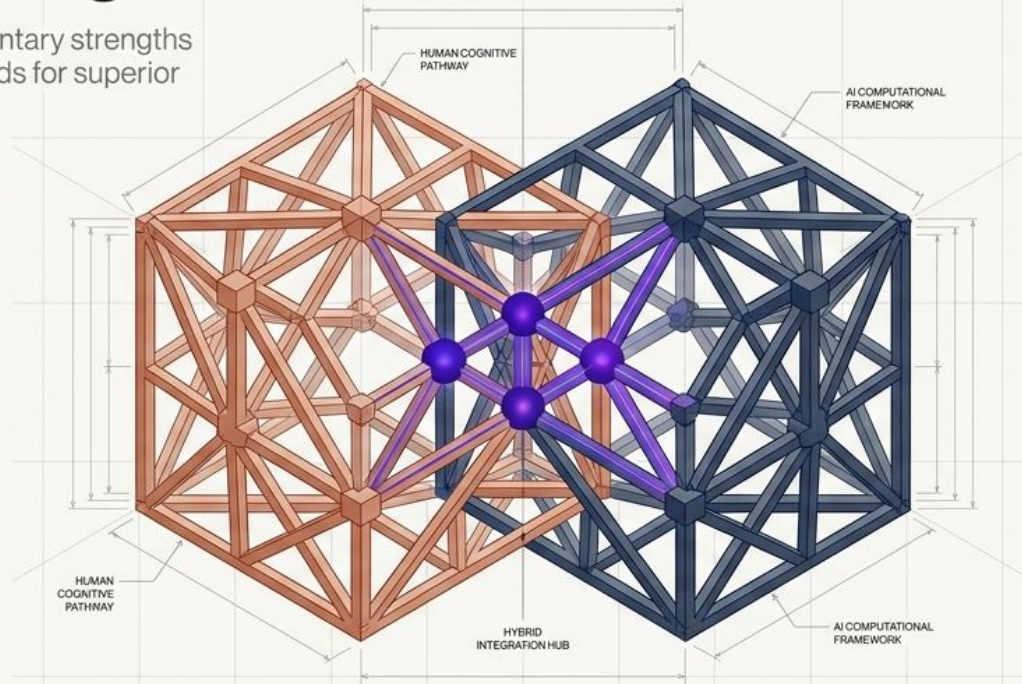


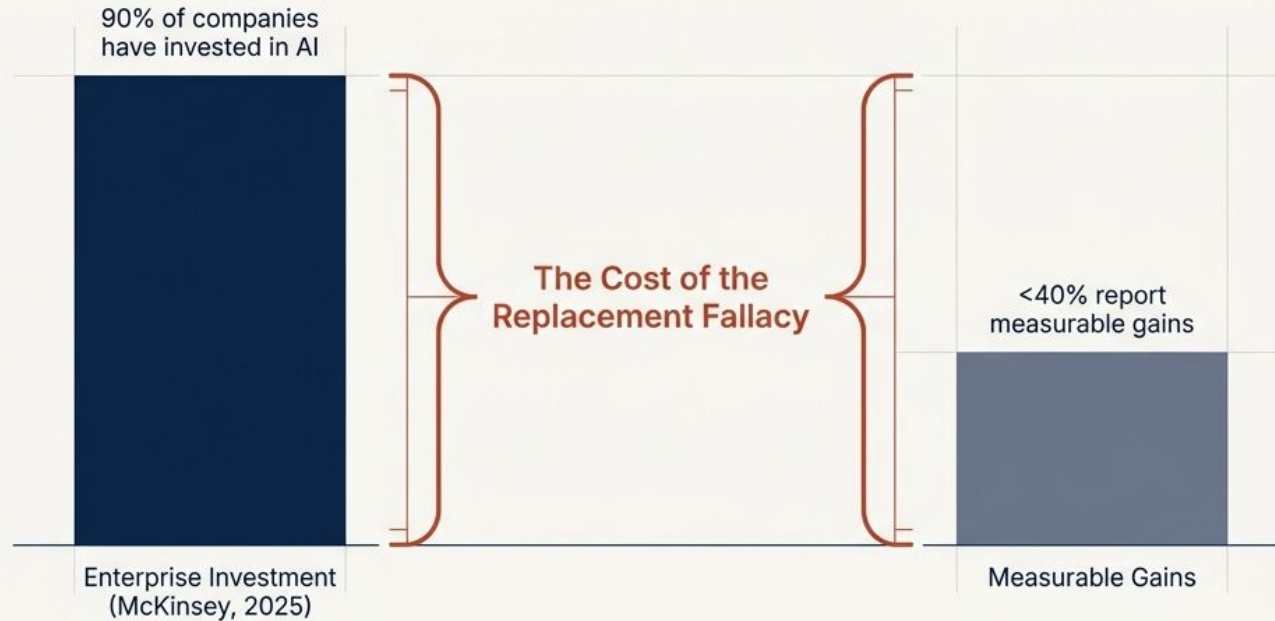
# Designing for Hybrid Intelligence

Harnessing the complementary strengths of human and artificial minds for superior organizational outcomes.



