
OPERATING CASE STUDY / DATA, ANALYTICS & AI

Operational Command-Center Governance

Make each operating decision traceable to a coherent measure, an accepted owner and a verified release

An anonymized operating-design case study of a leadership command center: reconciling customer-quality measures, incomplete reporting periods and agent-assisted analytics before translating dashboard signals into operating decisions.

PROJECT CONTEXT / DECISION INTELLIGENCE & PERFORMANCE GOVERNANCE

BLUF / BOTTOM LINE UP FRONT

Reconcile the measure before releasing the decision.

RECALCULATED FINDING

A reported component sum exceeds its headline by 9.8%. Under a shared denominator and disjoint-subset definition, that is an arithmetic contradiction. Multiplying all values by the same factor preserves it; the repair must resolve metric identity or source versions.

CONTRIBUTION IN THE SOURCE RECORD

Metric definitions, denominator challenges and acceptance checks. Provisional registry-level hoop support for operator direction.

EVIDENCE STATUS

Registry-based design and reconciliation case. No authenticated field adoption, causal customer improvement or realized financial savings is established.

BLUF: analytical inference. Source contribution: historical record. Client and internal identities anonymized.

EXECUTIVE ABSTRACT / DECISION AND EVIDENCE

Fund a trustworthy decision workflow before expanding the dashboard

[AI] The operating contribution is a specification for defensible interpretation: connect the measure, source version, reporting window and response owner before asking leaders to act.

Structured abstract	Executive assessment
Context [HR]	A distributed service network needed a daily view of customer-quality gaps, targets and actionable drivers. Reporting drew from several read-only sources with inconsistent population definitions.
Objective [HR]	Bring headline measures, period comparisons, driver drilldowns and action guidance into one leadership workflow with explicit acceptance checks.
Approach [HR]	Operator-directed, agent-assisted construction; numerator and denominator reconciliation; settled-period checks; source comparisons and internal consistency tests.
Findings [RC/AI]	Components exceed one headline by 9.8% under comparable definitions. Other snapshots do not violate that floor. A universal scaling fix cannot resolve the offending snapshot.
Decision value [AI]	The analysis specifies which interpretations must be held and what evidence can release them. Historical dollars saved or decisions prevented cannot be estimated from the register.
Implications [PD]	Adopt a Decision Reconciliation Contract (DRC), then test decision loss in a controlled benchmark. Treat a live operating-effect study as a separate investment gate.

The immediate executive decision

[PD] Appoint one metric owner to settle definitions, one platform owner to bind displayed values to immutable inputs, and one operating owner to accept responses. Authorize the reconciliation stage and a bounded benchmark only after its evidence bank is independently adjudicated.

EVIDENCE BOUNDARY

[AI] The design record supports scrutiny of requirements and arithmetic. It does not establish that this command center was adopted, that a reported correction persisted, or that customer outcomes changed because of it.

Labels: [HR] historical record; [RC] recalculated; [AI] analytical inference; [PD] proposed design. Source basis S1; see private annex.

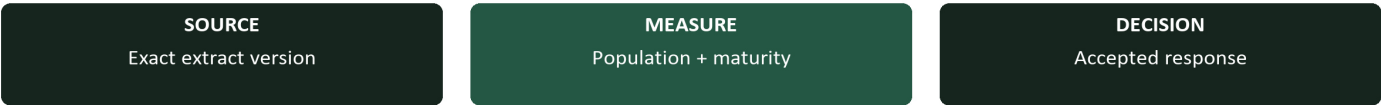
EXHIBIT 1 / THE OPERATING PROBLEM

A connected dashboard becomes useful only when its measures agree

[HR/AI] The source record describes a move from fragmented reporting toward an integrated leadership routine. The decisive design requirement is agreement about what each displayed value measures.

THE SAME SCREEN CAN CONTAIN DIFFERENT MEASURES

Historical design / proposed acceptance contract



A data connection establishes access; it does not establish comparability.
Bind each displayed value to the complete measure definition.

Historical source: protected register S1. Acceptance design: proposed DRC.

Registered design [HR]	Decision requirement [PD]
Headline and period views	Show population, numerator, denominator, maturity cutoff and source version beside each comparison.
Driver and location drilldowns	Reconcile the children to their parent or explicitly identify overlap and an unallocated remainder.
Guided actions and impact bridges	Separate observed gaps from assumed response effects; route an accepted owner before execution.

[AI] A successful data connection demonstrates access at that moment. A lineage record documents a claimed derivation. Neither establishes that the selected population, maturity window or cost basis answers the operating question. These are semantic acceptance tests, not cosmetic interface checks.

[HR] The register records repeated operator challenges to denominators, inconsistent displays and unsupported content. It later describes the asset as discoverable but no longer the active daily reporting path. Evidence from a successor surface is excluded from this case.

Source: S1 master, narrative, decisions and timeline; claim ledger in private annex. Interpretation: W3C DQV; Schelter et al. (2018). HR registered design; AI inference; PD proposed acceptance contract.

EXHIBIT 2 / A NEW ANALYTICAL FINDING

Uniform rescaling preserves the headline–component contradiction

[RC] Normalize the contested headline to 100. Its recorded component sum is 109.8: a negative remainder under the shared-denominator, disjoint-subset contract.

POSITIVE RESCALING CANNOT REPAIR A NEGATIVE REMAINDER

Recalculated • contested headline = 100 • same positive scaling applied to both

HEADLINE 100.0	COMPONENT SUM 109.8	REMAINDER −9.8
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Required identity: headline = disjoint subset sum + nonnegative remainder
For $k > 0$, $k \times (\text{component sum} - \text{headline})$ remains positive.

Conditional on matching population, window, maturity, denominator and disjoint categories.

[AI] The test applies only if components are nonnegative, mutually exclusive subsets of the headline, with the same population, time, maturity and denominator. The selected buckets need not exhaust the headline. If categories overlap or use different denominators, reconcile their identities before applying this test.

Candidate repair	Analytical result
Multiply headline and buckets by $k > 0$	Cannot repair the contradiction: $k \times (\text{sum of buckets} - \text{headline})$ remains positive. The excess ratio is unchanged.
Replace the headline with the bucket sum	Closes the display by construction but incorrectly assumes the selected buckets are exhaustive.
Recover the matching metric snapshot	Required. Another registered reference leaves a positive remainder; neither snapshot is silently discarded or averaged.

WHY THIS CHANGES THE DECISION

[AI] A scale-factor patch may make a chart look plausible while retaining an impossible accounting relationship. Hold the affected decision and repair the identity join; do not announce an operating improvement.

Source: S1 metrics M01 and M06; evidence_audit.json component_closure. RC: $100 \times \text{recorded component sum} / \text{contested headline}$, rounded to 109.8. Conditions and alternate version retained in the private ledger.

