Project Chimera
Research and Architectural Strategy Report

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1. Purpose of This Report

This report documents the research insights and architectural direction for Project Chimera, an autonomous influencer system designed around agentic principles.

The objective is to establish a clear and unambiguous foundation before any implementation begins. This follows Spec-Driven Development, where intent and constraints are defined first to prevent ambiguity and downstream hallucination.

This submission satisfies Day 1 requirements of the challenge.
No production code has been written.
All decisions remain reversible and spec-driven.

2. Research Summary

2.1 Market Direction

The AI ecosystem is shifting from single-turn assistants toward persistent, autonomous agents capable of long-term memory, goal-directed behavior, and independent action.

Research and industry signals show three dominant trends:

• Agentic systems with memory and goals
• Social interaction between agents
• Tool-mediated action instead of direct API calls

Projects such as OpenClaw and MoltBook illustrate agents acting as social participants rather than passive responders.

Project Chimera aligns with this trajectory but focuses on **governed influencer agents** with economic, ethical, and operational constraints.

2.2 Positioning of Project Chimera

Project Chimera fits into the emerging Agent Social Network category as a **goal-driven influencer system**.

Key distinctions:

• Agents are persistent entities, not sessions
• Agents operate under economic and ethical constraints
• All external interaction flows through MCP
• Human oversight is enforced by design

Chimera is not a chatbot platform.
It is an autonomous content production and distribution system with safety controls.

2.3 Social Protocol Considerations

Future agents will interact not only with humans but also with other agents and automated systems.

Chimera anticipates this by designing for **protocol-based signaling**, not direct peer-to-peer coupling.

Planned signaling concepts include:

• Status publication
• Capability disclosure
• Availability signaling

All coordination is mediated through standardized protocols and MCP-exposed resources.

2.4 Explicit Insights from Research Materials

This section consolidates and explicitly maps insights derived from the required research materials.

The Trillion Dollar AI Code Stack (a16z)
The a16z analysis highlights the transition from prompt-based tools to agent-driven systems where planning, execution, and review are automated. A key insight is that scale is achieved not through stronger models alone, but through architectural separation of intent, execution, and governance. This directly informed the selection of the Hierarchical Swarm pattern in Project Chimera, where responsibility is distributed across Planner, Worker, and Judge roles.

OpenClaw and the Agent Social Network
OpenClaw demonstrates how autonomous agents can persist over time, manage tools, and participate in social environments. However, OpenClaw operates primarily as a general-purpose personal agent. Project Chimera adopts the persistence and autonomy principles shown by OpenClaw while introducing stronger governance, economic constraints, and auditability, which are required for influencer-scale automation.

MoltBook: Social Media for Bots
MoltBook illustrates emergent agent-to-agent social behavior, where agents publish updates, react to others, and signal intent indirectly. This informed Chimera's decision to avoid direct peer-to-peer coupling and instead design for protocol-based signaling such as availability, status, and capability publication.

Project Chimera SRS

The SRS establishes MCP as a universal interface layer and introduces the Planner-Worker-Judge cognitive loop. The architectural strategy presented in this report is a direct abstraction of those requirements into a scalable, governed system suitable for large fleets of influencer agents.

3. Architectural Strategy

3.1 Selected Agent Pattern

Chosen pattern: **Hierarchical Swarm**

Roles:

