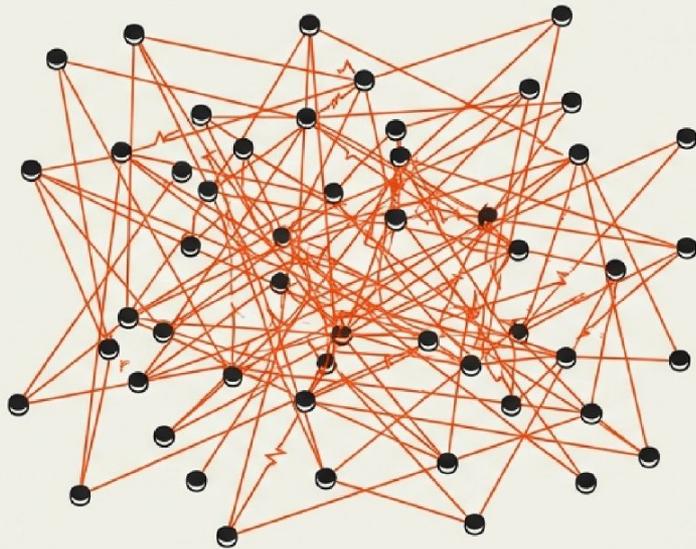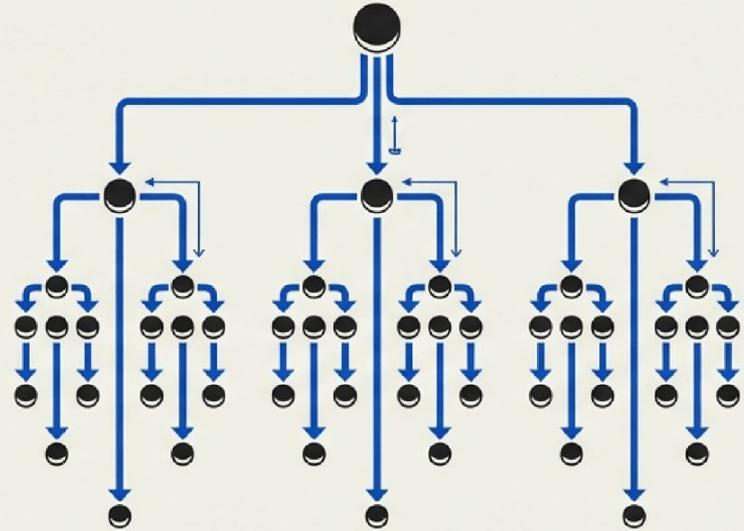# Organizational Theory as the Foundation for Agentic AI

MESH // CHAOTIC COORDINATION CRISIS

HIERARCHY // ENGINEERED STRUCTURE & SCALABILITY

Why Multi-Agent Systems Fail at Scale and How Design Principles Solve the Coordination Crisis.

Based on "Organizational Theory as the Foundation for Agentic AI Systems" by Jonathan H. Westover, PhD.

Human Capital Innovations

The Coordination Tax:
Why More Agents Doesn't Mean Better Results

The Promise
JetBrains Mono
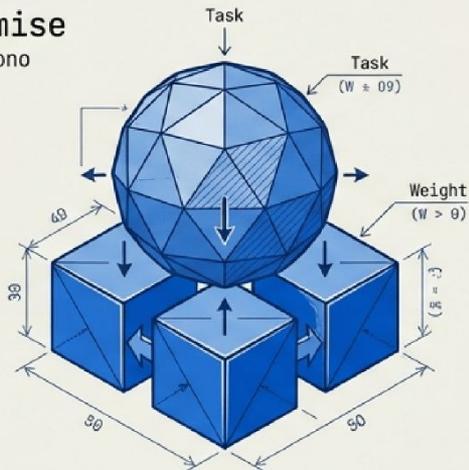
Agentic AI is defined not as chatbots, but as systems that maintain state, plan sequences, and invoke tools. The expectation is "Agent Swarms" that self-organize to solve complex problems.

The Reality
JetBrains Mono
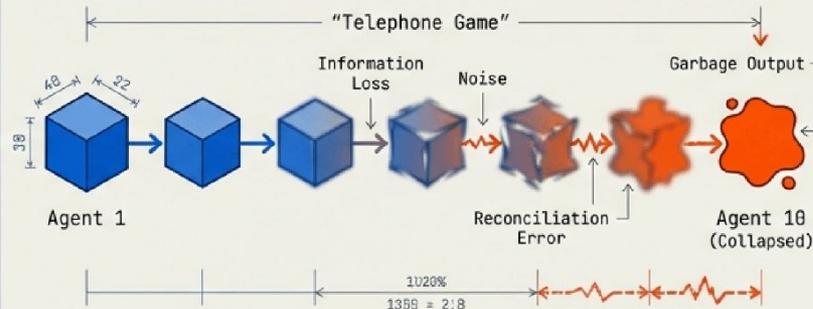
Systems that work elegantly with 3 agents collapse under overhead with 10. Information degrades as it passes between agents. Token costs explode as agents clarify, restate, and reconcile, creating a "Coordination Tax" that kills ROI.