EXHIBIT 3 / POPULATION RECONCILIATION

A denominator correction cannot travel between different metrics

[RC/AI] The register combines a broad-population comparison with a scoped comparison. Recalculation shows that the factors quoted for one metric were attached to another.

TWO METRIC COMPARISONS REQUIRE TWO SEPARATE RECONCILIATIONS

Recalculated • broad-population rate / scoped-population rate

OVERALL QUALITY
Approximately 1.36×

TIMELINESS COMPONENT
Approximately 1.85×

Each ratio pairs its own numerator with its own denominator.
A factor copied between metrics changes the meaning of the result.

Source: S1; both recorded timeliness numerator variants round to the same public ratio.

[RC] For the overall quality measure, the broad-to-scoped rate ratio is about 1.36. For a timeliness component, it is about 1.85 under either recorded numerator version. These are two descriptive scope contrasts; neither is a treatment effect or a transferable conversion factor.

[RC/AI] If the broad population truly contains the scoped population under a common definition and window, subtracting their counts implies that the outside group has about 2.20 times the scoped overall rate. That conditional result reverses the direction described in one source narrative. Original membership is required before using it operationally.

Conflict	Publication and release rule
Count and denominator both change	Recompute from the paired counts. A denominator-only substitution can manufacture a different rate.
Different denominator label matches the value	The lost-item reference reproduces on another exposure basis. Keep denominator status unresolved; numerical coincidence is not source authority.
Alternative report covers another window	Preserve the comparison as a diagnostic lead, not a same-window validation pass or failure.

Source: S1 M02–M03 and recorded cross-checks. Private audit retains both timeliness numerator versions, exact population factors and conflicting exposure definitions. Public ratios are relative internal measures.

EXHIBIT 4 / PERIOD COMPLETENESS

A zero can be a valid outcome even when an empty feed also displays zero

[AI] Completeness must be determined independently of outcome value. A rule requiring a positive defect count can exclude genuinely successful exposure.

COMPLETENESS IS A FEED STATE, NOT AN OUTCOME VALUE

Analytical inference / proposed missing-data contract

VALID ZERO Exposure; no events	INCOMPLETE FEED Unknown event count	MATURE PERIOD Independent watermark
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Removing only true zero-event exposure raises the retained rate.
Hypothetical bias factor = $1 / (1 - \text{excluded exposure share})$.

Do not replace missing events with zero or remove genuine zeros as missing.

[RC] For nonnegative exposures, an aggregate rate formed as total events divided by total exposure must lie between the included daily rates. The contested week-to-date value falls below the two stated settled days. If the displayed zero day is a genuine completed observation, however, the lower aggregate becomes mathematically possible.

[PD] Gate inclusion on independent ingestion and maturity watermarks. Then sum eligible event counts and exposures over identical weekdays in the current and comparison periods. Retain valid zero-event days; quarantine incomplete days with an explicit missing state.

Illustrative excluded exposure [PD]	Inflation in the retained rate [RC]
5% in genuine zero-event days	5.3%
10% in genuine zero-event days	11.1%
20% in genuine zero-event days	25.0%

[RC] If q is the share of exposure removed solely because its event count is zero, retained rate = full rate / $(1 - q)$. These are hypothetical sensitivities, not estimated project bias. The registered matched-period reduction remains descriptive and cannot resolve selection or causality.

Source: S1 M04, decisions on reporting windows and completeness. RC: ratio-of-sums identity and $r_{\text{filtered}}/r_{\text{full}} = 1/(1-q)$. Completeness status of the displayed zero is unresolved; NIST Weighted Mean informs aggregation.

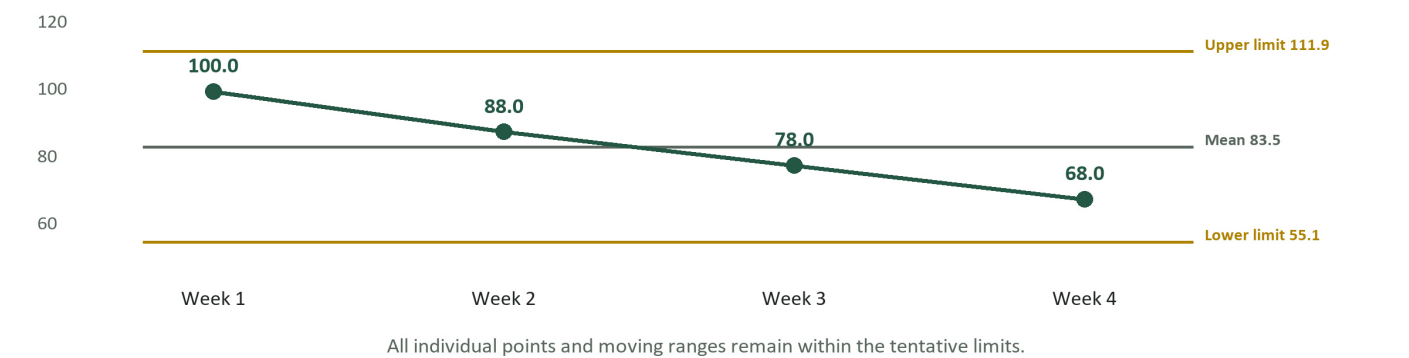
EXHIBIT 5 / SIGNAL AND NOISE

A falling count sequence does not establish a better operating process

[RC/AI] Four inherited weekly counts fall within tentative individual and moving-range limits. Exposure is missing, so the sequence cannot establish a rate improvement.

FOUR OBSERVATIONS PROVIDE A TENTATIVE SCREEN, NOT AN EFFECT

Recalculated • first inherited weekly count = 100 • exposure unavailable



Diagnostic [RC/AI]	Interpretation
Individual observations and moving ranges	No point exceeds the provisional limits. Classify these movements as within-limit variation under this screen, not demonstrated process change.
Only four points	Limits are highly tentative; short history, trend, calendar effects and changing mix can invalidate a natural-process interpretation.
Missing weekly denominator	Lower counts can follow lower exposure. No event/exposure panel supports a defensible Laney p' rate analysis.

[HR/AI] The count sequence is inherited context, not a contemporaneous outcome panel for this command-center intervention. An apparent decline therefore cannot substantiate its impact even if a longer series later establishes a process signal.

OPERATING RULE

[PD] Freeze comparable definitions and a baseline phase, collect denominators and maturity flags, and predeclare special-cause rules before using the chart to trigger corrective work.

Source: S1 M09; evidence_spc.json. Index: first recorded weekly count = 100; common positive scaling preserves XmR classification. Tentative limits: mean ± 2.66 × mean moving range; MR upper = 3.268 × mean MR.

