117-356-D The Three-Layer AI-Economy — Version 2

Dual UX, Shared Systems of Record, and the Governance of Cognitive-to-Physical Commitments

12 November 2026

Prologue — A model that became clearer by evolving

The original three-layer AI-Economy distinguished the accelerating world of cognitive and agentic decisions, the enterprise systems that record commercial commitments, and the physical resources that must ultimately fulfill them. That distinction remains. What has changed is our understanding of the top interface: the first layer is best described simply as the UX Layer, with two interoperable entry paths—Agentic UX and e-Commerce UX. A mission may enter through one and cross into the other without losing its identity.

This chapter records Version 2 as the current architectural hypothesis. It supersedes the earlier placement of the human-versus-agentic channel split entirely inside Layer 2, while preserving that earlier formulation as part of the research lineage. The new placement does not remove the need for differentiated admission controls inside Layer 2.

1. The revised three-layer architecture

Layer	Canonical name	Primary responsibility
1	UX Layer	Human and agentic initiation, interaction, preparation, review and handoff
2	Enterprise Commerce & Systems of Record	Admission, authoritative commitments, orders, inventory, payments, reservations, reconciliation
3	Physical & Economic Resources	Capacity, production, transportation, energy, delivery, fulfillment and settlement evidence

Layer 1 contains two entry paths:

- Agentic UX, where software actants can search, compare, plan, and prepare proposals; and
- e-Commerce UX, where people browse, review, modify, approve, or transact directly.

These are interaction paths, not mutually exclusive mission types. Layer 2 is the shared enterprise transaction core. Layer 3 supplies the constrained world against which commitments are ultimately discharged.

2. Two UX paths, not two independent economies

The Agentic UX path may be machine-paced, parallel, and persistent. The e-Commerce UX path is ordinarily human-paced and designed for direct inspection and consent. Yet either path may call the same enterprise services, and one undertaking can traverse both. An agent may operate a human-oriented website; a human may use an agent-native service through an intermediary. Accordingly, channel classification must reflect the actual actor, authority, and operation—not merely the visual appearance of a webpage.

A dual-UX architecture preserves existing enterprise investment. It does not require rebuilding inventory, reservations, payments, and ERP into parallel human and agent databases. Rather, the two UX paths converge on one authoritative system of record, with distinct admission and control policies where justified.



3. Three operating modes of commerce

Mode	Entry and control path	Commitment authority
A — Human-direct	e-Commerce UX → Layer 2	Human approves and enterprise commits
B — Agent-assisted, human-committed	Agentic UX → governed handoff → e-Commerce UX → Layer 2	Agent prepares; human authorizes exact commitment
C — Agent-autonomous	Agentic UX → agent admission → Layer 2	Bounded, verifiable delegated authority permits agent action

Mode B is a particularly practical transition path for enterprises concerned about unauthorized bots. The enterprise can accept the agent's discovery and cart preparation while requiring the customer to complete a protected checkout. Mode C is not an automatic entitlement of every agent: it depends on destination policy, appropriate delegation, regulatory constraints, and validated technical controls.

4. The Human Commitment Gate

The Human Commitment Gate (HCG) is the proposed control point at which an agent-prepared commercial proposal is presented to a human who may authorize the consequential commitment. It is more precise than a generic human-in-the-loop review: the human is not merely observing reasoning but is approving a specific proposed action. The gate may reside at the boundary between UX paths, with enterprise-side verification and enforcement in Layer 2.

A robust HCG should bind a short-lived proposal reference to its essential details; authenticate the human approver; show price, quantity, counterparties, terms, and consequences; revalidate availability; prevent replay and silent mutation; and record the exact approved version. The agent must not be able to change material terms after approval without a fresh authorization decision. A click is meaningful only when the person can understand what is being approved.

5. One GCID across a human–agent handoff

The GUDIYA Cognitive Cookie, GCID, identifies the governed undertaking rather than a browser session or agent. The human principal may initiate a mission; one or more actants perform comparisons and prepare a cart; the human reviews and approves; enterprise services commit; physical systems fulfill. The participant and authority may change at each stage, but the undertaking and its obligation lineage remain logically continuous.