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The Mathematics of Failure

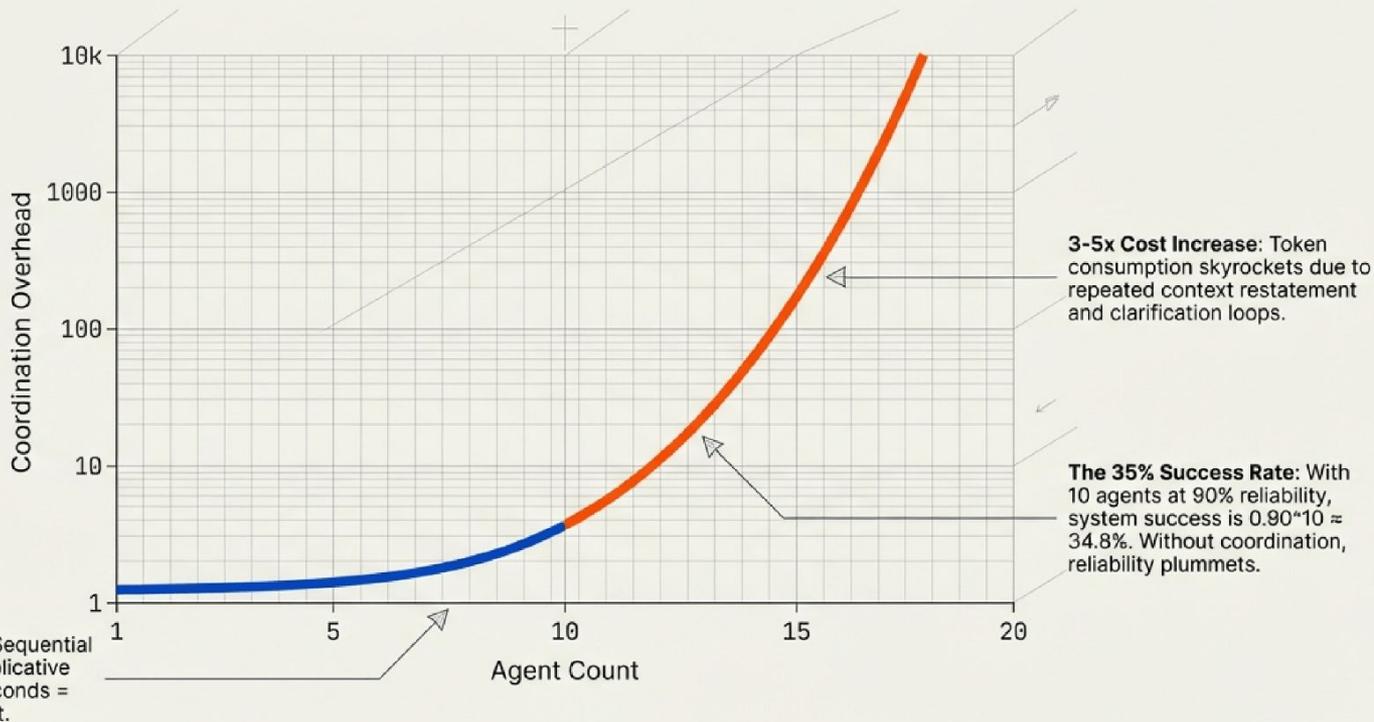**3-5x Cost Increase**: Token consumption skyrockets due to repeated context restatement and clarification loops.

The 35% Success Rate: With 10 agents at 90% reliability, system success is $0.90^{10} \approx$ 34.8%. Without coordination, reliability plummets.

Latency Compounding: Sequential processing creates multiplicative latency. 5 agents x 10 seconds = 50 seconds minimum wait.

y-axis: Coordination Overhead — 1, 10, 100, 1000, 10k

x-axis: Agent Count — 1, 5, 10, 15, 20

The bottleneck isn't model capability. It is coordination.

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We Are Repeating the Management Mistakes of 1920

Organizational theorists (Galbraith, March & Simon) have studied coordination for a century. We are currently building AI systems that assume models have 'unlimited managerial capacity." They do not.

