DISTRIBUTED COGNITIVE AUTONOMOUS INFRASTRUCTURE (DCAI) PROGRAMME — WORKING PAPER 3

Order Without Custody: Governance-First Design for Merchant Commerce Rails in Low-Infrastructure Economies — The Tapstall Case

Courage Garikai · Tapstall · Coldcode Si Labs, Harare, Zimbabwe
21 October 2026 · 1.0 (pre-submission draft) · CC BY 4.0

Abstract

Small merchants across sub-Saharan Africa already sell at scale — through WhatsApp threads, Facebook pages, and a phone number painted on a wall — but they sell without a record. The order exists as a chat message, the payment as a screenshot, and the month-end as a memory argument between a shopkeeper and whoever keeps the books. The obvious remedy, a payments platform, is the one remedy that most of these merchants cannot and should not accept: it requires custody of their money, which in weak-recourse jurisdictions converts a bookkeeping problem into an insolvency risk, and it prices itself as a share of volume, which taxes the merchant precisely for succeeding. This paper argues that the binding constraint on digital commerce at this tier is not payment capability but reconciliation — the ability to state, without custody, who owes what and what is still outstanding — and that reconciliability is an architectural property, not a feature.

The argument is developed as a revelatory single case (Yin, 2018). **Tapstall** is a merchant order rail built and operated by the author on a zero-marginal-cost stack (Cloudflare Workers and KV free tiers, GitHub Actions, Whop for the subscription leg only), serving Zimbabwe, South Africa, Kenya and Nigeria. It holds no balances, makes no payouts, performs no currency conversion, and prices flatly. Its money-shaped output is not a wallet but a document: a per-day settlement statement that separates matched from expected, and reports to chase as the single actionable number.

Five mechanisms are formalised and each is tied to an artefact that a reader can inspect: the **No-Custody Rail (NCR)**, with a completeness result showing that the statement is derivable from the event log alone, and therefore that certainty does not require custody; **Admission-Gated Discovery (AGD)**, a seven-predicate admission gate for autonomous prospect discovery, with a provenance coverage measure that makes each hook checkable on the page it came from; **Reserve-Ladder Scheduling (RLS)**, a lexicographic budget regime under which automation can never be the reason an order fails to land; **Surface-Disjoint**

Order Without Custody

Governance-first design for merchant commerce rails in low-infrastructure economies

by Courage Garikai

Published by Coldcode SI Labs
First edition, 2026

Copyright © 2026 Courage Garikai. All rights reserved.

No part of this publication may be reproduced, distributed, or transmitted in any form or by any means without the prior written permission of the publisher, except for brief quotations in reviews.

Coldcode SI Labs Library · couragegarikai@atomicmail.io

Multi-Tenancy (SDM), a lattice of posting and visibility surfaces that keeps platform operators permanently outside the merchant's audience; and the **Constrained Persuasion Doctrine (CPD)**, a set of forbidden persuasive moves binding on all generated copy.

The empirical heart of the paper is forensic rather than promotional. Across the build's release chain (v1.0.0 to v1.9.1; 419 passing assertions on a 14,855-line codebase), five classes of governance failure are identified from verbatim production traces: provenance collapse (47 pre-gate "leads" that were page titles), budget cannibalisation (a single dead directory consuming a day's discovery allowance), representation drift (a Nigerian trunk zero that produced a number nobody could dial), surface collision (two Apps Script files competing for one menu and one queue view), and custody leakage attempts in documentation. Each is stated as a signature, a detector, and a design response. The taxonomy is offered as reusable diagnostic vocabulary for anyone operating autonomous systems under legal and financial constraint.

The paper is candid about what it is not: there are no paying customers in the measurement window, no control condition, and no inference beyond the case. Its claims are architectural, its evidence is reproducible, and its contribution is a demonstration that a merchant rail can be built to be auditable before it is profitable — and that in this market that ordering is not a virtue but a precondition.

Keywords: merchant commerce; reconciliation; payment custody; platform governance; agentic AI; admission control; multi-tenancy; informal economy; mobile money; design science; single-case research; sub-Saharan Africa

1. Introduction

1.1 The problem with the obvious answer

Consider a hardware shop in Harare that sells tills and weighing scales, and an accountant in Bulawayo who keeps books for eleven such shops. The shop already takes orders: a customer messages a photograph of a scale they want, the shop replies with a price in USD, the customer sends an EcoCash transfer or hands over cash, and the goods are delivered by a cousin on a Friday. This works. What does not work is the record. At month-end nobody can say which orders were paid, which were promised, which were delivered, or which customer still owes forty dollars. The accountant reconstructs the month from screenshots and a WhatsApp search box, and prices her uncertainty into the fee.

