ITEM #202 - A Unified Evaluation Framework for Three Intelligence Paradigms: Statistical, Structural, and Knowing–Doing Co-Progress Intelligence

Conversation： ACLM Vertical Bridging Simplification

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(English Version)

Abstract

As artificial intelligence systems diversify in form and capability, disagreements over "what counts as intelligence" have intensified.
This item introduces a **Unified Evaluation Framework for Three Intelligence Paradigms**, synthesizing prior DBM work on Structural Intelligence, Knowing–Doing Co-Progress Intelligence (KD-CPI), and the re-evaluation of Large Language Models (LLMs).

Rather than ranking models by scale or performance alone, this framework establishes **paradigm-consistent evaluation criteria**, enabling fair comparison without conceptual conflation or premature dismissal.

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1. The Problem of Mixed Evaluation Standards

Many contemporary AI debates suffer from a core methodological error:

Judging one paradigm using the success criteria of another.

Examples include:

- Evaluating LLMs solely by structural stability
- Expecting statistical models to produce explicit reasoning graphs
- Dismissing runtime intelligence due to lack of persistent structure

This item resolves such confusion by separating **paradigm identity** from **engineering maturity**.

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2. The Three Paradigms of Intelligence

2.1 Statistical Intelligence

Core premise: Intelligence emerges from statistical regularities in large datasets.

Defining traits:

- Pattern generalization
- Probabilistic inference
- High data dependence
- Weak internal structure

Strengths:

- Broad coverage
- Fast deployment
- Strong surface competence

Limitations:

- Poor explainability
- No intrinsic evolution mechanism
- Heavy reliance on external supervision

2.2 Structural Intelligence (DBM)

Core premise: Intelligence arises from stable, compositional structures operating over metric spaces.

Defining traits:

- Explicit internal representations
- Differential trees and structured distances
- Explainable reasoning paths
- Constructive evolution (APTGOE)

Strengths:

- Interpretability
- Long-term knowledge accumulation
- Governable evolution

Limitations:

- Higher design complexity
- Slower early-stage capability emergence
- Requires deliberate structure engineering

2.3 Knowing–Doing Co-Progress Intelligence (KD-CPI)

Core premise: Intelligence operates under unavoidable incompleteness, where action and knowledge must co-evolve.

Defining traits:

- Fuzzy metrics
- Anytime decision-making
- Action-as-measurement
- Evidence-driven refinement

Strengths:

- Survival-grade decision-making
- Adaptation under uncertainty
- Competitive initiative

Limitations:

- High exploration cost
- Requires strict risk budgeting
- Vulnerable without structural consolidation

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3. LLMs Repositioned within the Three-Paradigm Framework

Under this unified view:

- LLMs are **not purely statistical**.
- They exhibit strong **KD-CPI characteristics** at runtime.
- They lack intrinsic **Structural Intelligence consolidation**.

Thus:

LLMs represent a **KD-CPI-dominant, statistically powered intelligence prototype**, behaviorally real, structurally immature, and evolutionarily externalized.

This reframing reconciles prior critiques (#162) with justified tolerance (#199).

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4. Evaluation Axes Across Paradigms

Axis	Statistical	KD-CPI	Structural
Metric Completeness	High (data-driven)	Fuzzy	Explicit & Stable
Explainability	Low	Post-hoc	Native
Runtime Intelligence	Moderate	High	High
Structural Accumulation	None	Partial / External	Intrinsic
Risk Control	External	Budget-based	Structural
Evolution Capability	Weak	Conditional	Strong

This matrix prevents false equivalence while enabling meaningful comparison.

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5. Engineering Implications

A mature AI ecosystem should:

- Avoid forcing all systems into a single paradigm
- Combine paradigms where appropriate
- Demand **structural consolidation** for long-term autonomy
- Accept **KD-CPI behavior** during exploratory phases
- Reject unbounded resource consumption without evolutionary payoff

DBM explicitly targets **the integration of KD-CPI into Structural Intelligence**, not its replacement.