(48,-1, 0 +1)   JetBrains Mono

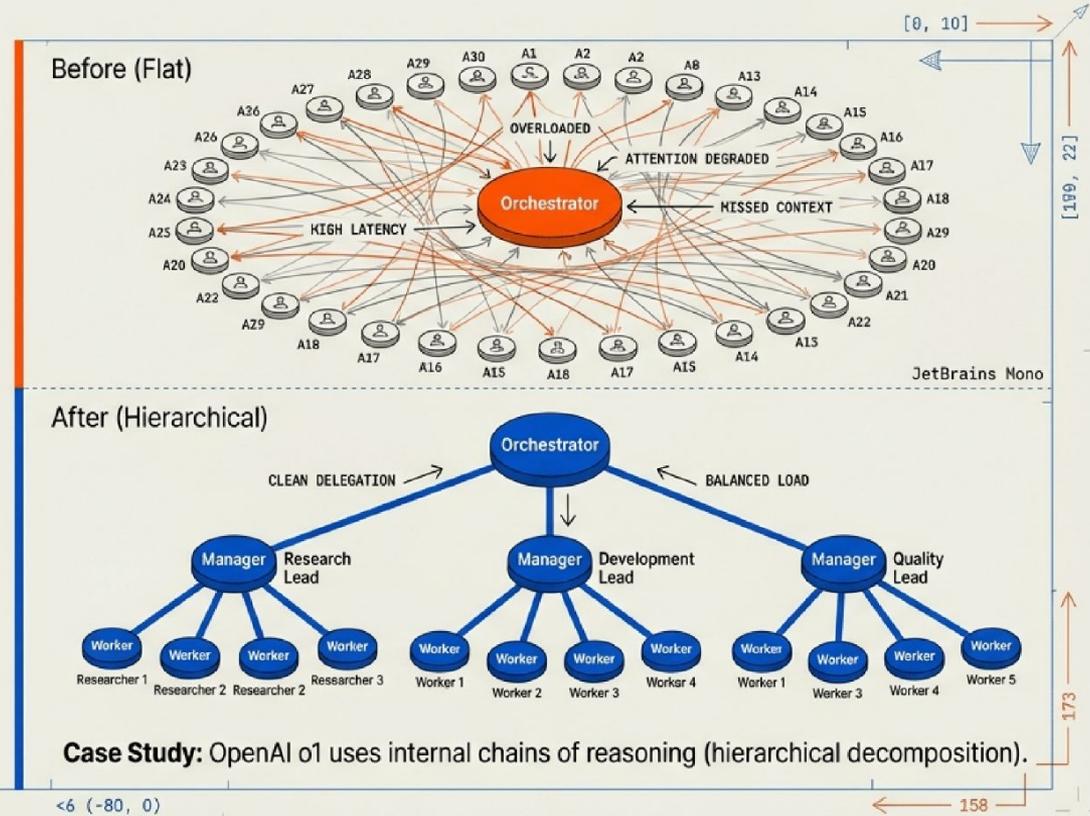| Human Org Concept (1920s)	AI Architecture Reality (2020s)
Span of Control (Managerial Attention)	Context Window & Attention Limits
Departmental Silos	Specialized Agent Roles
Memos & Specifications	Structured Artifacts (JSON/Schemas)
Bounded Rationality (Cognitive Limits)	"Lost in the Middle" Phenomenon

[0, 10]

[100, 22]

"*Organizations that recognize agentic AI as fundamentally an organizatianal design problem stand to gain significant competitive advantage.*"

[75, 21]

173

<ʘ (-80, 0)   150

Principle 1: Hierarchy and Span of Control

The Problem: An 'Orchestrator' agent cannot effectively manage 50 subordinates. Attention degrades.

The Fix: Classical theory (Urwick, 1956) suggests a span of control of 5–7 direct reports.

AI Design Pattern: Introduce 'Middle Manager' agents. Group agents into functional clusters (e.g., Research Lead coordinates 5 researchers).
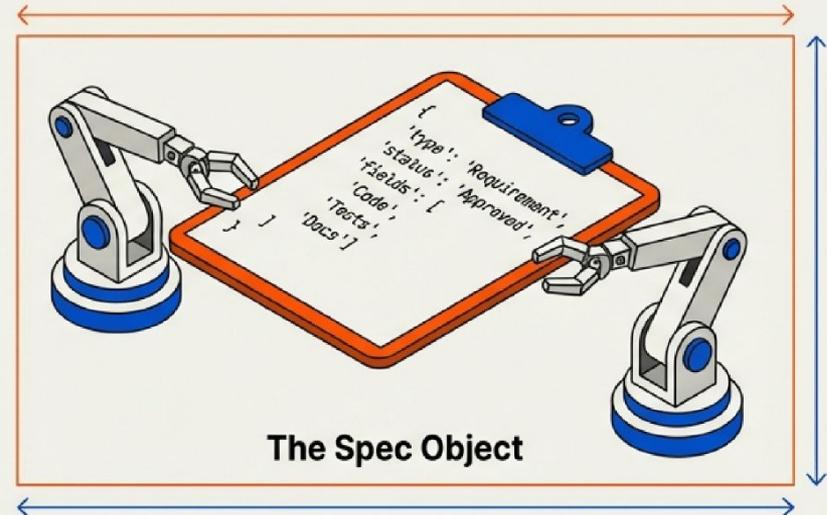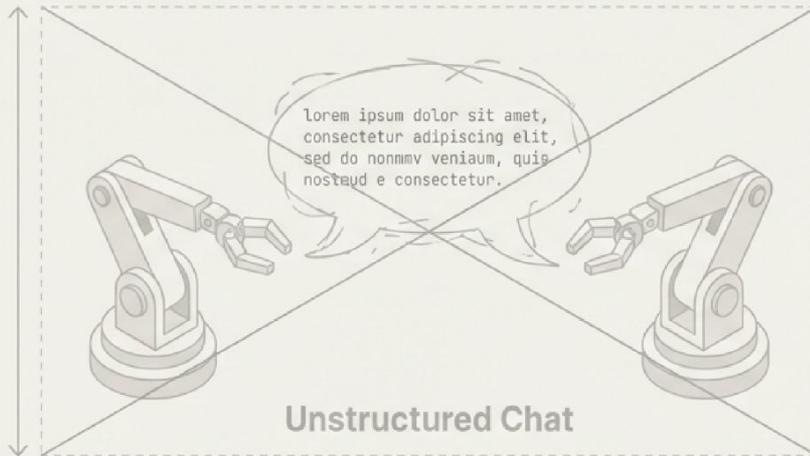

Case Study: OpenAI o1 uses internal chains of reasoning (hierarchical decomposition).

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Principle 2: Boundary Objects Over Unstructured Chat

The Problem: Passing freeform text between agents creates the "telephone game" and hallucination.

The Fix: Boundary Objects (Star & Griesemer, 1989). Shared artifacts that different groups can reference.