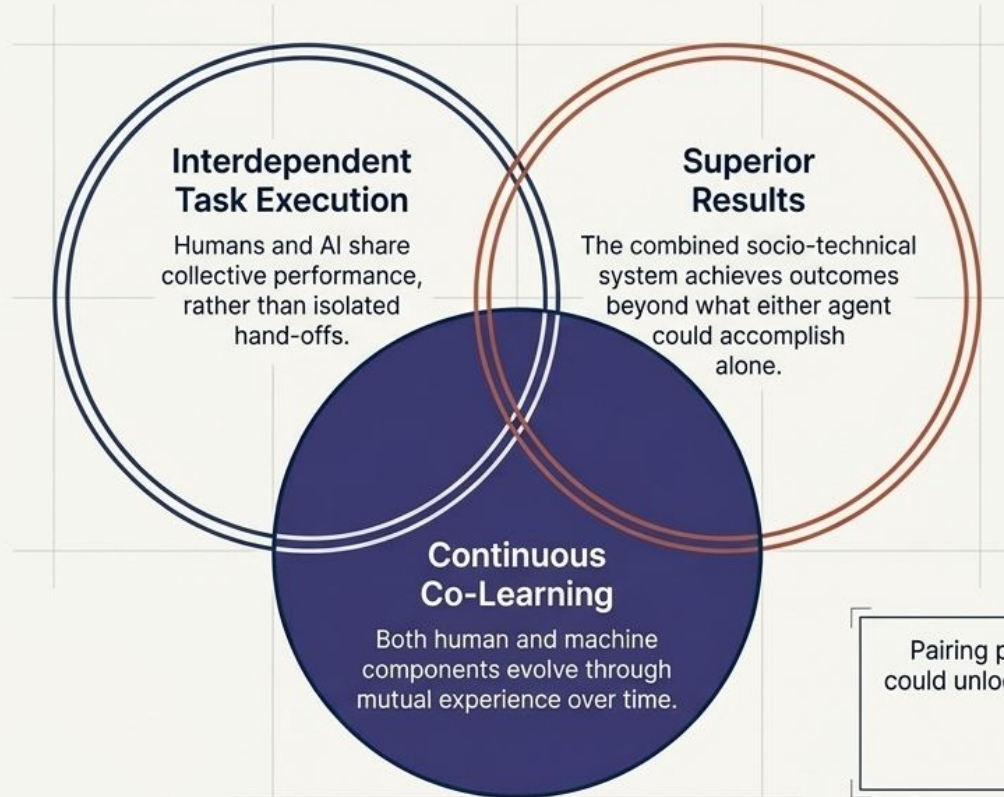
Based on the research of Jonathan H. Westover, PhD and the Dellermann et al. Taxonomy

# The enterprise AI paradox stems from the replacement fallacy



The gap between technical promise and organizational payoff is not a technology failure. It is a design failure caused by treating AI as a replacement for human judgment rather than a complement to it.

# Hybrid intelligence requires collective performance and continuous co-learning



Pairing people thoughtfully with AI tools could unlock nearly \$3 trillion in economic value in the US alone by 2030.