Stage	Active participant	Governance requirement
Intent	Human principal	Authorize scope, constraints and mission
Discovery and comparison	Agentic actant	Valid mission participation and bounded delegation
Proposal / cart preparation	Agentic actant	No unapproved binding commitment
Handoff and checkout	Human principal	Fresh authentication, exact-proposal approval
Transaction	Enterprise service	Independent admission, integrity, idempotency and authorization
Fulfillment	Resource operator	Evidence of allocation, delivery, exceptions and settlement

GCID is not a universal bearer credential and need not be disclosed to every merchant. A derived, purpose-bound interaction identifier can link enterprise evidence to the protected mission context. Principal-ID, Actant-ID, service credentials, approval records, and transaction IDs remain distinct.

6. Layer 2 remains differentiated at the admission boundary

Moving the UX split to Layer 1 does not mean the enterprise treats all incoming operations alike. A human checkout, a delegated agent purchase, and an untrusted automated scrape present different authentication, fraud, rate, consent, and liability concerns. Layer 2 may therefore implement human-admission and agent-admission policies using shared gateway infrastructure, while retaining one authoritative transactional core.

This separation resolves the earlier ambiguity: the UX channels originate in Layer 1; their authority is checked and enforced at Layer 2; the resulting obligations ultimately reach Layer 3. A control point can straddle an architectural boundary without becoming a new economic layer.

7. The system-of-record bottleneck survives the revision

Modern databases already operate at machine speeds. The constraint is not that databases inherently work at human interaction speeds. Rather, safe enterprise commitment requires validation, coordination,

concurrency control, inventory integrity, payment processing, downstream synchronization, and reconciliation. Those operations have finite capacity and sometimes involve slower external systems.

Agentic UX can produce more candidate actions and more correlated bursts than a human UX workload. If both channels converge on the same enterprise core, unbounded agent demand can saturate shared services and impair human access. The architecture therefore requires differentiated admission budgets, workload isolation, bounded retries, backpressure, and explicit fairness policies.

8. Three velocities and a backlog

Let λA and λH denote admitted agentic and human requests per unit time, weighted for their resource cost, and $\mu 2$ the sustainable Layer 2 processing capacity for the relevant operation mix. A simple steady-state condition is $\lambda A + \lambda H < \mu 2$. This inequality is illustrative, not a complete queueing model: bursts, priorities, transaction contention, and service classes require more detailed analysis.

For an unfinished-work stock B, a basic accounting identity is dB/dt = admitted work rate − completed work rate. A persistent positive difference produces backlog growth. Layer 3 imposes a separate constraint: the stock of accepted commitments must remain supportable by available and future physical capacity, inventories, reserves, and credible replenishment schedules. Selling a future airline seat is not the same as transporting a passenger immediately.

Thus cognitive decision velocity, safe transaction-commitment velocity, and physical fulfillment velocity are distinct. The Grid must monitor the interfaces and delays among them, not assume that accelerating cognition accelerates the rest of the economy.

9. A worked example — agent prepares, human commits

A customer asks an agent to find an affordable nonstop flight. The agent searches multiple providers, compares fares, and prepares a proposed itinerary. The airline permits discovery and preparation but requires the customer to complete checkout. A short-lived proposal reference moves the selected itinerary into the e-Commerce UX. The customer reviews the current fare, baggage terms, passenger information, and payment. Only then does the airline's authoritative reservation system commit the purchase.

The agent may finish its immediate task before the passenger travels. The GCID-linked mission, however, retains the relevant obligation and fulfillment status until proper disposition. If the fare changes, the proposal must be revalidated. If a payment times out, the system must reconcile the actual transaction state rather than blindly retry. If the agent resumes later, it must not infer that the prior approval extends to materially different terms.

10. Human commitment as a governance mechanism—not a universal stabilizer

The HCG can strengthen authority assurance and reduce some forms of uncontrolled autonomous commitment. It may also act as a rate-limiting element. Yet it is not a general stability guarantee. Thousands of people can approve simultaneously; agentic discovery traffic may already overload search APIs; and poorly designed checkout flows can encourage mechanical click-through. The gate should therefore be evaluated as one control among several, not as a substitute for system capacity, sound transaction design, or Grid observability.

11. Cross-layer feedback and emergent instability

A fare change may trigger synchronized agent searches. Congested services return timeouts. Agents retry or spawn delegates. Duplicate requests increase contention. Delayed confirmations leave uncertain reservations; physical seat capacity remains finite. The same positive feedback pattern can occur in

procurement, logistics, cloud capacity, and financial services. Each actant may follow its local rules while their collective behavior degrades the shared field.

GUDIYA's proposed stabilization mechanisms—admission damping, retry suppression, delegation caps, reconciliation barriers, cognitive viscosity, and bounded resource-aware intervention—should be tested against conventional baselines such as idempotency, queue management, rate limiting, and distributed tracing. The Grid's distinctive value must be demonstrated, not presumed.