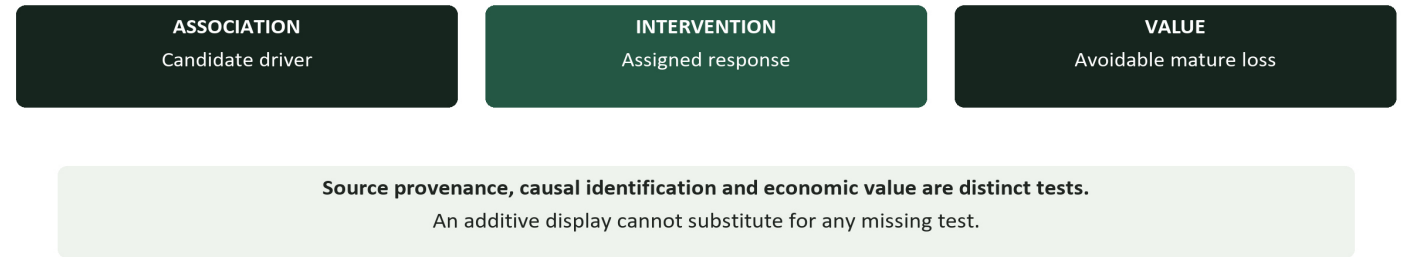
EXHIBIT 6 / FROM DRIVERS TO DECISIONS

A plausible impact bridge still needs a defensible intervention effect

[HR/AI] The register describes weighted drivers, inherited correlations and proposed action bridges. These can organize investigation; they cannot by themselves price an operating intervention.

A CORRELATION BRIDGE DOES NOT IDENTIFY AN ACTION EFFECT

Historical model ingredients / analytical inference



Inherited regressions and gross per-event values are not realized project benefits.

Evidence state	Permitted use
Inherited bivariate associations [HR]	Prioritize candidate mechanisms and out-of-sample checks. Do not add separate fitted relationships as independent causal contributions.
Proposed weights and per-event value [HR]	Expose the assumptions. Verify construct alignment, overlap and avoidable cost before calculating a business case.
Unsupported drafted bridge values [HR]	The register reports some removals and continuing issues. Require a version-specific source manifest before release; do not repeat invented detail as a project result.

[AI] The useful operator intervention was to demand an intelligible chain from source to measure to response. Whether a bridge is numerically additive is a different question from whether acting on its driver changes a mature customer outcome. Both tests matter.

[PD] Evaluate decision quality first with a held-out, adjudicated packet bank. A separate field design must estimate customer effects, including execution fidelity, overlap with other programs and incremental resource cost.

Source: S1 M05, M07–M10; decisions and governance. Interpretive basis: Shmueli (2010); OECD/JRC (2008). Historical design and proposed evaluation are separated; no bridge value is represented as realized savings.

EXHIBIT 7 / THE RELEASE MECHANISM

The Decision Reconciliation Contract makes the next action explicit

[PD] DRC is a proposed operating contract: release a decision only when its evidence identity, arithmetic, maturity and accountable response pass separately.

RELEASE THE DECISION ONLY WHEN EACH CONTRACT GATE PASSES

Proposed Decision Reconciliation Contract • no compensating average score



A failed gate names a resolver, required evidence and a resumption condition.
Any material version change reopens the affected gate.

Measure decision loss across all scheduled cases, including holds and timeouts.

Gate and owner [PD]	Required evidence and state change
Identity / metric owner	Approved construct, paired count and exposure, eligible population, taxonomy and version. A changed field reopens reconciliation.
Integrity / platform owner	Stored query or extract hash, recomputation, component checks and truthful missing states. A failed check holds the affected view.
Decision / operating owner	Applicable response, accepted capacity, due time and escalation path. A hold names the resolver and the evidence needed to resume.
Value / sponsor and analyst	Benchmark decision loss, full workflow cost and separate field-effect plan. More released decisions alone is not success.

[PD] First recover and reconcile the source artifacts. Next validate the contract on untouched examples, including legitimate zeros, overlapping categories and stale versions. Then test the user workflow under random assignment. Progress to field evaluation only after the benchmark and its harm checks pass.

SUCCESS IS A BETTER DECISION, NOT A HIGHER RELEASE COUNT

[PD] Score false releases, unnecessary holds and timeouts across every scheduled packet. A system cannot appear useful merely by suppressing difficult cases.

Proposed framework derived from the source reconciliation; not a historical platform, certification or deployment. Technical propositions and the executable planning model follow.

TECHNICAL ANALYSIS

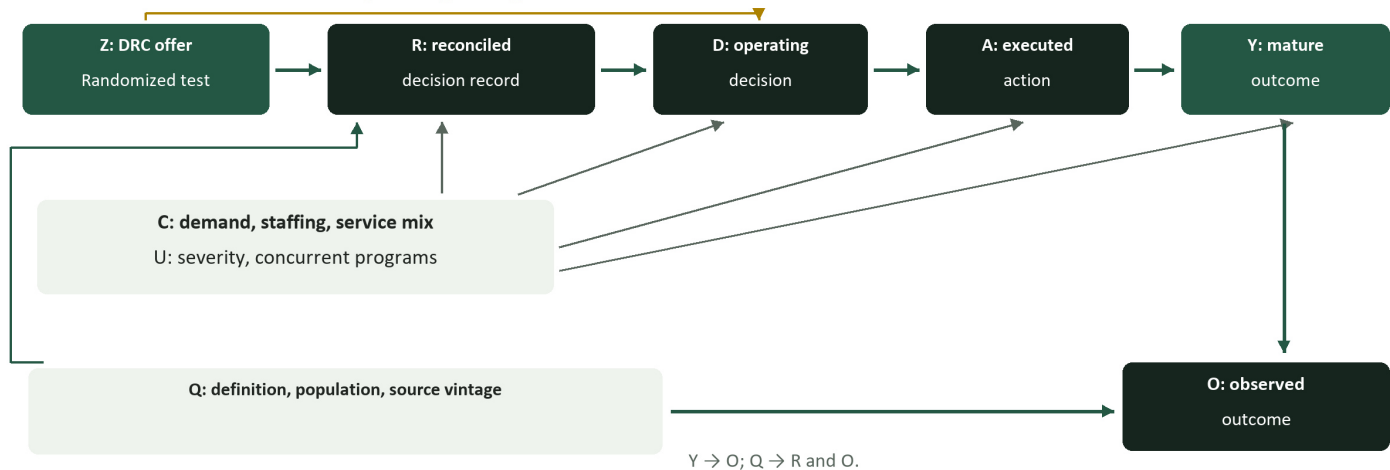
A reconciled decision record is an intermediate outcome

[AI/PD] The Decision Reconciliation Contract (DRC) connects a verifiable measurement to an authorized decision. It does not make a corrected display an operating treatment.

REPORTING QUALITY AND CUSTOMER IMPACT HAVE DIFFERENT PATHS

Proposed causal graph • arrows are hypotheses, not historical effect estimates

Z can also change D through training and escalation.



[PD] Z is randomized access to the DRC interface and workflow; R is the released decision record; D is the decision; A is an executed operating action; Y is a mature customer outcome. Q represents source identity, definitions and vintage, while O is the recorded outcome. Baseline demand, service mix and staffing form C; unmeasured severity and concurrent programmes form U. Arrows describe hypotheses, not estimated effects.