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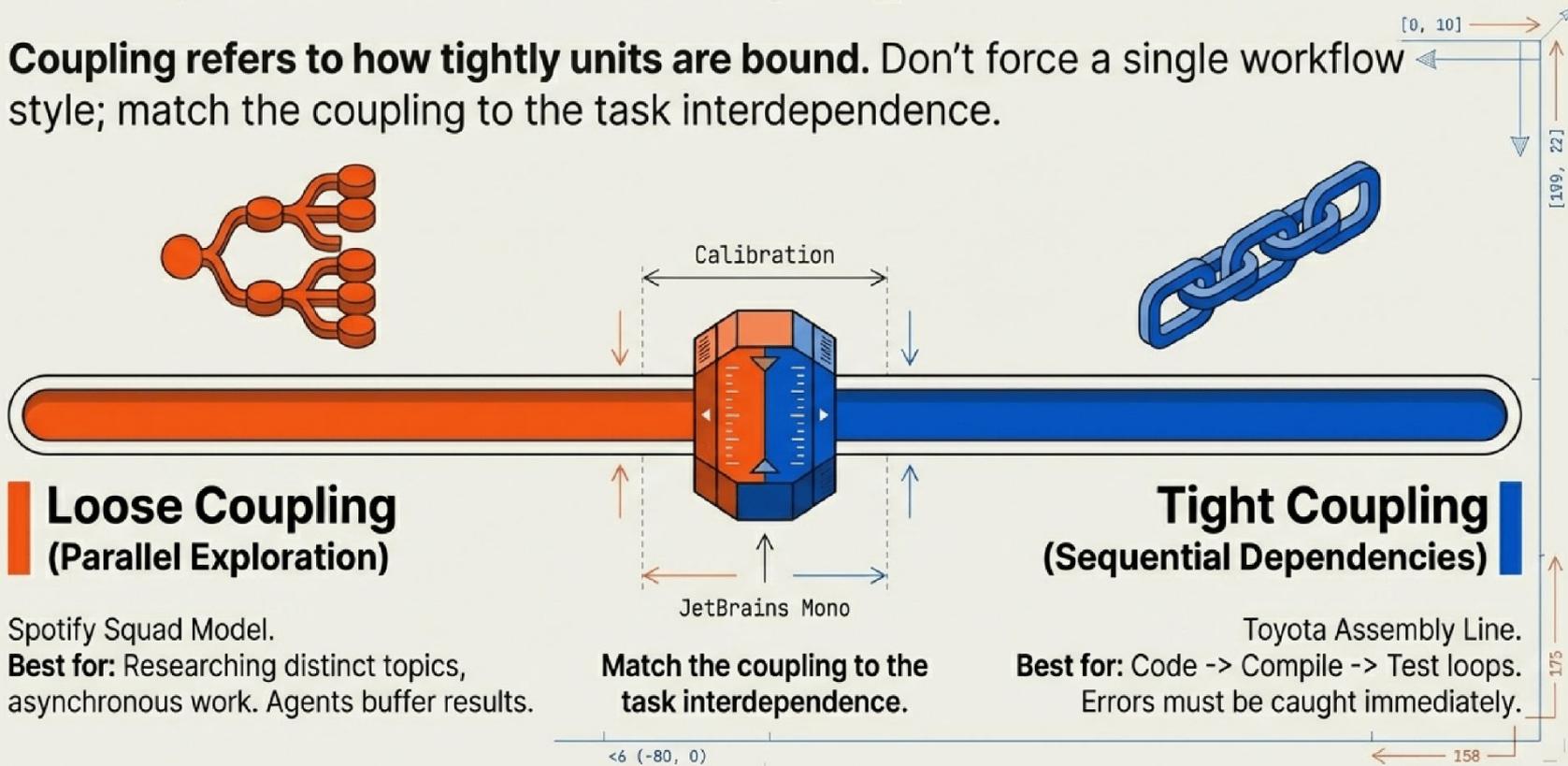
Unstructured Chat

The Spec Object

Industry Parallel: Just as Stripe uses detailed API specs to align teams, AI agents need **structured schemas** (**Requirements Object**, **Design Spec Object**) to align research and execution.

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Principle 3: Calibrated Coupling

Coupling refers to how tightly units are bound. Don't force a single workflow style; match the coupling to the task interdependence.

Calibration

[0, 10]

[199, 22]

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Loose Coupling
(Parallel Exploration)

Tight Coupling
(Sequential Dependencies)

Spotify Squad Model.
Best for: Researching distinct topics, asynchronous work. Agents buffer results.

Match the coupling to the task interdependence.

Toyota Assembly Line.
Best for: Code -> Compile -> Test loops. Errors must be caught immediately.

175

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Principle 4: Managing Bounded Rationality

The Problem: "Lost in the Middle" phenomenon. Models have finite attention. Feeding an agent the entire project history ensures failure.

The Fix: Division of labor and information abstraction (Simon, 1957). Managing an agent serups in the ulti- primate project abstraction, chariflot tofonh middle managers. Fine point mustcenecate the agents loss analysis are not matamap.

