials for all AI output releases, with Bitcoin ordinal inscription providing permanent public verification endpoints.
- 5. **Interoperable Audit API Framework** enabling third-party verification of audit integrity without content exposure, supporting regulatory compliance across clinical, legal, and financial domains.
- 6. **Mandatory Human Oversight Architecture** implementing programmatic blocks preventing AI autonomous operation through technical constraints including approval gate mechanisms, credential verification systems, and real-time monitoring protocols.

Commercial Applications

- Clinical Research Reproducibility: Systematic review and meta-analysis audit logging with PROSPERO protocol compliance and statistical validation checkpoints
- Regulatory Compliance Infrastructure: Automated audit trail generation for FDA, EMA, and other regulatory submissions with cryptographic verification capabilities
- Legal Documentation Systems: Tamper-evident audit logs for Al-assisted legal research with blockchain-anchored human oversight records
- Enterprise Al Governance: Multi-tenant audit systems enabling organizational Al compliance monitoring with role-based access controls

Implementation Status

- Operational System: Complete Al-Human Synergy Sentinel Protocol™ v3.0 deployment with 134+ validated meta-analysis executions demonstrating full reproducibility from source data to final outputs
- Blockchain Integration: Active Bitcoin OP_RETURN anchoring across 5+ transactions with optional ordinal inscription pilot execution completed for public audit verification
- Cryptographic Validation: SHA256 + RIPEMD160 dual-hash system operational with OpenTimestamps integration providing decentralized time-anchoring capabilities
- Ethics Firewall: Preliminary enforcement engine operational. Core logic includes structured termination rules for human-inserted fabrication, LLM hallucination

- interception, and unauthorized override resistance. Statistical drift detection in roadmap. Full automation in development.
- Clinical Validation: Partial validation completed on benchmark meta-analysis (Telles et al., Pediatrics, 2020; DOI: 10.1542/peds.2020-0146). Pilot confirmation of all core modules achieved: Al-human screening, OCR extraction, 134 reproducible forest plots, audit-integrated funnel plot generation. Meta-regression module and PDF annotation extraction pipeline in progress.
- PROSPERO Registration: Public protocol CRD420251065371 demonstrating Al-Human Synergy™ systematic constraint implementation in real-world clinical research
- Trademark Protection: Filed applications for Al-Human Synergy™ (#2535745) and Al-Human Synergy Sentinel Protocol™ (#2549093) establishing proprietary technical constraint frameworks
- Patent Protection: Provisional Patent filed (AU #2025902482, US #63/826,381). Filing process self-audited using the system's own dual-hash (2HA) and OP_RETURN mechanisms anchored via Bitcoin TXIDs: 964e6b06a207363be59e853bedbd1dddf21ba5d881b8d7d1a5e4e8e383c7bc48 and 8c2eb08d7a58edf0ea2178fe0d81218dd0b5d15bc71cc6fca0a840ad8fee741d.
- API Development: Interoperable verification endpoints under development (target: https://www.meta-analysis.ai) enabling third-party audit validation capabilities

Audit References

Artifact Type	Identifier	Verification
OP_RETURN (US)	TXID: 8c2eb08d7a58edf0ea2178fe0d81218dd0b5d15bc71cc6fca0a840ad8fee741d	Block Hei
OP_RETURN (AU)	TXID: 964e6b06a207363be59e853bedbd1dddf21ba5d881b8d7d1a5e4e8e383c7bc48	Block Hei
Audit Log SR035	audit_log_MVP1-SR035.json	SHA256: b826ea7 2HA (RIPI audit_l
Audit Log SR034	audit_log_MVP1-SR034.json	SHA256: 659d9d4 2HA (RIPI audit_1

Ordinal Chain Position

This inscription serves as the canonical audit confirmation for the patent activation of Sentinel Protocol's Al-Human Synergy™ system under CDA Al governance.

We don't use Al - we synergize with it. We don't automate humans out - we amplify human reasoning in.

SentinelProtocol #AlHumanSynergy #PatentPending

Contact & Custodian

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Dr. Fernando Telles BMedSc(Adv) MD(Dist) ■ Dr.Telles@aihumansynergy.org https://www.aihumansynergy.org CDA AI I AI—Human Synergy™ IP Custodian This audit log was immutably published on the Bitcoin blockchain via Ordinal inscription on 19 June 2025.

TXID: b233578055bb5412b0a478c99811fc692839be4f418b26bbbb1b37c2a02b243a Block:901,858 Viewable on-chain at: https://mempool.space/tx/b233578055bb5412b0a478c99811fc692839be4f418b26bbbb1b37c2a02b243a