[AI] The registered specification and reconciliation work concern the production and checking of R. The proposed benchmark would observe Z, R and D. It executes no field action and cannot identify $A \rightarrow Y$. Training and escalation can also connect Z directly to D; assignment is therefore not automatically a valid instrument for record use.

[AI] Q can change both R and O without changing Y. A lower displayed defect rate can reflect a denominator or coding revision. Residual disagreement must be investigated through these unmeasured or unresolved paths, not assigned automatically to an operating cause. Common staffing and shared queues can also transmit effects across organizational boundaries.

Basis: registered design and acceptance requirements [HR]; proposed causal graph [PD]. Historical software correctness and customer impact remain distinct.

TECHNICAL ANALYSIS

An arithmetic guard works only after its predicates are verified

[AI] Internal consistency can disprove a joint set of measurement claims. It does not, by itself, identify the correct replacement value.

Two identities, with different admissibility conditions

[AI] For nonnegative counts N_i and positive exposures E_i on disjoint reporting periods, the combined rate is $\sum N_i / \sum E_i = \sum w_i r_i$, where $r_i = N_i / E_i$ and $w_i = E_i / \sum E_i$. It lies between the component rates. An unweighted mean answers a different question unless exposures are equal or a special numerical coincidence occurs.

[AI] A headline rate must exceed or equal the sum of displayed component rates only when the components count nonoverlapping subsets of the headline numerator and share its unit, eligible population, time window, maturity and denominator. Overlapping defect labels can legitimately sum above a unique-unit headline. In that case, deduplicate the union or display an explicit overlap bridge; do not force the numbers to agree.

Registered issue [HR]	Admissible interpretation [AI]
Headline below its purported component sum	At least one partition, population, denominator or binding claim fails; the guard cannot name the failing field.
Week-to-date rate below every included daily rate	Impossible for the same positive-exposure periods and definitions; investigate additional days, maturation and different cohorts.
Broad-scope rate exceeds the intended rate	Compare numerator and denominator scope ratios separately. A common scalar repair is not justified when the ratios differ.

[RC/AI] The privately transcribed late-bucket counts imply a broad/scoped rate ratio near 1.85; a separate topline pair implies about 1.36. These are distinct metrics, not interchangeable versions. Both pairs put their broad rate above their scoped rate. If each broad population contains its scoped population, the outside-scope rate must also exceed the scoped rate; the source’s opposite population interpretation is unsupported. Category and scope branches must remain separate.

[PD] Bind every guard to a machine-readable predicate record and a declared rounding tolerance. Passing the check permits further validation; it does not authenticate the source, prove the partition complete or establish causal attribution.

Basis: registered metric and source-version conflicts [HR/RC]; ratio identities [AI]; NIST, Weighted Mean; Schelter et al. (2018).

TECHNICAL ANALYSIS

Outcome-dependent completeness can manufacture a worse rate

[AI] A rule that retains only periods with positive defect counts can remove valid exposure. It must not substitute for an ingestion or maturity test.

Separate zero, missing, inapplicable and immature

[HR] The registered matched-days proposal identified complete periods partly through a positive conceded-count condition. The intent was to avoid immature data. [AI] A fully observed period can instead contain genuine zero defects. Conversely, a positive count can coexist with substantial late arrivals. Neither sign establishes completion.

[AI] Let N be defects across retained periods, E their eligible exposure, and E_o positive exposure in fully observed zero-defect periods. Removing the zero periods reports N/E instead of $N/(E+E_o)$. For $N>0$, this necessarily raises the rate. The inflation factor is $1+E_o/E$. This is an algebraic selection effect, not an estimate of bias in the historical application; the omitted exposures are unavailable.

Clock or state	Required contract [PD]
Occurrence versus posting	Retain both timestamps and the extraction vintage. Do not compare an event-cohort rate with a posting-period flow.
Weekly comparison	Use identical weekday coverage and declared cohort maturity; expose unmatched days and their eligible exposure.
Cross-metric freshness	Resolve the latest admissible period separately for each metric family. A shared screen date must not conceal different horizons.
Zero versus unavailable	Release zero only after eligibility, exposure, ingestion and maturity checks pass. Otherwise preserve the relevant missing or immature state.

[PD] Completeness should be established independently of the realized outcome: expected source partitions received, reconciliation to upstream control totals, declared late-arrival horizon and exception review. These are candidate checks, not proof that an arbitrary fixed lag achieves full maturity. A later outcome correction must create a new version, preserving the original decision record.

[AI] Matching a reference on a selected day is a finite acceptance result. Durability requires held-out dates, all supported populations, boundary periods and subsequent releases. The source describes both a temporary match and a later regression; neither a permanent success claim nor an absolute never-correct claim survives that chronology.

Basis: registered completeness rule and chronology [HR]; zero-defect selection identity [AI]; Wang and Strong (1996); W3C Data Quality Vocabulary.

TECHNICAL ANALYSIS

Validate metric meaning before measuring agreement

[PD] The audit unit is a metric-context-version decision, not a tile, API response or metric name. Identity and freshness are necessary inputs to a valid comparison.

Metric family	Construct and invariance tests [PD]
Customer defect outcomes	Specify unique units versus events, exclusions, exposure cohort, reporting horizon and category partition. Reconcile the displayed rate to its own numerator and denominator.
Lost-unit headline and attribution	Keep distinct source constructs separate. A quantity-only attribution tree cannot supply a rate denominator or silently replace the headline.
Dispatch exceptions and process quality	Freeze eligible events, opportunity denominator, node crosswalk and process version. Distinguish counts, rates, percentages and percentage-point changes.
Targets and composite priority	Record policy versus weekly plan, version, direction and valid subgroup. Normalize before weighting; overlapping mechanisms cannot be counted twice as benefit.

[HR/AI] The registry describes reused identifiers, different definitions under similar labels, unit scaling mistakes and conflicting target versions. It also describes a lost-unit rate whose transcribed arithmetic matches a different denominator from the accompanying explanation. A numerical match is a diagnostic clue; it does not authorize relabelling the denominator without source-owner confirmation.

A reproducible classification audit

[PD] Freeze a future frame of metric-context decisions spanning source modes, metric families, business lines and node types. Two trained reviewers, blinded to build version and developer claims, independently classify identity, maturity, partition and release validity against an independently maintained requirement dossier. Resolve disagreement only after retaining the original labels.

[PD] An initial random core of 200 context decisions gives an approximate worst-case agreement margin of ± 6.9 percentage points under independent sampling. This is not a kappa precision claim or a census of the current catalogue. Shared metrics, sources and templates require cluster-aware intervals and a revised sample size. Add rare exceptions separately; estimate population rates only with valid design weights.