Executive / Orchestrator — Strategic View

[5:1 ABSTRACTION]

Middle Managers — Summaries

[10:1 CONDENSATION]

Worker Agents

[DATA FLOW]

[199, 22]

[HIERARCHY LEVEL]

event_stream
text_data
raw_logs
raw_logs

External Memory: Offload facts to RAG databases, not the context window. Use hierarchical summarization to preserve signal.
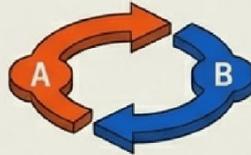
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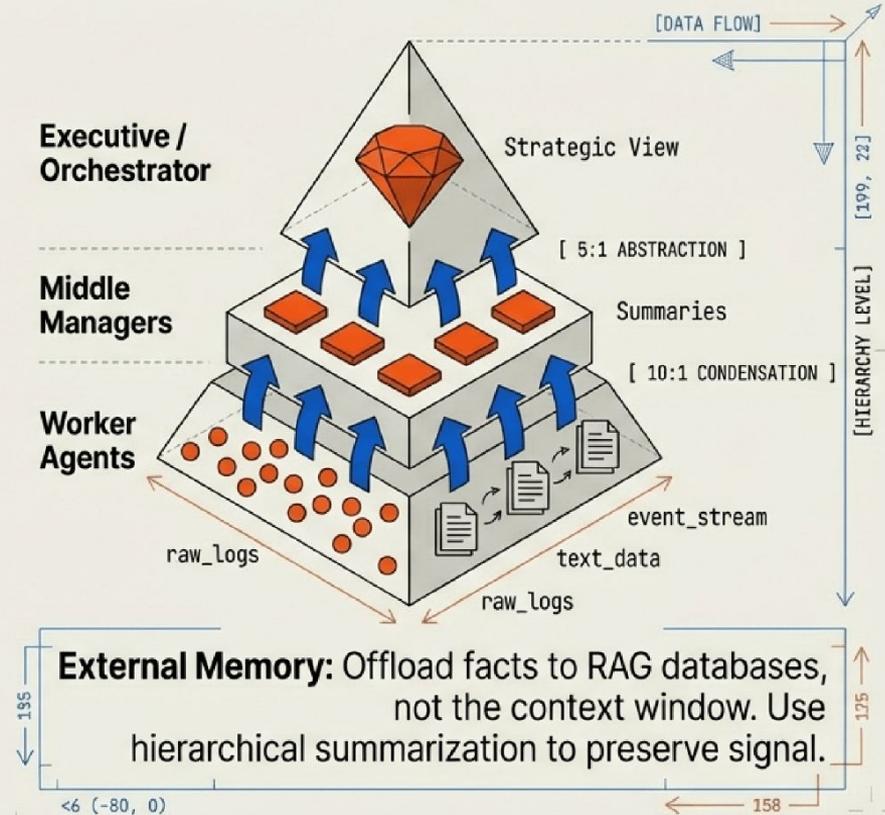
Principle 5: Shared Language and Protocols

Even with specs, interpretive disconnects occur. "Improve code" means different things to different models. We need strict protocols.

[0, 10]

[199, 22]

[PROTOCOL CARDS]

Domain Ontologies

Define strict vocabularies. Example: 'Critical' vs 'High Priority' must be mathematically defined.
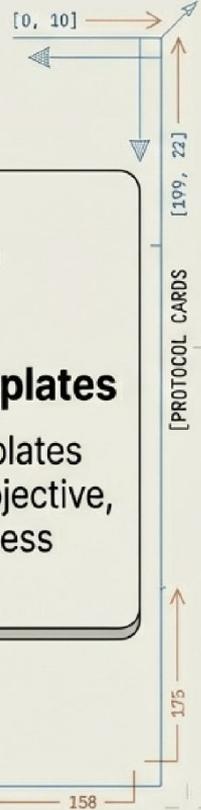
Read-Back Protocols