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6. Why This Framework Matters

This unified framework:

- Explains why LLMs feel intelligent yet fragile
- Clarifies why structural systems start slower but mature stronger
- Provides a principled answer to AGI hype vs. denial
- Establishes fair, non-polarized evaluation criteria

It shifts AI discourse from **capability spectacle** to **evolutionary accountability**.

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7. Conclusion

Intelligence is not monolithic.

By distinguishing Statistical Intelligence, KD-CPI, and Structural Intelligence, we gain a coherent framework for evaluation, design, and governance.

This tri-paradigm perspective is essential for building AI systems that are not only powerful, but sustainable and accountable.

ITEM #202 - 三范式智能的统一评判框架：统计智能、结构智能与知行同进智能

（中文版）

摘要

随着人工智能形态的多样化，围绕“什么才算智能”的争论日益激烈。
本条目提出一个**三范式智能的统一评判框架**，整合 DBM 体系中关于：

- 结构智能（#160 / #162）
- 知行同进智能（#198）
- LLM 评判反思（#199）

的核心思想，建立**范式一致、工程可落地的评判坐标系**。

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1. 问题根源：范式混用的评判错误

当前 AI 讨论中最常见的错误是：

用一种智能范式的标准，去裁判另一种范式。

例如：

- 用结构稳定性否定 LLM 的智能性
- 要求统计模型给出可解释推理图
- 因无稳态结构而否定运行态智能

本框架的目标，是**先区分范式，再讨论成熟度**。

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2. 三种智能范式

2.1 统计智能

核心前提： 智能源自数据统计规律。

特征：

- 强模式泛化
- 概率驱动
- 高数据依赖
- 内部结构弱

优势：

- 覆盖面广
- 上线快
- 表层能力强

局限：

- 难以解释
- 无内生演化
- 依赖外部监管

2.2 结构智能（DBM）

核心前提： 智能源自稳定、可组合的内部结构。

特征：

- 明确的内部表示
- 度量空间与差分树
- 可解释推理
- 建构性演化（APTGOE）

优势：

- 可治理
- 可积累
- 长期稳定

局限：

- 早期构建成本高
- 起步慢
- 需要系统级设计

2.3 知行同进智能（KD-CPI）

核心前提： 在不完备条件下，行动与知识必须同步推进。

特征：

- 模糊度量
- Anytime 决策
- 行动即测量
- 证据驱动演化

优势：

- 生存级决策能力
- 强适应性
- 抢答竞争优势

局限：

- 探索成本高

- 需要风险预算
- 若无结构易失控

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3. LLM 在三范式中的重新定位

在统一框架下：

- LLM 不是纯统计智能
- 其运行态高度符合 KD-CPI
- 但几乎不具备内生结构智能

因此可以准确表述为：

LLM 是一种以统计能力为底座、
高度偏向知行同进的智能原型，
在行为上真实，在结构上未成熟。

这同时解释了其能力爆发与结构脆弱性。

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4. 统一评判坐标轴

维度	统计智能	知行同进	结构智能
度量完备性	高（数据驱动）	模糊	明确稳定
可解释性	低	事后	内生
运行态智能	中	高	高
结构积累	无	外生/局部	内生
风险控制	外部	预算制	结构内建

维度	统计智能	知行同进	结构智能
演化能力	弱	有条件	强

该表避免了简单排名，强调**适配性而非优劣论**。

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5. 工程与治理启示

一个成熟的 AI 生态应当：

- 承认多范式并存
- 鼓励早期 KD-CPI 探索
- 要求长期结构固化
- 拒绝无约束的资源浪费
- 将探索行为纳入演化与治理体系

DBM 的目标不是取代 KD-CPI，而是**吸收并约束它**。

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6. 为什么这个框架重要

该框架能够：

- 解释 LLM“像智能却不稳定”的根源
- 澄清 AGI 夸大与全盘否定的两极
- 为研究与投资提供理性判断标准
- 将讨论从“能力奇观”拉回“演化责任”

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7. 总结

智能不是单一形态。

通过区分统计智能、知行同进智能与结构智能，我们获得了一个**清晰、公平、可治理的统一评判框架**。

这是迈向成熟 AI 理论与工程文明的重要一步。