[PD] Publish the confusion matrix, $\kappa = (p_o - p_e) / (1 - p_e)$, uncertainty and error severity; p_o is observed agreement and p_e is chance-expected agreement. A prevalence-specific pilot simulation must set the final kappa sample size. Agreement between reviewers who share a mistaken reference is reliability, not construct validity; an independent source-owner review and adversarial examples remain necessary.

Basis: registered metric, denominator and target conflicts [HR]; proposed audit [PD]; Cohen (1960); Schelter et al. (2018); OECD/JRC (2008).

TECHNICAL ANALYSIS

The short count sequence does not establish a process improvement

[RC/AI] The available weekly count observations decline, but the record supplies neither corresponding exposure nor a stable intervention comparison.

Baseline-indexed calculation [RC]	Value
Ordered observed count values	100.00; 88.04; 78.01; 68.01
Individuals mean / mean moving range	83.51 / 10.66
Tentative individuals limits	55.15 to 111.88
Moving-range upper limit	34.85
Arithmetic screen	No individual or moving-range point exceeds these limits.

[RC] For this screen, $MR_t = |x_t - x_{t-1}|$, the center is the sample mean, individuals limits are $\text{mean} \pm 2.66 \times \text{mean}(\text{MR})$, and the moving-range upper limit is $3.268 \times \text{mean}(\text{MR})$. Indexing by a positive fixed baseline preserves crossings. The private audit retains raw observations, source cells and calculation precision.

[AI] These limits use very few observations and are tentative. No crossing is insufficient evidence of stable routine variation. A monotone short segment may arise from changing volume, event mix, definitions or seasonality; no available exposure series separates those paths. The declining counts are not a defect-rate reduction, a dashboard effect or a warrant to adjust an operating process.

[RC/AI] The private inventory contains 17 screens: four reported operating sequences, five display or version sequences, two explicitly fabricated profiles and six plan-endpoint pairs. Short daily-rate vintages remain separate; a process-pass sequence remains private to avoid reconstructing protected rates. All individual points lie within their mechanical bands. None establishes a stable phase or operating effect.

[PD] Before operational monitoring, fix the process phase, eligible population and taxonomy, then collect an adequate baseline with exposure and ascertainment information. Laney p' is appropriate only for a justified binary rate with paired counts and opportunities, a stable construction and estimable extra-binomial dispersion. Large denominators or a repeated-events-per-opportunity metric alone do not justify that chart.

[AI] Deming’s tampering argument cautions against responding to noise as a process change. It does not excuse a semantic defect in the reporting system. A wrong denominator can warrant a software hold even when every plotted point lies inside a statistical band.

Basis: registered weekly dispatch-exception count context [HR/RC]; NIST Individuals Charts; Deming Institute, Funnel Experiment. No historical causal effect is estimated.

TECHNICAL ANALYSIS

An outlier list is a selection mechanism, not a treatment effect

[AI] The intended priority view combines exposure, process measures and economic weights. Each choice changes who receives attention and what a later comparison means.

[HR] The design proposed ranked sites, volume weighting, configurable process weights and a drilldown to actions. It also identified low-exposure outliers and distinguished local adherence from capability constraints. No fixed selected cohort, delivered-action panel or follow-up comparison is supplied.

Quantify a sensitivity without inventing a historical adjustment

[PD] Suppose standardized baseline and follow-up scores are jointly normal with correlation ρ , no treatment and unchanged population means. Selecting the worst tenth of baseline scores yields a baseline mean about 1.755 standard deviations above average. Expected spontaneous reduction is $(1-\rho)\times 1.755$: 1.228, 0.702 or 0.175 standard deviations for $\rho=0.3, 0.6$ or 0.9 . These are invented selection scenarios, not fitted correction factors for the source cohort.

[PD] Freeze selection before treatment; keep original membership through graduation, closures and missing reports. Compare selected treated units with selected concurrent controls and show nonselected context separately. Eligibility floors reduce unstable tiny-denominator ranks but do not eliminate regression to the mean, confounding or multiple-comparison selection.

Moderator	Why transfer may fail [AI/PD]
Business line and node type	Different process opportunities, source definitions and available actions can invalidate a pooled score or intervention.
Volume and service mix	A rate outlier and a large absolute contribution answer different allocation questions. Report both before prioritization.
Authority and local capability	A location cannot execute a centrally owned policy change. Route capability gaps to the authorized owner rather than treating them as local noncompliance.
Source and target coverage	A missing bridge or unsupported goal cannot be repaired by increasing a composite weight.

[AI] The weighted index is a normative priority rule, not an estimated causal production function. Correlated inputs may count the same underlying problem repeatedly. Audit rank stability over plausible weights and exclusion rules, then compare the resulting decisions under equal resource capacity. Gross unit-cost weighting cannot establish avoidable savings.

Basis: registered ranking and authority design [HR]; normal-tail sensitivity [PD]; Barnett et al. (2005); OECD/JRC (2008).

TECHNICAL ANALYSIS

The defensible contribution is specification and diagnostic control

[HR/AI] The evidence register attributes product direction and acceptance requirements to the case lead. It distinguishes those activities from application coding, source ownership and customer outcomes.

Personal contribution claim	Process-tracing grade [AI]
Defined the daily decision need, metric scope and fallback states	Provisional hoop: register descriptions and document metadata are consistent with authorship; original artifacts are not independently reopened.
Diagnosed inconsistent metrics and demanded arithmetic verification	Provisional hoop: recorded instructions and examples support the described role. They do not authenticate execution of every check.
Implemented the application code	Not supported as a personal contribution: the register assigns code generation to a builder system.
Secured durable access, adoption or operating benefit	Not established: no authenticated grant, repeated acceptance, use panel or causal outcome evaluation is supplied.

[AI] A hoop test asks whether necessary evidence is present. A smoking-gun test requires a distinctive trace that is unlikely under competing explanations, such as an authenticated instruction linked to a versioned implementation and independently reproduced change. A doubly decisive test must also exclude alternatives. Repeated summaries, copied metadata and first-person agent text cannot substitute for those tests.

A documented conflict protocol

[PD] Preserve every source version with metric identity, population, extraction time, maturity and record locator. Prefer authenticated source rows and executable formulas when available, then contemporaneous diagnostic outputs, then summaries. Authority never follows convenient agreement. With only register transcriptions, publish the algebra under each compatible version and retain the unresolved fork.

[AI] The reported temporary metric match and later regression support a durability question. They do not support either permanent release readiness or an assertion that a correct live display never existed. Similarly, differing unit costs can represent different defect constructs or periods; neither is a saving and neither should become a low/high benefit scenario without a crosswalk.

[AI] A later discoverable asset establishes discoverability. It does not establish usage, ownership transfer or continuing maintenance. The record’s references to a successor reporting surface and separate forecasting work remain outside this project’s contribution boundary. No adoption trace was recovered; that does not establish whether adoption occurred elsewhere.

Basis: registered authorship, implementation boundaries and chronology [HR]; Collier (2011). Grades are analytical assessments of available evidence, not credentials.