Agent B must restate the understanding of the task to Agent A before executing. (Borrowed from Aviation).
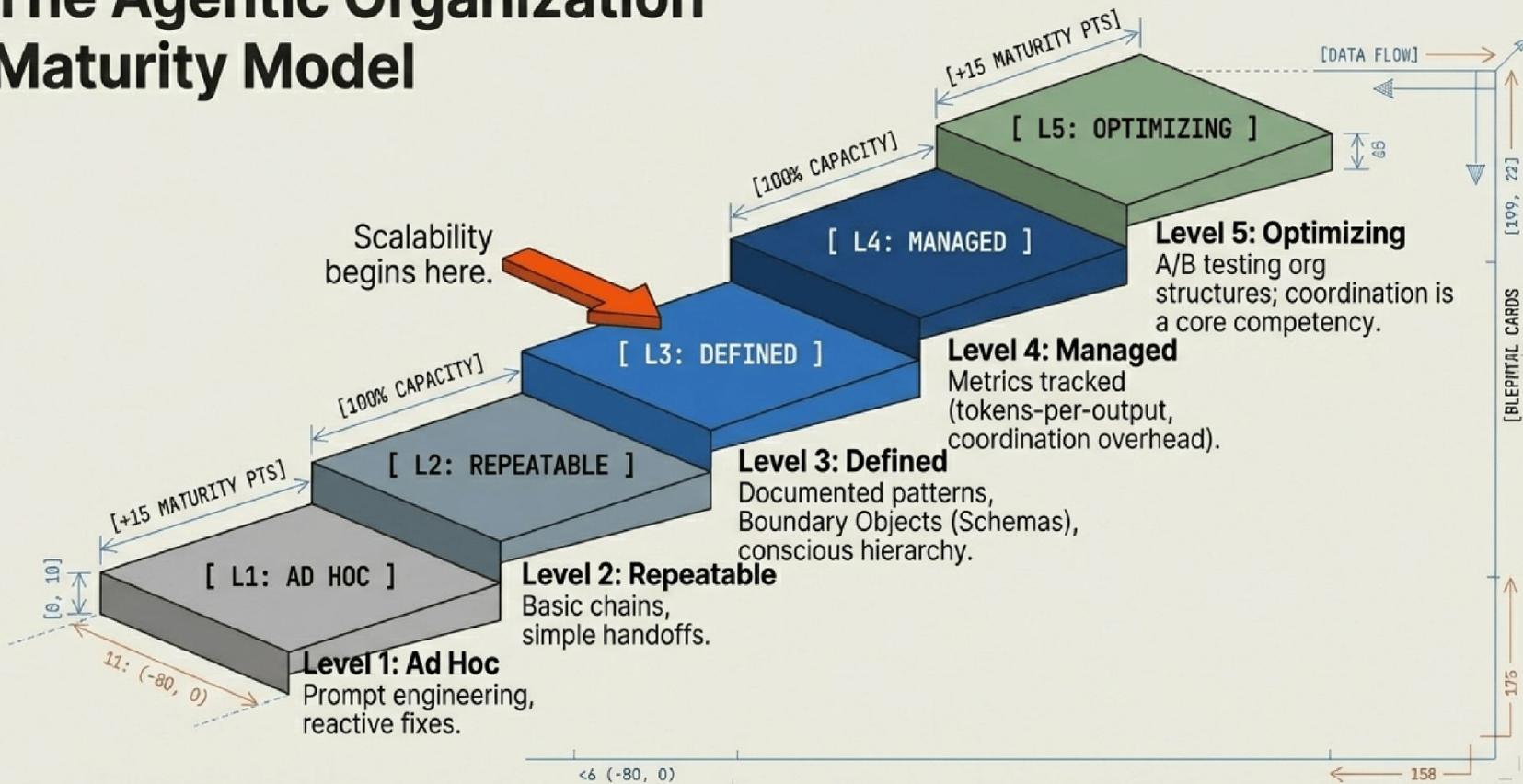
Standardized Templates

Task assignment templates with fixed fields for Objective, Constraints, and Success Criteria.

Industry Parallel: Boeing engineers use 'interface control documents' to prevent physical crashes. AI needs the same to prevent logic crashes.

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The Agentic Organization Maturity Model

[+15 MATURITY PTS]

[L5: OPTIMIZING]

[DATA FLOW]

Scalability begins here.

[100% CAPACITY]

[L4: MANAGED]

Level 5: Optimizing
A/B testing org structures; coordination is a core competency.

[L3: DEFINED]

Level 4: Managed
Metrics tracked (tokens-per-output, coordination overhead).

[100% CAPACITY]

[L2: REPEATABLE]

Level 3: Defined
Documented patterns, Boundary Objects (Schemas), conscious hierarchy.

[+15 MATURITY PTS]

[L1: AD HOC]

Level 2: Repeatable
Basic chains, simple handoffs.

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l1: (-80, 0)

Level 1: Ad Hoc
Prompt engineering, reactive fixes.

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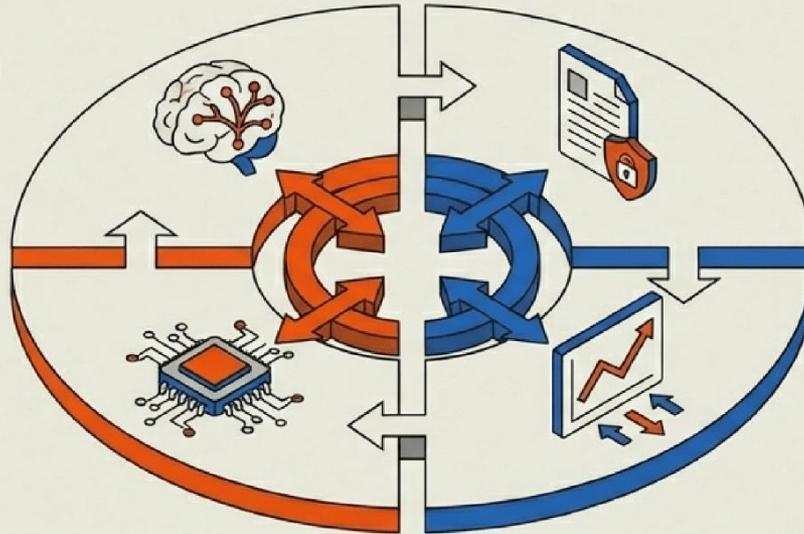[BLEPIXAL CARDS]

[199, 22]

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Building the Cross-Disciplinary Design Team

You cannot build Level 3+ systems with ML Engineers alone.

Org Psychologists
Design roles, flows, span of control.

Domain Experts
Define the "work" and ontologies.