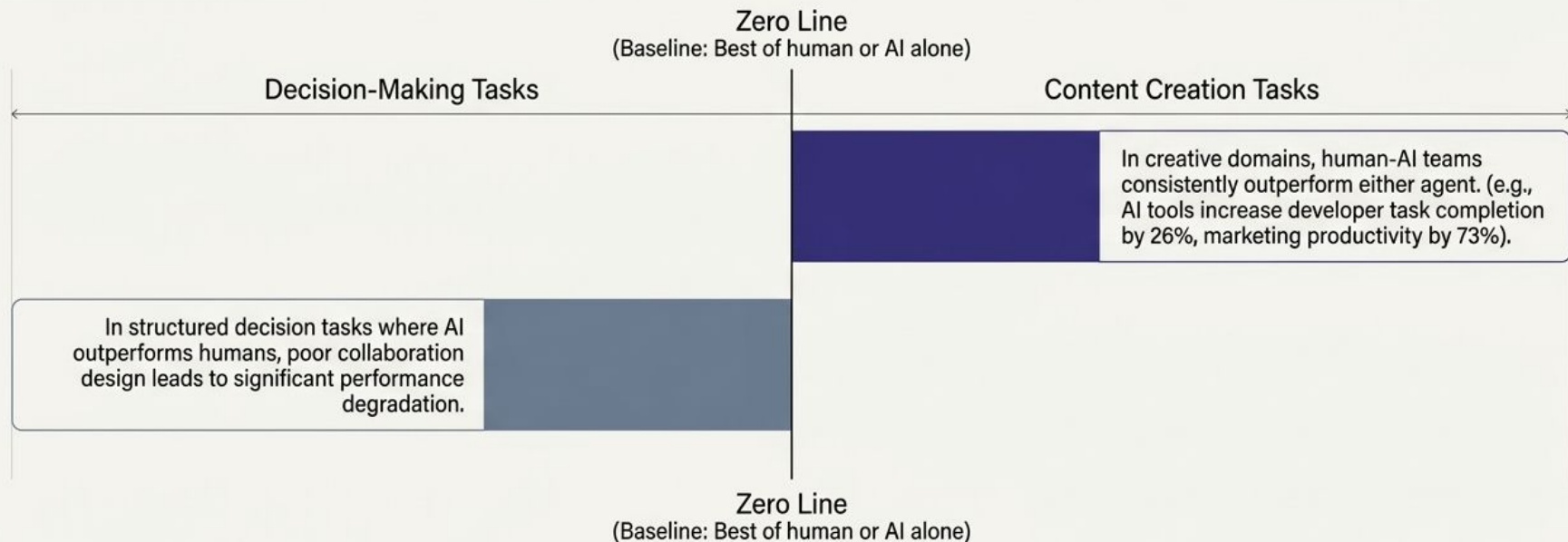
— McKinsey Global Institute

# Most enterprise deployments stop short of true hybrid integration

| Approach                   | Core Goal          | Nature of Process                   | Human Role                   | Learning Loop                 |
|----------------------------|--------------------|-------------------------------------|------------------------------|-------------------------------|
| Automation                 | Efficiency         | Static                              | Replaced / Exception Handler | None                          |
| Decision Support           | Insight            | One-way                             | Ultimate Decider             | Human learns, machine static  |
| <b>Hybrid Intelligence</b> | <b>Superiority</b> | <b>Dynamic &amp; Interdependent</b> | <b>Collaborative Partner</b> | <b>Continuous Co-Learning</b> |
|                            |                    |                                     |                              |                               |

A dashboard presenting predictive analytics to a human is decision support, not hybrid intelligence. True hybridity requires a genuine two-way feedback loop.