TECHNICAL ANALYSIS

Test the release decision before claiming a customer benefit

[PD] The first experiment evaluates whether the DRC changes decisions on identical evidence. It makes no operational intervention and cannot authorize a field-effect claim.

[PD] Randomize independent leaders in parallel to a DRC interface and workflow or the usual presentation. Both arms receive the same frozen packet bank, evidence and source-owner requirement manifest. Establish valid versus invalid records by independent adjudication before assignment; seeded faults must represent explicit failure classes, not an assumed production prevalence. There is no learning crossover.

[PD] The primary intention-to-treat estimand is usual-arm mean decision loss minus DRC-arm mean decision loss over all scheduled packet decisions at their original deadlines. Preregister mutually exclusive invalid releases, unnecessary holds of valid records and timeouts, and assign explicit hypothetical costs. Include every assigned packet, not only decisions completed or released. The independent leader is the sampling and assignment unit; repeated packets do not multiply independent sample size.

[PD] The accompanying model specifies a finite hypothetical benchmark population, costs, cluster distribution, critical values and power at the economic boundary. Its incremental effort cost must apply to the same packet pool and horizon. Field recruiting, actual error prevalence, correlated leaders and uncertain prices require a pilot and renewed sizing. The benchmark is conditional on its frozen bank; generalization requires an independent bank and operational validation.

Distinct gate	Evidence required [PD]
Decision quality	Lower confidence bound on loss reduction exceeds the same-horizon incremental cost; unacceptable invalid releases and delays also fail prespecified guardrails.
Live operating usefulness	Representative authenticated records, stable as-of rules, accepted decision ownership and feasible action capacity.
Customer effect	A separately powered randomized rollout with mature, independently ascertained customer outcomes and intact upstream eligibility.

[PD] For the later field test, randomize independent service domains sharing neither staff nor constrained queues, stratified by business line and node type. Assign the complete dashboard-plus-response protocol; preserve all upstream eligible units, including holds and cancellations. Freeze an outcome horizon and original promise clock, estimate assignment ITT, and measure execution as a mediator. A staggered design needs uncontaminated controls and group-time effects; baseline and pretrend diagnostics cannot prove parallel trends. Customer power, break-even and spillover feasibility are unresolved here.

Basis: proposed parallel decision benchmark and separate field design [PD]. Numerical assumptions appear in the decision model; no historical customer or cash benefit is claimed.

TECHNICAL ANALYSIS

The contract makes four claims that a future study can reject

[PD] The DRC requires metric identity, a reproducible calculation, declared maturity, explicit unresolved conditions and an accepted decision owner before release.

Falsifiable proposition	Test and decision consequence [PD]
P1: identity checks reduce invalid release	On a frozen adversarial bank, compare assignment-level invalid releases. Refute a prespecified useful reduction if its compatible upper bound lies below that threshold.
P2: independent completeness avoids selection bias	Include genuine zero-defect, late-arriving and missing-partition cases. Check whether release decisions preserve eligible exposure and reject incomplete positive-count periods.
P3: durable checks outperform one-day matching	Freeze rules, then test unseen periods, populations and software versions. A material false-pass rate on these holdouts contradicts the claimed durability.
P4: decision value exceeds implementation burden	Compare the lower benefit bound with incremental cost and prespecified guardrails. An interval spanning break-even is inconclusive; an upper bound below it contradicts economic benefit under the stated prices.

[AI] Schelter and colleagues automate explicit data constraints. Wang and Strong distinguish consumer-relevant quality dimensions; W3C separates quality measurements from provenance. This case proposes that a release assertion bind its arithmetic to the identity and clock of the decision it authorizes. This extension remains unvalidated.

[AI] Deming’s tampering argument separates noise from intervention need. Campbell warns that consequential indicators can be distorted; a positive-count completeness proxy is therefore an auditable design risk, not evidence of employee gaming. Ittner, Larcker and Randall distinguish measurement-system assessments from economic outcomes. Tucker and Edmondson’s learning research motivates converting repeated patches into owned source corrections; it does not prove that escalation occurred here. Composite-indicator guidance requires transparent normalization and sensitivity before rank-based resource allocation.

Consolidated limitations and reproducibility

[AI] Original application code, queries and source exports were not recovered. Register transcriptions support a reconstructable account, not authentication of software state. Source forks, unknown category overlap, inconsistent clocks, missing exposures and absent adoption/outcome panels block historical causal and financial inference. The private annex retains source locators, alternate arithmetic and mechanical screens. Public figures are indexed or relative. Proposed audits and experiments remain prospective; correcting a reporting defect cannot be booked as customer improvement or counted again as information value.

Basis: proposed DRC [PD]; Schelter et al. (2018); Wang and Strong (1996); W3C; Deming; Campbell (1976); Ittner et al. (2003); Tucker and Edmondson (2003); OECD/JRC (2008).

PROSPECTIVE MODEL / DECISION BENCHMARK

Test the decision workflow before claiming an operating effect

[PD] All probabilities, losses and costs below are hypothetical. This matched-content benchmark tests decision quality; it does not estimate customer impact or production savings.

[PD] Randomize independent leaders to current validated reporting or the frozen Decision Reconciliation Contract interface and orientation. Both arms receive the same 32 unique packets: half require release; half require hold and escalation because of a material inconsistency. Randomize order, give no correctness feedback and prevent collaboration. Underlying content is identical.

[PD] A separate blinded panel freezes the truth manifest, admissible actions and deadline before assignment. Retain every packet in the ITT denominator. An unexplained abstention, late answer or unsubmitted answer is a timeout, not a correct hold. Correct decisions have zero decision loss.

Packet truth	Wrong decision	Timeout
Hold required	Erroneous release: 10	6
Release required	Unnecessary hold: 3	3

[PD] Usual probabilities: erroneous release 0.18 and invalid-packet timeout 0.04; unnecessary hold 0.12 and valid-packet timeout 0.04. At the planning alternative they become 0.08, 0.02, 0.09 and 0.02. A shared easy/hard leader type shifts release error by +/-0.025 and hold error by +/-0.015; each type has probability one-half.

DECISION BOUNDARY

[RC/PD] Usual expected loss is 1.26 per packet, indexed to 100. Holding everything produces 1.50; timing out produces 4.50. Suppression cannot win this benchmark.

[PD/RC] Finite categorical model; equal packet classes and conditional independence within latent leader type are planning assumptions. The benchmark needs a live-prevalence transport study before operational use.

PROSPECTIVE MODEL / EXACT POWER AND REDESIGN

A larger leader sample resolves the stated benchmark decision

[PD] Require both 80% power to distinguish break-even from zero and 80% probability of clearing break-even at the hypothesized full effect.

[RC/PD] Full expected improvement is 50.40 reference-loss points. Incremental workflow effort is assumed to cost 20 points in the same service pool, so break-even is 20. The original small design fails; the smallest passing design requires 68 independent leaders per arm.