AI Engineers
Implementation & model constraints.
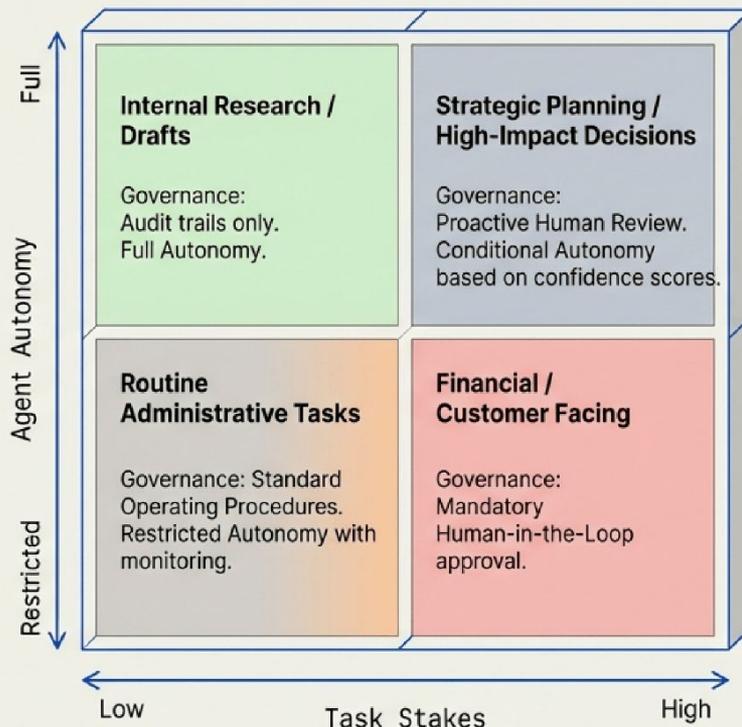
Data Scientists
Measure coordination efficiency.

Treat the team as a 'Connect + Develop' ecosystem (P&G), integrating diverse expertise rather than siloing tech.

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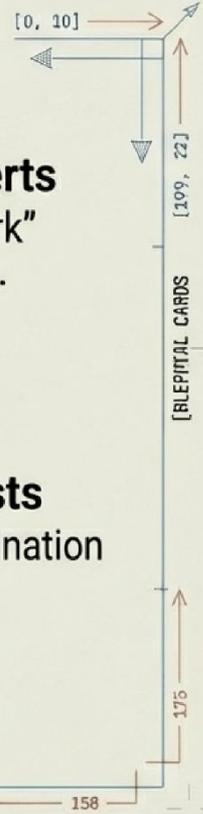
Governance: Balancing Autonomy with Safety

The governance framework must adapt to the risk profile of the task and the agent's capabilities. This approach ensures operational safety while maximizing efficiency and innovation.

Risk-Based Oversight

Internal Research / Drafts

Governance: Audit trails only. Full Autonomy.

Strategic Planning / High-Impact Decisions

Governance: Proactive Human Review. Conditional Autonomy based on confidence scores.

Routine Administrative Tasks

Governance: Standard Operating Procedures. Restricted Autonomy with monitoring.

Financial / Customer Facing

Governance: Mandatory Human-in-the-Loop approval.

Agent Autonomy — Full / Restricted

Task Stakes — Low / High

Exception-Based Oversight Protocol

Define clear operating parameters.

If an agent hits a constraint or low confidence signal, it escalates to a human. This parallels

parallels corporate "Delegation of Authority".

Agent → Constraint / Low Confidence → Human Review

[109, 22]

[109, 22]
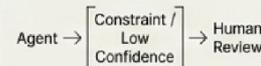
[BLEPTAL CARDS]

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[JetBrains Mono]

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Infrastructure for Experimentation

Apply the scientific method to organizational design. Don't guess—test.

Org Testbed

Task: Code Feature X

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A/B Test

A
Flat Structure
(5 Agents)

B
Hierarchical Structure
(1 Manager, 4 Workers)

Measurement Node

Coordination Overhead (Tokens): XXXX

Success Rate: XX%

Latency: XXms

[0, 10]

[109, 22]

[BLEPITAL CARDS]

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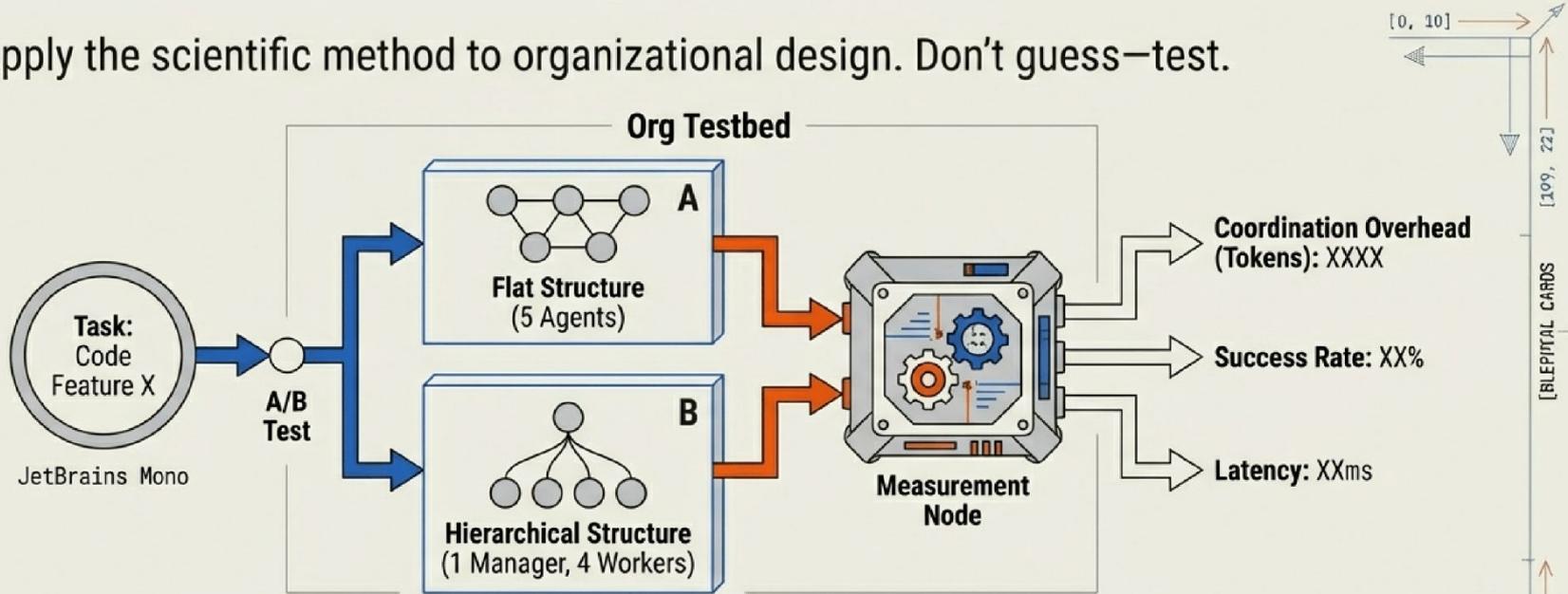
Action: Move from 'Prompt Engineering' to 'Organization Engineering'. Run simultaneous tests to identify optimal structures, referencing Google's experimentation culture.