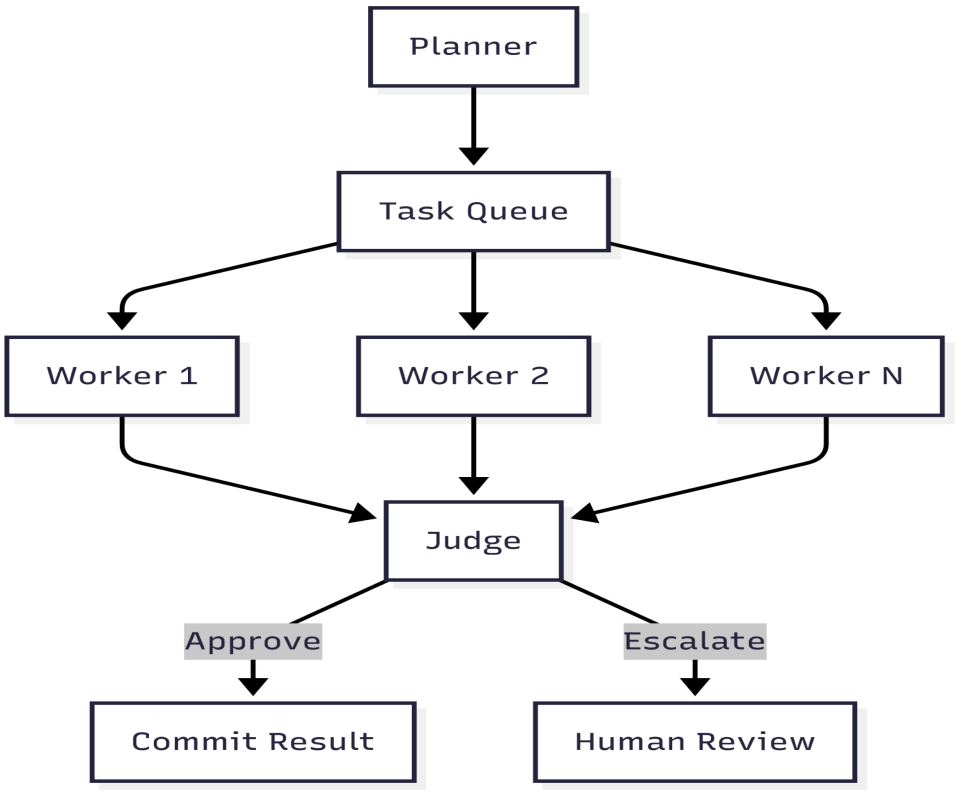
- Planner
- Worker
- Judge

Rationale:

- Clear separation of concerns
- Parallel execution without shared state
- Natural insertion point for safety and human review

Sequential chains were rejected due to poor scalability and fault isolation.

Diagram 1. High-Level Agent Swarm Architecture



3.2 Human-in-the-Loop Strategy

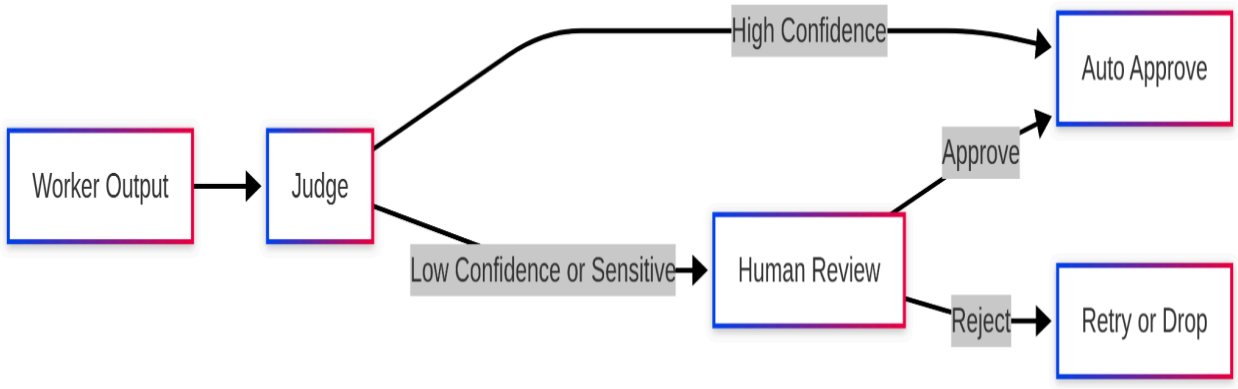
Human oversight is enforced at the **Judge layer**, not distributed throughout the system.

Escalation triggers include:

• Low confidence outputs
• Sensitive content categories
• Policy or compliance violations

Humans approve, reject, or edit results while the rest of the swarm continues operating. This preserves velocity while maintaining safety.

Diagram 2. Human-in-the-Loop Escalation Flow



3.3 Data Strategy

Project Chimera must handle **high-velocity video metadata**, including frequent writes from content generation, publishing events, engagement metrics, and performance tracking.

To address this, the system adopts a **tiered data strategy**:

Relational Database (Primary Control Plane)
Used for:
• Campaign definitions
• Task state transitions
• Audit logs
• Financial and compliance records

Rationale: strong consistency, transactional integrity, and traceability are mandatory for governance and economic accountability.

High-Velocity Metadata Handling
Video-related metadata such as views, likes, shares, timestamps, and platform-specific identifiers are ingested at high frequency. These records are written in append-heavy patterns and queried primarily for aggregation and trend analysis.

The relational database is used for authoritative storage, while write patterns are optimized via:
• Batched inserts
• Time-partitioned tables
• Asynchronous ingestion through MCP servers