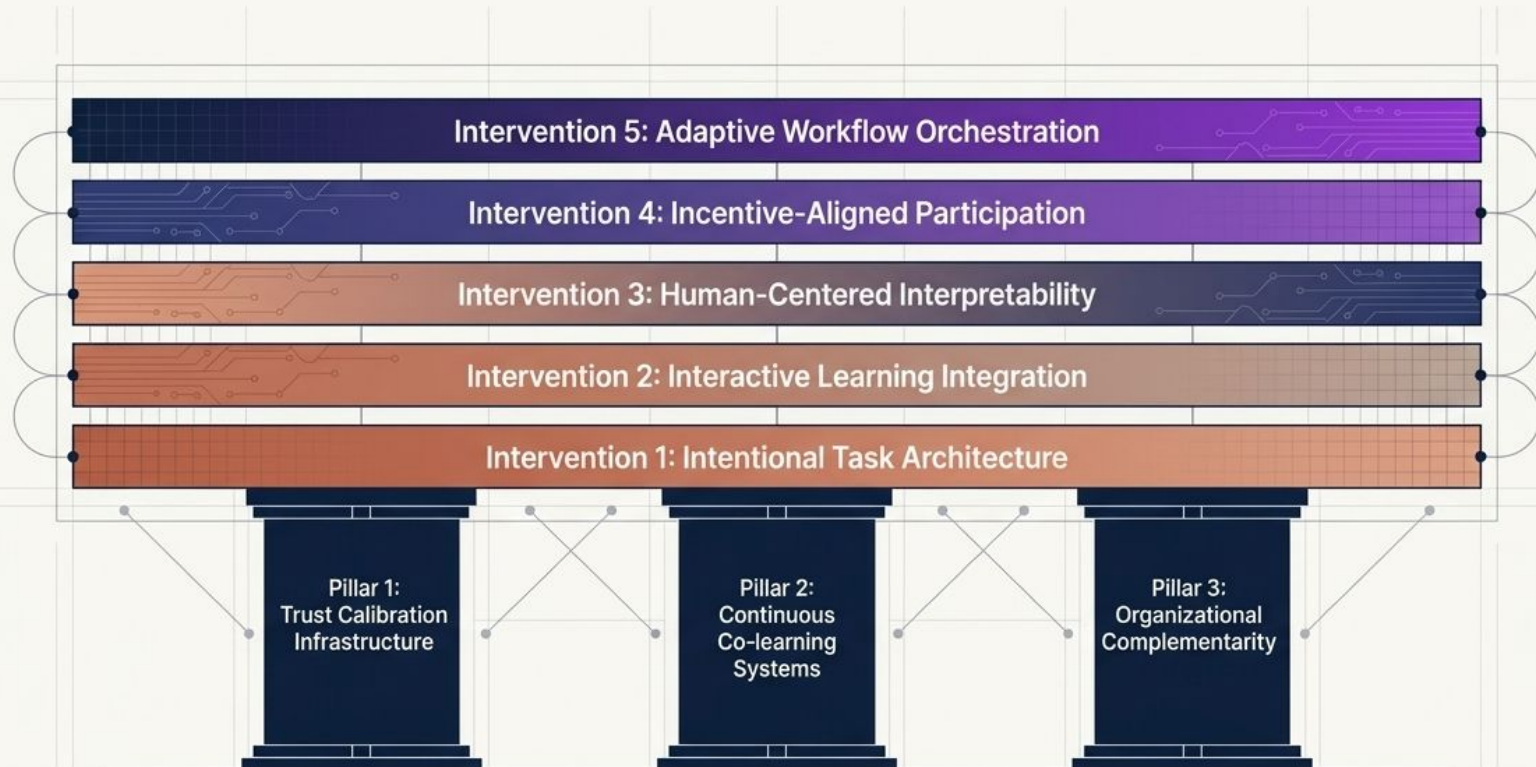
# Simply combining humans and AI without structural design produces mediocre results



The design of the interaction matters more than the sophistication of the algorithm.

# The Hybrid Intelligence Architecture Framework

Translating the Dellermann taxonomy of design knowledge into an actionable enterprise playbook.



# Intervention 1: Map workflows to complementary cognitive strengths

The Intentional Task Architecture Matrix

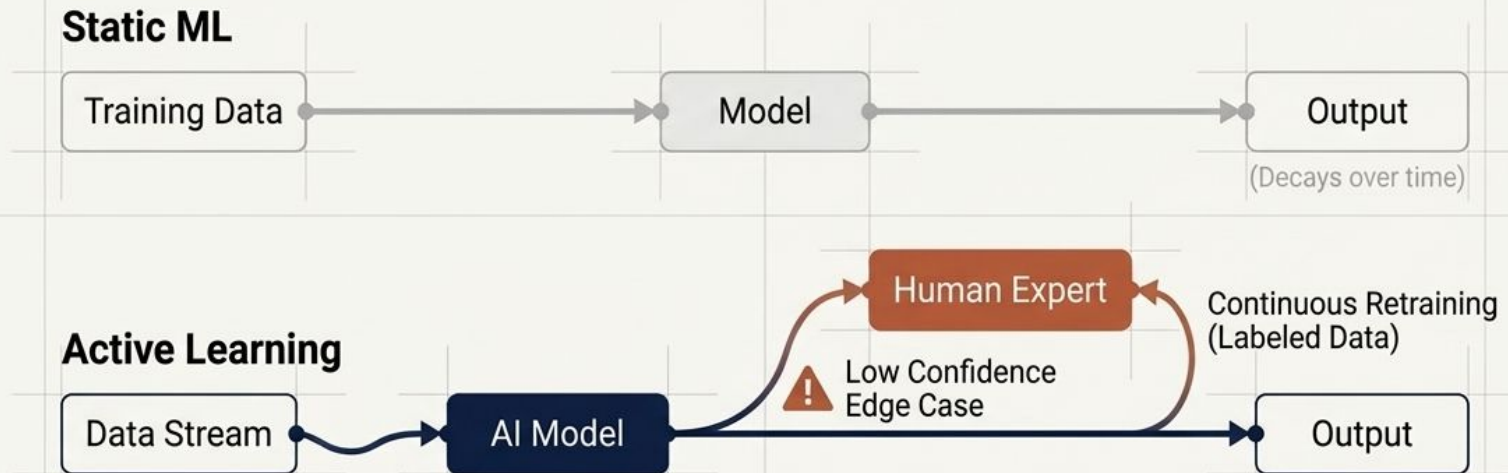
| Recognition                                                             | Prediction                                                 | Reasoning                                                            | Action                                                   |
|-------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------|
| <b>AI Superpower:</b> Scale and Speed.                                  | <b>AI Superpower:</b> Processing vast datasets.            | <b>AI Superpower:</b> Pattern identification.                        | <b>AI Superpower:</b> Execution.                         |
| <b>Human Superpower:</b> Edge cases and Novelty.                        | <b>Human Superpower:</b> Context and Qualitative shifts.   | <b>Human Superpower:</b> Causal inference and Common sense.          | <b>Human Superpower:</b> Teaching examples.              |
| <b>Optimal Design:</b> AI processes base data, human reviews anomalies. | <b>Optimal Design:</b> AI forecasts, human contextualizes. | <b>Optimal Design:</b> Human leads strategy, AI structures analysis. | <b>Optimal Design:</b> Human calibrates autonomy limits. |