12. First-class objects and evidence across the layers

Layer / boundary	Representative first-class objects	Evidence required
L1	Principal-ID, GCID, Actant-ID, mission participation, proposal	Intent, delegation, action provenance, proposal version
L1 ↔ L2	Handoff, Human Commitment Gate, approval attestation	Human identity, approved scope, freshness, anti-replay proof
L2	Session, security context, transaction, system-of-record state	Authorization, transaction outcome, idempotency, reconciliation
L2 ↔ L3	Obligation, resource allocation, fulfillment order	Accepted commitment, reserved capacity, exception
L3	Resource, capacity, fulfillment and replenishment events	Physical status, delivery, settlement and remaining exposure
Governance	GUCL, F-UDL, stability event, intervention, fitness assessment	Time-bounded lineage, uncertainty, recovery and closure

These objects form a federated temporal relationship graph, not a rigid containment tree. A single GCID can traverse both UX paths; one actant can serve multiple missions; an obligation can outlive every initiating session. Governance must preserve the difference between correlation and causation, and between evidence of a claim and verified physical outcome.

13. Architectural invariants

The following proposed invariants are particularly important: a credential alone never proves mission authority; an agent-prepared proposal is not a binding commitment; human approval applies to an exact, current proposal; a transaction is not complete merely because the browser closes; the enterprise system of record remains authoritative for its transactions; and a mission is not closed until outstanding obligations receive an accountable disposition.

A further invariant protects enterprise autonomy: a GUDIYA GCID does not override merchant admission policy, legal consent, payment rules, or regulated human attestations. The Grid coordinates only within its authorized scope and must represent unknown or inaccessible external state honestly.

14. Engineering validation agenda

A useful demonstrator should implement all three operating modes against the same mock enterprise system of record. Compare human-only traffic, agent-only traffic, and mixed traffic. Test cart handoffs, stale proposals, changed prices, duplicated checkout attempts, agent replacement, session loss, approval replay,

concurrent demand spikes, inventory exhaustion, and delayed fulfillment. Include a scenario where the Grid loses connectivity and local controls must enforce a safe degraded mode.

Measure approval correctness, unauthorized commitment prevention, throughput, tail latency, queue growth, duplicate obligations, human-channel fairness, mission-lineage completeness, time to reconciliation, physical overcommitment, and intervention side effects. Evaluate whether the dual-UX architecture and GUDIYA controls add measurable value beyond standard e-commerce and distributed-systems techniques.

Proposed Canon doctrines

THE DUAL-UX, COMMON-COMMITMENT PRINCIPLE

The UX Layer of the three-layer AI-Economy shall support Agentic UX and e-Commerce UX as distinct but interoperable entry paths. A governed undertaking may traverse either or both paths without losing mission identity or obligation lineage. Both paths shall converge upon authoritative enterprise commerce and systems-of-record controls, with differentiated admission and bounded authority where required. The UX may change; the actor may change; the authority may change; accountability shall remain continuous.

THE HUMAN COMMITMENT GATE PRINCIPLE

An enterprise may permit an actant to discover, compare, and prepare a commercial proposal while requiring a human principal to approve the consequential commitment. Approval shall be specific, current, authenticated, auditable, and resistant to replay or material post-approval alteration. Agent preparation shall not be confused with human authorization or authoritative transaction acceptance.

THE COGNITIVE-TO-TRANSACTIONAL VELOCITY DECOUPLING PRINCIPLE

The speed of cognitive intention generation shall not be presumed equal to the safe rate of enterprise commitment or physical fulfillment. Authorized admission, backpressure, transaction integrity, reconciliation, and resource-aware controls shall manage the mismatch across the three layers. The Stability Grid shall observe cross-layer feedback and intervene only through approved, bounded mechanisms.

Epilogue — One mission across two interfaces and three economies

The emergence of agentic commerce does not require abandoning the existing commerce stack. It requires acknowledging that the customer interface can now be shared between human and autonomous participants, with authority moving deliberately between them. The enterprise remains responsible for the integrity of its accepted commitments; physical resources remain finite; and the governed mission remains accountable until its consequences are properly settled.

The architecture is therefore simple in its outline and demanding in its implementation: one UX Layer, two interoperable paths, one shared transactional authority, one constrained fulfillment world, and a federated governance framework capable of tracing the whole undertaking.