Per arm / total	80% MDE	Economic power	Both gates
34 / 68	28.01	89.5%	Fail
68 / 136	19.90	99.6%	Pass*
88 / 176	17.52	>99.9%	Pass*

[PD] Let lambda move the four error probabilities linearly from usual reporting to the stated alternative. The exact finite distribution sums independent leader losses in each arm; it preserves within-leader clustering. A two-sided zero test uses strict 2.5% tail thresholds. The economic test uses the upper 97.5% quantile at lambda=0.39685, where expected benefit equals cost.

[PD] Invert the monotone upper-tail tests for an exact known-family 97.5% lower bound. Clearance requires that bound to exceed 20; false clearance is at most 2.5% for effects at or below break-even. This is not a field confidence guarantee. FFT convolution is checked against direct convolution, exact moments and categorical simulation.

DECISION BOUNDARY

[RC/PD] *Conditional only. Doubling leader heterogeneity requires 83 leaders per arm. Re-estimate nuisance probabilities and error dependence in a blinded pilot, then recalibrate; a larger nominal sample alone cannot repair a wrong model.

[PD/RC] Exact known-family planning; realized lattice size is conservative. Shared managers, training or decision support may reduce the number of independent leaders.

PROSPECTIVE MODEL / SAME-UNIT ECONOMICS

Price additional verification work before approving the workflow

[PD] The economics use arbitrary planning loss units. They are not historical dollars, realized savings or a customer-benefit estimate.

[PD] Set usual mean decision loss to 100 at a preregistered fixed service volume. Assign incremental verification and adjudication effort 9, workflow training and support 6, and maintenance 5, for cost 20. Allocation is per the same eligible-packet service pool; study recruitment does not redefine that pool. Research-only benchmark measurement is budgeted separately.

[PD] Net planning value equals usual-minus-workflow decision loss, expressed in reference points, minus incremental workflow cost. Error-loss weights exclude that additional workflow effort; it is charged once. Use no further avoidable-share or cash-conversion multiplier on this utility scale.

Expected effect	Cost 12	Cost 20	Cost 28
12.60	0.60	-7.40	-15.40
25.20	13.20	5.20	-2.80
50.40	38.40	30.40	22.40

[PD] Rows correspond to one-quarter, one-half and full movement along the declared probability path. These are scenarios, not confidence intervals. A smaller live prevalence of material inconsistencies, a lower cost of wrong release or a different hold penalty can change both the estimand and the decision.

[PD] Separate field equation: $\text{net} = \text{eligible volume} \times \text{mature customer ITT reduction} \times \text{avoidable cost per outcome} \times \text{non-overlap share} - \text{incremental cost}$. Fix population and maturity prospectively. These inputs are unavailable; this field model is unpowered and unestimated.

DECISION BOUNDARY

[PD] Before a live pilot: validate the loss codebook, measure actual workload and consequence costs, preserve the all-packet denominator, and power unweighted erroneous-release and unnecessary-hold guardrails. Primary-loss power does not establish guardrail safety.

[PD/RC] Utility-based benchmark economics. A separately randomized operating-domain trial with mature outcomes is required for customer or financial impact; it is currently unpowered.

PROSPECTIVE MODEL / VALUE OF INFORMATION

Purchase evidence only when it changes the next authorized decision

[PD] This separate three-state model values an evidence purchase. Its payoffs do not depend on achieving the benchmark effect and must not be added to outcome value.

[PD] States are: basis and authority adequate, routing passes; basis and authority adequate, workflow needs repair; or basis/authority unresolved. Assign the unresolved state first to avoid overlap. Priors are 0.40, 0.35 and 0.25. Actions are bounded next-stage validation, repair and rerun, or hold/escalate; none grants production deployment.

Action / state order above	1	2	3
Bounded validation	18	-12	-30
Repair and rerun	-4	12	-8
Hold and escalate	0	0	0

[RC/PD] Without new information, repair has expected value 0.60; perfect information adds at most 10.80. Signal accuracy is 0.45, 0.70 or 0.90; each wrong label receives half the remaining probability. Optimize actions after each signal, then subtract the evidence-acquisition cost.

Signal	EVSI	Evidence cost	Net EVSI
Low	0.323	0.75	-0.427
Base	5.085	1.50	3.585
High	8.895	3.00	5.895

[PD] Action costs are already netted in payoffs; acquisition costs are separate. The signal experiment must be calibrated to actual evidence. Negative net value means decline that purchase under these assumptions, not waive mandatory reconciliation, safety or authority checks.

DECISION BOUNDARY

[PD] A positive information value can justify a bounded audit even when deployment is held. It is not proof that the dashboard produces better customer outcomes.

[PD/RC] Exact finite-state Bayesian decision calculation; no historical priors or payoffs are inferred. EVSI is bounded by EVPI in the same utility model.

Reproduce the analytical finding without disclosing the operating record

[AI] This is an operating-design and source-reconciliation case. Its public contribution is a falsifiable decision contract, not a retrospective impact estimate.

Claim class	Meaning and publication boundary
[HR] Historical record	A registered requirement, reported check or artifact state. The register is available; the underlying historical artifacts remain unrecovered.
[RC] Recalculated	Arithmetic from registered inputs, protected relative comparisons and explicitly hypothetical planning calculations. Recalculation does not authenticate the source.
[AI] Analytical inference	Interpretation constrained by metric identities, source conflicts and evidence strength. A conditional contradiction does not identify the correct replacement value.
[PD] Proposed design	The DRC framework, benchmark, field protocol and value-of-information scenarios. These are recommendations, not historical implementations.

Reproduction order

[PD] Verify the workbook hash and cell-linked extraction. Recompute each metric-specific source branch, the component inequality, zero-selection identity and tentative process screens. Rerun the separate finite-law decision benchmark and information-value model. Then rebuild the figures and document, checking the public transformation and rendered pages.

[PD] The private package retains raw values, identities, exact locators, source-selection rules, code, declared assumptions, independent numerical checks and rendered-page review records. It does not embed the original workbook or recreate the unavailable historical application. Share the public PDF separately from this package.

ORIGINAL ANALYTICAL CONTRIBUTION

[AI] A universal scale correction cannot repair a common-basis component contradiction; an outcome-dependent completeness rule can bias the reported measure. Both findings change release requirements without claiming an observed customer benefit.

Labels: [HR] historical record; [RC] recalculated; [AI] analytical inference; [PD] proposed design. Source basis S1; see private annex.

RESEARCH REFERENCES / METHODS AND INTERPRETATION

Verify a measure before relying on its presentation

Primary scholarly and official sources inform interpretation and the proposed design. They do not independently corroborate this project.

Schelter, S., Lange, D., Schmidt, P., et al. (2018). Automating Large-Scale Data Quality Verification. *PVLDB*, 11(12), 1781–1794. Full original. Declared constraints motivate executable checks; passing selected checks does not establish complete semantic correctness.