## Case Study: The Stitch Fix Model

Algorithms process 90+ client attributes and GPT-4 summarizes histories. Human stylists focus exclusively on creative curation and emotional resonance. Neither works alone.

# Intervention 2: Design active learning pipelines to focus expensive human attention

## The Active Learning Pipeline



Static models depreciate. Active learning routes only the lowest-confidence cases to domain experts, minimizing cognitive burden while maximizing the learning signal.

# Intervention 3: Embed human-centered **interpretability** at the prediction level

The Interpretability X-Ray



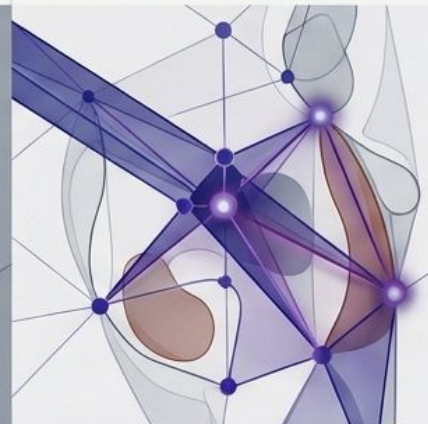
**Black Box**  
(Invisible logic)



**Algorithm Transparency**  
(General logic visible)



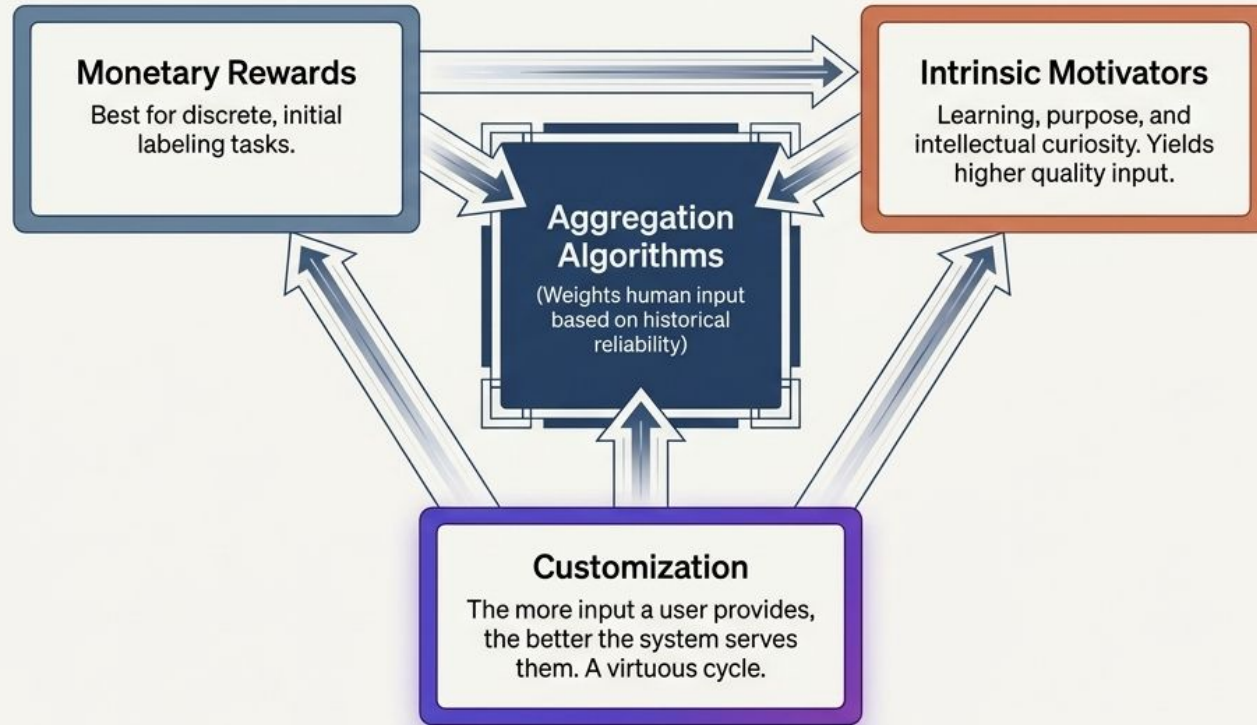
**Global Interpretability**  
(Feature reliance understood)