Summary of Design Patterns

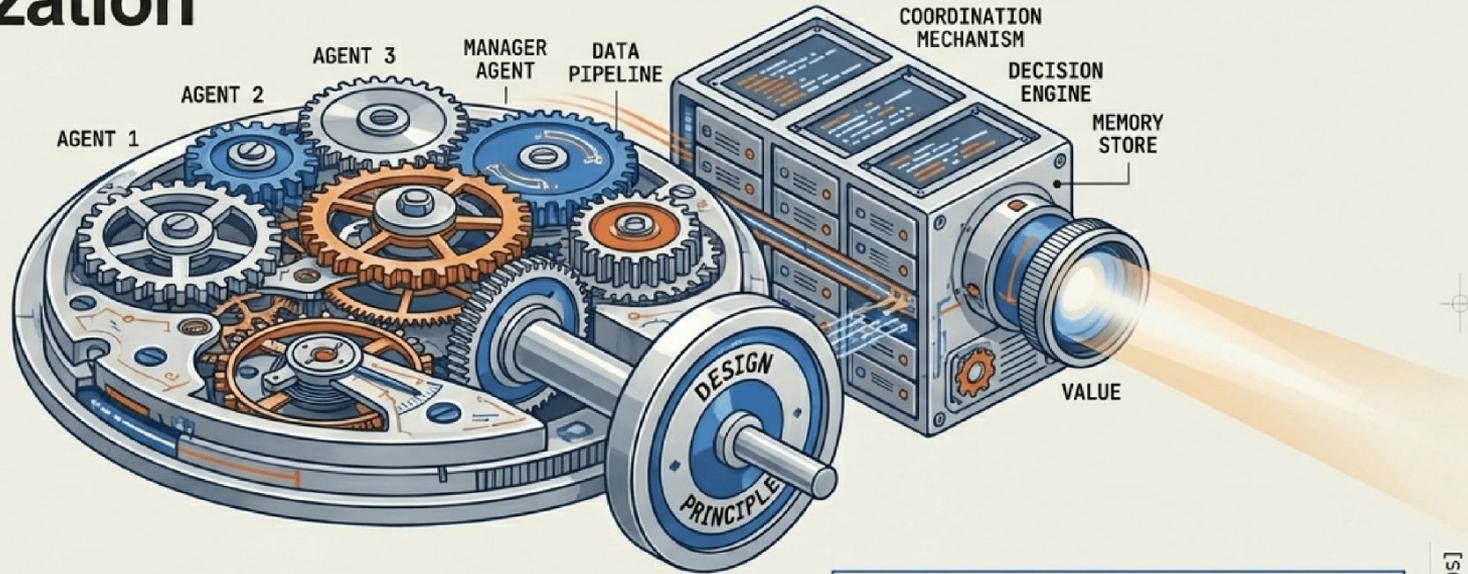| Problem	Org Theory Solution	Technical Implementation
Span of Control Overload	Hierarchy	Intermediate "Manager" Agents
Ambiguity in Handoffs	Boundary Objects	JSON Schemas & Specs
Bottlenecks vs. Drift	Calibrated Coupling	Phase-based Async/Sync flows
Context Limits	Division of Labor	RAG & Hierarchical Summarization
Misinterpretation	Shared Ontologies	Read-back Protocols

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<6 (-80 , 0)>

[BLEPITAL CARDS]

Domaine Text, Slate Grey

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The Competitive Advantage is Organization Organization

AGENT 1
AGENT 2
AGENT 3
MANAGER AGENT
DATA PIPELINE
COORDINATION MECHANISM
DECISION ENGINE
MEMORY STORE
DESIGN PRINCIPLE
VALUE

Models are becoming commodities. The differentiating factor is not the intelligence of the individual model, but the organization of the system.

Stop treating agents like chat tools. Start treating them as an organizational design challenge.

[BLEPITAL CARDS]

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<6 (-80 , 0)>

[ORGANIZATIONAL CARD]

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HCI