W3C (2016). Data on the Web Best Practices: Data Quality Vocabulary. Working Group Note. Quality measurements bind a metric to an evaluated resource and provenance. The note does not supply a universal quality definition or certify this case.

Fielding, R., Nottingham, M., & Reschke, J. (2022). HTTP Semantics. RFC 9110, §15.3.1. Official standard. Successful transport is distinct from application-specific metric validity; no particular connector behavior is inferred.

NIST (1997). DATAPLOT Reference Manual: Weighted Mean, 2-65. Official definition. The case derives the exposure-weighted ratio-of-sums and convex-hull consequences explicitly.

Wang, R. Y., & Strong, D. M. (1996). Beyond Accuracy: What Data Quality Means to Data Consumers. *JMIS*, 12(4), 5–33. Full original scan. Context, representation and accessibility inform metric acceptance; they do not establish operating benefit.

Shmueli, G. (2010). To Explain or to Predict? *Statistical Science*, 25, 289–310. Author manuscript. Predictive relationships and explanatory causal quantities have different objectives. A fitted driver association is not an identified intervention effect.

Source scope is stated in each reference and the private research memo. Historical project assertions come from protected register S1. The cited literature supplies no external review or project endorsement.

RESEARCH REFERENCES / METHODS AND INTERPRETATION

Separate routine variation, selection and causal evidence

Primary scholarly and official sources inform interpretation and the proposed design. They do not independently corroborate this project.

NIST/SEMATECH. e-Handbook of Statistical Methods: Individuals Control Charts. Official method. Individuals and moving ranges support a tentative variation screen; an inherited four-point series cannot establish a stable operating phase or treatment effect.

Laney, D. B. (2002). Improved Control Charts for Attributes. *Quality Engineering*, 14, 531–537. Primary publication. Overdispersion motivates adjusted attribute limits. The present evidence lacks a suitable repeated event/exposure panel, so no Laney p' result is manufactured.

Barnett, A. G., van der Pols, J. C., & Dobson, A. J. (2005). Regression to the Mean: What It Is and How to Deal with It. *IJE*, 34, 215–220. Primary abstract and metadata. Selection on extreme values motivates the independently derived normal-tail sensitivity; that sensitivity is not a historical estimate.

Cohen, J. (1960). A Coefficient of Agreement for Nominal Scales. *Educational and Psychological Measurement*, 20, 37–46. Primary publication record. Kappa motivates a proposed coding-reliability audit. No observed agreement result or kappa precision is asserted.

Callaway, B., & Sant'Anna, P. H. C. (2021). Difference-in-Differences with Multiple Time Periods. *Journal of Econometrics*, 225, 200–230. Author manuscript. Group-time treatment effects inform a possible staggered field design; that design is not the randomized decision benchmark modeled here.

Collier, D. (2011). Understanding Process Tracing. *PS: Political Science & Politics*, 44, 823–830. Primary publication. Diagnostic tests constrain contribution claims. A registry reference to an original artifact is provisional support, not independently authenticated proof.

Source scope is stated in each reference and the private research memo. Historical project assertions come from protected register S1. The cited literature supplies no external review or project endorsement.

RESEARCH REFERENCES / METHODS AND INTERPRETATION

Make the contribution testable against the literature

Primary scholarly and official sources inform interpretation and the proposed design. They do not independently corroborate this project.

The W. Edwards Deming Institute. The Funnel Experiment. Official account of the tampering demonstration. Responding to routine variation can worsen a process. The case neither observes nor estimates tampering-induced harm.

Campbell, D. T. (1976). Assessing the Impact of Planned Social Change. Occasional Paper 8, Dartmouth College. Original reprint. Consequential indicators can distort behavior; rewarding release volume is therefore a design risk, not a diagnosis of intentional gaming here.

Ittner, C. D., Larcker, D. F., & Randall, T. (2003). Performance Implications of Strategic Performance Measurement in Financial Services Firms. *AOS*, 28, 715–741. Primary abstract and metadata. Measurement-system satisfaction and economic results differ; neither dashboard completeness nor user approval substitutes for value evaluation.

Tucker, A. L., & Edmondson, A. C. (2003). Why Hospitals Don't Learn from Failures. *CMR*, 45(2), 55–72. Author working paper. First-order workarounds can leave system constraints unresolved. Named resolution ownership is a proposed extension to reporting failures, not an empirical replication.

OECD/European Commission JRC (2008). Handbook on Constructing Composite Indicators: Methodology and User Guide. Official handbook. Normalization, weights, overlap and sensitivity require disclosure. DRC uses mandatory gates rather than a compensating composite score.

Strong, M., Oakley, J. E., Brennan, A., & Breeze, P. (2015). Estimating the Expected Value of Sample Information Using the Probabilistic Sensitivity Analysis Sample. *Medical Decision Making*, 35, 570–583. Author repository. Information value depends on decisions and a future-evidence model. This case uses an exact finite-state illustration, not the authors' regression estimator.

Source scope is stated in each reference and the private research memo. Historical project assertions come from protected register S1. The cited literature supplies no external review or project endorsement.

The case supports a reconciliation gate and a controlled next test

[AI] This report records author-led review with parallel source, methods and analytical agents. It is not external peer review, client approval or certification.

Major issue	Disposition in the revised case
Metric and version conflicts	Overall and timeliness scope factors are separated; the nested-population interpretation is conditional. A matching rate does not settle the lost-item denominator.
Internal invariants	The component floor requires disjoint subsets and a common denominator. A universal multiplier preserves the violation. An alternate source version is retained.
Completeness and variation	Genuine zeros remain eligible. Missing and immature periods require independent evidence. Tentative count limits cannot support a rate or causal improvement claim.
Evaluation and economics	An all-packet decision-loss benchmark prices false release, unnecessary hold and timeout. Finite-law power, break-even and heterogeneity sensitivity are explicit hypothetical calculations.
Sources and attribution	Cell reconciliation does not authenticate original artifacts. Design direction has provisional registry-level support; field adoption, customer effects and savings remain unestablished.

Partner critique: can a COO act on page one?

[AI] Yes: appoint metric, platform and operating owners; hold the affected interpretation until source identities reconcile; authorize a controlled decision benchmark after an independent truth manifest exists. The finding changes the repair choice rather than merely calling for more data.

Minor revisions and publication disposition

[AI] Review separated transport success from measure validity, all-hold behavior from useful caution, codebook agreement from construct validity, and planning loss units from dollars. Numerical reproduction and actual rendered-page reviews are recorded against the final artifact hashes.

REVIEW DISPOSITION — PASS WITHIN STATED SCOPE

[AI] The publication supports a registry-based design case and a reproducible proposed test. It cannot establish historical deployment, individual causal contribution to outcomes or realized economic value.

Labels: [HR] historical record; [RC] recalculated; [AI] analytical inference; [PD] proposed design. Source basis S1; see private annex.