**Local Prediction Interpretability**

**Mayo Clinic Radiology:** The AI acts as a second set of eyes, identifying concerns with visual overlays explaining why specific features drove the assessment. The human retains full diagnostic authority based on local prediction interpretability.

# Intervention 4: Structure incentives to sustain high-quality human participation



## Case Study: Cindicator Fintech Platform

Aggregates predictions from human financial analysts.

AI weights predictions based on individual analyst reliability.

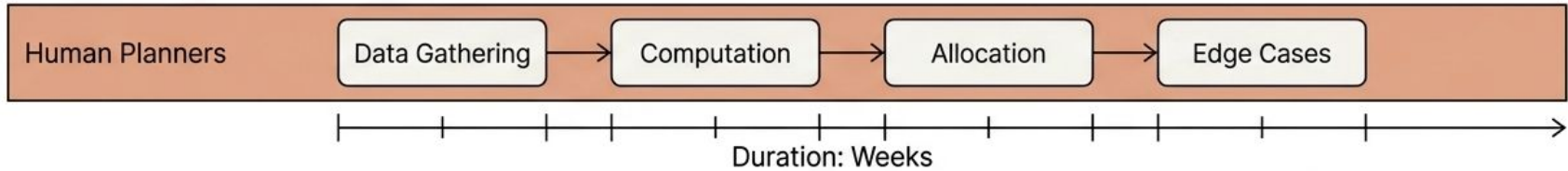
Analysts receive monetary and reputational rewards.

Human-dependent aggregation dramatically outperforms simple majority voting.

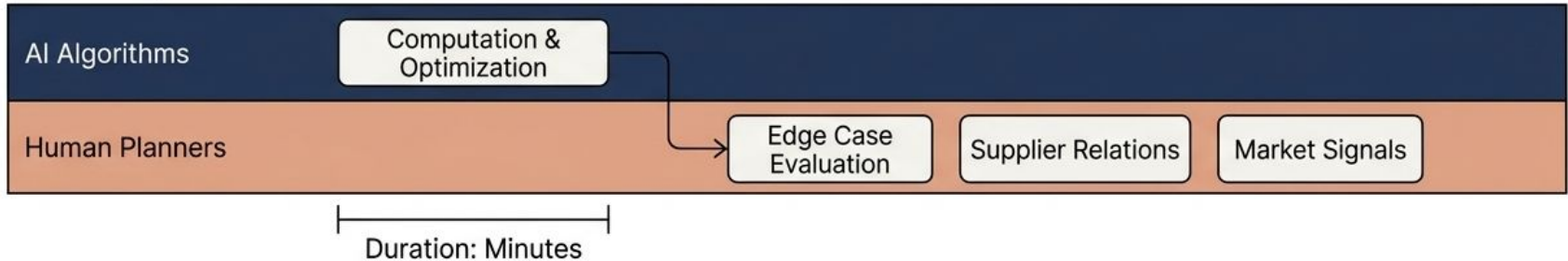
# Intervention 5: Orchestrate adaptive workflows, rather than inserting AI tools