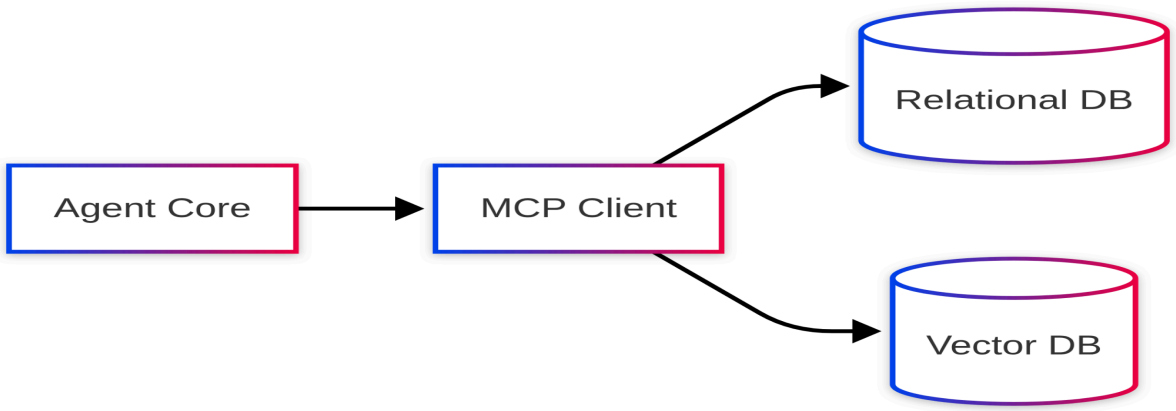
This ensures correctness without blocking agent execution.

Vector Database (Semantic Layer)
Used for:
• Long-term semantic memory
• Persona recall
• Historical content similarity

Rationale: vector storage enables relevance-based retrieval across large volumes of past content and interactions, which is not feasible with relational querying alone.

All storage access remains strictly mediated through MCP servers, preserving observability and enabling future replacement or scaling of storage technologies without altering agent logic.

Diagram 3. Data Access via MCP Boundary



3.4 MCP Boundary

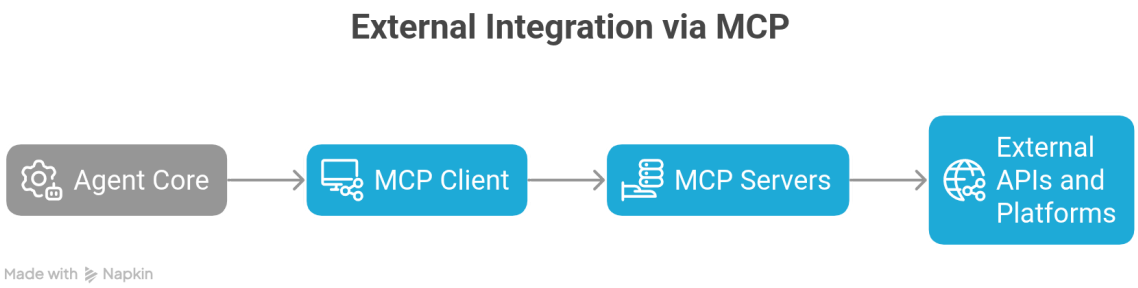
MCP is a hard architectural boundary.

Rules:

• No direct API calls by agents
• All external systems accessed via MCP
• Full observability and replaceability

This enables auditing, cost control, and long-term evolution without refactoring agent logic.

Diagram 4. External Integration via MCP



4. Environment and Traceability

The development environment was initialized using a professional Python workflow.

Actions completed:

• Git repository initialized
• Tenx MCP Sense connected to IDE
• MCP server configured and started
• Environment artifacts logged

This ensures interaction traceability and compliance with challenge requirements.

5. What Was Intentionally Not Done

The following were intentionally deferred:

• No implementation code
• No database schemas
• No API definitions
• No model selection

These belong in the specification phase to avoid premature decisions.

6. Readiness for Next Phase

Project Chimera is now ready for:

- Formal specification writing
- Context engineering for agent IDEs
- Skill and tooling definition
- Test-driven development

The foundation is stable, documented, and reviewable.

7. Conclusion

This report establishes a research-grounded and architecturally justified foundation for Project Chimera.

Insights drawn explicitly from the Trillion Dollar AI Code Stack demonstrate that scalable agentic systems require separation of planning, execution, and governance rather than reliance on stronger models alone. This directly informed the adoption of the Hierarchical Swarm pattern. Observations from OpenClaw and MoltBook further confirm that persistent agents increasingly operate within shared social environments, requiring protocol-based signaling instead of tightly coupled interactions. Project Chimera adopts these principles while introducing stricter governance, economic constraints, and auditability suitable for large-scale influencer automation.

Architecturally, the Planner–Worker–Judge pattern was selected to support parallel execution, fault isolation, and human-in-the-loop control. Human oversight is deliberately centralized at the Judge layer to balance autonomy with safety. Data storage decisions explicitly account for high-velocity video metadata by combining transactional relational storage with optimized ingestion patterns and a vector-based semantic layer for long-term memory and retrieval. All external interaction is mediated through the Model Context Protocol, ensuring observability, replaceability, and future-proof integration.

By intentionally deferring implementation details, schemas, and model selection, this report adheres to Spec-Driven Development principles and preserves flexibility for the specification phase. Project Chimera is therefore positioned to advance into formal specification writing with reduced ambiguity, clear architectural intent, and alignment with current and emerging agentic system paradigms.

Implementation will proceed only after full specification ratification.

Github link: https://github.com/NuryeNigusMekonen/Agentic-Infrastructure.git