The standard prescription is a payments platform: a wallet, an acceptance product, a dashboard. Three properties of that prescription make it wrong for this tier of merchant.

Custody. A platform that accepts money on a merchant's behalf is holding funds it must later disburse. In jurisdictions with slow or contested commercial recourse — and Zimbabwe's multi-currency, cash-scarce, high-inflation-memory economy is the paradigm — that in-

termediation is a risk transfer the merchant did not ask for. When the platform fails, the merchant's money is inside the failure. The literature on mobile money is largely a literature about inclusion (Suri and Jack, 2016; Jack and Suri, 2014); the literature on platform failure is largely about consumers (Rochet and Tirole, 2003; Parker and Van Alstyne, 2005). The merchant-as-creditor of an insolvent intermediary is the gap between them.

Percentage pricing. A fee proportional to volume is a tax on success and a subsidy to failure. For a merchant whose monthly turnover is a few hundred dollars, the difference between 1.5% and a flat annual fee is not a pricing preference; it is whether the second employee gets hired.

Capability without custody. Nothing about the merchant's actual problem — knowing — requires the platform to touch money at all. What the merchant lacks is not a recipient of funds but a **record that both parties trust**, produced without the platform ever becoming a counterparty.

1.2 The thesis

This paper's thesis is that for merchants at this tier the scarce good is **reconcilability**: the capacity to state, at any moment and from evidence both sides can inspect, what was ordered, what was matched against a payment the merchant received directly, what remains expected, and what must be chased. Reconcilability is a design property of a socio-technical system. It can be engineered without custody, and engineering it without custody is strictly better for the merchant than engineering it with custody, because it removes an entire failure class (the intermediary's solvency) instead of insuring against it.

The paper demonstrates the thesis with **Tapstall**, a merchant order rail deployed in production on a zero-marginal-cost stack. Tapstall gives a merchant a storefront, an order link, a one-tap confirmation for the buyer, and — the artefact that carries the thesis — a **settlement statement** that the shop can hand to its accountant. Money moves between the buyer and the merchant through rails the merchant already uses. Tapstall holds nothing.

1.3 Contributions

1. **A design theory of custody-free reconciliation** (§5.1): the No-Custody Rail, with definitions, four invariants, and a completeness proposition showing that the statement is a function of the event log — so the merchant's certainty is not purchased with counterparty risk.
2. **An admission-control formalism for autonomous discovery** (§5.2): a seven-predicate gate, a provenance coverage measure `\kappa_{\text{hook}}`, and a precision argument explaining why an ungated crawler produces exactly the failure it produced here (47 rows of page titles).
3. **A starvation-freedom result for platform budgets** (§5.3): the reserve ladder under which orders are structurally immune to automation's appetite, stated as a theorem over priority reserves.

4. **A surface lattice for multi-tenant governance** (§5.4) and **a doctrine of constrained persuasion** (§5.5), both offered as constraints that are checkable in code and in copy rather than as policy prose.
5. **An empirically grounded taxonomy of governance failures in autonomous systems** (§7): five classes (provenance collapse, budget cannibalisation, representation drift, surface collision, custody leakage) with verbatim production evidence, signature predicates, detectors and design responses.
6. **A measurement base** (§6) for a zero-capital merchant rail: throughput, budget consumption, verification surface, and the refusals — because a discovery system's honesty is better measured by what it declines to file than by what it files.

1.4 Reading map

§2 situates the work across four literatures. §3 states the research design and its disciplines. §4 describes the case. §5 is the formal core and the paper's theoretical contribution. §6 measures. §7 is the forensic heart. §8 discusses implications. §9 concedes threats to validity. §10 concludes with an agenda.

---

2. Background and related work

2.1 Entrepreneurship without capital: effectuation, bricolage, and their limit

Sarasvathy's (2001) effectuation theory describes expert entrepreneurs reasoning from means at hand rather than from a pre-specified goal: they take affordable losses, stitch partnerships from self-selected stakeholders, and treat surprises as resources. Baker and Nelson (2005) describe bricolage — making do with whatever is to hand, often violating institutional expectations about what a firm of a given size should look like. Both traditions explain the merchant in §1.1 remarkably well: she has a phone, a customer list, a cousin with a van, and a cousin with a bank account, and she assembles a functioning commerce system out of exactly those parts.

What neither tradition was written to explain is what happens when the means at hand include **software agents that act under the founder's name several times a day**. The effectuation literature's inventory question ("what do I have?") acquires a new kind of answer — I have a machine that can call four hundred prospect pages a week — and with it a new kind of hazard, because an agent's acts are attributable to a human who may not have watched them happen. This paper takes effectuation as given and asks the engineering question that follows from it: **what must be true of the architecture for that attribution to remain honest?**