Before & After Swimlane Diagram

## Before: Sequential Constraints

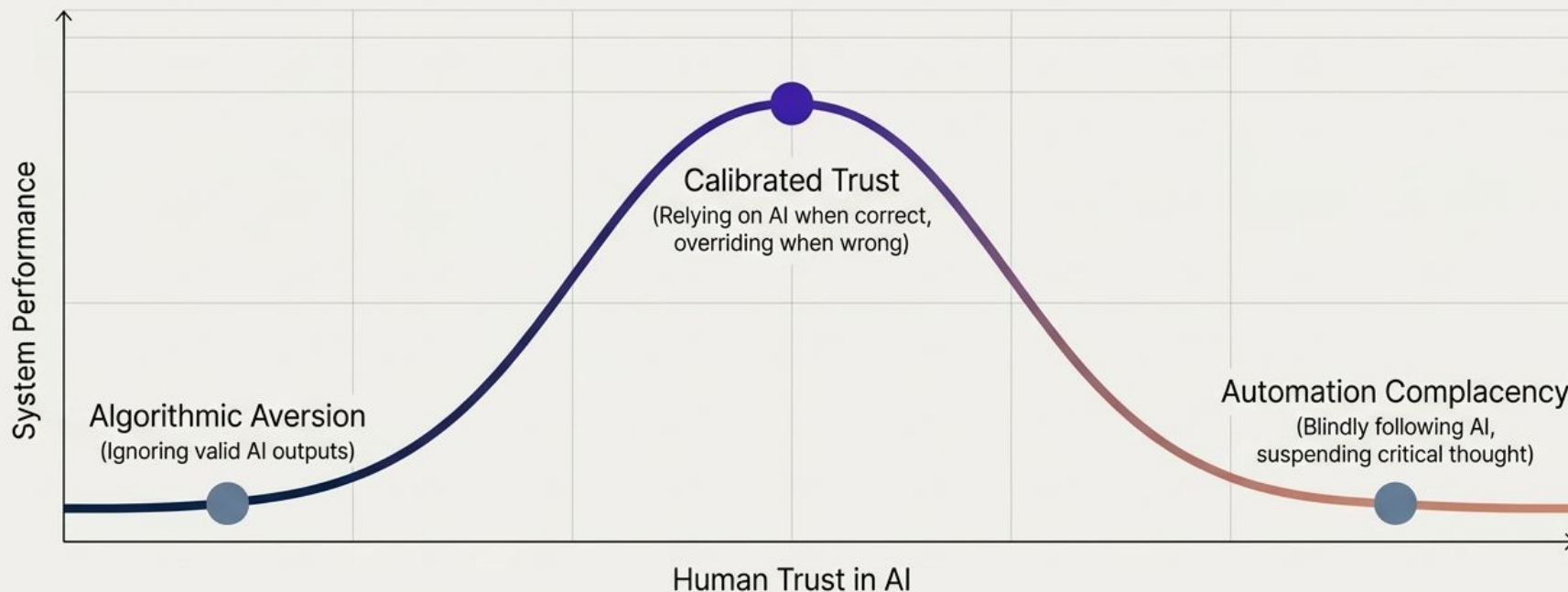


## After: Adaptive Orchestration



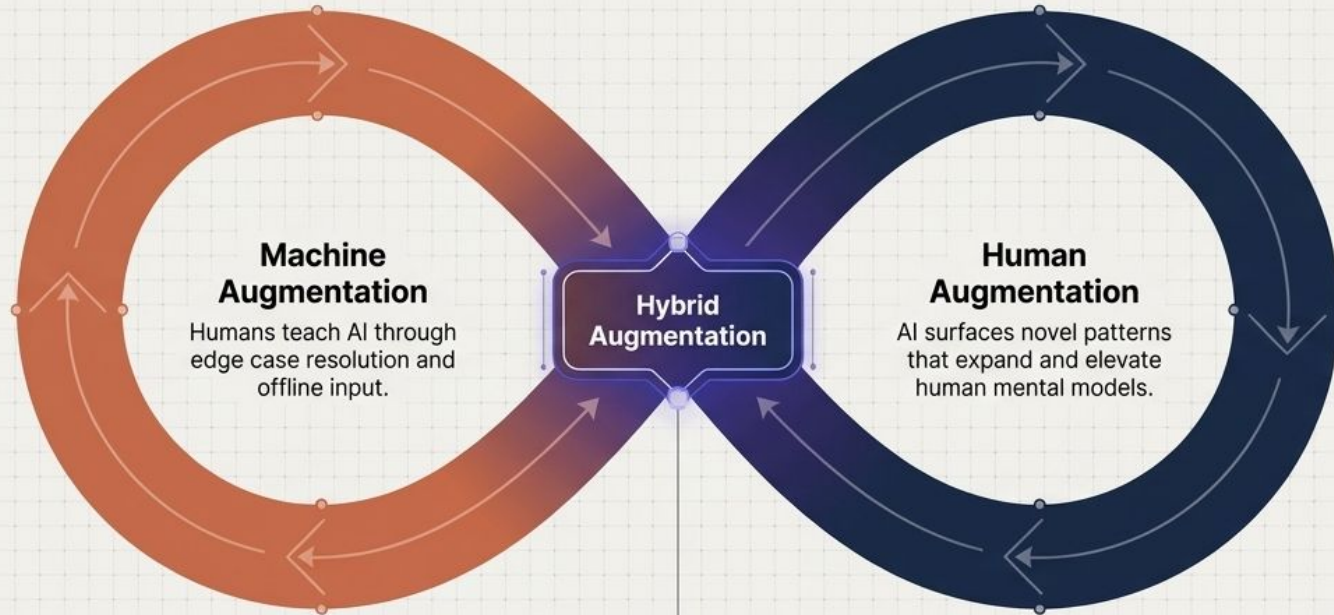
Toyota compressed resource allocation from weeks to minutes. Critically, zero planners were replaced; they were redeployed to higher-judgment activities that algorithms cannot capture.

# Pillar 1: Build infrastructure to calibrate, rather than maximize, trust



Research consistently shows both over-trust and under-trust degrade performance. Calibrated trust requires transparency mechanisms (visible confidence scores), ongoing performance tracking, and role-specific AI literacy.

## Pillar 2: Engineer continuous, bidirectional co-learning systems



### Case Study: DeepMind's AlphaGo

The system initially learned from human expert games (Machine Augmentation). By playing itself, it invented novel strategies that were then studied by human masters, fundamentally changing their understanding of the game (Human Augmentation).

# Pillar 3: Redesign organizational structures for genuine complementarity



## 1. Contribution-Based Roles

Define jobs around cognitive contribution type (e.g., “Domain Judgment Provider”) rather than legacy software tasks.



## 2. Trait-Matched Teaming

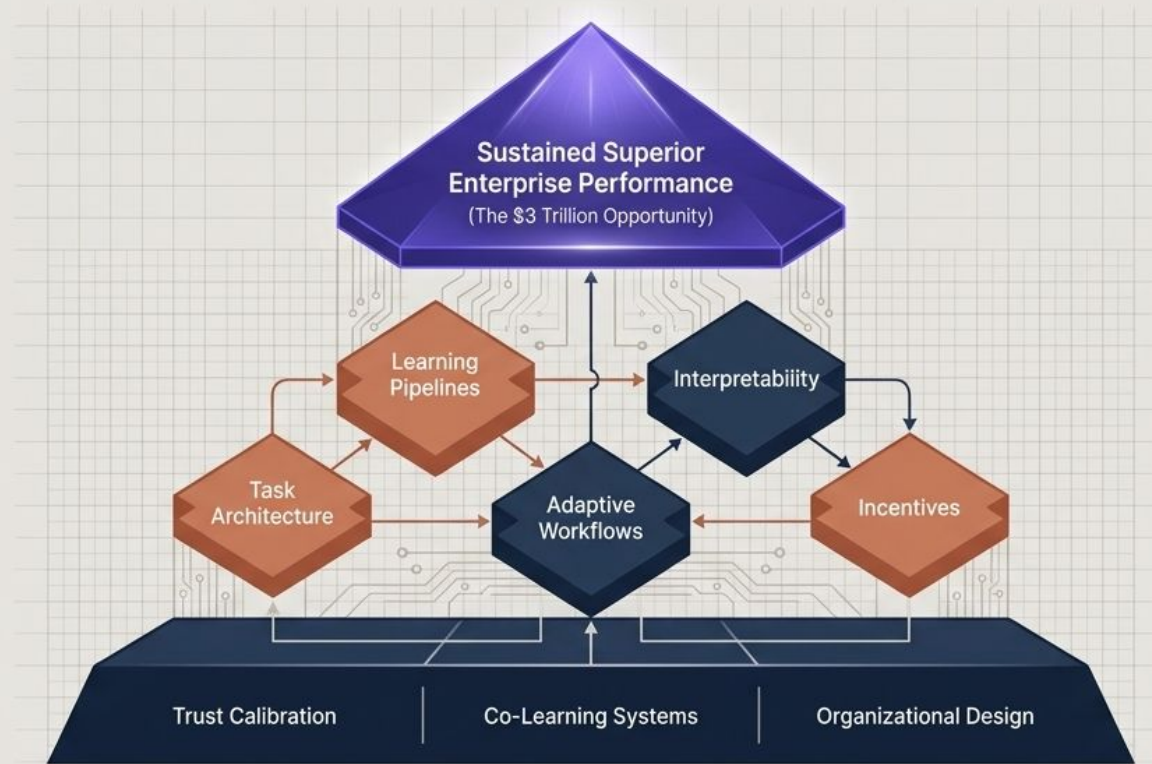
Field experiments prove AI and human personality traits must complement. Conscientious humans paired with open AI agents dramatically improve output. Mismatches degrade it (Agarwal et al., 2025).



## 3. Shared Agency Governance

Accountability frameworks must explicitly define who owns the outcome—the human approver, the model designer, or the deploying entity.

# The Master Blueprint: The Hybrid Intelligence Operating System



The most successful organizations of the next decade will not be those with the most advanced algorithms, but those with the most thoughtfully designed collaborations between human and artificial minds.